UNIVERSITY OF TECHNOLOGY SYDNEY

MUTUAL LEARNING FOR SOCIAL CHANGE
APPENDICES

Institute for Sustainable Futures

Yarra Valley Water

2011

Mutual Learning for Social Change

Using social research to support the introduction of urine diverting toilets in the Kinglake West Sewerage Project

APPENDICES

Prepared by the Institute for Sustainable Futures
for Yarra Valley Water

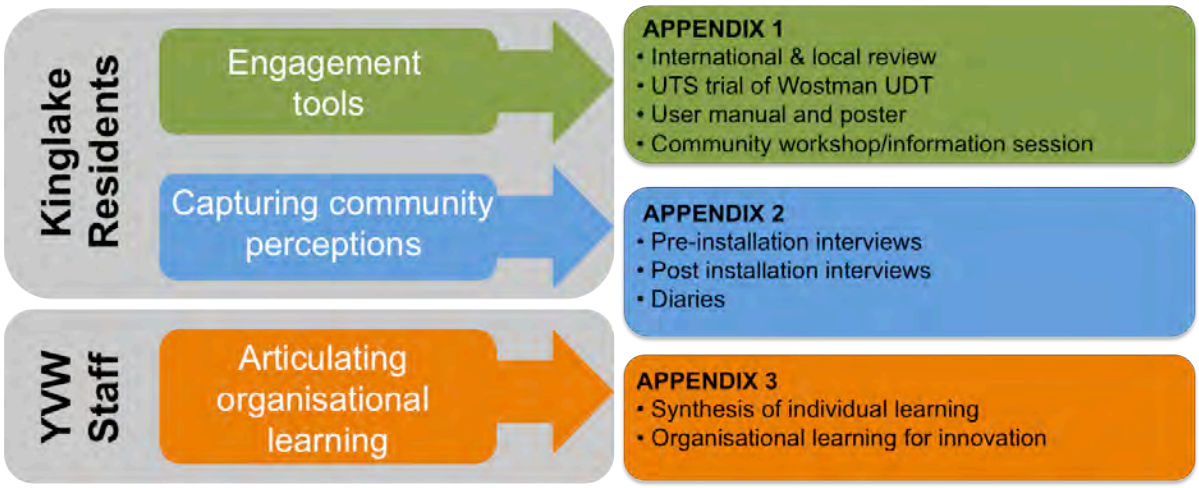
Institute for Sustainable Futures
University of Technology, Sydney
PO Box 123, Broadway, NSW, 2007

Contents

Explanatory notes on Appendices

The Appendices provide details of each of the project elements, structured as in the figure below.

Appendix 1 is focused on the engagement tools created for Kinglake residents.
Appendix 2 is focused on the Kinglake community's perceptions on urine diversion tracked over time.
Appendix 3 is focused on the articulation of the learnings for YVW staff involved in the Kinglake project team.



Each appendix draws from and includes deliverables and relevant sections of Progress Reports, and show how each project element developed and changed over time. The task map overleaf illustrates the timing of tasks and the reporting period for each progress report.

The project element descriptions include an outline of the aims of the task, excerpts from the relevant progress reports with dates indicated, and the task outputs/deliverables.

Timeline and coverage in progress reporting

		Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11
Progress report date/period →		11-May-10		12-Jun-10		6-Oct-10			15-Mar-11					23 June 2011					
Task ↓																			
ENGAGEMENT TOOLS (Appendix 1)	A International and Local Review	Completed																	
	C Users' Manual & signage		Modify scope			Draft	Revised and finalised manual & signage												
	UTS trial of Wostman UDT				Proposed UTS trial	Installation, NATA testing, trial report													
	E Workshop									Revised concept plan					Community Info Evening				
CAPTURING COMMUNITY PERCEPTIONS (Appendix 2)	B Pre-installation Interviews		Pilot inteviews scoped	Pilot interviews (analysis report)			Pre-inst. interviews (analysis report)												
	F Post-honeymoon Support Interviews									First post-installation interviews (prelim analysis report)				Remaining post-installation interviews					
	D 'The Toilet Papers' Diary		Early diary distribution	distribution & plans to continue						Briefing for YVW staff to distribute				Incentive offered for return of diaries		Task dis-continued			
ORGANISATIONAL LEARNING (Appendix 3)	J Evaluation of Learning													new task agreed			Interviews and briefing paper		Workshop and report

APPENDIX 1: ENGAGEMENT TOOLS

1.1 International and local review of user manuals for urine diverting toilets

Aim and task description
The review aimed to gather examples, lessons, insights and experiences from elsewhere, that can be adapted for the UDT User Manual and associated materials.
The task was to review existing published and web-based materials and manuals targeting users, owners, cleaners, municipalities, etc. [note: in this review, the focus is on urine diversion and capture, and excludes the reuse component]

11 May 2010

We have completed the literature review on user manuals and associated documentation, and will provide that once the contract is signed. The results are intriguing – in short, there is very little to go on! Intriguingly, most manufacturers have not considered the users.

KINGLAKE MUTUAL LEARNING FOR SOCIAL CHANGE PROJECT

International and local review of user manuals for urine diverting toilets

For Yarra Valley Water

Authors

Dena Fam, Cynthia Mitchell & Kumi Abeysuriya

3 June 2010

Institute for Sustainable Futures

Disclaimer

Please cite this report as: Fam D., Mitchell C. & Abeysuriya K., 2010, *International and local review of user manuals for urine diverting toilets*, Prepared for Yarra Valley Water by the Institute for Sustainable Futures, University of Technology, Sydney.

Abbreviations

UD	Urine Diversion
UDT	Urine Diversion Toilets
GTZ	German Technical Association
EAWAG	Swiss Federal Institute of Aquatic Sciences and Technology

TABLE OF CONTENTS

1 Introduction

The trial of urine diversion (UD) toilets at Kinglake in collaboration with YVW takes an innovative approach to supporting innovation by investing significantly in social research. As socio-technical change requires not only the operation of functional technology but also requires supporting changing social habits of practice, ISF is developing a user manual for Kinglake residents to inform, instruct and support residents in adopting UDT as an alternative sanitation system.

The first component of the social research project is a review of existing local and international 'user manuals'. User manuals are defined as informative and instructional material provided by manufacturers on how to manage, operate and maintain their toilet system. An overview of existing user manuals is a precursor for developing a Kinglake user manual and provides insights and examples of what might be adapted.

1.1 Process/Method

In attempting to gain information on 'user manuals' ISF has taken a multi-pronged approach by contacting both manufacturers of UD systems and practitioners involved in trialling UD.

Manufacturers involved in this review were asked to provide a 'user manual' which informs customers of appropriate means to managing their toilet and potential problems that may arise in using a new system of sanitation. In many cases the manufacturer was unsure of the meaning of the term 'user manual'. We therefore broadly defined 'user manual' to include information to help users manage, operate and maintain their toilet as well as FAQs on the system.

User manuals selected for the review have been produced by the leading manufacturers of both UD and waterless toilet manufacturers both internationally and locally. Manufacturers that did not provide substantial post-installation information or did not have available information on user manuals were omitted from the review.

Toilet manuals included in the review were:

1. Wostman Ecology AB (urine diversion)
2. Gustavsberg (urine diversion)
3. Dubbletten (urine diversion)
4. Roediger (urine diversion)
5. Separett (waterless urine diversion)
6. Clivus Multrum (waterless toilet)
7. Nature Loo (waterless toilet)

Additionally, user-focussed information was also sought from leading European research institutes who have actively engaged in large scale pilots in their own organisations (i.e., have firsthand experience of UDTs use). These included:

1. German Technical Association (GTZ)
2. Swiss Federal Institute of Aquatic Sciences and Technology (EAWAG)

1.2 Evaluation Criteria

The criteria for reviewing manuals relate to the anticipated requirements of Kinglake residents as early adopters of UDT. As a radical innovation that is unfamiliar to many

Australian households user manuals will be critiqued on how appropriate they are for new users of UD systems. We reviewed manuals in relation to:

- The information provided and whether it is appropriate for new users of UDT
- How engaging the material is in communicating maintenance, operation and management issues
- How accessible the manual is as a quick reference tool for trouble shooting eg. length of manual and percentage of text compared to easier to access images and graphic representation
- Whether the manual provides appropriate FAQs for new users

We were also on the lookout for how the manuals presented particular issues we identified as necessary to include in the user manuals for Kinglake residents, such as:

- General use – need for men to urinate sitting, use by children, advice for visitors, managing toilet paper
- Cleaning – what cleaning products to use, how to clean the toilet, dealing with contamination of the urine bowl (faeces, blood, vomit etc)
- Troubleshooting – dealing with blockages, odours

A summary and implications for YVW follows next. Commentaries on the evaluation of individual manuals and instructional materials are provided in Sections 3 and 4 respectively. The commentaries include web links to materials available electronically. Manuals that were only available in hard copy are included as scanned documents in the appendix.

2 Summary and Implications for YVW

The review of international and national user manuals has highlighted a surprising lack of consideration by many manufacturers in providing support to end-users in the maintenance, management and operation of their new system. It suggests that they had little appreciation of UDTs as socio-technical change that required end-users to be informed and supported in changing habits of practice, for example, for men to be seated, for the need to use biodegradable cleaning products, and routines for managing potential clogging (struvite precipitation).

User manuals that fared better in our evaluation were those that provided graphic representation of not only how the system is configured by also how to use, clean and maintain the system. Graphics with minimal text provided a quick reference for end-users in trouble shooting.

The majority of manufacturers reviewed did not provide appropriate user friendly information/instructional material. In addition, there were some recurring characteristics that emerged.

- **'User manuals' being used as marketing and promotion tools**

'User manuals' have been defined by many manufacturers to mean promotional material where the benefits of the system are communicated, generally with reference to decreased costs and water consumption and the ecological and environmental benefits of UDT and waterless toilets, but little reference to everyday maintenance issues.

Odour management has been highlighted by all manufacturers, but primarily from a marketing perspective of correcting perceptions about potential odours associated with UDT technology, rather than from a troubleshooting perspective.

- **A lack of practical guidance on how to manage, operate and maintain the system.**

A number of suppliers of urine diversion/waterless toilets provided incomplete information for users in managing, maintaining and operating their toilets. Several manufacturers mentioned in interviews that practical advice on the system was given informally during conversation with the customer at the point when the system was being purchased. It suggests an assumption that the user will be well informed about the system at the time of purchase and that verbal communication between the supplier and customer about the management of the toilets will suffice when purchasing the system. Even if true, such an approach fails to recognise that the customer receiving the verbal information may not be the person maintaining the toilet, or may not recall all of the information after a lapse of time, or that the occupants of the house may change in the future.

None of the manufacturers have made reference to issues dealing with taboo issues such as menstruating or vomiting.

- **Technical focus**

Most manufacturers placed an emphasis on providing detailed engineering drawings of the toilet and installation of the system. While the provision of engineering drawings may be helpful for owner/builders in installing the new toilet, this is much less relevant for Kinglake residents since they are having their UD toilets purchased and installed by YVW.

- **Historical information**

A small number of manufacturers have provided extensive background information to the user on the history UD and benefits not only to individual customers but also the broader community, and in some cases reference to global benefits of alternative sanitation systems (NatureLoo, Clivus Multrum, Dubbletten). While this will be of interest to Kinglake residents the greater concern will be for informing residents on how to use, manage and operate their systems while dealing with problems that will arise.

The review of user manuals has highlighted the neglect by most manufacturers to consider users being introduced to these socio-technical systems, unlike YVW that has recognised that this is critical for the process of behavioural change to occur and for the new system to be successfully adopted.

It means that material for user manuals would largely need to be 'invented' for the Kinglake community, and maintained as a 'live' resource that can be updated as people share their experiences using the UDTs. Hard copy manuals should be user friendly – brief, visual and clear – and include the basic information noted in the previous section. Supplementary information that may be of interest to some but not all users could be made available through the YVW website.

3 Review of manuals

3.1 Wostman Ecology AB - EcoFlush urine separating toilet

www.wostman.se/ecoflusheng.html

There is little practical information on Wostman's website for informing or instructing end-users on everyday maintenance and operation of the toilet[1]. The primary function of the website is for promotional purposes in advertising the economic and environmental benefits of urine diversion technology eg. reducing 80% water consumption in toilet use.
The section 'FAQs' provides technical information regarding dimensions, appropriate connections, urinary drainage, outflow piping and does not offer practical advice for the user of the toilet on cleaning, maintenance and operation. On request further information on installation requirements are available with graphic representation but there is no other practical advice on the operation of the system.

POSITIVE: Visual representation of the water saving benefits of urine diversion is very effective and engaging
NEGATIVE: Lack of practical guidance on trouble shooting, cleaning requirements, dealing with odour issues and clogged pipes and the need to change habits of practice in use

3.2 Gustavsberg – wall hung WC with cistern

www.berger-biotechnik.com/assets/s2dmain.html?http://www.berger-biotechnik.com/

Gustavsberg promotional material informs the user of the ecological and economic benefits eg. reduced water consumption, increased capacity of sewage tanks as well as benefits for wider society eg. reduced costs of wastewater treatment and potential reuse of urine in agriculture (although there is no reference to how to reuse urine)

Functional characteristics, a range of applications, building conditions, plumbing and maintenance aspects are all mentioned in the user information available on-line. The need to sit to urinate is mentioned as a maintenance issue. Biotechnik have noted that they inform customers informally about operational aspects of the system eg. cleaning. On request further information on installation is available with photographic representation of the installation and pipe maintenance.

POSITIVE: mentions the need to sit to urinate, photographic representation of toilet, individual and community benefits mentioned, visual representation of pipe cleaning through photographic images
NEGATIVE: Lack of practical guidance on trouble shooting, cleaning requirements, dealing with odour issues and clogged pipes.

3.3 Dubbletten – Urine Diversion toilet

www.dubbletten.nu/english-presentation/english-presentation.htm

[1] The Wostman website appears to be under development since this review was conducted,

Dubbletten provide an on-line and hardcopy manual. The marketing material positions the toilet in context of the bathroom suggesting the need to collect toilet paper separately to reduce water consumption, specifically referencing the need to changes in habits of practice. Seven system configurations of the toilet are provided, from discharging urine directly to the sewer to urine separation and composting wastewater on-site.

The site informs users of the nutrient value of urine through scientific analysis and personal anecdotes on the development of the toilet. The importance of nutrient recovery is legitimised by discussing international regulatory frameworks that support sustainable wastewater management. There is a significant amount of information about why urine diversion is important supported by scientific research and environmental regulation but less information on how to manage, operate and maintain the system.

POSITIVE: supportive documentation to legitimise resource recovery, contextualising the toilet in everyday practices eg. suggestion of collecting paper separately, reference to children using the toilet
NEGATIVE: Lack of practical guidance on trouble shooting, cleaning requirements, dealing with odour issues and clogged pipes.

3.4 Roediger – NoMix Toilet

www.roevac.com

Roediger provide technical and instructional drawings on how the mechanism for diverting urine is achieved. The need to sit down in order for the toilet to operate effectively is emphasised. But the focus is on the technical function of the toilet rather than the socio-cultural challenges of adopting a new sanitation system. On request further images on installing the toilets are provided. There is not information for the customer on how to manage, operate or maintain the system

POSITIVE: mentions the importance of sitting to urinate, well designed instructional technical drawings and photographs
NEGATIVE: Lack of practical guidance on trouble shooting, cleaning requirements, dealing with odour issues and clogged pipes.

3.5 Separett – Villa (waterless urine diversion)

www.separett.com

Separett provides graphic representation of a closed loop nutrient cycle which is encouraged through the use of their toilet. There is a very concise explanation and photographic representation of how each component of the system functions, including ventilation, urine separation and the use of composting bins. Separett also provides additional attachment and information about children using the toilet.

There are detailed engineering drawings of the toilet and the ventilation system as well as an explanation of why the toilet remains odour free. Storage and composting is visually explained through 4 simple images with accompanying text. Regulatory approvals and standards included to legitimise the system.

POSITIVE: The use of stylised images to inform the operational process, photographic images to toilet itself to help users identify necessary components, 50% of the brochure is made of images, photographs and engineering drawings, highlighted bullets points and text differentiation. Large proportion of space dealt with ventilation and odour control
NEGATIVE: A FAQs section would be useful for end-users

3.6 Clivus Multrum

www.clivusmultrum.com.au/faq.html

Clivus Multrum provides a comprehensive overview of the system and its benefits. Questions about odour management, cleaning products and processes, energy efficiency, financial cost and reusing the end product are clearly answered. Graphic images of where the systems have been installed are included.

Technical drawings and visual representation of how the system in installed and waste is composted provides a system wide explanation for customers purchasing the system.

POSITIVE: A thorough FAQs section includes trouble shooting, the process of composting and waste management is thoroughly explained
NEGATIVE: 13 page document may be too large for quick reference to problems, there isn't easy access to information that provides quick 'tricks and tips'. The manual is specifically designed for customers considering purchasing the system rather than a customers with a system already installed which will require more concise trouble shooting material

3.7 Nature Loo

www.ecoflo.net.au
This 16 page document focuses on promoting the system by highlighting water and cost savings, alignment to Australian standards certification and Nature Loos superiority in odour management. This material is more of a catalogue than user manual with majority of information dealing with the availability of multiple toilets models. On request Nature Loo has highlighted that further operational and maintenance material is only available after purchase. Nature Loo therefore does not provide open source information on managing their waterless toilets.

Nature Loos promotional material includes testimonials by users that provide positive experiences of the system but little information on the challenges of installing a waterless toilet eg. cleaning, trouble shooting etc.

POSITIVE: Photographs of the whole system including toilets and composting chambers
NEGATIVE: 16 page document with too much text to be used as a quick reference user manual, lack of practical guidance on trouble shooting, cleaning requirements etc.,

4 Review of instructional material

Promotional material from the leading research institutes working on UD, the German Technical Association (GTZ) and the Swiss Federal Institute of Aquatic Sciences and Technology (EAWAG) have been included in this review as both institutes have developed particular approaches to engaging end-users in trailing and adopting UDT through experiential learning.

4.1 Technology Review: Urine Diversion components

http://www.gtz.de/en/themen/umwelt-infrastruktur/wasser/29856.htm

The technical review is an overview of urine diversion components such as waterless urinals, urine diversion toilets, and urine storage and reuse systems. This 30 page document is a review of every aspect of UD from the source (toilet) to reuse (field). The technical report is available in both a hard and soft copy and while it is a comprehensive review of UD components, it does not provide easy access to information for end-users on everyday aspects of managing their systems. While the report has been suggested by GTZ as an appropriate user manual, much of the material is focused on installing UD in the developing world which may be inappropriate for Kinglake residents.

POSITIVE: Well laid out comprehensive report on every aspect of UD, photographic representation of UDT
NEGATIVE: Long 30- page document with focus on issues related to developing countries and extensive reference to urine diversion dehydration systems rather than UD flushing systems.

4.2 Interactive web-tool by Novaquatis - Switzerland

http://www.novaquatis.eawag.ch/tool/index_EN

The interactive tool by Novaquatis relates specifically to the NoMix project piloted at EAWAG in Switzerland. The interactive tool is a valuable source of information for end-users, in particular the FAQs page which answers many of the questions that end-users may ask about UD, including odour management, issues related to cleaning, changing habits of practice, managing the use of toilet paper etc. The web tool navigates a range of different research areas of the UD system including human waste, collection and storage and reuse of urine in agriculture, therefore much of the information that relates specifically to the use of UD in households is spread out throughout the website.

While a web based tool may not be the most appropriate means of communicating for everyone, it does offer a comprehensive overview of UD. The layout and use of animation is engaging for viewers

POSITIVE: Well organised web based tool that offers comprehensive information on UD, animated areas of interest are engaging for the viewer, FAQs are directly related to questions end-users would ask
NEGATIVE: Web based material may not be accessible for everyone at Kinglake, research strands that may not be of interest to householders requiring specific practical guidance.

5 APPENDIX

Additional Gustavsberg maintenance material obtained from the distributor, and EcoFlo manual.
All other materials are available online and in the public domain.

2/4 litre separation wall-hung WC with cistern

Maintanance

BERGER
BIOTECHNIK GmbH
Sustainable Systems and Products for on site
Biological Waste Treatment, Ecological
Sanitation and Water Saving

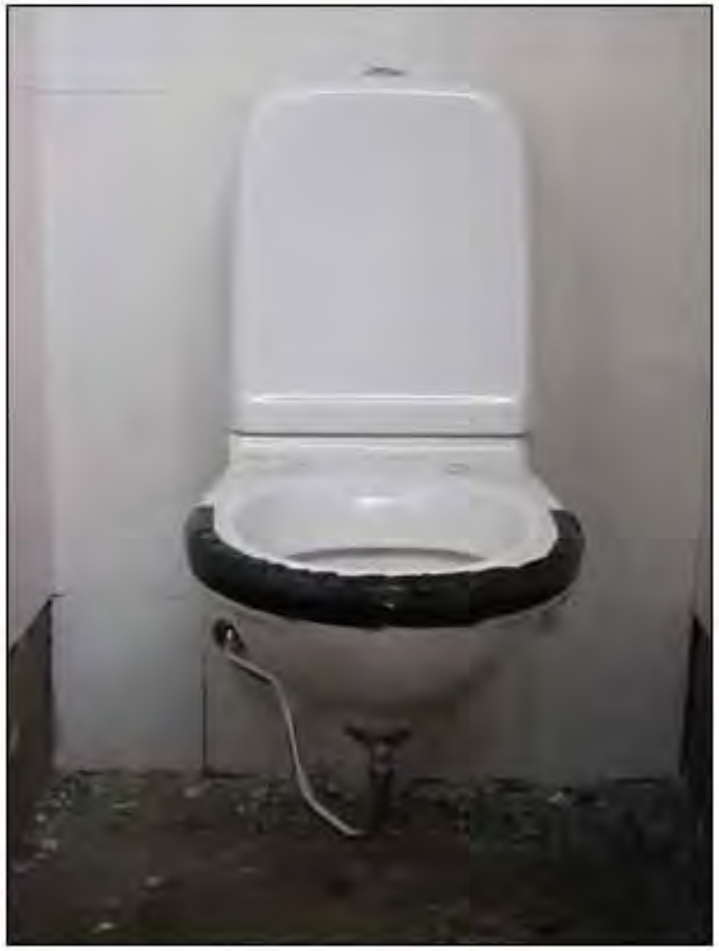
Juliusstraße 27 - D-22769 Hamburg
Fon 0049 40 439 78 75 - Fax 0049 40 43 78 48
www.berger-biotechnik.de - info@berger-biotechnik.de

2/4 litre separation wall-hung WC with cistern

Installation

BERGER
BIOTECHNIK GmbH
Sustainable Systems and Products for on site
Biological Waste Treatment, Ecological
Sanitation and Water Saving

Juliusstraße 27 · D-22769 Hamburg
Fon 0049 40 439 78 75 · Fax 0049 40 43 78 48
www.berger-biotechnik.de · info@berger-biotechnik.de

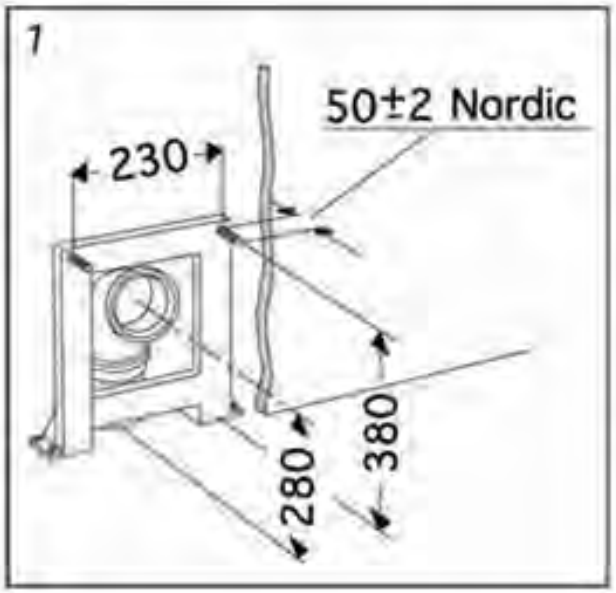


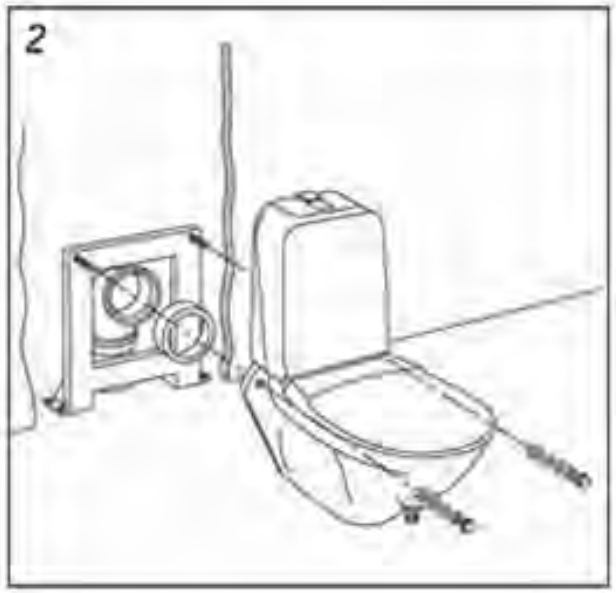
BERGER
BIOTECHNIK GmbH
Sustainable Systems and Products for on site
Biological Waste Treatment, Ecological
Sanitation and Water Saving

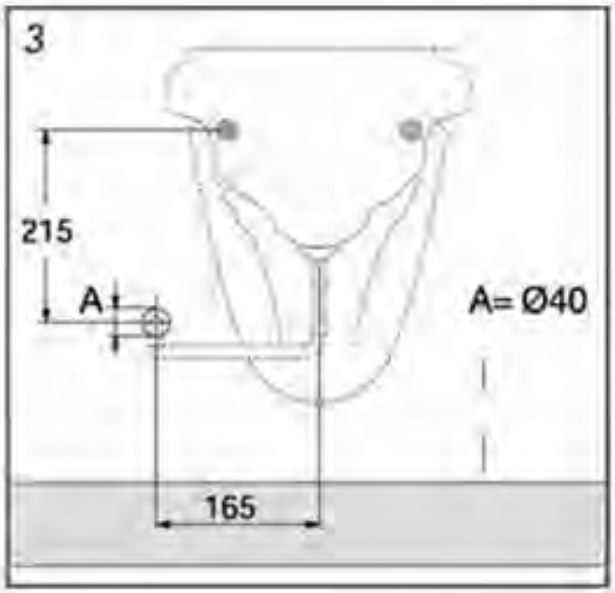
Juliusstraße 27 · D-22769 Hamburg
Fon 0049 40 439 78 75 · Fax 0049 40 43 78 68
www.berger-biotechnik.de · info@berger-biotechnik.de

2/4 litre separation wall-hung WC with cistern

Installation







a. Follow the instructions of wall-hung WC. In addition mark the hole for the urine pipe, which is on the enclosed template too. Make sure, if the pipe must be on the right or on the left side of the toilet, depending on the type of pipe that is delivered.

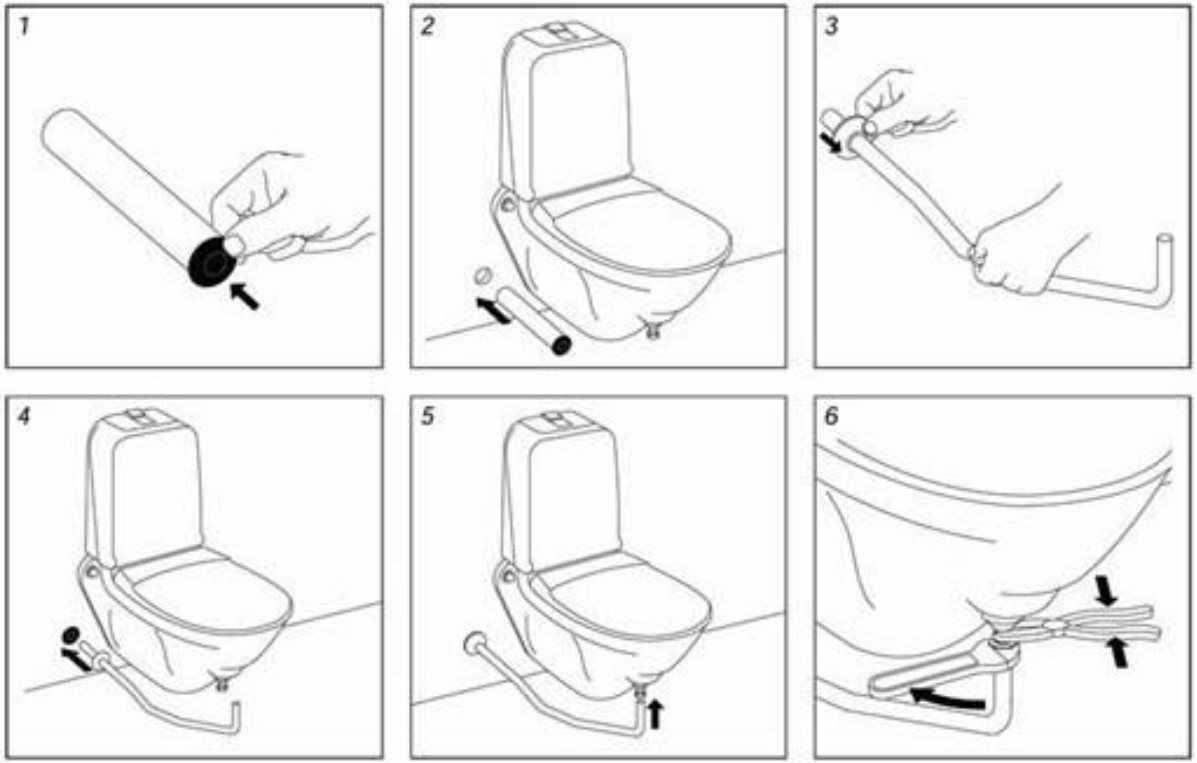
b. Drill a hole through the wall for the enclosed white pipe (40 mm diameter) and put in the enclosed rubber sleeve with metal cover.

BERGER
BIOTECHNIK GmbH
Sustainable Systems and Products for on site
Biological Waste Treatment, Ecological
Sanitation and Water Saving

Juliusstraße 27 · D-22769 Hamburg
Fon 0049 40 439 78 75 · Fax 0049 40 43 78 48
www.berger-biotechnik.de · info@berger-biotechnik.de

2/4 litre separation wall-hung WC with cistern

Installation



c. Connect the long end of the urine pipe into the rubber sleeve and fix the vertical part of the urine pipe with the urine discharge part. Make sure that the sewer part is also well fixed and vertical.

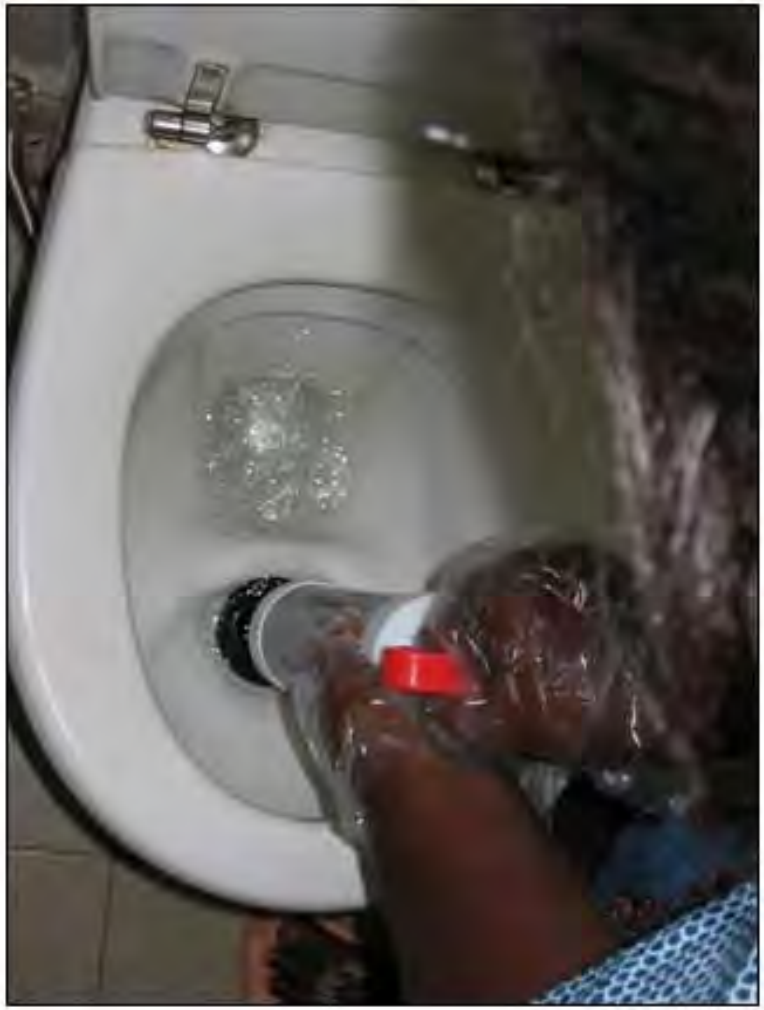
d. Be careful that no parts come into the discharge pipe for urine.

2/4 litre separation wall-hung WC with cistern

Maintanance

BERGER
BIOTECHNIK GmbH
Sustainable Systems and Products for on site
Biological Waste Treatment, Ecological
Sanitation and Water Saving

Juliusstraße 27 - D-22769 Hamburg
Fon 0049 40 439 78 75 - Fax 0049 40 43 78 48
www.berger-biotechnik.de - info@berger-biotechnik.de



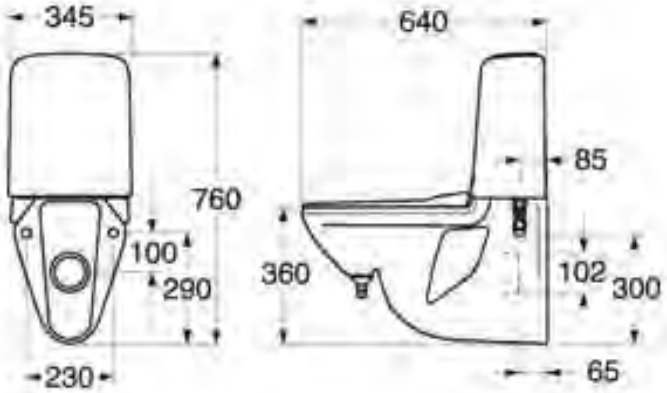
BERGER
BIOTECHNIK GmbH
Sustainable Systems and Products for on site
Biological Waste Treatment, Ecological
Sanitation and Water Saving

Juliusstraße 27 · D-22769 Hamburg
Fon 0049 40 439 78 75 · Fax 0049 40 43 78 68
www.berger-biotechnik.de · info@berger-biotechnik.de

2/4 litre separation wall-hung WC with cistern

Product description

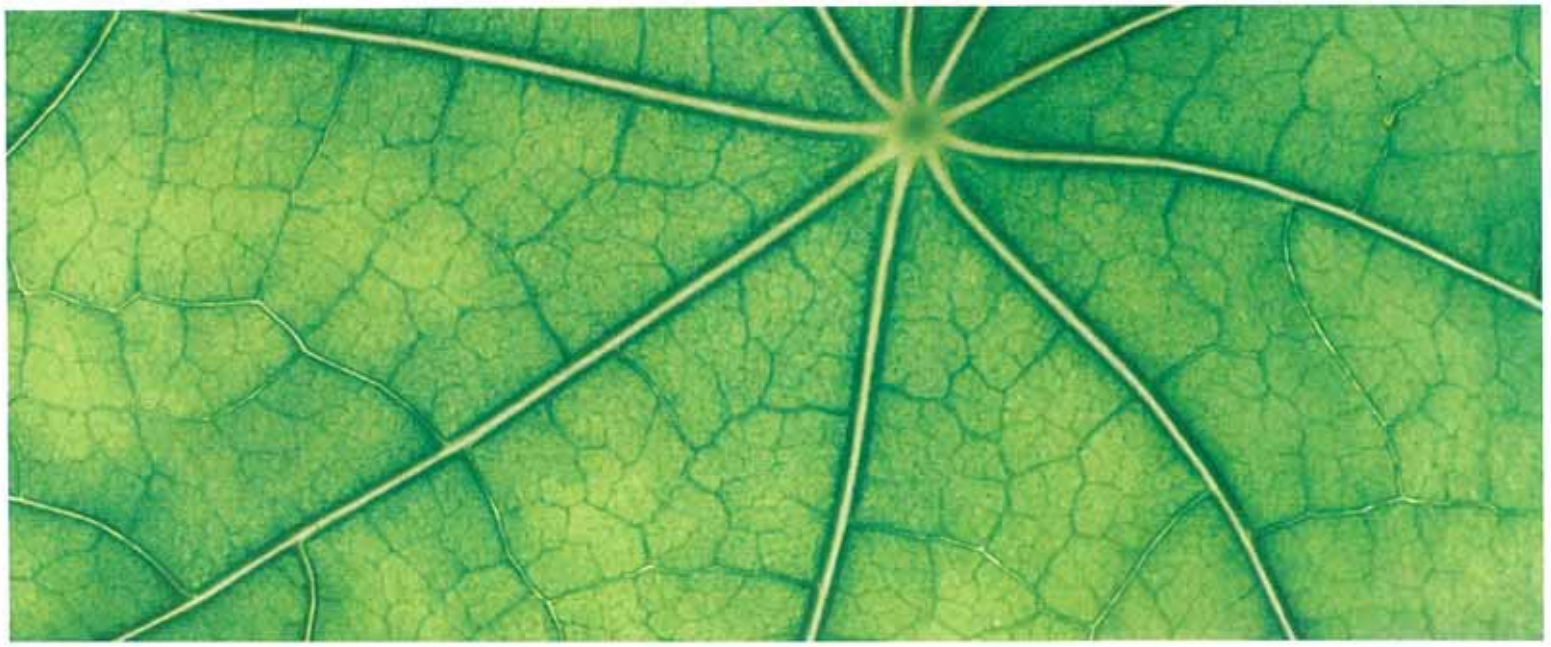
Scope of delivery: 2/4 litre water saving toilet, urine tube, sieve cover, luxury seat and flushing cistern
Measures: see engineering drawing
Weight: approx. 30 kg
Material: toilet and cistern from sanitary ware, seat Duroplast (Pressalit), urine tube and sieve cover V4A
Colour: white
Miscellaneous: 2-quantities-flushbutton for 2 l and 4 l flushing



Go with the flo

Certified Product™
Australian Standard

ECOFLO
WATER MANAGEMENT



Ecoflo
We minimise the flo of H2o

Ecoflo Water Management is Australia's leading supplier of "zero water input" domestic toilets and Greywater systems. For nearly 15 years, while building our reputation as an innovative leader in waterless toilets and Greywater systems, we've been delivering the best in value and Quality Assured products to home owners.

With scientists predicting that droughts will become more severe and prolonged over the coming decades affecting communities throughout the country, there's never been a better time for you to "Go with the flo" and do your bit for water conservation.

The installation of an Ecoflo Water Management waterless toilet and Greywater system reduces the annual water consumption of the average family by 35,000 litres.

The cost to purchase and install an Ecoflo system is significantly less than any other type of approved waste treatment system while running costs are minimal.

An Ecoflo is an investment in the future of Australia's water supplies and provides you with the most economic and sustainable way to treat human waste. Read on - you'll find out why thousands of Ecoflo products have already been installed in homes around the country and how to choose the best Ecoflo product to suit your needs.

Palisade Pedestal

Sun- Mar Excel

Why install a waterless toilet?

To Save Water

Each year a typical suburban home flushes 35,000 litres of potential drinking water down the drain and into sewers. Most Ecoflo toilets use no water at all, conserving this precious resource and saving you money in the process.

To Minimise your Impact on the Environment

Waste from flushing toilet systems attached to on-site waste water treatment plants is normally treated with harmful chemicals for disinfection, and so much energy is used in the process that domestic solar power systems struggle to handle the load. Ecoflo's systems use a natural biological process, are environmentally-friendly and help return nutrients to the soil. Most systems consume minimal electrical power.

To Be Self-Sufficient

With a waterless toilet, Greywater system and rainwater tank, your house and garden can be self-sufficient when it comes to water and waste management.

To Save Money

Apart from the initial low-cost of a combined waterless toilet and Greywater system, there are other benefits, compared to flushing toilet systems - like no service or maintenance contracts, lower electrical costs, fewer moving parts and no pumps. Ecoflo provides sustainable alternatives and are less expensive than flushing toilet on-site systems, such as aerated waste treatment systems, septic tanks and worm farms. This typically represents an ongoing saving of $500 per year on top of the water saving and initial investment.

And with no water down the toilet you have the opportunity to install a smaller lower cost water tank!

To Add Value to Your Home

Just as water tanks add value to your home, so do waterless toilets, as we all strive to minimise water consumption and conserve resources.

"A water-wise home will attract a premium and may become the major contribution to achieving a sale." – A leading property developer

Cost Guide

The following table compares the cost of a combined waterless toilet and separate Greywater system against systems involving the flushing of 35,000 litres per year of water down the toilet. The table is offered only as a guide. Installation costs differ widely depending on local site conditions

Nb Since a home with a flushing toilet will waste 35,000 litres per year of drinking water down the toilet, the already low cost of a waterless toilet can be offset by reducing the size of the water tank required.

	Equipment and Installation	Ongoing Cost
Waterless toilet & primary Greywater treatment	$4,500 - $5,500	Minimal
Septic Tank	$5,000 – $10,000	Low
Septic Tank with large sand filter or reed bed	$10,000 - $15,000	Low
Aerated water treatment system	$10,000 - $15,000	$500 per year

Is a waterless toilet right for me?

If the location where you want to install a waterless toilet can be connected to a town sewerage system, chances are your local council will insist that you connect to it.

However, as of 2007 some metropolitan city councils are beginning to understand the significant role waterless toilets can play in water conservation and are beginning to allow their use in sewered areas.

We suggest you contact your council plumbing officer and question them about this. There is no single more effective way to reduce your water consumption than to stop flushing water down the toilet. If the response is unsatisfactory speak to their supervisor or give us a call!

Of course not all of our customers feel compelled to discuss their toilet arrangements with the council! Many waterless toilets are installed without referral to a council authority.

Once you're convinced a waterless toilet is right for you and your intended use, you'll find all the information you need to make an informed purchase in the following pages.

Ecoflo can supply a suitable waterless toilet for any type of home including low and high set, slab floor and two-storey homes. We can also supply a toilet for mobile homes, granny flats, boats, weekenders, work sheds – just about any structure. Use our easy step-by-step guide and product specifications table to help select the Ecoflo model best suited to your needs.

Ecoflo – The Standard in Performance, Choice, Service and Value

Certified Product™ Australian Standard

Performance - When you "go with the flo" you're buying much more than the best value waterless toilets and Greywater systems - you're buying quality-endorsed products certified to Australian Standards 1546.2 for waterless toilets. If you want to be certain your toilet has adequate capacity, and is safe, you need a toilet certified to the tough performance criteria of AS1546.2 - not one that has State Government approval issued many years ago when standards were lower. If you're comparison shopping, we suggest you ask why our competitors' products don't have certification to AS1546.2 and what was the date of the state approval.

As of 2008 Ecoflo is the only major manufacturer with Australian Standards 1546.2 certification!

Choice - Ecoflo does not sell scaled-down industrial sized toilets, designed for roadside use or parks. As the specialist in, and largest supplier of, waterless toilets for domestic installations, we offer the widest choice of toilets specifically designed for the home. There are batch, continuous and hybrid process systems. We offer all three! This gives you maximum choice in terms of design and ease of servicing.

Capacity / flexibility – Our competitors' products are very large and of fixed capacity. Ecoflo offers, In addition to good sized self-contained units (the entire unit is above the floor), large capacity split systems (composter under the floor). We have low profile split system units requiring just 650 mm clearance between the ground and the bathroom floor and a footprint of < 700 mm square. Since many people prefer the look of a split system this is a real design and cost advantage over our competitors' units requiring over 2 cubic metres for installation under the floor. The Nature Loo range, being modular, has almost unlimited capacity through the addition of extra chambers. This offers our customers the opportunity to start small and low cost and expand capacity as their family grows. Depending on the model the chambers do not need to be located beneath the pedestal. Some models allow the connection of two or more pedestals to the one composter.

Bathroom design – unique to Ecoflo is a range of pedestals to choose from which resemble the style of "normal flushing toilets", but without that ugly and wasteful cistern. Some models can also be colour coordinated to match your other bathroom fittings. Ask for details.

Service - Whether you're looking for assistance in choosing the right model for your needs, or optimising the performance of your system, our friendly team is here to help. Just as our products are built to last, so too is our commitment to service.

Value - ***If you can find a better value waterless toilet, certified to Australian standards or not, we would like to hear from you!***

Ecoflo answers your questions

Q. Do waterless toilets smell?
A. Ecoflo's domestic waterless toilets are odourless. Ecoflo's products use advanced technology to pull odours down into the system and out into the atmosphere via ventilation systems – some of which only use as much power in a day as a 60-watt light bulb uses in an hour. Ecoflo also offers solar and wind-driven ventilation systems.

Pandora Pedestal

Q. Will I need to get council approval?
A. Most Ecoflo toilets have state approval. Local council approval is site specific. If you are planning a new home you will need to make an application to council. If you find the council is advising against the installation of a waterless toilet, or recommending another type of system altogether, please call an Ecoflo consultant immediately to see if we can help you get council approval for your chosen system.

Q. How much water will I save?
A. The amount of water you will save will depend on the number of people living with you and using the waterless toilet. However, approximately 10,000 litres of water per person will be saved each year, giving you the satisfaction of saving water and money, whilst helping sustain and actually improve the environment.

Q. How much money will I save?
A. Apart from the thousands of dollars saved when buying and installing a waterless toilet relative to a water flushing toilet, there is the ongoing annual saving due to lower energy costs, the lack of pumps requiring service and replacement and the mandatory system service fees - according to one council officer a saving of $800. With no water down the toilet you could also install a smaller water tank!!

Q. Why are Ecoflo waterless toilets the least expensive?
A. Ecoflo is the only major company in waterless toilets to rotomould its own composting chambers. This unique cost advantage and our high volume of sales ensures the lowest costs.

Q. What makes an Ecoflo the best choice?
A. Ecoflo offers the best value products coupled with quality assurance through Australian standards certification.

There's an Ecoflo for Everyone!

Ecoflo manufactures the Nature Loo range of conventional waterless toilets and Greywater systems in Brisbane. Nature Loos rely on radiant heat and aeration to drive the composting process. Ecoflo is also the sole importer of Canada's Sun-Mar toilets which use a unique rotating biodrum to generate accelerated composting.

Please see page 14 for Options and page 11 for the cost of the best priced toilets in Australia.

NATURE LOO – Classic Range

The Classic range is the standard Australian split system waterless toilet. It has no moving parts, except the fan, is modular, allowing for additional capacity to be added later at minimal cost, and is the lowest cost approved waterless toilet Australia-wide. It's small size and modular design allows it to be installed in spaces where other toilets will not fit.

The Classic 750 has the conventional looking clean white Pandora pedestal (see page 6 for photo) with timber seat. It requires 750mm under floor vertical clearance.

The Classic 750-3 is the standard product with three chambers. The Classic 750-2 is best suited to intermittent weekender type use but is adequate for couples in warmer climates. It has two chambers.

The Classic 1000 is the deluxe version of the 750 with 20 per cent extra capacity per chamber. Being larger, it requires 1000 mm vertical clearance beneath the bathroom floor. It comes with a trolley to facilitate the rotation of the chambers. The standard Classic 1000 includes the contemporary looking Palisade pedestal and timber seat (see page 2). A heavy duty white seat is available.

The Classic 1000-2 has two chambers. The Classic 1000-3 has three chambers for larger families and cooler climates.

The Classic 1000 is also a good choice for a small commercial or workplace installation.

The Classic 650 is the smallest and lowest cost of the Classic family. It is ideal for weekenders and intermittent use. It requires 650 mm under floor clearance. As of early 2008 it has not been submitted for Australia wide approval but is allowed in Queensland. All other Classic models are approved Australia wide.

Classic 1000

Classic 750

The capacity of the Classic 650-2 can be increased by adding more chambers.

The standard Classic 650 has the Pandora pedestal and timber seat.

All Classic toilets can be customised. The main options are listed on pages 14-15.

SUN- MAR Centrex range

The Centrex toilets are split system units with a unique and patented rotating drum beneath the floor. The bio-drum sets up optimal composting conditions by regularly aerating and mixing the contents and maintaining even moisture distribution.

The standard units, the Centrex 3000 and 2000, use 500mL of water per person per day to flush the waste material sideways into the dry composter. The advantages of this unit are that It allows more than one pedestal to be attached to one central processing unit and gives people who feel the need to flush the option to do so.

The A/F versions, the Centrex 3000 A/F and 2000 A/F, have the composter directly beneath a Palisade style pedestal (see p. 2). There is no micro flush and no option to have 2 or more pedestals

We recommend the standard sized unit, the 3000, particularly in colder geographical locations, but we also stock limited quantities of the smaller 2000.

Both versions and sizes are supplied with a 240 volt fan. If ordered specifically they can be supplied with a 240 volt heater. The primary function of the heater is to evaporate urine which otherwise drains into a small gravel pit. (The specification for Australian toilets is different from those in the Sun-Mar brochure)

There is also the NE version with a 12 volt fan for use with solar power and a slightly reduced capacity.

STAND ALONE SELF-CONTAINED SYSTEMS – For slab on ground

Sun-Mar Excel Range

The unique Sun-Mar tumbling biodrum technology ensures the best possible composting conditions through

- Aeration
- Mixing
- Even moisture distribution

The Excel is a self-contained single unit composting toilet designed for those who are unable to install a chamber beneath the bathroom floor. It employs the Sun-Mar patented rotating bio drum technology to establish ideal composting conditions. It has an attractive high-gloss finish that suits modern bathrooms and is suitable for homes with up to 3-4 people. The Excel can be recessed into the floor to reduce its height

The Compact SM is a lower profile version of the Excel with reduced capacity and is popular in ensuites and granny flats.

The Excel NE, unlike the standard model, has no heater. It has a 12 volt fan and transformer. This reduces usage to 2-3 people but is well-suited to homes using solar power or for holiday homes. The NE can be supplied without the fan and transformer at reduced cost but this is not recommended where the unit is being used daily inside the home.

Sun-Mar Excel

The Excel M is a modified Excel suitable for large boats and mobile homes. In its standard form it has 240 and 12 volt fans and 240 volt heater. In the Sun-Mar brochure it is also referred to as the Excel AC/DC. It is popular with people who want the option to use 12 volt solar power or mains power.

The Mobile is a smaller version of the Excel M. Please see the Specification table on page 12 for fan and heater combinations.

Nature Loo Compact NL

The ***Compact NL-2*** Package is an affordable, easily installed model designed for low volume or part-time use in weekenders, sheds and workshops. The composting chamber serves as the toilet pedestal so you can use it anywhere - even on a slab floor!

There is also the ***Compact NL -3*** for higher volume use and cooler locations.

The Compact has not been submitted for state approval. Its technology is, however, the same as the Australian standards1546.2 certified Classic range.

There is an option to convert the Compact NL at a later date into the split system Classic 650.

Greywater

Nature Clear GWS10 provides a simple low cost effective means of treating Greywater. The contents of the half cubic metre tank filter the water and set up a bio-film to clean the water biologically. The system removes food scraps plus hair and lint from laundries. It also reduces harmful chemicals from detergents. Since the water passes through the system in minutes, bacteria causing odours do not become established. A 45 litre grease trap is supplied for the kitchen water which is best connected to its own trench.

Nature Clear is approved in Queensland with distribution of the treated water via sub surface irrigation (100 x 100 mm trenches which are inexpensive to dig). 2 x 20 metres of 65 mm diameter slotted pipe is supplied. Nature Clear GWS10 has not been submitted for approval outside Queensland but some councils in NSW and Tasmania have allowed them to be installed.

A holding Tank is the alternative to Nature Clear when councils will not permit the use of GWS10. Since this is basically a small septic tank just for Greywater, it is accepted by most councils. It relies on solids separating from the water over time. It is far less efficient than a Nature Clear and more expensive on an installed basis.

Guide to Selection

SPLIT SYSTEMS – Elevated floor

	V/C (1)mm	Price A$	EP (2)	Notes (3)
Classic 750-2	750	2,450	2-3	Pandora pedestal with
Classic 750-3	750	2,800	4	trolley option
Classic 1000-2	1000	2,900	3-4	Palisade pedestal trolley
Classic 1000-3	1000	3,300	5-6	Included
Classic 650-2	650	1,750	1	Pandora pedestal
Classic 650-3	650	1,995	2	Pandora pedestal
Centrex 3000	800	3,975	6-7	Micro flush ceramic pedestal
Centrex 3000 A/F	1000	3,975	6-7	Sun-Mar pedestal
Centrex 3000 NE	800	3,975	5-6	Micro flush ceramic pedestal
Centrex 3000 A/F NE	1000	3,975	5-6	Sun-Mar pedestal
Centrex 2000	800	3,750	4-6	Micro flush ceramic pedestal
Centrex 2000 A/F	1000	3,750	4-6	Sun-Mar pedestal
Centrex 2000 NE	800	3,750	3-5	Micro flush ceramic pedestal
Centrex 2000 A/F NE	1000	3,750	3-5	Sun-Mar pedestal

STAND ALONE SELF-CONTAINED SYSTEMS – Slab on ground

	Price A$	EP*	Notes
Excel	2,970	3-4	240 v fan and heater
Compact S-M	2,450	1-2	240 v fan and heater
Excel NE	2,700	2-3	12 v fan and transformer
Excel Mobile or AC/DC	3,100	3-4	12 and 240v fan and 240v heater
Mobile	2,390	1-2	12 v fan and heater
Compact NL 2	795	1	12 v fan
Compact NL 3	940	2	12 v fan
Excelet 2	1650	1	12v fan and transformer
Excelet 3	1895	2	12v fan and transformer

GREY WATER SYSTEMS

	Price A$	EP*	Notes
Nature Clear GWS10 system	1310	5	Excludes sand and gravel

Code
(1) V/C = Vertical clearance under floor for split systems (minimum) – allow extra 50 mm if ordering the trolley for the Classic 750.
(2) EP = Equivalent people on a full time basis (4 EP is equivalent to 8 people part-time) assuming minimum average temp of >12 deg C
(3) See page 14-15 for other options including ceramic and alternative pedestals.
Price = including GST ex-Brisbane

Specifications – Sun-Mar®

	Excel	Excel NE	Compact SM	Mobile	Centrex 2000	Centrex 2000 NE	Centrex 2000 A/F	Centrex 2000 A/F NE	Centrex 3000	Centrex 3000 NE	Centrex 3000 A/F	Centrex 3000 A/F NE
Composting Capacity												
Number of Equivalent People (full-time use)	3-4	2-3	1-2	1-2	4-6	3-5	4-6	3-5	6-8	5-7	5-7	5-7
Electrical												
Fan Watts (required or optional hook-up)	35 req.	2.	35 req.	4 req.	35 req.	2.	35 req.	2.	35 req.	2.	35 req.	2.
Average Heater Watts	150	N/A	125	63	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unit Dimensions cms												
Height (Composter Only)	84	80	72	71	71	67	71	67	77	74	77	74
Depth	84	82.5	84	57	68.5	67	68.5	67	70	70	70	70
Width	57	57	54.5	49.5	115.5	115.5	115.5	115.5	180	180	180	180
Waste Chute Diameter	N/A	N/A	N/A	N/A	9	9	25	25	9	9	25	25
Vent & Drains cms												
Vent Pipe	5	10	5	7.5	5	10	5	10	5	10	5	10
Drains (required or optional hook up)	1.2 opt	2.4 req.	1.2 opt	2.4 req.	2.4 req.	2.4 req.	2.4 opt.	2.4 req.	2.4 req.	2.4 req.	2.4 opt.	2.4 req.
Weight (kgs.)												
Shipping Weight	45.5	43	41	36	54	49	56	52	78	75	81	77
Shipping Carton Dims cms												
Height	91.5	91.5	77.5	94	76	76	91.5	91.5	84	84	84	84
Length	90	90	90	73.5	119	119	119	119	153.5	153.5	153.5	153.5
Width	71	71	71	56	72	72	72	72	71	71	71	71
Rough-in Measurements cms												
Depth required to remove drawer	117	117	114	79	114	114	114	114	116	116	116	116
Rec. depth to centre of chute from wall	N/A	N/A	N/A	N/A	27	27	30	30	27	27	30	30
Min. vertical gap under bathroom floor	N/A	N/A	N/A	N/A	95-140	95-140	95-145	95-145	100-145	100-145	100-145	100-145
Approvals and Certification												
Australian standards 1546.2 certification	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
State approvals	ALL	QLD, WA NSW, NT & others pending	QLD,WA NT & NSW others pending	Not required	QLD, WA , NT& NSW others pending	QLD, WA , NT& NSW others pending	QLD, WA, NT, VIC & NSW others pending	QLD, WA , NT& NSW others pending	QLD, WA, NT, SA & NSW others pending	QLD, WA , NT& NSW others pending	QLD, WA, VIC, NT & NSW others pending	QLD, WA, NT & NSW others pending

Specifications – Nature Loo

	Classic 1000-2 2 chambers	Classic 1000-3 3 chambers	Classic 750-2 2 chambers	Classic 750-3 3 chambers	Classic 650 – 2 2 chambers	Classic 650 – 3 3 chambers	Compact NL 2 2 chambers	Compact NL 3 3 chambers	Excelet 2 2 chambers
Composting Capacity									
Number of Equivalent People (full-time use)	3-4	5-6	2 ,	4	1	2	1	2	1
Electrical									
Fan Watts (required or optional hook-up)	5 req.	5 req.	2 req.	2 req.	2 req.	2 req.	2 req.	2 req.	2
Unit Dimensions cms									
Height (Composter Only)	90	90	70	70	55	55	55	55	62
Depth	85	85	62	62	45	15	45	45	72
Width	80	80	60	60	45	45	45	45	52
Waste Chute Diameter	25	25	25	25	25	25	N/A	N/A	N/A
Vent & Drains cms									
Vent Pipe	10	10	10	10	10	10	10	10	10
Drains (required or optional hook up)	2.5	2.5	1.9	1.9	1.9	1.9	1.9	1.9	1.9
Weight (kgs.)									
Shipping Weight	35	40	20	25	18	22	12	16	
Shipping Carton Dims cms									
Height	80 x 2	80 x 3	60 x 2	60 x 3	70 x 3	70 x 4	55 x 2	55 x 3	
Length	90 x 2	90 x 3	70 x 2	70 x 3	45 x 3	45 x 3	45 x 2	45 x 3	
Width	80 x 2	80 x 3	60 x 2	60 x 3	45 x 3	45 x 3	45 x 2	43 x 3	
Rough-in Measurements cms									
Depth required to remove drawer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rec. depth to centre of chute from wall	30	30	30	30	30	30	N/A	N/A	N/A
Min. vertical gap under bathroom floor	100	100	75	65	65	N/A	N/A	N/A	N/A
Approvals and Certification									
Australian standards 1546.2 certification	YES	YES	YES	YES	NO	NO	NO	NO	NO
State approvals	ALL	ALL	ALL	ALL	QLD only	QLD only	QLD only	QLD only	QLD only

N.B. All Nature Loo toilets can have increased capacity by adding extra chambers

Options and Accessories

PEDESTALS (zero flush classic spilt-systems only)			
	Standard Pedestal	Palisade viz standard (see page 2)	Pasadero (Urine Diverting) viz standard (see pedestal sheet)
CLC 650	Pandora (see pg 6)	**+ $ 60**	**+ $ 85**
CLC 750	Pandora	**+ $ 60**	**+ $ 85**
CLC 1000	Palisade (see pg 2)	**N/A**	**+ $ 25**

TROLLEY	
A trolley can be supplied for the Classic 750 (1 only required)	**$ 170**
The Classic 1000 can be supplied without the trolley	**- $ 170**

WASTE CHUTE (Classics and Centrex A/F only)	
If your bathroom floor is >70 cms above the composting unit you will need an extra length of chute and a seal	**$ 86**

ENZYMES (All Toilets)	
To accelerate composting, provide a fresh fragrance and as a biodegradable cleaner 1 litre concentrate bottles (20L when diluted) enough for 2 years	**$ 30**

SEATS	
A white plastic seat can be substituted for the timber seat on the Palisade pedestal	**No charge**

Options and Accessories

FANS	
12 or 24 volt and 2 watt (Nature Loos and Sun-Mar NE models) 12 or 24 volt 5 watt (Nature Loos and Sun-Mar NE models)	**$ 50** **$ 55**
240 volt 35 watt (Other Sun-Mar models)	**$ 90**

UPS (Only 12 or 24 volt toilets)	
The Uninterrupted Power Source will provide power to 12 or 24 volt fans during 3-4 hour black outs. Price quoted is valid when UPS purchased with a toilet	**$ 125**

SOLAR POWER SYSTEM (12 and 24 volt 2 watt systems only)	
A 30 watt panel, regulator and 33 a/hr battery for continuous power to 12 or 24 volt fans	**$ 645**

WIND DRIVEN VENTILATORS (Nature Loos only)	
Where there is no electrical power we can supply a ventilator which will turn in wind speeds of >5km/hr. This is not recommended for full time use toilets in the home.	**$ 165**
If the fan and transformer are not required the cost of the ventilator is	**$ 75**

Conditions
We reserve the right to modify specifications of Nature Loo products
The specifications of Sun-Mar toilets supplied in Australia may differ from those supplied in N America as per the Sun-Mar brochure

Ecoflo Owners Say...

"I have had absolutely no problems with my Nature-Loo and recommend that everyone should have one."
– M Ryrie Western Australia

"May I take this opportunity to thank you all at Nature Loo for your ongoing excellent service. This is the second composting loo I have purchased through you and whenever I have had a problem or needed a replacement part either under warranty or to purchase, you and your staff have always responded quickly and efficiently to my requests and the required items have been sent out immediately with a minimum of fuss. Thank you!"
– Carolyn Gee, QLD

"We are extremely happy with how our Nature Loo is operating. It is extremely well-designed so there is rarely any soiling of the pedestal and absolutely no odour. We are very happy with the huge water saving."
– Jill and Brad Kneebone, WA

"Since owning the Nature-Loo Classic, I have to tell you I absolutely hate using flushing ones, and I tell anyone turning their noses up at the idea of a CT (compost toilet) that it is in fact the WC that is a disgusting idea!"
– Mike Stasse, QLD

"There is absolutely no smell from our Classic toilet. I don't know why anyone would want anything else." – *Mt Nebo, QLD*

"Let me say how excellent I think your Nature-Loo is."
– J Wallwork, Victoria

"We installed a Nature-Loo three and a half years ago. We looked carefully at all the options and there is no doubt that we made the right decision. It is a wonderful product - we are about to install a second in our main house."
– C Beckett, TAS

"The Compact Nature-Loo was just brilliant while we built our house."
– T Keetly, SE QLD

ECOFLO
WATER MANAGEMENT

PO Box 2157
Toowong, Qld 4066 Australia
Phone: +61 7 3888 1810
Fax: +61 7 3888 5550
Email: info@ecoflo.net.au
Web: www.ecoflo.net.au

1.2 UTS trial of Wostman urine diverting toilets

Aim and task description
In the absence of useful information to draw on for the manual, the UTS trial was added to the project scope to enable us to prepare the manuals on the basis of experiential knowledge.

12 June 2010

To fill the information gap that emerged in the literature review, we proposed a mutually beneficial plan to generate our own experience-based material for the manuals, as a variation involving co-investment by YVW and UTS, which has been accepted by YVW.

UTS' investment will be through our local project piloting UDTs[1] which will be greatly enhanced by undertaking a pre-pilot installation of one UDT each in the male and female toilets on our UTS office floor prior to the actual installation in the public space. Such a pre-pilot, which we hoped to implement in 4-5 months time, will enable us to identify and iron out potential hiccups, as well as to discuss these toilets with first-hand experience at the pre-launch awareness/publicity events.

Our proposition is for YVW to sponsor the pre-pilot installation at UTS by providing ISF with 2 Wostman toilet suites as soon as practicable. ISF will fast track our planning for the pre-pilot installation, for installation ideally in late July, and then draw on our direct experience in order to create a far better user manual for Kinglake. YVW's sponsorship of the pre-pilot will be suitably acknowledged in all media, presentations and publications.

An additional benefit for YVW is that we will arrange for Caroma Dorf's NATA testing of the Wostmans against the Australian and USA Standards, with the added bonus of providing clear advice for YVW and Kinglake plumbers and residents on the optimal setting for Wostman flush volumes.

The outcome is that YVW gets a far better user manual and clear advice on flush volumes in a timely way, and ISF gets the opportunity to pre-pilot and identify

[1] Our local research project "Transitioning to sustainable sanitation futures: a transdisciplinary pilot project of urine diversion, phosphorus recovery and reuse in agricultural applications" (aka UTS Funny Dunny project) is funded by a UTS Challenge Grant and co-contributions from several collaborators. It is a pilot retrofit of a male and female toilet block on the UTS campus with about 25 UDTs from different European manufacturers, to study a range of critical issues for their uptake – technological, regulatory and institutional, stakeholder engagement etc. Our research team includes the full suite of partners who can contribute to these different facets. Caroma Dorf, which is part of our team, has offered to test the performance of the different toilet models we import using their NATA approved testing rig. Our plan is to take delivery of the toilet suites in about 3-4 months, and to commission them over the Christmas break.

practical issues before we 'go live' at UTS. Knowledge sharing between the Kinglake pilot and the UTS pilot is an added benefit for all parties.

The revised timing for the user manual will depend on the timing of the pre-pilot installation – approximately 2-3 weeks after they are in place. We anticipate delivery in mid-late August, assuming all goes to plan.

6 October 2010

Highlights from trial installation of Wostman Toilets at ISF

Under a mutually beneficial co-investment plan agreed to in June, YVW delivered 2 Wostman toilets to ISF to enable us to prepare the toilet user manual with firsthand experience, while ISF installed the toilets and conducted the required additional research through funding from our local UDT pilot at UTS which benefitted through fast tracking of its pre-pilot trial.

Prior to installation, a workshop was organised with Mr. Les Barnard (Manager, Plumbing Policy Standards and Regulations at Sydney Water Corporation and member of the national Plumbing Regulators Forum) and key members of our local research team including our plumber, to discuss installation compliant with NSW plumbing regulations[1].

ISF's investigations included having the toilet tested in a NATA accredited facility, gathering information from users through multiple methods (in-toilet surveys, flip charts in male and female wash rooms for unstructured feedback, anonymous online surveys before and after installation, and informal conversations) and close communication with the cleaning contractors.

Key experiences of relevance to YVW described here are:

- Results of performance testing against Australian Standards
- Installation issues
- Socio-technical performance
- Design issues

Results of performance testing against Australian Standards

The results for the Wostman toilet in the specified tests under the Australian Standard for water closets are provided overleaf.

In summary, they showed that

i. The full flush volumes (5L average) are significantly greater than Wostman's published figure of 2.5L
ii. The half flush volumes (1.3L average) are significantly greater than Wostman's published figure of 0.2L
iii. The toilet totally failed the paper discharge test on half flush
iv. The water seal depth of 25mm is much shallower than the minimum of 45mm specified in the Standard.

[1] The ISF pre-pilot trial does not include storage tanks, but will include urine sampling prior to discharge to sewer. Once the sampling device is in place we will seek approval under 'NSW performance based compliance' for installation of a product without Watermark approval. (The main pilot project will most likely include storage tanks for the planned agricultural trials with urine)

Wostman Ecology Ecoflush tests of toilet performance against Australian Standard AS 1172.1 – 2005 Water Closets

	Full flush	Half flush
Flush volume (L)	5.11 + 0.72 (mean)[2] 0.06 + 0.11 (sx)	1.29 + 0.32 (mean)[3] 0.11 + 0.05 (sx)

Solids discharge test (full flush)
Standard: a pan shall discharge all four test pieces, with a trailing water volume of not less than 2.5L in at least eight of ten consecutive tests. (full flush)

Number discharged	4 (in all 10 repeats)
Trailing water L sx	3.8 0.3

Paper discharge test
Standard: a pan shall discharge from the outlet spigot of the pan all of the paper in at least two of the three tests

	Full flush	Half flush
number discharged of 6 test paper squares	5; 6; 6 (3 repeats)	0; 0; 0

Water Seal:
Standard: pan shall have an integral trap providing a water seal depth of 45mm minimum (see figure 1)

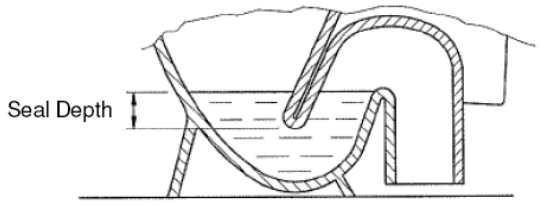


Figure 1 – Typical Water Seal

Wostman Ecoflush has only 25 mm water seal depth.

Reduced flush liquid contaminant test
dye is added to the empty sump and flushed. The percentage of dye remaining in the sump is measured and recorded

% dye remaining	½ flush	F flush
Mean sx	17.07 2.02	0.66 0.10

[2] Not 2.5L as specified on website/brochure
[3] Not 0.2L as specified on website/brochure

Installation issues

- The toilet was installed with urine outlet pipe through the floor, with a locally constructed water trap added. This configuration was chosen to lower the risk of blockages and to get a better water trap[4] . This may not be an option for Kinglake homes on concrete slab floors.

- Replacing a standard Australian toilet with a Wostman toilet left a gap of about 10 cm from the wall. This means that if a lavatory is *designed* for installing a Wostman UDT, the sewer pipe connection will be closer to the back wall than is standard for Australian toilets – so replacing a UDT with an Australian toilet at a later stage would involve a major alteration. This can become a significant issue for Kinglake residents building new homes with UDTs unless the option for future retrofits is planned for[5].

Urine pipe installed through the floor

Water trap constructed under floor

Toilet retrofit showing space from back wall

Socio-Technical Performance

Half-flush testing

Since the toilet 'failed' the Australian Standards paper discharge test for the half flush, ISF conducted in-toilet surveys with toilet users over several weeks to understand the performance of the half flush. Users were asked to respond to a yes/no question about flushing success each time they used the toilet half flush, by placing a sticker corresponding to their answer. We asked a different question each week (or fortnight), building on what we learnt from the previous week:

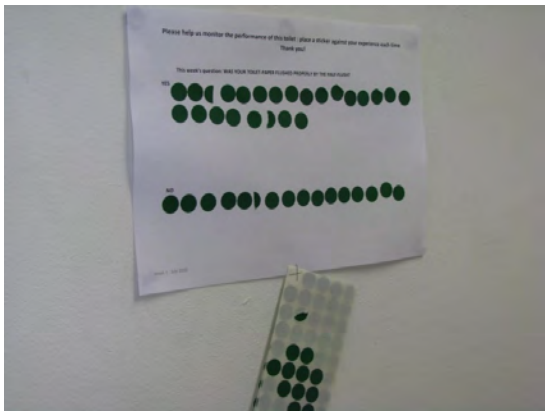
- Was your toilet paper flushed by the half flush?
- Was your toilet paper flushed by a long/short half flush?
- Was your toilet paper flushed by pressing the half flush button for 1 second/2 seconds/ 3 or more seconds?
- Was your toilet paper flushed by pressing the half flush button for 1/2 second/1 second/ 2 seconds?

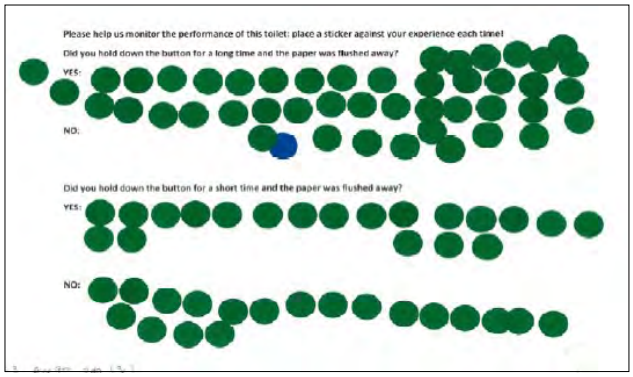
We found that users learnt very quickly how to adjust their practice for successful half-flushing: early in the first week, users answered 'no' more frequently than 'yes' to whether the paper flushed, but this trend reversed by the middle of the week. Subsequent questions indicated they learnt to hold down the half-flush button for longer (which can lead to flush volumes up to a full flush). Holding it down for 1 second seems to be adequate *on average*.

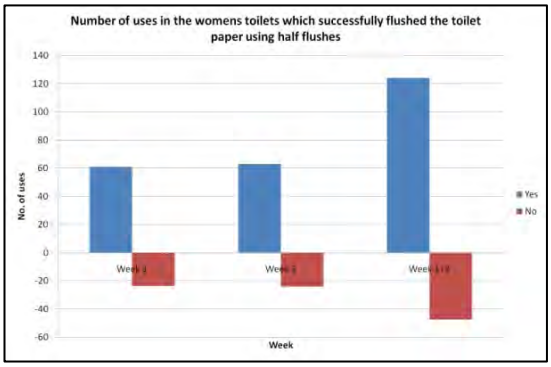
[4] The Wostman manual describes this 'under the toilet' configuration in the text as the recommended installation, but ambiguously shows illustrations of only the alternative 'behind the toilet' urine pipe installation which utilises the bend in the hose as the water trap. They sell a water trap for 'under the toilet' configuration as a separate part that is not shipped with the standard order.

[5] One Kinglake resident identified this as an issue in the interviews, see Appendix 1.

Interestingly, we found the success rate of the Wostman's half flush is not significantly different to the 'normal' toilets.



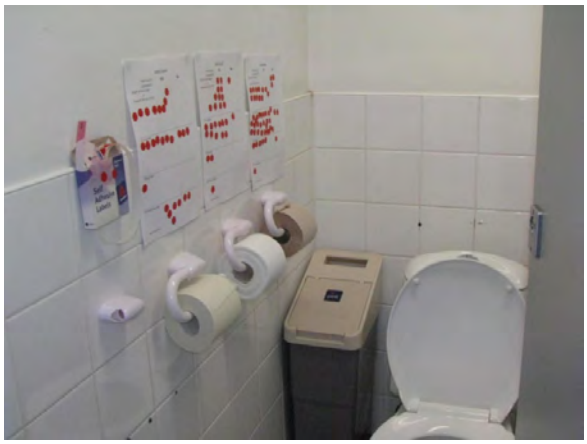


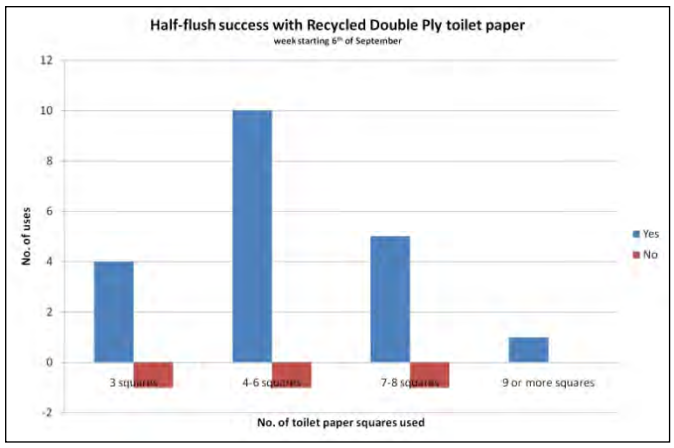


In-toilet surveys for half-flush testing

Toilet paper types

Since the Australian standard uses paper similar to phone-book paper as a test medium for flushing, we wanted to test whether half-flushing performance is influenced by the type of toilet paper.
We tested single ply, 'luxury' double-ply and unbleached recycled double-ply paper, and found no significant difference in flushing performance[6].





Testing toilet paper types

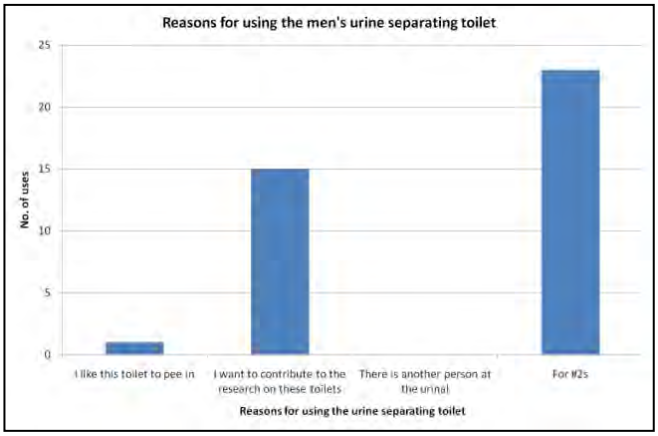
[6] Users were asked to press flush button for 1 second for this survey.

Cross contamination and cleaning issues

Users have criticised the toilet design, particularly the ease with which the front urine section is contaminated with faecal matter. We had two episodes when cleaning staff had to push faecal matter down the urine pipe – the only method by which the blockages could be cleared while complying with OH&S standards. The cleaners noted further OH&S risks in using the supplied brushes because of contaminants spraying off the bristles when cleaning blockages, requiring staff to wear a face mask in addition to the usual gloves.

Gender differences in user experiences

Men were reluctant to sit for urination and in any case preferred using the urinals. Most men used the UDT primarily for bowel motions, or to contribute to the UDT research.



Our female users were generally more positive about using the UDTs than male users, and more willing to provide mainly enthusiastic unstructured feedback via the washroom flipcharts.

There were many comments from women about habitually dropping the paper into the front of the toilet, and the difficulty remembering new habits of practice to put the toilet paper in the back.

A further issue discussed at length on the flipcharts was faecal cross contamination and sitting postures for reducing the chances of this.

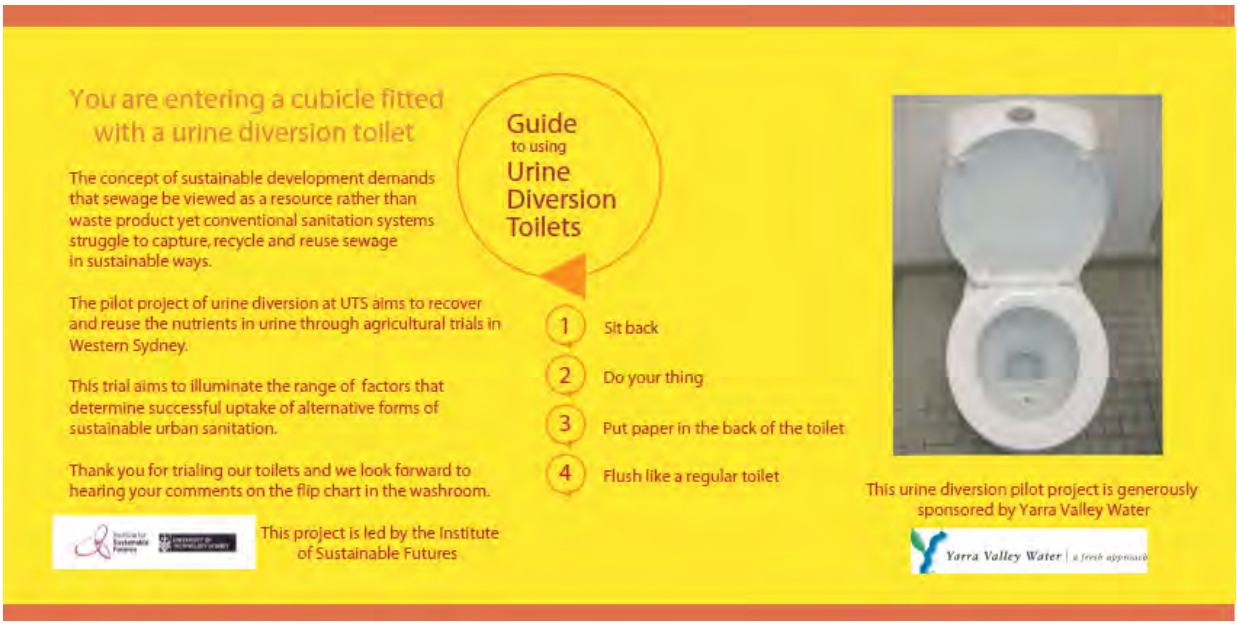
Design issues

- Dilution of urine:
  Visual estimates suggest that at least 200 ml goes down the urine outlet with a half flush[7] (and more with a full flush) – leading to significant dilution. ISF will be measuring this at the next stage, when the urine outlet is being connected to our urine sampling unit.
  The high dilution has implications for trucking the contents of the collection tanks – the efficacy of the system is greatly reduced if it is largely water being transported.

- Unprotected urine outlet:
  The lack of a grate or grill on the urine outlet makes it easy for materials such as toilet paper to block the outlet. The cleaning contractor noted that this poses a high risk for vandalism in a more public installation.

- Dam/barrier design
  The location of the dam and relatively small rear section makes faecal 'skid marks' highly likely. Flushing does not wash the dam with sufficient speed/force during a full flush so 'skid marks' are persistent when they occur.

[7] The statement in the Wostman documentation: "Since the urine requires very little water to wash away, EcoFlush uses as little as 0,2 litre when flushing in the urine bowl" probably refers to the volume flowing into the urine outlet, although this was previously mis-interpreted as a specification of a half-flush volume of 0.2 l.



Signage on door of Wostman toilet

The 'Grand Opening' celebration outside the ISF women's toilet block on 28th July

1.3 User Manual and Signage

Aim and task description
The task was to prepare content (copy and diagrams) for locally relevant, humourous, short, and useful manual & signage for users (owners and renters), working with YVW designers to ensure outputs are well-targeted.

11 May 2010

Modifications to User Manual
We had proposed staging the user manual, but emerging information from YVW suggests that a 'road test' of a draft manual will not be feasible because the installation is less advanced than we understood from earlier conversations. Our goal here will revert to a having a finalised user manual and other engagement tools incorporating user feedback if possible around September.

6 October 2010

Final drafts of the manual (booklet) and signage (wall poster) are being provided in conjunction with this report.

These deceptively simple products belie the effort it has taken to reach this point through diligent use of information design principles including responding to a wide range of key stakeholders. For example, the decision to incorporate a talking 'Kenny' character as an engaging visual communication tool was in response to a number of Kinglake residents wanting a manual with minimal text for quick reference on how the toilet is to be used. We believe this decision has resulted in a far better, more accessible manual, and it significantly increased the level of effort to complete the task.

The manual is the result of at least five iterations as the design evolved significantly through our process, which elicited and responded to feedback from YVW, ISF staff/users of the UTS trial and Kinglake residents.

- *Early draft*: A first draft was provided on request to YVW in late-July, to enable inclusion in the Welcome Kit handed out to residents moving in. The draft content was based on UDT literature, communications with YVW's Rita Narangala, and issues raised in the pilot pre-installation interviews with Kinglake residents.
- *Wostman toilet trial at ISF*: A brief report on the trial with the 2 Wostman toilets provided to ISF by YVW is provided in Appendix 2. The practical experience as well as social research with ISF staff/users provided important subtle shifts for inclusions in the manual (e.g., in the FAQs).
- *Kinglake resident feedback*: At the recent second round pre-installation interviews, Dena Fam showed recent drafts to select residents (as appropriate within the context of particular interviews) and noted their responses as well as particular questions they had which needed to be

addressed in the manual – e.g., questions about types of toilet paper that can be used, and (mis-)use during sickness such as vomiting.
- *Meeting assessment criteria of ISF's review of manuals in Task A:* Final changes were made as the manual was checked against the criteria by which other manuals were assessed in our *International and Local Review of user manuals for urine diverting toilets* completed in May.

Well over a hundred images were taken of 'Kenny' to visually explain multiple aspects of the UD system including cleaning, maintenance and appropriate use of the toilet. Some of these required sewing the doll into particular postures. The final products are the result of numerous iterations using Adobe Photoshop and Illustrator to create and adjust the layouts and manipulate the images.

Intellectual Property issues

ISF checked the Australian Copyright Act and sought initial advice from the UTS Research and Innovation Office (RIO), all of which indicated that use of 'Kenny' in the context above was within the Special Exemptions that meant no copyright was being infringed. We pursued this further to be quite certain, and were subsequently advised by RIO that it would be safest to request permission from Thunderbox Films to use the 'Kenny' character. This has now been obtained.

Please note that YVW may need to contact Thunderbox Films directly if YVW wishes to use the materials beyond Kinglake West. The response to UTS from Thunderbox Films' publicist Ms. Deb Fryers (Mail: PO Box 1068, Daylesford, VIC 3460; Tel: 0437 255 657; Email: deb@shanejacobson.com.au) on 1 September 2010 is reproduced below.

> *Thanks once again for your email, I have reviewed your request with Clayton Jacobson (Creator/Director of Kenny) and he is happy to approve the use of the Kenny Doll image in the education manual for the YVW urine diversion user manual.*
>
> *We would like UTS to add the following text to the bottom of one of the pages where the Kenny Doll image appears along the lines of* ***Kenny image provided by Thunderbox films - captions by UTS (or whom ever is the copywriter).*** *Once this has been amended can you send back to me to review.*
>
> *Please note this approval is based on our support of the people of Kinglake ONLY and this is not an endorsement of UTS or Yarra Valley Water or any other corporate identity. Finally we are giving you approval for the KENNY DOLL IMAGE to be used in the manual ONLY (pending above suggested text amendments) and no further usage of the KENNY DOLL image has been approved.*

Once we have received YVW's feedback to the final drafts, we will finalise the permissions with Thunderbox Films in line with the above before delivering the products to YVW.

URINE DIVERSION USER MANUAL

EVERYDAY PRACTICES

Don't perch on the front of your dunny like an ol' budgie! Sit back on the seat so you don't cause a mess...

SIT BACK ON THE SEAT

Oh yeah...it helps if blokes sit down to pee ...so you're not splashin' all over the place, but of course stand up if you have to!

MEN CAN SIT OR STAND TO PEE

PLACE YOUR PAPER IN THE BACK

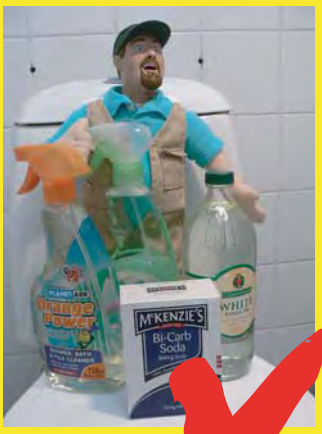
The urine pipe will get blocked if you put paper or other stuff in the front, so make sure you put the paper in the back of the toilet.

'Kenny' used with permission from Thunberbox Films - captions provided by the Institute of Sustainable Futures, UTS

URINE DIVERSION USER MANUAL

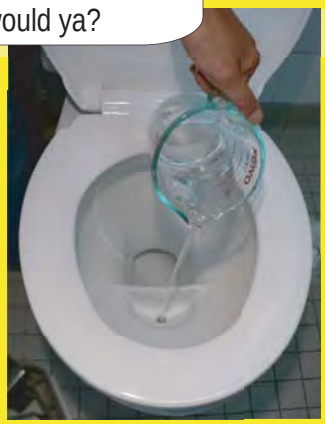
ROUTINE TOILET CLEANING

CLEAN WITH BIODEGRADABLE PRODUCTS



Use a small brush for the urine hole

PIPE MAINTENANCE EVERY TWO MONTHS



EVERY TWO MONTHS:

1. Dissolve 3 tablespoons of citric acid powder in 1 litre of hot water from the tap (not boiling)
2. Pour mixture into the urine hole (don't flush)
3. Leave soaking for two hours or overnight
4. After soaking, flush urine pipe with 1 litre of hot water

(Citric acid is available from the baking section of the supermarket)

3 tablespoons of citric acid powder

+

leave in the urine pipe for 2 hrs or overnight

The urine pipe needs flushing to reduce build up of urine crystals, if you don't flush the pipe every couple of months urine could build up and block the pipework.

FAQs

- *What sort of toilet paper should I use?*
  You can use any kind of toilet paper but try not to use excessive amounts. Urine diversion toilets in some countries are installed with a separate bin to collect toilet paper. While we don't expect you to separate your paper it's good to be aware that the toilet flushes best with less paper.

- *What are the advantages of urine diversion toilets over normal toilets?*
  By separating the urine in the toilet and limiting the nutrients going into the septic system, it is much easier and cheaper to manage the rest of the wastewater.

  The added benefit is that urine can be used for crop production because it has all the necessary nutrients, including phosphorous, nitrogen and potassium in the right ratios.

- *What will happen with our urine?*
  Once the urine is collected it will be trialed at a local turf farm where it will be tested as a potential fertiliser.

- *What if someone is sick and needs to vomit? Where should they go?*
  It is ok to vomit in the back section of the toilet which will flow to the septic tank. It is important to try and avoid any solids getting in the urine section so the pipe doesn't get blocked or the urine get contaminated. If possible, it might be best to vomit in a bucket and then carefully empty it down the back section of the toilet.

TROUBLE SHOOTING

- *Urine is flowing slowly down the urine hole, what should I do?*
  If urine is flowing slowly down the urine hole it may be due to a blockage in the urine pipe (eg. paper, faeces, hair) or build up of waste on the inside of the urine pipe.

  Use biodegradable cleaners and the small brush provided to clean the urine pipe. If urine is still flowly slowly the manufacturer recommends using a solution of caustic soda and allowing it to soak overnight (or at least 2 hours). Caustic soda is usually available in the cleaning products section of supermarkets. **Please note that caustic soda is highly corrosive on the skin and clothing so extreme care should be taken – always wear protective gloves and eye glasses/goggles.** Follow the instructions on the package to make a solution in a plastic container (the solution will dissolve aluminium containers and can burst a glass vessel as the solution heats up when dissolved).

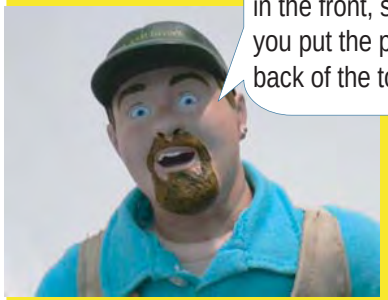
- *How do I know whether the urine tank is full?*
  The tank will be checked by YVW regularly to determine when your tank is full and when it should be collected. You won't need to check the tank yourself.

CONTACT NUMBERS

Emergencies and Faults
Ph: 13 27 62

Golden rules for using your urine diversion dunnies

1. PLACE YOUR PAPER IN THE BACK



The urine pipe will get blocked if you put paper in the front, so make sure you put the paper in the back of the toilet

2. SIT BACK ON THE SEAT

Don't perch on the front of your dunny like an ol' budgie! Sit back on the seat so you don't cause a mess...

3. MEN CAN SIT OR STAND TO PEE

Oh yeah...it helps if blokes sit down to pee ...so you're not splashin' all over the place, but of course stand up if you have to!

Yarra Valley Water | a fresh approach

4. CLEAN WITH BIODEGRADABLE PRODUCTS

'Kenny' used with permission from Thunderbox Films - captions by the Institute of Sustainable Futures, UTS

1.4 Community workshop/engagement event

Aim and task description for workshop
The intention of the workshop was as a practical engagement tool to complement residents engaging with the UDT User Manual, based on adult learning pedagogy that places participatory learning ahead of written instructions in terms of effectiveness.
In particular, it aimed to

- improve resident's capacity to respond to issues
- start building a network within the community
- facilitate process of behavioural change by sharing community understandings about the project
- build on the 1st round of interviews on understanding motivations for installation

The intention was to hold the workshop relatively early on in the project following the pre-installation interviews and preparation of the manual. In the design phase of the social research project, it was expected that all the participant households would have moved in to their homes over a period of a few months.

15 March 2011

Status

The team meeting on 21 October 2010 discussed the relevance and usefulness of the workshop as originally conceptualized given the construction delays and other problems. We had follow-up discussions with Toni Meek and prepared a proposal for a process to revise the positioning and objectives of the workshop in collaboration with YVW to better serve the current context of the project. In November, YVW decided to put this on hold and focus energies on the audit of the plumbing and resolution of other technical issues at Kinglake.

Issues for follow up

As noted in our proposition on 9 November 2010, there may be value in considering the following questions and re-designing a workshop as appropriate.

- The workshop could be an opportunity to shift negative perceptions formed around the initial problems people experienced when first using UDTs. Our own trials at ISF show that the design of the UDTs is problematic in public settings or for people without 'green' commitments, but many users at Kinglake appear to have adapted to manage these problems. Sharing these stories could help others with

any problems, and to shift the negative 'public' perceptions that persist.

- There is potential for YVW to use the workshop to address wider issues than just the UDTs, since most residents perceive all the elements of the sewerage project (STEP/STEG, greywater system and UDTs) in aggregation - for example, to discuss the rainwater tank size and YVW's review of the greywater recycling and consult the community about the way forward.
- Will the workshop be one too many impositions of this community's time? (The best way to resolve this may be to ask the community).

23 June 2011

ISF's agreed contract included a community workshop, originally designed as "a practical engagement tool to complement residents studying the UDT User Manual". In November 2010 we revised the positioning and goals for the workshop since the context and timeline of the project had changed since we began. After consideration, YVW decided to put the workshop on hold until a technology audit was completed to resolve the issues that had arisen at Kinglake.

At the review in March we decided to replace the workshop task by ISF's participation in the Community Information Evening at Kinglake being organized by YVW on 11 April, to provide information about the social research and the larger context of urine diversion.

Kinglake Community Information Evening (replacing Community Workshop)

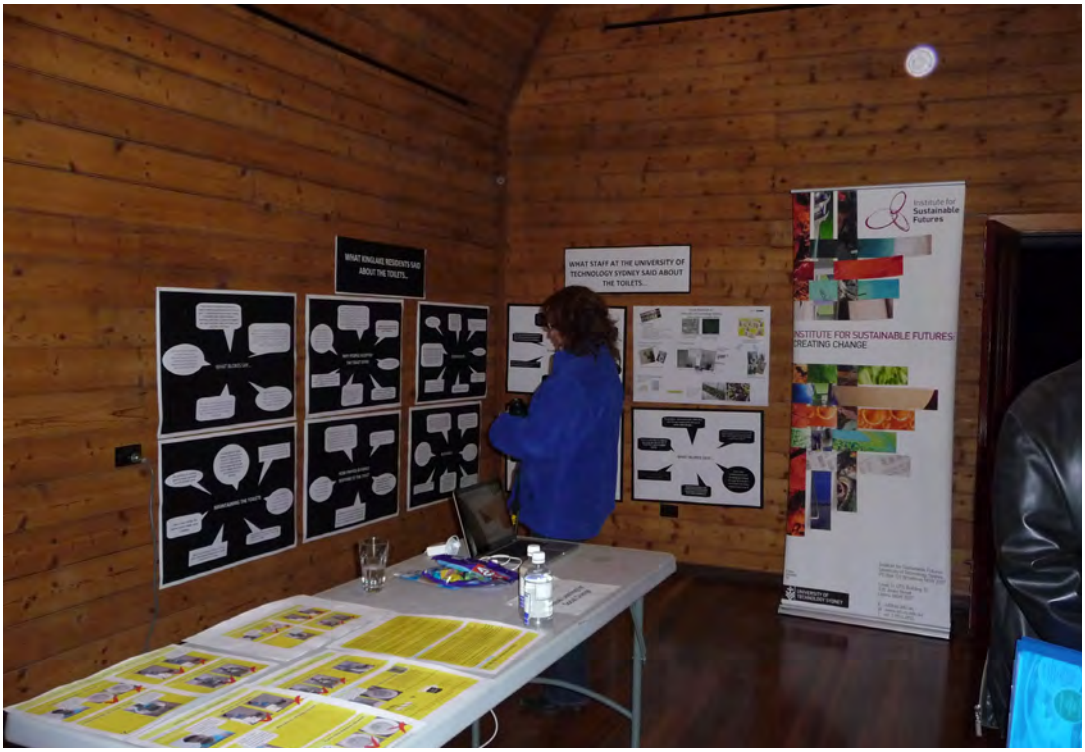
Aims and task description
The Information Evening was organized by YVW as part of the required community engagement for the EPA works approval process. It was designed by YVW to provide the community with information about all the different elements of the project through a variety of visual displays, and give them the opportunity to speak with YVW staff and ask any questions.
ISF's role was to provide information about the social research at Kinglake, and to place the UDT trial in a wider context of urine diversion with information on 'Peak phosphorus' and the UDT trial at UTS.

23 June 2011

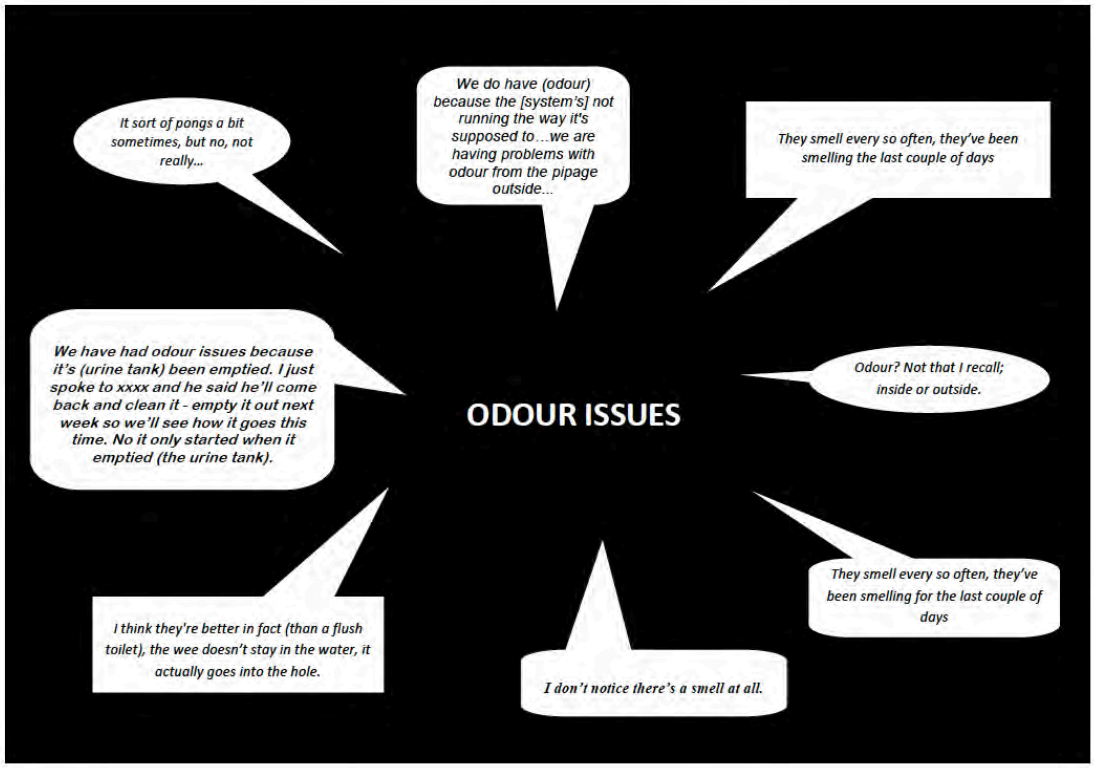
Dena Fam and Kumi Abeysuriya prepared and displayed a series of posters showing what community members had to say about different issues with their UDTs. We also provided information about the UDT trial at our Institute and what ISF users had to say about the same issues. As a way of contextualizing the 'bigger picture' we had a video running on continuous loop showing the ABC's Catalyst program on Peak Phosphorus, which included ISF's Dana Cordell explaining the potential role of urine diversion and showing the UDTs at ISF (which were provided by YVW).

ISF's involvement in the event was valuable in conveying that community voices were being heard. Some people expressed pleasant surprise at seeing their negative comments on display. This was also the first time Kinglake residents got to see what others in their community were saying.

A 'pee and poo tossing' game was enjoyed by the children and added an element of fun and good humour.



ISF's display



An example poster of what the community was saying

APPENDIX 2 : CAPTURING COMMUNITY PERCEPTIONS

2.1 Pre- installation interviews

Aim and task description
The face-to-face interviews prior to installation of urine diverting toilets (UDTs) are designed to establish baseline social data and to build relationships with householder – this is fundamental to develop trust and to being able to engage people as participants in co-learning/mutual learning.
In particular, they aim to:

- uncover motivations as they influence behaviours at later stages;
- explore existing knowledge, practices, and expectations prior to installation;
- prepare and support residents for something they haven't experienced before, and for likely problems; and,
- identify preferred communication and learning modes so engagement materials can be appropriately targeted.

11 May 2010

Modifications to Pre-Installation Interviews

Our goal is to maximise the usefulness of this project to YVW and the people of Kinglake. To meet this goal in the context of the delayed project initiation and Dena Fam's international commitments in June-July led us to decide to stage the pre-installation interview task as follows, in consultation with Toni Meek:

a) conduct between 5 and 10 pilot pre-installation interviews with the UD pilot participants closest to installation and use of the toilets in late-May; and
b) conduct pre-installation interviews with the remaining participants in August, applying valuable lessons from pilot interviews to this second stage of the task.

Our initial rationale for this modification stemmed from an understanding that the first of the UD toilets were very close to commissioning, and a concern that the delayed start could lose eligible participants from the pre-installation part of the study. The benefit to the project is that this is in fact a better process to follow – in addition to keeping us closer to the project timeline.

YVW has sent out letters this week to the Kinglake participants who are most advanced in their construction, to prepare the ground for Dena to contact them shortly.

ISF had expected that there would be 5 - 10 participants in this group, however the letter has been sent to 22 participants. To keep relationships with the residents on track, Dena will make contact with all 22 in good faith, and use some selection criteria to choose a smaller set (5 – 10) for the pilot interviews.

From the information we've received so far from YVW, it seems the actual progress of the reconstruction for each participant in this group is unclear. Although not part of ISF's schedule of work, Dena will seek information on this on YVW's behalf from those she contacts for this pilot round of interviews.

12 June 2010

Dena contacted most of the 22 Kinglake participants from YVW's list (and left messages for those she missed), and conducted ***9 pilot pre-installation interviews*** between 20 and 24 May. A preliminary analysis of the interviews is appended.

She was the recipient of great generosity and friendliness from all her interviewees, as well as Schultz the plumber and Roger Wrigley who took her to the turf farm that will take the urine nutrients.
The interviews are fascinating and valuable, showing

- That we need to shift our questions going forwards
- Several issues for YVW's attention
- Several fresh ideas to consider for the presentation of Manuals
- Matters that need to be addressed in the Manuals

Dena has also sent YVW her most recent information on the residents addresses and planned dates for moving in, so YVW's database may be updated.

Dena plans to return to Kinglake in early August to complete the interviews with the (~29) remaining households.

6 October 2010

ISF sought to contact all the remaining Kinglake West residents on YVW's list of 35 households in the UDT trial[1] to complete the pre-installation interviews, further to the 9 interviews conducted as a pilot in May. Seventeen interviews were scheduled, 14 were conducted including 1 by telephone, and another will be conducted by telephone in mid-October.

[1] ISF was again able to provide an update to YVW about changes to residents' addresses, planned dates for moving in and information such as one withdrawal from the pilot as a result of talking with neighbours, and two indefinitely delayed due to difficulty obtaining insurance.

A preliminary analysis of the second round pre-installation interviews is included in Appendix 1.

From the pilot interviews, we realised that residents did not distinguish UDTs as separate, but rather saw them as an integral part of the sewerage project, so our interviewer Dena Fam prepared herself for the second round by becoming familiar with the details of the greywater systems and STEP/STEG system, in addition to the UDTs which are the focus of this social research. A couple of the questions tested in the pilot round were also reframed, for example, direct questions that people were not responsive to were asked more indirectly. Most of the interviews in the second round were also longer and more in-depth than the pilot interviews.

The interviews provided insight into the issues affecting residents in adopting UDTs and the integrated sewerage system, as well as their perceptions on the viability of the system in regard to everyday habits of practice. While the second round of interviews reinforced many of the issues brought up in the pilot pre-installation interviews, some new themes also emerged, such as positive comments on UDTs from actual users, negative views based on hearsay, and whether there was any need for the greywater systems.

12 June 2010

Preliminary observations from pilot pre-installation interviews with participants in the urine diverting trial in Kinglake

In this preliminary analysis we report on some issues that may be useful for YVW's planning. These relate to

- Motivations for agreeing to be part of the UD trial
- Issues of concern to the interviewed households/persons
- Some suggestions to YVW from interviewees

Motivations

It was quite difficult for participants to see the UD toilet as a separate trial within the Kinglake sewerage project – they saw it as an integrated package of the STEP/STEG system, greywater system and UDTs.

- When asked about motivations for being part of the *UD trial*, many answers were **integrally tied up with the STEP system**, such as:
  - It was part of the 'package' – UD wasn't chosen deliberately by participants
    "When you're trying to do it in such a hurry too I guess but okay yes cool, septic yes. Along with the septic came obviously the toilet and grey water."

    "That just came with the package - the urine diverting thing. I didn't sort of - I wasn't looking for a urine diverting."

    "the urine separator toilet I only really saw at the information session. That's, kind of, like, oh, well, that's unusual. Okay, yeah, whatever, just put up with it. You know, that's fine… So that didn't sell it. It was just like, okay, that's fine; that's what you get to do it."

  - Felt they had no choice after the bush fires
    "…then the fires came and my tank was taken, but it wasn't supposed to be, so I've got no choice but to go with the free one, because I can't afford to put one in."

  - If they didn't accept it now, at no cost, they would be required to pay for it later
    "…if I didn't go ahead with it (now), five, ten years down the track they'd probably make (it) compulsory, make me put a treatment plant in. They're not cheap. They're probably 12 or 14 thousand dollars for a treatment plant. … So instead of being caught that way, I was happy to go okay, if you're are willing to spend the money, give me the grey water system, the urine tank - it's here or there to me."

  - Previous septic was a hassle/not working properly/needed replacement anyway
    "I was just looking for a system that stopped me digging up that pit every couple of months."

- The **economic incentive** has been a major factor
  "So money was the main reason that I couldn't afford to put in a treatment plant myself."

  "Also the benefits they offered in that they would install it free"

- Some felt the offer **makes the rebuilding process easier**

"I honestly think that a lot of people since the bushfires have just taken it on because it's another problem they don't have to worry about. Yarra Valley is taking care of it."

"It's just another thing along that rebuilding process though that I think it just all just flowed really…"

- There are generally **high expectations about the good performance of the sewerage system under YVW**

  "because it's a project, you know, they're going to monitor it. They want it to work so it's going to be, probably, better [than] if you're doing it yourself 'cause they're looking to keep it working properly for the first few years then it'll work out."

- **Environmental concern** around failing systems was the main motive for one person, while others noted it as one of the benefits.

  "Probably environmental more than anything. I am not a greenie as in I wouldn't tie myself to a tree or hug a tree. ... But I think it was more environmental than anything. ... Where I am in town, where the catchment area -the same as this block, this block is the catchment area, for Melbourne's main water supply. You know you hear about the leaching that's going on out of say Richmond and Hawthorn of old septic systems that are leaching into the Yarra River and that's why it's a brown river… There are occasions where there's been a cluster of dead fish in the river and they've linked it back to old sewer systems. Although we don't have the population like inner Melbourne, we've still got the same environmental factor that could occur."

At least two people appear to be under the **impression that the effluent sewer is a conventional sewer** that takes everything, which was another benefit they saw – for example:

"What happens with the tanks and what happens to where you've got to come in and take them out, the same as what happens when you've come in and put them in. (…)
now they're putting another big tank in the ground which when the thing comes down the street, that won't be needed.
(…) a positive is the fact that they're taking it all away. It's not going into the ground around your block anymore, so taking it away to have it into a sewerage treatment plant somewhere, a huge big one."

"We wanted the whole system itself, you know, with the grey water system, recycled water, all that sort of thing and it just sounded better that we were going to have main septic instead of, you know, just out the backyard. So yeah, we were all for it. … So yeah, we just didn't want to have to deal with seepage in the backyard pretty much. We just wanted it like it'd be on town septics…".

Issues of concern

- Several **operational/installation problems** were noted by the two households already using UDTs
  - Odour

    "So now that that tank - the urine tank is filling, you don't have that between the air and the space. Yes, I haven't noticed it as much now. I think it was just the first week."

  - Low flush volume

    "If you push this one, probably two seconds and it's stopped. It's empty and it doesn't take that long to fill. Yes maybe it isn't using the full amount of litres. Like pressing the half flush I just don't try it anymore because it doesn't have enough water come out or anything so I just do the full flush"

- Low water pressure
  "it's just trickling in so I'm wondering whether once that one's not functioning and it goes to the normal one."

- Overflow of urine bowl
  "Yes because the urine one is dry; there's never any water in there so what it basically does is it comes down and fills that up first with water and then overflows into that to get rid of the other. That's why it's probably not going away. Four times I had to flush the toilet last night. So instead of overflowing it comes back up."

  "Like when you flush the big flush it all just goes into your septic but yes.Yes it was actually flushing and going over into the other part."

- Paper blockages
  "it's got blocked quite a few times. Yes I bought a packet of skewers so I can get down the hole. I like the system but I don't like the toilet. I hate going to the toilet to tell you the truth. Oh no it's going to get blocked again. Here we go. You don't want to be putting your hand anywhere near the toilet you know what I mean?"

- Pumps for greywater not working
  "I actually ran out of water last week so the actual pump wasn't working. No of the actual tank and I couldn't flush the toilet. We're virtually using our fresh water to flush the toilet which it's not supposed to be like that. We wouldn't have known unless we ran out of water."

➢ The **two men using the toilets** had some issues with habits of practice
  "Yes that's what I say you've got to change your habits but I don't like the idea of that because if you don't do it properly you're touching it."

  "Yes and just using the toilet. I don't like it. I'd rather a normal one. … But every time I go to the toilet, I have problems with the toilet….yes it's a great idea but it just doesn't work for me. They say oh why and I say well wait until you get one and you'll either - it'll work well for you or it won't. I don't know. It doesn't work well for me. I'm the only one out of four of us here; so one out of four. (…) I've tried lots of different ways. I still can't get it right. I don't know. I'll be honest; I've tried everything… Might get a little port-a-potty outside. Yes but if I'm the only one that's had that problem and I've tried everything; I've tried covering up that front hole and doing this and doing that and either way you just block it; it's as simple as that whether it's toilet paper or something else. You just block."

➢ One male user didn't like the **size and shape of the toilet**
  "I don't know if it's just my bum or what it is. I just don't like - it makes it harder to go to the toilet really. It's like oh geez. (…) maybe wherever they're made in Sweden or something, they're different shapes or something, I don't know. (…)Y ou must be alright if you've got a small bum really; I don't know. I just can't use it. I don't know."

In addition to the problems actually experienced, above, there were many questions and anticipated concerns about the systems

➢ **Difficulties for men having to sit down**
  "it seems to me like they're trying to make blokes sit down to pee…because it has to go in the front section. … You try getting up at two o'clock in the morning with a boner and [laughter] and trying to pee in the first portion of it. You know, you'd be snapping your old fella off [laughter]. It's a fact. It's funny, but it's a fact. In

fact when I first saw it I thought, no, no, that's not going to work. And even if you sit down, I mean it's still going to go out in the air, you have to have some space, you know [laughter]. I don't mean to be rude, but that's a fact. You know, so that's why, I've been told there's going to be a lot of lemon trees. Everybody's going to have half a dozen lemon trees in their backyard and they'll be going out and piddling on them."

- Concerns from hearsay about **cleaning the toilets**

  "He said they're not that good to clean out when you do a number twos. … He reckons he has to clean out the urine … or something every now and then with skewers or something. "

- Several people had concerns around the **maintenance of the urine tanks**
  - Monitoring tank level

    "Well, when people come they had talked about smart meters these days where no-one has to ever come in and read your meter. How do we know when it's full and how often they come and pump it out."

  - Process for urine collection

    "Like when that's full if they just forget about us because we were a bit early, what happens?"

    "When are they planning on collecting the urine, do I have to be home?"

  - Issues with trucks coming to empty tanks

    "It's OK for the trucks to come now we don't have anyone living next door to us yet but if they sell and build a house there, there'll be no gap between houses to get a truck through. And they want to get a truck here in winter? They'll get bogged. What's going to happen to our landscaping, with trucks moving through there all the time?"

    "Well, you know, your property, it's private property, so we're sort of letting - I mean I haven't got nothing to hide. I'm not worried, but it's just the fact that some people - you know, you open your house up and you've got to have a truck come down your driveway every three months. …

    "Now if I wanted to have a six foot high front fence with a couple of German Shepherds running around, what do they do then if I'm not home? … I might put a fence in, a gate, and have a dog and put a fence up there. Do I have to be home to let this truck back down the driveway?"

    "If they're coming in to pick up this urine, how are they going to do it? If they are going to have a big truck, do they expect that big truck to be backing over my concrete driveway? Which I would not be happy with that, because then - and then you are going to have big cracks in your concrete driveway. … But are they strong enough to have a pump that comes from the truck out in the street to the tank for the urine? I don't understand how that - it's a pretty long pipe isn't it?"

- Additional sewerage costs

  "… she said something about this is going to cost the same as what it cost people downtown and I said yeah, but we don't live downtown. We moved out here because we can't afford to live downtown and that's why we're out here and we are putting up with a bit of inconvenience because on the pension we can live. But if they start charging us a fortune every year for everything, we are going to be in trouble and that really concerns me."

  "Are pensioners going to have a discount or something because it's going to be something we haven't had before? This is a new expense added on top of everything we've already got and that was one of the points that really worried me. (…)They did say at one of the meetings that they were going to look into seeing what

can be done for pensioners. I don't know how far they've gone or if they've even done anything or forgotten all about it. ”

- Energy costs

  “I think you use more energy. Look around. We've got a pump - there's pumps in all these systems here. Whereas, beforehand, I only had one water pump, and that would run my mains water. Now I've got one that runs my mains water, one that runs my grey water, one that runs the septic. Well, in the septic tank. It's got a pump in it. And there's also - there might be another pump or two.”

  “So really that, with the pumps and all that running now and which they are and the lights going on and off and everything, really it’s doing nothing apart from using power. … And it’s still costing me money running all these pumps so you can’t win. But I’m sure that they’ll figure out; I’m sure it’s only something small.”

  “The systems not energy friendly, we have 3-4 pumps and we don’t want that, its a lot of power. How much is it going to cost us? (…)
  We have 3 pumps. How often are they working? Kerrie has problems with hers. Hers turns on every 6 seconds and it doesn’t even give them grey water”

- Some were concerned about the operation of pumps
  - Anticipated blockages in pumps

    “what I’m saying the pit that it goes into, the shower and the washing machine water is still going to have their hair and everything going into there. That’s got to be pumped from there to that grey water thing so I’m hoping I’m not going to experience the same problems with that pump clogging up with their hair.”

  - Noise

    “I hear his grey water system gurgling all the time. I'm going what the hell's it doing? And I put mine in under my house here. If I knew it would gurgle like that all the time I probably would have put it outside. But I wasn't to know it was such a noisy - but anyway. We'll wait and see.”

- A couple of people were concerned about the risks of cross connections and system failures

  “you don’t really know. I was thinking when I was doing some concreting out there, I was thinking I was using recycled water but I wasn’t. I was using normal water so I mean recycled and normal is coming out of one tap and urine is going here and there. I just hope they never get crossed over at any stage.”

  “…[a system can] be as high tech as you like, you know. Space ships still blow up. If a system breaks down is my whole family - we're all going to be sick because we've all drunk contaminated water because of this system? I'm not saying it will happen, but in theory I feel like it can happen. … Maybe they're not connected, but I think they are.
  I realise they have one way valves and these computers so all the grey water fill up or dispose of, you know, if there's too much in there. I don’t know how that part works… I'm not exactly sure how all the plumbing works with the grey water and the black water and the clear water. If the grey water runs out it gets topped up by your clear water. And if your grey water overfills it goes into your black water.”

- Some were worried about the complexity of the systems

  “If you open the cupboards up, I was here when the guy was here and I had a look and it’s like oh wow. Because this guy is down you know - it’s oh what a mess. I know Yarra Valley Water are paying for it all now which is a great thing and that but if that breaks down in 10 years time or something like and it’s up to us, there’s circuit boards, there’s all kinds of things in there. It’s like oh, they won’t be cheap; they won’t be cheap at all let alone get someone out to actually who has to know about it. I don’t know.
  I would’ve really probably not tried it; I would’ve gone back to your normal septic but still diverted your great water over to somewhere else into another tank. “

"[the plumbers] They're great guys and do a great job but it's just that - yes they probably don't know enough about them as well. Yes, they know all about the plumbing but this part; oh it's just - I just really didn't think we needed it. I mean it's great that yes it's all done and there's no charge and all that. That's very nice for everyone."

- Lack of clear instructions for when things go wrong

  "Where [indicator lights] don't flash and it's like what do you if something is actually wrong? Like where do we go? "

  "Also who do I call if something goes wrong? I know who to ring for the grey water and septic but what about the [UDTs]?"

- There was some lack of understanding of the relevance of the UD pilot

  "No, I still think the whole thing's pretty bizarre. I said if you want to collect urine, park a tanker under the MCG there and you'll fill them up as quick as they come in and out."

- Some wondered about the need for the greywater systems

  "And we're told that the grey water system needs self-cleaning and that water will come from our rain tank. YVW said we'd save 30% water but are we using the grey water for? We don't need that much water."

- There were questions around cleaning products in relation to the greywater system

  "Obviously you disinfect the floors and that sort of stuff. You know is that - does it make any difference? For your grey water … when you're actually doing it and then you're tipping it down - because the laundry. Down the sink."

Suggestions for YVW

- A contact person to help communicate/mediate with 'tradeys'

  "Your typical Aussie tradey's very laid back and: yes, you'll be right, I'll do it. A week later: yeah, I'm getting to it. … but I'm saying there's hiccups. So I don't know how it's working from their side, maybe they need a contact person as well for everybody to deal with and then they've got - you know, like, just levels. They might need a contact person for the builders to contact then speak to the plumbers, 'cause I think a lot of it's trying to go straight to the plumber... You might make it more professional or something like that; they might need that, more, contact person. I don't know, but I'm very aware that there are some issues.
  I had to go to Rita and say: look, can you - this is what my builder's trying to do. Can you speak to someone at Schultz - and it's got sorted within a day. So obviously she's got someone that's cracked down really quickly… there's obvious issues and I know from speaking to someone else there was issues too. Not bad, you know, just those little communication things, so obviously, like, sort of, tradey-type practices"

- Inspection of installations of UD, septic and greywater systems and plumbing

  "Maybe there's another thing you could do to keep a lot of people out in the long run is to have - probably have an inspector or a clerk of works or whatever you like to call him, to come around and inspect Schultz..."

- Ensure aesthetics of tank installation

  "I think the biggest concern, like I said before, it's just the way they finish and leave it when they are finished what it's like. It shouldn't be standing out. Do you know what I mean? Blending into the landscape. Blended

in, because some of them are sticking out of the ground. … Yeah. The garden and the driveway and what kind of a mess it's going to be left in."

6 October 2010

Second round pre-installation interviews with participants in the urine diverting trial at Kinglake West

16-21 August 2010

The second round of interviews reinforced many of the issues brought up in the pilot pre-installation interviews, but also raised a few new themes and ideas to consider for the presentation of manuals and signage. Of the 13 face-to-face interviews and 1 telephone interview in this round, 2 interviewees had moved into their new homes with UDTs.

The analysis of the 14 interviews is based on transcripts and field notes, and is arranged around the key themes that emerged, summarized below:

- **Performance of UDTs**: Some users had positive comments about the performance of UDTs compared to 'normal' toilets. Others had a few issues with maintenance and blockages.
- **Expectations about problems with UDTs**: Although there were only 5 households in the community using UDTs at the time of the interviews, it was clear that there has been active discussion amongst others and much hearsay about difficulties. One household even pulled out of the trial because of the negative feedback from neighbours. On the other hand, another interviewee realistically expected to have teething problems and felt that good support systems would help them to cope with it.
- **Motivations for participation in the trial:** There was some consistency with the pilot interviews about motivations – economic incentives, environmental concerns, being part of the trend, belief there was little choice - a few interviewees were very enthusiastic about their pioneering role in creating change towards sustainability.
- **Financial costs** (mainly referring to the system 'package' as a whole): A majority of interviewees are under economic pressure and/or experience financial hardship, and were concerned about the largely unquantified additional costs involved, and in some cases questioned the value represented.
- **Greywater system:** There were mixed views about the value of the greywater system. Some people only signed up for it because it was seen to be part of the 'package' on offer, although they did not feel a need for it. A few people mentioned that since the fires, new homes are required to have significantly larger rain water tanks (minimum 55,000 gallons) so they would have more water available than before, and therefore little need for grey water as an alternative source.
- **Communications**: Several interviewees complained about poor lines of communication with plumbers, and between plumbers and other tradesmen, that led to poor coordination of work and frustration. A few interviewees had frustrations trying to communicate with YVW.
- **Engagement with plumbers**: There were a number of negative comments about work of and relationship with the plumbers.

EXPERIENCES WITH URINE DIVERSION TOILETS	
IMPROVED ODOUR PERFORMANCE: The practice of limiting toilet flushing has meant a couple of residents have noticed a distinct reduction in odour of the urine diversion toilets.	• I think they're better in fact (that a flush toilet), the wee doesn't stay in the water, it actually goes into the hole. • …sometimes in the mornings and they're a bit on the nose because everybody would have done a wee overnight and then nobody had flushed because we just don't flush. They would be a bit pongy. But now, I don't notice there's a smell at all.
WATER AND ENERGY SAVINGS: One resident noticed the lower water use of a Wostman and consequent reduced pumping to fill the cistern. (See Appendix 2 for measured flush volumes, which fall between an Australian 3 Star(6/3L) and 4 Star (4.5/3L) toilet.	• I think they're good (the UDTs). They seem to use much less water. I've noticed that, because you hear the pump go off at least twice with our other system, when it was filling the cistern. But now, it goes off once, if that.
CLEANING: One user found the toilet awkward to clean due to the design of the bowl.	• It's just the cleaning part I don't like is just the design of how it's – you know, all these fiddly little bits that you've got to clean.
BLOCKAGES: Two households reported experiencing blockages associated with children/visitors.	• it's been good. It's only blocked once and it was one day when one of my kids' girlfriends came. She wasn't sure about it. That was the only time. It wasn't a big drama. • For the first couple of weeks (it got blocked) until I sorted my kids out. Then if any other

	kids come in, then we've got to sort of educate them.
DESIGN OF THE URINE DIVERSION TOILETS: The design of the toilet in shorter in height than a conventional toilet with the inside diameter of the bowl smaller in diameter. One resident in particular found the height of toilet in comparison to conventional Australian toilets problematic.	• They're very low. We're very big people. Yes. So we're all huge. So I felt that they were very low. He's got…bad hips.

EXPECTATIONS (OFTEN BASED ON HERESAY)	
REALISTIC EXPECTATIONS OF ARISING ISSUES: One resident has said they were willing to accept arising issues and problems with the system which will undoubtedly need to be worked out, as long as they have support from YVW throughout the process.	• We kind of expect there will be issues, you know it's a new system and you've sort of got to work your way through them. We don't expect that it's going to be perfect right from the start, as long as that support is there as well to work through the problems is what we're expecting.
BLOCKAGES There was a significant amount of discussion on blockages of the UTDs primarily hearsay with information elicited from neighbours experiences rather than direct experience.	• I think the neighbours had issues already - the guy two doors up. • We've heard from neighbour that they've had nothing but trouble. So we're a little bit concerned. • I think there's been a few different theories (about blocking), one was that the cleaning product that you have to use wasn't available at the start. • Everyone was like, oh here we go. Because I know (the neighbour's) carked it the first weekend they were in there.

	• Apparently they're having a problem - apparently, only hearing - that they've been having a problem every week or every fortnight with it you know what I mean.
ENTHUSIASM FOR ENVIRONMENTAL BENEFITS: While all residents mentioned the environmental benefits of the integrated system, one resident specifically mentioned the flush toilet as a wasteful system in relation to environmental sustainability and was looking forward to starting the project.	• It's sort of to a point, like, when are we going to hurry up and get this toilet in, because I want to stop using a wasteful toilet!
CHILDREN: A concern for parents was the potential for children clogging the toilet with misplaced paper/faeces. Two residents have made the assumption through discussions with neighbours, that children are the cause of blocked urine pipes with one resident explaining the process of educating children in how to use the toilet.	• … we've got three young girls and explaining to them, you know, to a two year old and a four year old, that they've got to be careful of where they put the toilet paper isn't as practical as an adult understanding what they need to do. • …kids, no matter what you tell them, it's going to get blocked all the time and I've got three young kids…well three lots have told me that's it happened.

MOTIVATIONS FOR TAKING UP THE SYSTEM	
TAKING PRIDE IN THE NOVELTY OF THE SYSTEM: The environmental benefits and novelty of the toilets have meant that two residents have commented on the pride they have in installing and using the UD system	• I think it will be a bloody... "Come have a look at our loo!" I'll just warn them that if they miss it turns all sorts of colours and sets off sirens or something! • I think, all in all, it's a great idea and I'm very proud that we can be part of something.
ECONOMIC INCENTIVES: Economic incentives were a major factor influencing the uptake of the system	• Well I mean it's either this or spend 15 or 16 grand on a treatment plant. • Cost wise, it's good your guys are doing it because that does take that burden off us, but in the long term wise we've going to hopefully have a system that we're not going to have too many problems with. • But it was just made the block that I bought, sort of made it a little bit more attractive. So I know that I was saving that money. We put some good things back into the house, saving that money.
ENVIRONMENTAL BENEFITS: While the degree in which residents were committed to the environment varied (eg. one family was committed to reducing their environmental footprint in the building of their home), the ecological benefits of the system were widely acknowledged.	• Environmental to be honest. The other thing is that there's got to be a better system than what we had. • Like I think any issues that we might have with it would probably outweigh, you know, like the environmental costs anyway. • Anything that can help the environment to me is fantastic, well that's why we live up here because (of) Mother Nature… • We were about to build a green house, environmentally friendly house, with minimal footprint to the site much, much earlier than even the Green Party were around.
NEIGHBOURS INFLUENCE: Discussion amongst neighbours signing onto the project	• … it was more I spoke to neighbours who have been here forever and they said we're doing it, it sounds like a good thing. Yes alright I'll do it.

influenced the uptake systems. In two cases the major motivation for taking up the systems was discussions amongst neighbours.	• Oh just the basic thing was everyone was doing it. I thought well hey if everyone else is doing it we may as well give it a shot.
BELIEF THERE WAS LITTLE CHOICE: There was a belief among some residents that if they didn't take advantage of the offer now, installation of the system would become compulsory in the future. This view was reinforced through earlier pre-pilot interviews.	• … you know, apparently we have got to have it now, do it now or you are going to have to do it in like a couple of year's time or something. • …I'm pretty sure they're going to make it compulsory for everybody to be on the main system. • …we'd also sort of been told that eventually most of the shire potentially could be swapping over to these systems, so we thought we'd give it a go.

FINANCIAL COSTS	
INSTALLATION: Installing UD systems has meant additional building costs for residents in fitting under house pipe work. There have been differences in quotes for under house piping ranging from $3000-$6000.	• Yeah the cost of installing it and stuff is - I'm not happy with because that's whacking… $6,000 on the cost of that for plumbing above the normal cost of it (additional costs for building). • I've spent an extra $3,000 in pipes under the house just for them to be able to hook up to.
MAINTENANCE: Residents were unsure of the on-going costs associated with maintaining the whole system and how the added systems would impact their finances.	• But you've got to again look at the cost behind that, the expense of maintaining it and the expense of running it, if you're still only on the same wages. • Then the maintenance fees, apparently with the recycling of water, it has to be maintained twice a year because the recycling water has a charcoal filter and so forth in it that has to be maintained. So there are extra costs again maintaining all of that. Yes, just costs we didn't have before. • "As I said the only thing that was turning me off was the cost, the maintenance and all that…" • "…How much is it going to add to our bill?"
SEWERAGE FEES/RATES: The added cost of sewerage fees/rates in using the new system was of concern to one resident.	• … you don't mind a couple of hundred on your rates or something. But if it's like $1,000 a year or something it's - because a lot of the people up there aren't even working properly yet.
ENERGY/PUMPING COSTS: Pre-bushfires, residents had previously paid minimal costs for pumping water from rainwater tanks and wastewater to septic	• …water up here is at a premium, electricity is at a premium and even buying Macca's at a premium. I don't know how much it costs to run one and I don't know if the costing was put in to any of the paperwork. You know, how much it

tanks. The need for extra pumps have increased the overall operating costs of the system. The uncertainty of the exact costs of pumping was raised as a issue of concern by a number of residents.	would cost to run a system like this… • "I was worried with the pumps 'cause that's a big load - that had a huge load on power... That's probably my only concern with the system is how much load the pumps have, how efficient they are and their duty time and cycle and how much current they draw in general." • We've found that there are five pumps running the system and the cost of that per day would be quite expensive with electricity rates what they are now which is expected to go up. So that is a concern. • "I understand that it's going to be more expensive but we're also in the situation where we're pensioners. Electricity goes up, we're literally screwed. I know not everyone's in our situation but, again, we're all in the situation where the cost of living is exorbitant now " • "Yeah, two doors down they were telling me that their [electricity bill] has gone up. Up to the point where theirs was only like $300 and now it's like $700."
RELATIVE VALUE: The conventional use of septic tanks by Kinglake residents before the bushfires has meant residents are comparing the cost of maintaining a septic in comparison to the new system and questioning whether the costs are justified.	• … the septic tank was virtually free, you know, your septic tank just fills up and we pump it out every so often. • Are we better off paying out money to have something that just runs without any cost?
COST CLARIFICATION: There was confusion with one resident not knowing who was responsible for paying for certain parts of the installation.	• I didn't know whether it was Schultz who had to do that or I had to. My initial thought, even though I purchased after the fires, was all this system was going to go ahead before the fire happened. So therefore I thought connection would be… they'd be doing the whole lot.

GREY WATER SYSTEM	
MALFUNCTION (hearsay): Discussions between neighbours has meant that residents are aware of malfunctioning systems in their community which raises their own concerns about how their system will function when installed.	• I guess the only other concern I had was that we were under the impression that the grey water system would flush the toilet and with our neighbour's they don't think that's happening with their system.
REUSE OF GREY WATER: For one resident existing standards of cleanliness has meant recycling grey water for internal household use is unacceptable.	• Oh I don't know if I want it in my washing machine. I am a bit fussy with my clothes. I don't really want it for my washing machine. I don't mind if the washing machine water goes into it, but I don't' want to re-use it for that. (...) Like if I'm dying my hair, I could dye my hair and wash it in the water that's going to come back through the clothes (...) It's just - I think what if you have someone doing their pee in the shower…what if they pee in the shower and then that's coming and wash our clothes in, no, no.
PERCEIVED NEED FOR THE GREY WATER SYSTEM: The majority of Kinglake residents are aware of the need to conserve water mentioning their own commitment to environmental habits of practice, for example, having short showers and limiting toilet flushing (eg. if its brown flush it down, if it's yellow let it mellow). In considering existing environmental practices in addition to the installation of larger tank sizes, some residents have questioned whether the grey water system is necessary.	• The grey water for us is a no - we don't' need it because we have so many tanks and we've got a bore. So grey water would just sit there and we'd never use it really. I don't water my garden. I only water my veggies. We've already got tanks set up down there. • I mean it's a good idea (the grey water system) but you don't need it at all. All the thing is, is that people just need to be encouraged (to save water). Like I've known living on property on tank water all my life, you don't have half an hour showers. You get in, you get clean and you get out. It's as simple as that. You use the water wisely. But if everyone upgrades their tank sizes no one should ever complain that they're got no water. I put one in that size because I like washing my car. • I mean the grey water is a good idea but also I've put in a 106,000 litre water tank so I'm not worried about grey water in a sense. • Only in probably the last couple of years we found we'd have to buy water in but no, we

	did extremely well with just 5,000 gallons (for a family of 4). • If everyone has these big tanks I guess they should have plenty of water. We didn't used to have that much water up here. Everyone had a lot smaller tanks (referring to regulations for 55,000 gallon tanks).
PERCEIVED BENEFITS OF THE GREY WATER SYSTEM:	• So to me the biggest benefit is the grey water, like that's what I'm really - I'm from Orbost where we lived off river water and there was a septic and there was no - you didn't even think about…

LINES OF COMMUNICATION	
COMMUNICATION WITH YVW: Two residents said they had been unable speak to a YVW representative with knowledge of the sustainable sanitation project and the UD systems. Both misleading information and an inability to forward the caller to knowledgeable staff was experienced.	• I'd actually rung someone from Yarra Valley Water I made a phone call there it's six months ago, when I decided to build… She told me that it wasn't going ahead until the end of next year and to ring back then. • The person on the phone had no idea about (the sanitation project), and couldn't put me through to anyone who did or anything like that.
COMMUNICATING WITH PLUMBERS: There have been issues communicating with contracted plumbers installing products. This lack of communication has subsequently left a number of residents feeling confused about the process of installation. One resident perceived communication issues during building to have financial implications further down the track.	• People have just put products in and under my home and haven't said a word. So I don't know what's going on… • It would be nice to know when the contractors are turning up and doing things and what process they have in all this business. When I get to my tile stage are they going to contact me or I contact them and they come and then put the toilets in apparently or do I put the toilets in. I don't know this, I've been told they do but then you speak to them inside and they go oh no • …'cause it was done straight up without us communicating [about putting in the toilets] about what was happening, like surely it could've been put further away from the wall so

	that we could eventually, if we decided we don't like the toilets, when it stops or whatever happens down the track (take them out), but now it's going to be quite costly to do that. [This comment relates to the positioning of the sewer plumbing for a UDT being significantly closer to the toilet wall than a standard Australian toilet. Also see Appendix 2 Installation Issues.]
COMMUNICATION BETWEEN PLUMBERS AND TRADESMEN: A lack of communication between tradesmen meant there were situations in which contracted tradesmen were unaware of the sequence of events that needed to be followed in installing the new system.	• I had my electrician organised to put the power there. They said no, you need more power which is a real issue once your house is already built 'cause now I've got horrible looking holes in my walls. You know, it should've been – right from the start we've got three pumps. This is how much power we're going to need and it would've created – unhappiness. • Like normally you do a sort of a meeting with your supervisor but they just turned up and started for the concrete one day and we thought ohh. So I had to ring Chris and say you've got to get round here and tell us what's going on and what we need to do because otherwise it's too late once the slab's down.

PLUMBING PRACTICES	
PROJECT MANAGEMENT: Some residents said that the project could have been better organised with a project manager to oversee the installation. Although the novelty of the system has provided understandable challenges for plumbers some residents perceived a lack of co-ordinated project management.	• Yes, xxxx who's very good but he's quite young…from my perspective, if I was running a project like that, I would probably look for somebody a little bit older …who may be not - wasn't a plumber, but who could be negotiating. • …I guess a project manager almost [is needed]…but I thought xxx was playing that role - who would be there just to go now what do you want? Then go to xxx now this is what I want you to do. To really supervise the whole - so that there was no angst.
TIME MANAGEMENT:	• I've known that some of our neighbours have complained that there's been issues with

Two residents in particular have suggested the installation of systems has taken longer than expected. Residents said that this was an issue of plumbers managing time and keeping residents informed of when they are expecting to have systems installed.	work being done when they weren't there or work not being done when they thought it was going to be done (HEARSAY). • Well it seemed to take forever. Once they start a job, it just went on and on and on. They're trying to multi-task. Of course, that's difficult because people are wanting it now and this. So they have to leave one job to go to another job. I understand…
KEEPING RESIDENTS INFORMED: In managing the installation of the systems there has been a lack of co-ordination between contracted plumbers and residents with two residents suggesting work is being done without prior knowledge. Issues in co-ordinating the management of the installation are compounded by lack of communication (as discussed above).	• I'm sick of people walking in on site too and just doing what they want. I'd rather someone contact me. If there's a fence there with a gate, they have to ring me or they're jumping the fence and they're breaking and entering. • There's no phone calls to say when and what they're doing things. You'll turn up to your house one day and there'll be someone under the floor and you won't know what's going on or what parts - I've rung… • They dug up the whole of the front garden. I didn't expect that, I think.
POST INSTALLATION CLEANUP: There has been an expectation by residents that plumbers would clean up after themselves which in some cases has not been met.	• Well they need to clean up their act a bit and get things done. I had all green grass…they dug a big hole and then just spread the mud out. I said … that's not clean enough … take it. But they couldn't be bothered as I can see getting a truck and driving it around the back. They just dumped all the shit there. • Like I'll show you I've had my septic tank was dug out and put here but then they've just dumped all the rubbish here and that's been a month and a half later. I want to put up my front fences and I've asked them three times to move it.
INSTALLATION PLANNING: One resident suggested management of the installation was hampered by plumbers not following building plans but rather installing tanks in an ad hoc manner.	• They dug a hole for a tank over here and I said that's not where the tank's going. It's going in over there. I'd actually sent a copy to Yarra Valley, got it all drawn it out and then he came and marked it out one day. I said that's not where it's going. I said you've got the plan and he said oh no I've left the plan in the offices back in … Hill. • Our issues haven't been with using it. All the issues have come from putting it in.

2.2 Post installation interviews – "post honeymoon interviews"

Aim and task description
Designed to be telephone interviews, post honeymoon interviews were intended to be carried out approximately 2 months after residents commenced using their UDTs and had gained some practical experience of the system. The interviews were planned to be staggered over time as people moved into their homes, and were to function as a following-up from the pre-installation interviews.
The goals were to:

- Find out about individual experiences, perceptions, preferences, unexpected issues etc. post installation.
- Reinforce sense of residents feeling supported through adoption of new toilets
- Determine individual learning experiences

6 October 2010

A few participants in the pilot pre-installation interviews have been using their UDTs for a couple of months and are ready for these, with others to follow soon. Interview questions have been drafted and planning is in progress to commence the Post Honeymoon Interviews later this month.

15 March 2011

Status

YVW's information shows that12 households have moved in to date. Dena Fam has conducted 8 Post-honeymoon interviews to December (including 2 interviews with one resident before and after a party of 50 friends and family at their home), and will continue with the others after allowing for time in residence.

The interviews completed thus far have been analysed in order to provide indicative results to YVW at this time – see Appendix. It is noteworthy that while residents recognise the poor design of the UDTs, they have been willing to accommodate, and have adapted and learnt ways to reduce problems they experienced in the early stages. Technical issues out of YVWs control, such as the odours emitted from poorly designed/manufactured Wostman toilets, has created extra issues of concern for residents.

Aside from the UDTs, residents also noted concerns about the cost and operation of the greywater systems, and issues with tradesmen, but many expressed a willingness to be accommodating of difficulties in recognition of novel infrastructure.

Issues for follow up

Scheduling the post-honeymoon interviews requires information about the dates when people commence using their UDTs (i.e., move in to new/reconstructed homes). Although residents provided their expected moving dates during the pre-installation interviews, reconstruction schedules have been significantly delayed in reality. ISF has therefore relied on communications from YVW about when people move in. Although YVW has provided us with updates from their project database, these have not been as frequent as we needed. We proposed a process whereby YVW staff update us each time a *Welcome Kit* was handed out, to signal that the resident had moved in, however this process has not worked effectively. We recognise that YVW staff have had other more urgent issues to deal with at Kinglake, and will continue to seek ways to obtain the information we require without making disproportionate demands on YVW (see 'project management' section).

The delays in construction of homes has reduced the effectiveness of the post-honeymoon interviews which we envisaged as taking place within a couple of months of the pre-installation interviews. The large time gap has to some extent weakened the momentum gained from the pre-installation interviews, with the good relationships fostered with residents over the face-to-face interviews fading in some memories. Dena has had some difficulty re-kindling the enthusiasm and cooperation in several instances that have made her wonder if residents were seeing her work as intrusive.

23 June 2011

14 post honeymoon interviews have now been conducted, and one more is planned in July. Although 25 of the 35 households listed in the Kinglake sewerage pilot were willing to participate in the first round of interviews, not all are participants in the post honeymoon interviews due to either delays in completion of their new/re-constructed homes or lack of interest by householders to be participants. Regular telephone updates between Rita Narangala and Dena Fam, initiated since our March review meeting, have improved ISF's ability to identify the households coming up for their second round interviews. We anticipate completion of 15 interviews when the social research project is concluded in August.

15 March 2011

Preliminary analysis of 'post-honeymoon' (second round) interviews with participants in the urine diverting trial at Kinglake West

THE TECHNICAL FUNCTIONALITY OF THE URINE DIVERSION TOILETS	
ODOUR ISSUES Odour has not been a major issue with the residents interviewed to date. In two cases the residents could identify the causes of urine, eg. after urine collection and incorrectly laid pipework	• Not that I recall; inside or outside. • We have had odour issues because it's (urine tank) been emptied. I just spoke to Graham and he said I'll come back and clean it - empty it out next week so we'll see how it goes this time. No it only started when it emptied (the urine tank). • We do have (have odour) - because the [systems's] not running the way it's supposed to…we are having problems with odour from the pipage outside... • They smell every so often, they've been smelling for the last couple of days • That seems to have disappeared because, of course, the urine goes straight down the hole. It doesn't sit there in the toilet bowl. • It sort of pongs a bit sometimes but not really no.
CLEANING IS AWKWARD The design of the toilet has been problematic for residents to clean. One resident suggested the need for different shaped brush to clean the urine divider	• They're still a pain in the butt to clean and that side of it but no I've got used to them now I think. • The little brush could have a longer handle on it perhaps. • I've been looking for a flat toilet brush because they're actually quite fishy to clean with a bog standard bog brush. Apart from that they're fine. • It's just hard to clean it without getting your hand in there. I don't mind that because I'm a [de-identified]. Other people, of course, do mind that. Apart from that they seem fine. • They're really awkward to clean. They're good…but they're shocking, awful to clean, the design is

	shocking. We've got no problems using them, its just a bad design
INADEQUATE FECAL SEPARATION The barrier separating urine causes fecal matter to remain on the divider, this create another challenge to cleaning and in one instance a resident has noted twice as much water required for cleaning the bowl	• …there's poo hitting the barrier which means more cleaning. • Um (laugh) still the same problem with the solids hitting the….barrier….because you're using…its just lucky that you're using recycled water because you have to flush the toilet twice every time you go. Cause once you flush it, you've got to brush it and flush it again. • We haven't got any issues apart but sometimes we get poo stains on the dividing bit. That's probably the only thing that I can think of that's an issue.
CLEANING MATERIALS The supply of citric acid has been valuable during cleaning with one resident experiencing reduced odor after use.	• I've used the citric acid a couple of times and it was all good. That little tiny brush is fabulous for the odd occasion that you get a bit of paper down there by accident and it's blocked. • that (citric acid) got rid of the smells, Yeah I was a bit concerned about that, not that is was bad but since we used it a couple of times (citric acid) and that was great
FLUSHING MECHANISM The flushing mechanism has been inadequate for some residents in clearing the bowl, notably the full flush	• I find that the flush side of it isn't adequate. The full flush to get rid of bowel motions doesn't have enough water behind it but that maybe because of my particular circumstances because I've got the (de-identified disease) but no one else has complained about it in that respect so I'm thinking it's more my issue - my specific toilet type thing. • Elise, she was saying that we might have to get someone it to actually fix one of the two toilets in an increase in flush and that should take care of it. • Ummm….ummm…I don't know its hard to say, I sort of got used it now so…but that's my only concern that you have to flush it twice every time you go but as far as everything else is concerned it is working well and its serviceable and yeah its good.

THE SOCIAL ISSUES FROM USING THE URINE DIVERSION TOILETS	
FAMILY AND FRIEND'S PERCEPTIONS OF THE TOILETS IN USE Residents did not have major problems with family and friends using the toilets but rather a sense of inquiry and curiosity with one male family member questioning the size of the urine bowl for use	• I don't mind…personally and I've had a couple of visitors who have been a bit, you know, have raised their eyebrows a bit. • Yeah most of them find that they're really excited about using it anyway. They don't say that really, but they do have a go. • Yes they all - it didn't seem to bother any of them too much not that they told me anyway. • Yes I think we've sort of got used to it now. The kids - they're fine. They just freak out. They just go what the…? What is wrong with your toilet? Yes kids are honest • I've heard stories about other people having problems with them but I can't really comment on that. I haven't had any problems personally with mine. • My son was sort of - he's a teenager and he sort of - as crude and rude and disgusting as anyone could be - thought it was a big joke and how am I supposed to aim and all of that.
FEMALE USERS QUESTIONING MALE USERS HABITS OF PRACTICE	• …men stand up that's plain and simple. That's what they're used to doing and what they're comfortable with. There is a bit of issue of splashback as far as aiming for the right spot. • I think it's more an issue of changing the males' habits long term - something that they're used to doing and are going to find difficult. But again the principle behind it is wonderful.
URINE COLLECTION There have been questions about	• … a guy come out yesterday and he said he was going to check the tank but he was only here for a really short amount of time and he left. So again I don't know if he collected or what he did - I didn't actually sit there and watch him.

when the tank is being emptied with one resident asking children not to flush toilets as she was concerned about overflow in the urine tank	• Yeah well he said, is it okay if I come in - and it must have been him because he said, is it alright if I come in every once and a while if you're not home and do what I've got to do. I said, no go for it. • I don't actually know if [de-identified] has been to empty the urine tank, but I don't think he has. He measured it, but I don't think he's actually emptied it yet. • He actually was great - he cleaned up after himself and put the soil all back and that was it. So I'm assuming that's what he came for. • [de-identified] across the road has had hers emptied already and but Ive been here for 6months and haven't had mine emptied yet, I just don't want there to be a leakage or something. They checked today and its nearly full. I think we're not flushing so much and because the grey water system isn't working Ive asked the girls not to flush so much
BLOCKAGES There are fewer concerns about blockages of toilets in the 2nd round interviews conducted to date with the blockages noted viewed as minor issues. One resident suggesting the urine brush was helpful	• We have small blockages, and a big blockage when we first moved in, we only get small ones now, the urine doesn't go down fast and is backing up • No problems. I was actually impressed because I thought maybe there'd be an issue with me having to come up every five seconds to unblock the front bit but no, it was just the once (during a party involving 50 people). • That little tiny brush is fabulous for the odd occasion that you get a bit of paper down there by accident and it's blocked. • We haven't had a blockage yet but we notice that sometimes it (paper) falls in the front and you've manually got to pick it up and put it in the back. Again you've got to wash your hands anyway so what difference does it make. But I think it's more an issue of getting used to the system more than anything else.

INSTRUCTIONAL MATERIAL	
URINE DIVERSION SIGNAGE AND MANUAL The UD manual has been helpful in instructing family and friends on how to use the toilets, one resident noting there isn't reference to vomiting and another highlighting she didn't receive the signage for the back of the toilet door	• I did make a bit of a mess in the old loo there. There's nothing in the instructions about number threes. • I just say to them (friends and relatives visiting), have a look at the chart. • The poo and pee key chains, they're hanging in my bathroom. But I bring them out occasionally and people are amused with them. • …the signage is fine. We put it up specifically in our second toilet - not the one in the ensuite because if anyone comes and visits us - that's the toilet they'll use so we put it in that one and the only problem again I see with that is little kids. • We got a welcome pack with the blue water saver booklet and the citric acid and the little brush but, no, I don't think we got any signs. • (After a party of 50 people) They all read the little notice that we put on the back of the toilets. There was a couple of people actually that said they'd read an article about it somewhere. So yeah, they'd had a bit of an insight into it. So they were all very interested and it didn't seem to be an issue.

GREY WATER SYSTEM	
COST OF PUMPING FOR GREYWATER As in 1st round interviews there is still a concern about the cost in pumping grey water. The practical experience of pumps not functioning as they should has concerned residents in regard to the extra cost incurred	• …[there's] been making awful, gurgling noises yesterday and using a lot of power turning on and off. So I don't know what's going on. So hopefully I'll get one of the chaps to come and have a look. • Yeah well ours hasn't been fixed and it's been recommissioned probably 5 times… and yeah it's just…our electricity bill is like 4 times what it was prior them being installed so I don't know if they're not working properly or…but Ive just about had enough to be honest with you. • Yeah apparently the guy's come to do the service and apparently the grey water's working fine and he reckons it's the plumbing…sending the grey water back to the toilets… And I said to him its pointless paying an extra electricity bill…for the pumps, its like 6 pumps to be running when the water's just sitting in the grey water system…its not going back flushing the toilet…its going back into the septic…they're doing it all for nothing, know what I mean? • It's not my ideal choice because every time - once it's all hooked up - every time you fire it up about three pumps start up. So who is going to pay the power bill?
ON-GOING MAINTENANCE COSTS OF GREY WATER SYSTEM There are concerns, that have been reflected in 1st round interviews, that on-going and long term operational and maintenance costs could potentially be unaffordable	• I was just reading today about when something breaks because that needs a plumber - whereas the old system, if something broke it was generally the tank was full so you've got to pump out and no more problems. This one with all the pumps and all the wiring and the pipes and everything I don't know what is going to happen five years down the track. That is when it is going to start costing us money I think. • Yes, you've got to run the system - like I say every time you turn a tap on, once this grey water thing is hooked up, there is going to be about three pumps start up. All of them cost money to run and then every couple of years it needs maintenance done. I'm not sure how long I'm going to be able to pay for that.

GREYWATER MALFUNCTION While YVW is in the process of responded to these issues, residents have concerns about malfunctioning grey water systems	• Its not like anyone's got a garden yet established, like..where they can use it, the whole point is that it goes back to the toilet which its not even doing! So…I just think we're going around in circles and (haha)…yeah • My grey water's not very well though. I'm just waiting for a chap from Yarra Valley Water. Hopefully I can hail them down and come and have a look. Because I've got some, what it looks like, bubbly water coming from under my house. • The grey water, the recycling unit, that's still in the process of being corrected. • The grey water hasn't worked yet. Septic is fine. It's just the grey water. It hasn't been working. They've changed pumps but they've been meaning to come back when they went. I haven't caught up with them probably two weeks ago when Yarra Valley Water came out and started finding out what was going on. I haven't heard since what they're going to do and what's going on. • We've had grey water problems, the pumps have gone off a couple of times, they went off this weekend but Rita's bringing a new pump for us to trial. The septic's been OK though • We still have the same issues about what happens when the power goes out. (in regard to running the UD toilets. we've had issues where it's gone off for 36 hours and I seriously believe that this should have come with a backup system of some sort as far as storing power to be able to flush. • Like I said apart form you know obviously the toilet itself is not too bad at the moment but all the other things that are going wrong with it, obviously the extra electricity bill and all that sort of stuff and its not going back flushing the toilet which is the main aim of it I guess, so yeah…Its not too bad…yeah

DEALING WITH TRADESMEN	
COMMUNICATION BETWEEN TRADESMEN One resident interviewed 4 weeks after moving in noted the lack of communication between builder and plumbers	• Unfortunately we had a lot of problems between the builders and...Schultz because there was lack of communication between them. Schultz - they guys themselves were wonderful - they've been available to talk to us and let us know what's going on as far as that's concerned. They've had minor issues like there was additional hole put into one of the main pipes that ran below ground and they didn't close it off and I mentioned it to them previously. But we had to dig around the hole again so that they could go back in and actually close it off. So minor things like that but Schultz has been fine. They're just doing their job too.
PLUMBERS COMMUNCATION In contrast to 1st round interviews, residents had more positive experiences n communicating with the plumbers and their response to arising problems	• But I mean the guys are doing the best they can. If they don't know something - they'll get back to us. • We've had things like…not all the plugs have been plugged in when they're supposed to have been and things were supposed to happen and they didn't because it wasn't quite done. But again it's all just teething issues - it's nothing serious and it's just a matter of shut up and get on with it.
STRESS OF BUILDING Importantly noted is the stress placed on residents in dealing with tradesmen on site for extended periods of time.	• Yes. I guess we're all pretty all a bit over the builders and plumbers, for varying reasons - not because of the system, but just because it all came at once. Do you know what I mean? You've got workmen on site all the bloody time….So it doesn't take much to tip us over the edge these days. A low threshold, you know.

ADOPTION OF A NEW SYSTEM	
WILLINGNESS TO ADAPT TO TRIAL AND ERROR. While there have been technical and social issues arising throughout installation a number of residents have suggested they were willing to put up with the inconvenience of trial and error and were willing to adapt to those problems if the problems are resolved.	• Of course it's a new system and of course new systems are going to have hiccups that it's going to take a while for the owners to get used to. Besides that I mean its fine. • It's not just us that's learning - it's them and it's also - you get people unfortunately with our situation who are still a little bit tempered and want it done perfectly the first time with no hassles - that's not going to work. You've got to realistic in that respect too. • It's not going to be fool proof - it's not going to be spot on every time. As long as we're all cool, calm and collected about it - we'll get through it. • Look, I mean we can't say anything bad about the system. I don't have any issues. The initial teething issues with the alarm going off, they all got sorted once we actually got water in the system. I know that my neighbours do have problems. • No, no. It's too early days. I mean I'm sure there's a few trial and errors going on. So, so far so good. • At this point it's little hiccups that come along the way. We discuss it with the guys that are here or they get back to us later on and tell us what the resolution. But everything that we've come up with so far has been resolved one way or another so we're doing pretty well. • It's a lot of minor things - it's a bit of leakage in the tanks themselves but the guys are all aware of it - they've been here sort of off and on ever since we moved in pretty much and they've been tackling the problem as it comes up. So it's not been an issue in that respect.

EXPECTATIONS OF YVW	
URINE GRATE Something that was suggested by YVW was the design and addition	• The toilet paper issue is sort of going be resolved in the sense that they're going to put the grate at the front of the toilet because again we've noticed that as much as you'd like to get it in the right place when you're dealing with the toilet paper - it does tend to fall in the front. But that again with

to the installation of a ‘urine grate’ to limit blockages through misplaced paper and debris. One resident has suggested that her experience with blockage from toilet paper will be overcome by the design of a grate.	the grate system will be taken care of. So again that's not so much an issue anymore.

2.3 Diaries *"The Toilet Papers"*

Aim and task description
Reflective diaries are a cultural probe often used in social research, and used in the Kinglake West context to provide a way of 'keeping a watching brief for the first week and troubleshooting' thereafter, where participants make explicit the successes and failures of operating the UDTs. Analysis can be fed back into revising the user manual, responding to residents, and adjusting YVW's installation routines etc.
The task was to prepare and distribute a daily diary (with prompted and open-ended questions) that begins directly after installation and continues for first few weeks or so. Includes pictures or photos. Used again whenever new experiences arise eg empty urine tank, menstruation, visitors, blockages. Completed diaries to be coded and analysed.

12 June 2010

The two households involved in the pilot interviews and already moved in to UDT-installed homes have enthusiastically accepted notebooks in which to diarise and keep track of experiences and issues arising. Diaries more tailored to the task will be handed out or sent to the remaining interviewees as they move in. We will also provide disposable cameras as a complement to 'The Toilet Papers'.

6 October 2010

ISF's Dena Fam provided diaries to two households who were already in their homes using UDTs at the time of the pilot pre-installation interviews in May, and to a further two households in the recent round of interviews. YVW's Rita Narangala has undertaken to distribute diaries to others as they move in, as part of YVW's Welcome Kits, and to advise residents of their use.

We had intended disposable cameras to be included with the diaries so residents could photograph and document issues arising in the use of the UDTs. This is a commonly used complement to diaries, to enable people to use images as well as words to communicate. Our cleaning contractors at UTS frequently use photos to report on their experiences. However the cameras have been rejected by a number of Kinglake households, as they were perceived as too intimate and personal; residents did not want to take photos of their toilets. Therefore ISF will continue to offer diaries and will stop offering cameras.

15 March 2011

Status

The first 2 diaries were distributed by Dena Fam in May 2010, with another 25 diaries left with YVW for distribution with the *Welcome Kit* as people moved in to their new homes and a further 15 diaries posted to YVW on request from community engagement staff.

We prepared a briefing note for YVW staff delivering the diaries on our behalf, including showing and explaining to residents how to use them, and a request to be informed by YVW each time a diary was handed over. That would enable us to manage the timing for the post-honeymoon interview i.e. 2 months after moving in, when we could check-in on the use of the diaries and arrange for their return for analysis. Unfortunately it appears that the diaries, and perhaps also the *Welcome Kit* with the user manual, signage and toilet cleaning materials, have not always been delivered at the point when people have moved in. Furthermore it has been unclear to us who is in charge of the distribution of diaries and what is happening with the timing of it. This undermines both the value of the diaries and the value of the post-honeymoon interviews. We do understand that YVW have had significant complaints and issues with other parts of the system, as well as the odour complaints to deal with. And going forward, we need to find a way to improve this situation (see 'project management' section).

We have also had poor results with the collection of diaries for analysis. Dena sent reply-paid envelopes to residents who participated in the earliest post-honeymoon interviews, for the return of their diaries as agreed in the interviews, but we have had not follow-through. Subsequently we requested YVW collect the diaries on ISF's behalf, but none have been received thus far.

Issues for follow up

It is difficult to gauge how effective this social research tool has been as no diaries have been returned yet. Most participants in the post-honeymoon interviews appeared happy to contribute to the diary with one resident taking two diaries to accommodate 2 UD toilets installed in her home. We recognise that it is possible that residents may be reluctant to return them, either because they have not used the diaries or because of some sense of potential embarrassment about what has been recorded in the diaries. Nonetheless, as noted above, we need to find a way to improve this situation.

23 June 2011

ISF included the diaries in the project design because they are an established cultural studies/social research tool that has been used effectively by others – for example by Zoe Sofoulis in 'Everyday Water: Values, Practices, Interactions' (2005) in Australia, and internationally by the Sustainable Water Improves Tomorrow's Cities' Health (SWITCH) consortium. With open-ended prompts, the diaries are intended as a means of not only uncovering underlying issues experienced by residents involved in research but also of building more effective partnerships for innovation in urban water management, with the residents being valued as 'experts' asked to express their own ideas about the experience and significance of changing their habits of practice.

The distribution and the collection of the diaries had several problems as explained in our March progress report. Following the review meeting it was decided that:

(i) YVW would continue to distribute the diaries to residents with the 'welcome kit' and improve the timing of this so householders receive them within a day or so of moving in, and

(ii) ISF would manage the return of the diaries by communicating directly with householders through the post-honeymoon interview, and sending them a reply-paid envelope.

Further to numerous unsuccessful follow-up attempts by Dena Fam, ISF decided to offer a $20 Bunnings or supermarket voucher as an incentive to residents to return diaries. Just 3 diaries have been collected so far, collected in person by Dena and with the offer of the incentive. This number is too small to make a meaningful research contribution, so we have secured agreement from Toni Meek that we abandon this task. Dena will continue to ask residents to return diaries that have already been distributed in reply-paid envelopes, for closure of the task to safeguard the reputation of the project, but will not pursue efforts to collect beyond this.

APPENDIX 3 – ARTICULATING ORGANISATIONAL LEARNING

Aim and task description
This task was to use social research to draw together what had been learnt from the project for the organization to move forwards in implementing innovation. It involved conducting interviews on the Yarra Valley Water project team and others involved in delivery of the Kinglake sewerage project to collate individual learnings, and translate these into organizational learning.

23 June 2011

At the review meeting, an additional task to evaluate what has been learnt from the Kinglake project was identified as of value to YVW. Creating the opportunity to reflect on the project and capture the learnings from a range of perspectives has the potential to add value at 3 levels:

(i) clarify how YVW might move forward for the remainder of the Kinglake project,
(ii) provide insight into improving future YVW initiatives involving innovative sustainable sanitation services, and
(iii) enable YVW to share learnings and advance the field for the broader sector.

ISF drafted a proposal that YVW accepted. This new task has limited impact on the project budget because it is largely funded from the now terminated Diaries task's budget. It also includes a large element of in-kind contribution from ISF in the analysis.

The Evaluation of Learning is designed as a two stage process:

* Interviews with key project members, to gather, analyse and categorise the range of experiences, views and learnings from the project
* A workshop to discuss emerging themes from the interviews, identify most significant learning experiences and translate these into recommendations for the remainder of the Kinglake project, other YVW projects and other UDT projects.

Interviews for the first stage were conducted on 8, 9 and 10 June by ISF's Keren Winterford, an experienced social researcher who is independent of the current project team. The 10 interviewees included YVW staff closely involved with the project, as well as Chris Chivers, the plumbing contractor from Select Solutions, and Dena Fam. Keren will return to YVW on July 12 to interview Sam Austin upon his return from leave.

A briefing paper based on the analysis of the interviews will be prepared as input to the half-day workshop (approximately 3 hours), scheduled for 10th August at a YVW venue.

Briefing Paper for Evaluation Workshop

Evaluation and capture of social/mutual learning from Kinglake West Sewerage Project

PLEASE READ BEFORE ATTENDING THE WORKSHOP ON Wed 10TH August, 2-5pm

Introduction

The social and technical challenges in implementing urine diversion at Kinglake, as well as at the University of Technology Sydney, have led to the insight that social learning is a critical ingredient for facilitating sociotechnical transitions.

The aim of this Evaluation Task is to determine how social learning is occurring amongst the key stakeholders associated with implementation of the Kinglake sustainable sewerage strategy, and help Yarra Valley Water to articulate what has been learned within the organisation thus far.

The value for YVW in tracking social learning throughout the sustainable sewerage initiative at Kinglake is that it:

- Provides an opportunity to reflect on both negative and positive outcomes
- Provides a means of collating and synthesizing multiple learning experiences throughout the project
- Provides a way of developing practice-based, industry-relevant recommendations for implementing strong innovations in the future, both within Yarra Valley Water and for the sector more broadly.

This document draws together the themes that emerged from the face-to-face interviews that you as key project stakeholders participated in. These main ideas will be the starting point for the workshop to be held on 10 August.

Methodology for identifying themes

Our researchers started by getting an overview of all the interviews (ie listening to the audio recording of each interview in full, and reading each transcript in full)
The transcripts were then analysed to elicit over 70 key issues or themes in relation to the key research question: '*what has been learnt about implementing innovative sustainable water services in Kinglake?*' Using NVivo software the transcripts were analysed to reveal the number of interviewees referring to each theme, the number of times interviewees made reference to each theme, and how the theme is associated with other themes – see Appendix B for the full list.

We then identified a subset of the most important themes. We judged a theme to be important if it was raised by 5 or more interviewees, or if it was particularly pertinent to the research question in italics above. The selection was reviewed by our researchers and revised twice through an iterative process to arrive at a summary of 23 key themes.

Outcomes

To provide a framework for communication, the outcomes or learning from the YVW interviews have been structured under three broad **categories**:

1. *Customer engagement* –arising from the engagement of customers throughout the trial that have triggered learning and reflection for YVW staff
2. *Project design and management* –issues associated with the design of the project and on-going management of YVW staff and contractors
3. *Project implementation* –arising from the installation and implementation of systems on-site and engagement with contactors, builders and homeowners

The interviews have provided a wealth of insights, but few of us have the time to read through them all, so we have sought to document the insights in accessible ways that allow glimpses of the richness.

At a high level, in this document, we provide in the next few pages 7-10 **themes** for each category. For each theme, we have distilled relevant interview quotes into a synthesis of a few lines. Often, there are diverging views within one theme. **As a minimum, we recommend you read the themes in this document before the workshop.**

We also recommend that you browse through the next level of detail because the range of **quotations** that relate to each theme are inevitably much richer than their distillations. In Appendix A, each theme is exemplified by a page or so of illustrative quotes. We guarantee you will be intrigued and perhaps see things a little differently once you have browsed these.

Customer Engagement Themes

CE (a): Engaging with bushfire victims: The team identified a range of important consequences for both YVW and the residents as a consequence of the bushfires. Team members agreed Kinglake residents had different needs as bushfire victims, but there were divergent views on how well or otherwise YVW responded to those needs. YVW also suffered reputational damage because in the eyes of the residents, they were, at times, just another government department that wasn't delivering on what they had promised.

CE (b): Informing residents on the challenges of trialing innovation: There was a diversity of opinion within the team in regard to the approach taken to engage residents in trialing innovation. Some of the team felt that YVW should have been more up front and open with residents about the fact this was a novel system, and therefore, despite YVW's best efforts, things would likely go wrong. Others felt the approach taken to engage residents in trialing innovation was adequate, reasonable and sound.

CE(c): Inconveniencing customers with multiple disruptions: Residents were inconvenienced when pipework and technologies had to be re-installed due to faulty performance. The challenge in trialing unfamiliar systems is that mistakes occur, systems are wrongly installed and consequently due to the inconvenience of multiple disruptions tensions between YVW and residents arise. Being victims of the bushfires exposed residents to further interruptions.

CE (d): Learning gained from individual verses community engagement: There were mixed opinions on the value of engaging with residents through a community meeting to discuss arising problems. While there was widespread support for the approach taken to engage residents through a community information night, some team members felt a more intense conversation with the community could have been constructive, and suggested YVW needed to learn how to deal with communal criticism.

CE (e): Keeping lines of communication open with residents and the community: Throughout the development of the project, increasing importance has been placed on communicating to residents how the trial was developing, the inherent challenges associated with trialing innovation and the impacts on the residents of adopting these alternative systems.

CE (f): Adopting appropriate communication tools for community engagement: Using forms of communication that were appropriate for conveying information to Kinglake residents was recognised. Some team members felt residents were not sufficiently engaged and therefore did not have a thorough understanding of the consequences associated with adopting the system, such as the financial impacts. Team members commented on the effectiveness of conducting face to face meetings upfront to establish rapport and clarify how the system would impact resident's day to day life.

CE (g): Clarifying legal rights of YVW staff and residents: For some team members, there is a lack of clarity around whether there were signed agreements by residents in taking part in the trial, this has subsequently created concern in regard to the legal rights of YVW staff (and customers) in working on residential properties.

Project Design/Management Themes

PM (a): Taking ownership of the project, whose responsibility is it?: Ownership of the project has been commented by team members from a number of different perspectives. Externally, outsourcing contracts, (and subsequently subcontracts) decreased responsibility and ownership for the project. Internally the issue of ownership was viewed by some team members as being inadequate within the team where an absence of departmental ownership exists.

PM (b): Departure from conventional YVW processes of management: The Kinglake project was not managed through standard YVW processes, but the reasons for this were unclear. A particular issue was that the planning team did not forward the project to the asset creation team after the initial design phase as would normally have occurred. A number of team members commented on the consequent lack of expertise in managing field work by the planning team.

PM (c): Lack of regular internal communication and team meetings: A general observation was that team meetings were fragmented, irregular and did not always involve necessary team members. Many felt that internal communication through regularly scheduled project meetings would have contributed to identifying and acting on emerging problems much earlier.

PM (d): Structuring processes for reflective feedback : A number of team members noted the need to build-in reflection throughout the project to gain insight into how the project was progressing and apply what was learnt. For example, the lack of reflection on the evolution of the project from a retrofit to a greenfield meant the project was not managed as a greenfield site would have been. One suggestion was to have reflective feedback from an external peer reviewer group as a way of operationalising reflection.

PM (e): Identifying motivations and incentives for adopting sustainable innovation: The majority of team members commented that careful selection of residents is required in trialling new systems. Many members of the project team felt, financial incentives were a major motivation for residents in taking the system but for the long term viability of the systems there was a common perception that residents also needed to be motivated by the environmental benefits of the system.

PM (f): Understanding the pros and cons of new technology: A common view amongst team members is that there was a lack of understanding and internal knowledge about the technologies adopted and that if a better knowledge base existed, problems could have been identified earlier. Some team members commented that knowledge was not only required about individual technologies but also how a combination of technologies functioned together.

PM (g): Inappropriate technology selection for the community: Some team members saw conservative water use practices, unsuitable climatic conditions and increased capacity of rain tanks at Kinglake, as incompatible with the use of greywater systems. A few team members felt the conditions set for funding the project, constrained the direction of the project once funding was committed - eg. residents were required to take the greywater system to be part of the trial.

PM (h): Pre-piloting technologies to iron out the kinks: The circumstances triggered by the bushfires meant that building and installing systems occurred rapidly without time to reflect on arising issues, consequently oversights in planning occurred. Many commented that in retrospect, it would have been beneficial to select a smaller sample of homes, or pre-pilot new systems in a more controlled manner where inherent problems in new technologies could be dealt with on a smaller scale.

PM (i): Auditing, compliance and regulatory engagement: Regulatory support was viewed as necessary at different stages of the project. While one interviewee saw engagement with plumbing regulators (PIC) enabled approval of technologies, another interviewee perceived a disappointing lack of interest by the PIC in the novelty of the trial. The lack of certification of new plumbing works by the PIC required YVW to audit compliance of plumbing works by contractors who in some cases were not working within the regulatory scope of the project.

PM (j) Pride as a staff motivator: The innovative nature of the Kinglake project, the opportunity act as leaders in the area of sustainability and the unprecedented investment in social research on the project was commented on by the majority of team members who were proud and excited to be part of such a pioneering project.

Project Implementation Themes

PI (a): Lack of experience and processes to support YVW staff working on residents properties: The Kinglake project presented a new way of working with residents where YVW staff and contractors work on resident's properties as opposed to a more public space. This is not only a new experience for YVW staff but also presented a dilemma in that there are no established processes and systems in place to support such interaction with residents. The lack of experience in working in this way means there have been mistakes made in interacting with residents on-site.

PI (b): Learning through trial and error: The process of learning through the experience of installing systems and rectifying initial mistakes has meant that the first round of installations has been characteristically problematic. But through the experience of learning-by-doing a greater knowledge of the range of issues associated with trialing innovation has been gained.

PI (c): Co-ordinating plumbers, builders and home owners: The challenge in installing novel systems in a greenfield project is that coordination is required between YVW, the homeowner, builder and plumber/s during the construction of the house. Communication and co-ordination between all parties was perceived as critical in installing new systems correctly.

PI (d): Proactive community engagement: Maintaining good communications with the community was recognised as central to YVW's project implementation. Some team members felt that the skills of YVW's community engagement staff should have been utilised to a greater extent. It was commonly agreed that plumbing contractors should not be negotiating work with customers on behalf of YVW.

PI (e): Outcome focused rather than process focused: The complexity of implementing the project meant that some YVW staff took on new responsibilities to meet the needs of residents and deliver the job. The approach by some team members was outcome focused rather than process focused, that sometimes meant going beyond conventional work descriptions, and thinking outside the square.

PI (f): Inadequate management of plumbing contractors: Management of plumbing contactors was viewed by many as being inadequately administered. The combination of substandard plumbing skills, subcontracting work to plumbers with little ownership over the project and the lack of adherence to basic plumbing code practices culminated in considerable rework of poorly installed system

Analysis - Interview themes and illustrative quotes

The outcomes or learning from the YVW interviews have been structured broadly under three main categories including *Customer Engagement* which highlight issues arising from the engagement of customers throughout the trial, *Project Design and Management* which highlight issues associated with the design of the project and on-going management of YVW staff and contractors and *Project Implementation* highlighting issues arising from the installation and implementation of systems on-site, including engagement with contactors, builders and homeowners

1. **Customer Engagement (CE)**
    a. Engaging with bushfire victims
    b. Informing residents on the challenges of trialing innovation
    c. Inconveniencing customers with multiple disruptions
    d. Learning gained from individual verses community engagement
    e. Keeping lines of communication open with residents and the community
    f. Adopting appropriate communication tools for community engagement
    g. Clarifying legal rights of YVW staff and residents

2. **Project Design/Management (PM)**
    a. Departure from conventional YVW processes of management
    b. Lack of regular internal communication and team meetings
    c. Structuring processes for reflective feedback
    d. Identifying motivations and incentives for adopting sustainable innovation
    e. Understanding the pros and cons of new technology
    f. Inappropriate technology selection
    g. Pre-piloting technologies to iron out the kinks
    h. Taking ownership of the project, whose responsibility is it?
    i. Auditing, compliance and regulatory engagement
    j. Pride as a staff motivator

3. **Project Implementation (PI)**
    a. Lack of experience and processes to support YVW staff working on residents properties
    b. Learning through trial and error
    c. Co-ordinating plumbers, builders and home owners
    d. Proactive community engagement
    e. Outcome focused rather than process focused
    f. Inadequate management of plumbing contractors

CE (a): The team identified a range of important consequences for both YVW and the residents as a consequence of the bushfires. Team members agreed Kinglake residents had different needs as bushfire victims, but there were divergent views on how well or otherwise YVW responded to those needs. YVW also suffered reputational damage because in the eyes of the residents, they were, at times, just another government department that wasn't delivering on what they had promised.
I speak for myself here but it was just really hard when the bushfires happened and well what do we do for the best? Should we do this? Should we do that? It was really very awkward and we were only doing things out of a sense of is this the right thing to do or not?
...we have had to tread really gently, because of the situation the customers are in. It just makes it hard sometimes, to make decisions. ... it is very easy for them to get depressed, and the general public on their side. Therefore, we have just got to tread really gently. I think that is the biggest social issue for us.
I think across the board everybody will agree that their attitude was certainly unique having been through what they'd gone through. Dealing with them, they needed to be probably dealt with in a different manner.
I think too we underestimated the needs of these people post Black Saturday. I wouldn't even say underestimated, I don't think there was actually consideration. We haven't treated them badly or any worse ...we just haven't treated them differently to any other customer which in hindsight we probably should have with what had happened prior to us starting work. There should have been maybe consideration, but hindsight is a marvellous thing.
There's a lot of times with the people up here where they get so angry and worked up because they've been - they're a bushfire victim. They've had every government department known to man promised them the earth. They've all half delivered. We're the last 'government' body up there and coped a fair bit of crap that we couldn't do anything about.

CE (b): There was a diversity of opinion within the team in regard to the approach taken to engage residents in trialing innovation. Some of the team felt that YVW should have been more up front and open with residents about the fact this was a novel system, and therefore, despite YVW's best efforts, things would likely go wrong. Others felt the approach taken to engage residents in trialing innovation was adequate, reasonable and sound.
I think we've got to spend more time with the community and make them understand exactly what they're getting in for, what we're proposing...while we're probably good at selling all the positives, we've also got to show them and say that hey, there could be some negatives. These are the possibilities and this is what we propose we'll do if this is the worst case that happened.
...it's important that we tell the people what they can expect. Not just in terms of okay, well we're going to come in here and we're going to put this in and this is where it'll go and it should take this long. But also to be open about it and say, this is a pilot for us as well and, as much we're confident that it's going to go well, and we've got plans, and it's not based on just guess work, that we might encounter some things and there'll be some teething matters.
...we all recognised that we were going into something that was new to us. Even though we might not have really communicated that - you're not going to go with that as our number one point to the community. Hey guess what? This project that's going to affect your lives - we've never done it before so we don't know how it'll go, obviously we think we know how it'll go but there's no guarantees.
I think the approach we took was reasonable and sound....we were pretty upfront with people in saying look this is a new technology. This is the area you live, these are the sorts of challenges and would you be interested in taking part in something that's new and different?
Knowing what I know now...I think we probably would have a more open approach from the outset...just be honest about it...this is what we're doing here. Probably have a big information session beyond the normal material that they have.

CE (c): Residents were inconvenienced when pipework and technologies had to be re-installed due to faulty performance. The challenge in trialing unfamiliar systems is that mistakes occur, systems are wrongly installed and consequently due to the inconvenience of multiple disruptions tensions between YVW and residents arise. Being victims of the bushfires exposed residents to further interruptions.
Fortunately for us I suppose the manufacturer supported us in that decision and came to the party and supplied an alternative that met our needs. But, once again, it means we've got to go back into a customer's property, dig up their house again - the interruption and everything onsite created quite a bit of tension.
If it was as easy as just go in and fix it that would be relatively straight forward. But it's the having to go in again and disturb the customer and say, sorry, we put it in wrong. You are just on the back foot right from the word go... You've got to go in and dig up through their landscaping to lay the pipes again, and you are worse than on the back foot - you are apologising all the way. It just makes a difficult situation. It was never going to be an easy job. It just makes it all the much harder.
It is like, oh God here we are again. Sorry, we have got another problem. So it was just, I think, people have a certain amount of patience to deal with these types of projects and we used that all up at the start and then we keep beg, borrowing and stealing some more from them.
They'd have so many different people coming up to them trying to get their time and get a quote or whatever. We don't want to be just part of this white noise that's part of their life. We want to make our interactions with them to be meaningful for them and not just a waste of their time. It's been difficult to try to balance that in with our communications approach.

CE (d): There were mixed opinions on the value of engaging with residents through a community meeting to discuss arising problems. While there was widespread support for the approach taken to engage residents through a community information night, some team members felt a more intense conversation with the community could have been constructive, but suggested YVW needed to learn how to deal with communal criticism.
...whether they've got that problem or not, they're always on the lookout, and if they've got some other sort of problem they say well Harry's got that problem, make sure I don't get it.... It's almost as if one person's problem becomes everyone's problem. It's a pretty small community up there and so everyone does talk to one another.
There was certainly some discussion early on as to whether we should have community meetings on it - to try to isolate the issues. But it was decided we should deal with them individually. That's turned out to be, I think, the best way - establish some personal relationships with...the customers.
No point standing up in a room and saying we're going to do this, this and this because it's not appropriate to do all of those things in every property. We need to look at each property individually. I think sticking to our guns and taking that individual approach meant that you could deal with exactly what was going on, on each property.
Basically everyone here was on board for not having a community meeting and then really through the media and the comms guys they turned our ideas around. We had the community meeting and I was quite surprised at how well it went and I was probably the person who said don't have it and I turned around and said, I am very glad we had it.
I think a lot of people here are still on training wheels with some of things in terms of feeling comfortable about doing it [community engagement]. The learning still has to happen within the business around what can be achieved through having not an all in brawl but a more intense conversation. Even with people being grumpy. You can still get some constructive criticism from that.

CE (e): Throughout the development of the project increasing importance has been placed on communicating to residents how the trial was developing, the inherent challenges associated with trialing innovation and the impacts on the residents of adopting these alternative systems.
I think you can never give enough [information]. You're always better giving too much and the customers can choose whether they engage with it or not. We might well have given all the information we had.
But it seems quite clear that people need to understand that they're going to have to tolerate [some teething problems] - and while those conversations were had I don't think, very clearly for a lot of people, that they didn't register...
Probably there is a bit of lack of communication in terms of what we've actually done and finished up with, the impacts on them in terms of any running costs or ongoing maintenance. Maybe that hadn't been gone through enough. The information was out there, but maybe it needed even a one on one session with some of these people.
The other thing is keeping the community up there up to date. A project like this, it grows legs very quickly. When you find something wrong you've got to fix it and not just fix it on one property. You've got to go and fix 20 properties. Trying to keep the entire community informed on what we were doing has been pretty difficult.
The days of someone knocking on the door and going, we're digging a new sewer through your backyard, we'll be there sometime in the next month, and that's all you told them, those days are gone. People want to be informed.
I think one of the things that we've learnt, is the value in sending out a monthly or fortnightly letter to everybody up there, even if it doesn't say anything. Just the fact that they're getting something from the water authority that says, we're doing this, this and this, nothing's really changed, reiterate what you've been through, if you've got any problems call these numbers.

CE (f): Using forms of communication that were appropriate for conveying information to Kinglake residents was recognised. Some team members felt residents were not sufficiently engaged and therefore did not have a thorough understanding of the consequences associated with adopting the system, such as the financial impacts. Team members commented on the effectiveness of conducting face to face meetings upfront to establish rapport and clarify how the system would impact resident's day to day life.
I guess it also reinforces some of the beliefs that I have, such as why muck around with different forms of technology to communicate with someone when it's simplest to either pick up the phone or just go and talk to them. Seeing the positive effect that has had on the people in Kinglake just reinforces how important it is to do that with other projects.
Rather than a phone call or letter or e-mail, actually sit face to face and say, here it is. This is what it looks like. This is where it will go. This is what it will do for you. This is how much it will cost to run down the track. This is what you need to do to maintain it. This is what you are going to get out of it. Have a very, very cut and dry process as to what that is and get that delivered I think personally to the customer.
Again I think it's just general [observation in] society that unless somebody is actually sitting there face to face telling you, people don't necessarily... I mean I sat in a meeting this morning where I sent an e-mail out and my boss said yes to it. Then I brought it up in the meeting and he sort of looked at me. I said, did you read it? He said, I read the first half. You know.
I think we really should have sat down with every person who wanted to be in the project, talk about the technology so they understood what they were buying into, talk about the impacts, so what is going to happen with their day-to-day life. Talk about the financial impacts so that they were formally informed and now making a decision that they were really buying in and committing to it.
I know the communications that we've used up there - some of the materials we've had used the Kenny character from the movies on the fact sheets that they have laminated. It's how to clean a toilet, or how to use it, and it's got a bit of humour in there in plain language. That's had really positive feedback from the people up there. I think it's making sure that you try to use the language of the people up there, if you can, and try to find the right way to be able to relate to people. I guess that'd be a key learning - just try to get your message across in a way that is the easiest way for the people to hear it.

CE (g): For some team members, there is a lack of clarity around whether there were signed agreements by residents in taking part in the trial, this has subsequently created concern in regard to the legal rights of YVW staff (and customers) in working on residential properties.
The other thing which I don't think we've really done any work on is that I'm not sure still what the homeowners have agreed to. Is there a trial document that they sign that gives us certain rights and gives them certain rights and obligations as well?
It's just a little bit grey. You hear all different things and I've seen a million different bits of paper but I haven't seen anything with a customer's footprint [signature] on it saying, I agree. That's the one thing that still worries me. What happens if we get a customer that turns round and goes, you can all XXX where do we go from there? Have we got a legal agreement that gives us rights or not or are we floating in the wind just hoping?
... I've got to go in there and tread on glass really, just the way you deal with the customer, because I don't know and I can't really find out from anyone, if there's a signed document.
Because when things happen now you can't go back and say, oh but you knew about this, you signed onto this because some of them really didn't. Part of that was because of the rebuilding from the fires.
....when it comes to the construction phase and I've got the opportunity to get them to sign something, I want it signed then there's no argument...it doesn't specify everything, but at least I've got something that says the customer's agreed this is where X, Y and Z are going. If they come back and say, no I didn't want it there, at least I can go, well you signed, what do you want me to do?

PM (a): The Kinglake project was not managed through standard YVW processes, but the reasons for this were unclear. A particular issue was that the planning team did not forward the project to the asset creation team after the initial design phase as would normally have occurred. A number of team members commented on the consequent lack of expertise in managing field work by the planning team.
Maybe initially the planning guys weren't aware of how deep some of the plumbing work was being done. It's probably something when we actually do a review on this - how those decisions were made - we need to look at. Probably in hindsight we should have managed it.
...the planners were really the only ones who had done the community consultation and planning phase, and because it was so new in terms of the way we do things, it was held in the planning area for, I think, longer - well, in hindsight, definitely, longer than it should have. It should have moved to the people who are used to making things happen on the ground, and used to dealing with contractors, and used to making sure we get the right quality earlier.
Yeah, we are not set up as a team per say, but that's the way that we generally work with our projects anyway. Like we are a team in terms of a cross functional team, but everyone has got other things they are doing as well.
'Planning' [department] plans the projects and then hands them over to asset creation, and asset creation build them. In this case planning, for whatever reason and I'm not sure on the reasons, the construction phase started under planning
...we (asset creation) probably should have been a lot more engaged early on in the project. I can understand why - because it was a trial project - so I can understand why our planning colleagues wanted to be involved and very close to it. But their forte is not managing work out in the field, ours is. So certainly that's one big thing for me.
I think because it's quite a different project to our normal capital projects where we plan an asset like a sewer park or pump station and this has so much more to it. It's sort of plumbing type work versus big construction type work. That's maybe where our standard....it didn't quite fit into our standard processes and it didn't get handed over.

PM (b): A general observation was that team meetings were fragmented, irregular and did not always involve necessary team members. Many felt that internal communication through regularly scheduled project meetings would have contributed to identifying and acting on emerging problems earlier.
So there are get-togethers every now and then. There weren't regular meetings like weekly or fortnightly meetings to go over the project, but certainly we have had a number of customer issues around there.
Perhaps in hindsight we should have more regular project meetings along the way. Maybe a regular, we've had a few but not a regular every month meeting trying to sort out issues on the project, you know a monthly project meeting.
I suppose I've learnt just what the importance of really good internal communication and understanding of roles in a team is. I've learnt I think the importance of just the constancy of communication that's required.
I think I've enjoyed the liaison and the contract management but it's sort of like we've got so many players involved in the project that I'm just probably wondering if there is a different way we could have engaged internally about it.
...it's like almost developing a culture of change and good practice around project management and yeah you want to broaden it out from the personal learning...there could be systemic ways that this [problem] could be addressed.
Just checking in with people - I think what we ended up - because we were a bit here and a bit there and all the rest it became a lot more reactive rather than proactive. Yes so I reckon if we had a little group of people check up - just checking on things more regularly. I reckon that might have made a difference in terms of spotting when things seem to be going a little bit off the rails.
I mean I'm only - my sense is that could have helped. We still had reasonable communication but there were times when I'd heard about a meeting and I thought, hmmm would have been good to have been there. Yes so that occasionally happened and maybe if - yeah a problem shared is a problem solved.

PM(c): A number of team members noted the need to build-in reflection throughout the project to gain insight into how the project was progressing and apply what was learnt. For example, the lack of reflection on the evolution of the project from a retrofit to a greenfield meant the project was not managed as a greenfield site would have. One suggestion was to have reflective feedback from an external peer reviewer group as a way of operationalising reflection.
...yeah well we knew it was experimental and we knew it was going to be like that but there's a point where you've got to stand up and take responsibility and say, have we gone far enough with this? Should we be pulling back et cetera, et cetera? That's something I think is an ongoing discussion for us internally with a lot of projects.
we need to be very clear with what went wrong and what worked and then make sure we use those learnings in installing it again. So I think if we don't do that we'd be stupid really.
You have to have a balanced view – and I question whether we did that well. So how can we be reflective - once you commit to doing something, how can you honestly step back and say is it going well? What would we do differently? Look I'm making it up as I'm going. I think it's to have a group as a peer reviewer that aren't captured by the day-to-day components because then they can give you that reflective feedback. So I think the reflective feedback - so I'd add that to it.
...just taking a bit of a step back early on in the project and taking the time just to think about how these things would interact and what are some of the issues that might come up? You can never plan for everything and you shouldn't I don't think because you will actually never get anything off the ground, but taking that time and maybe that time wasn't taken because of the way that the rebuilding from the fires happened.
It is quite a complex project. I think it would have been good I guess to actually take stock and see that the project was changing from a retrofit type of project to a greenfield kind of project and how we might be working in with builders and builders' plumbers and customers and all these different needs at the one time.

PM (d): The majority of team members commented that careful selection of residents is required in trialling new systems. In Kinglake, financial incentives were seen as a major motivation for residents but for the long term viability of the systems there was a common perception that residents also needed to be motivated by the environmental benefits of the system.
...when you're going to put the number of elements we've put together you really need people who are wedded to the sustainability environment - that needs to be their focus because I think then they have a tolerance for the learning that they need to go through and the behavioural change they need to go through to adapt this new technology.
So you know people who are prepared to shape their lifestyles for the greater good and I think that when you're doing something like this - that's as challenging as this is - then you need people that have that focus because they're prepared to go on the journey with you.
...once upon a time people would have gone up there [Kinglake] because it was cheap. So if they're doing that then, you know that's a different reason for living there and that's a financial reason. Maybe they're not good candidates for what you're doing because there may be an electricity cost down the track - maybe not a big one.
I mean you know there's lots of things people go yeah, yeah, right, I can climb that hill or I can, and they just can't...we need to try and balance our need to trial something with finding the right people. Obviously in this sort of situation you need a community, so you need enough people in a fairly close proximity.
how does this impact people in terms of their day to day life? I don't think we thought maybe enough about that. It's not big things, but they have got alarms they have to attend to, they have got to use different products in their washing. They have to clean differently in their toilets. When you add all those little things up, I think that's even enough to make people a bit annoyed if they are not completely on board.
...most of the community we're working with have adopted this technology for a monetary reason. Because they're rebuilding from a bushfire, we've offered that we'll do this work on your house, it's no cost. They see that as a monetary saving so they sign up for it without really considering that it is a trial and that the monetary benefit, while there is a fairly big monetary benefit, that there could also be a few headaches along the way.

PM (e): A common view amongst team members is that there was a lack of understanding and internal knowledge about the technologies adopted and that if a better knowledge base existed, problems could have been identified earlier. Some team members commented that knowledge was not only required about individual technologies but also how a combination of technologies functioned together.
That would be one thing...looking into each of the technologies a bit better..... The technology suppliers did this talk to us which all this information came out that I thought 'how did we not know this earlier on?'
Little things like if you had to install this (Nubian system) on someone's bedroom wall, you would have the conversation with them and say, it would be better for us to not install this than put it on your bedroom wall because you will not sleep [because of the sounds of the pumps running]. So one of the guys...was in a corrugated iron house, so you can imagine this guy wasn't sleeping!
There could have been a bit of a perhaps a workshop around all the 'what ifs' of each technology and I think you probably could have ironed out a few issues then.
I wish I had probably taken it a bit more seriously and gone right, let's get my teeth into this whereas I relied too much on [others] knowledge. So I would just refer everything back to [others] and say, what is this, what is that? I probably personally should have got more involved in those technical details so I could have answered people's questions better. I could have identified some other problems earlier, maybe myself.
I think just have we really understood the different technologies and this is as a layperson I'm saying this - we can all have our opinion when we're not a plumber or an engineer. But could we have tested out a little bit more the interfaces of the two systems so that we had some degree of confidence that they were more likely to work than not. So a bit more homework around that.
I'm only just commenting from a very non involved point of view on the technical side of things but is that something we probably needed to have thought through a little bit differently? yes you're going into the unknown but we do know enough about a lot of these things to think how detailed have been the risk assessments in doing this? What can we lose out of it for us? What could be gained?

PM (f): Some team members saw conservative water use practices, unsuitable climatic conditions and increased capacity of rain tanks at Kinglake, as incompatible with the use of greywater systems. A few team members felt the conditions set for funding the project, constrained the direction of the project once funding was committed - eg. residents were required to take the greywater system to be part of the trial.
...perhaps this isn't an appropriate system for this community because these people use water very scarcely. They've never been on town water or piped sewage, so they use water quite sparingly, they have particular habits of water use...I don't know whether they need or want a greywater system
So they're the elements that I would do differently. So it's selecting the area, the technical selection - being able to review the products if they don't work; changing them. It's hard to change once you've gone down a path and you have funding and you've got to do this.
But when you start to think about that with the interaction of the fact that their water is coming from water tanks, not reticulating water, you start to think well God was this even appropriate in the first place?
They are still developing emerging technologies and even things like they said to us in that meeting in January, if it gets below 18 degrees in the treatment column, things really slow down. We said, well it snows in Kinglake. Oh okay, that shouldn't be a problem?
I think the other thing that complicated the customer consultation as well was in order for us to use the funding and go ahead with the project, the urine separating toilets and the grey water systems had to be part of it because they were the innovate aspect I suppose. It was a bit of a mixed message because we were telling people it was a voluntary project. They didn't have to take part if they didn't want to, but at the same time we were saying you can only have a sewerage connection if you take up the toilet and the grey water system as well.
So we ended up with a grey water system and it was designed at a point of time here. Then there were the fires and people ended up with larger tanks system competes with the tanks, so should we have pulled that out.

PM (g): The circumstances triggered by the bushfires meant that building and installing systems occurred rapidly without time to reflect on arising issues, consequently oversights in planning occurred. Many commented that in retrospect, it would have been beneficial to select a smaller sample of homes, or pre-pilot new systems in a more controlled manner where inherent problems in new technologies could be dealt with on a smaller scale.
...the job site exploded exponentially...very quickly. We started off with one or two and all of a sudden we are five and 10, 15 houses on the go. You just multiply the problem out I think. We all got a little bit caught short.
...this thing exploded, that the project exploded quite quickly in terms of the volume of work on and the fact that we were essentially installing a fairly well untrialed process. I think that's where we came unstuck, where we had most issues.
We had to rush a lot of the things. We still had to tender for things like the grey water treatment system and make sure we went through the proper processes. I guess it meant that there were oversights in terms of planning, you know some of the details around installing the technology and how things would actually fit together.
The brakes should have been possibly put on that. Get one from go to wao, iron out the kinks, let it run for a little bit and make sure that we are right. It's all fairly new technology....
Don't try and barrel into 20 and 30 houses all in one go. Take four or five, give them a go and you get a good cross section there. You might only get a couple in one house, you get a family in another one, you get a single in another. You get a good opportunity to monitor that for a few months and just see how it goes. I suppose that's sort of the crux of it.
I would have picked a smaller group of people. I know 25 is not many. We originally based - we had a sort of minimum number that would determine whether the project would proceed or not. We based that on having enough urine to be able to - run agronomic trial or something. I don't think that was the most important thing.

PM (h): Ownership of the project has been commented by team members from a number of different perspectives. Externally, outsourcing contracts, (and subsequently subcontracts) decreased responsibility and ownership for the project. Internally the issue of ownership was viewed by some team members as being inadequate within the team where an absence of departmental ownership exists.
...so we outsourced everything which meant that we then had to go to a plumber and the plumber then outsourced it. So what happens is you get decreased responsibility or ownership. So you really have to have a very good person in the field and ideally they're in the project team; and probably within the company.
...we had to step into that management role and take charge or take ownership of the project really and make sure we could deliver what we'd done, more or less promised the customers we would.
If it's a trial, we should own the trial and really show the community that we do own the trial.
I think part of the problem also with this project is starting to become the ownership. Who owns this project? ...planning...started it off and now we're in a bit of it and the ISF stuff from the urine stuff is still sitting over in [the planning] area and then certain stuff becomes operational and moves to the Mec and Elec team and the maintenance team. So I still think someone needs to take ownership of this and make sure that they continue to work with people and issues. Will it be me or my area? I don't think so. So that is something that Yarra needs to address as well.
[the project] will move into different phases, so that is why someone will need to sit across the top of it and make sure that they are still...filling in the gaps and making sure that we are still learning as much as we can from...people's experiences are out there and like I said collecting the next phase information, are we actually saving any water? What are we actually doing out there?
So I think we have definitely got some work in terms of ironing out that process still, but once again it is tricky.....it's probably in a phase where someone else needs to take ownership for this project...I don't know who.

PM (i): Regulatory support was viewed as necessary at different stages of the project. While one interviewee saw engagement with plumbing regulators (PIC) enabled approval of technologies, another interviewee perceived a disappointing lack of interest by the PIC in the novelty of the trial. The lack of certification of new plumbing works by the PIC required YVW to audit compliance of plumbing works by contractors who in some cases were not working within the regulatory scope of the project.
... one of the most important things...is to get the regulatory aspect settled first and make sure everybody involved is across what the regulator is going to require. We had a few small gaps where it was a bit vague on what the requirements were, especially with new technology that's untried. You need to have a very tight scope so that the contractor really understands what he's pricing and what he's going in to do.
Whilst we had a fairly good scope...our contractor has never read it...it's just so frustrating when you're onsite and you say to him, you've got to do this. Why? It's in the scope. In the what? It's the thing I've given you like five times. Read it. Yeah, it's just mind boggling.
I suppose one of the disappointing things is how little [interest] the actual plumbing regulator in the state [showed] - it's a trial, it's innovative. You would have thought that the regulator might have wanted to have a bit more hand in it, but they really didn't show a lot of interest... didn't show any interest whatsoever.
It's a strange set of affairs when you think that, not going back that far, every single below ground drain in Victoria was inspected prior to backfill. We've gotten to the stage of 'self-certification' which we run in Victoria now where the plumber does his work and issues a certificate saying it complies, but there's no one checking... Everywhere, across the state. The Plumbing Industry Commission looks at approximately five per cent of a plumber's work which is a pretty low number.
I think the stakeholder engagement has worked well. Getting the right regulatory parties involved early and making sure they are aware of the project and what the purposes were. Similarly engaging the Plumbing Industry Commission as well and getting permission to install the urine diverting toilets. I know that's been a blocker in some other projects where they haven't been able to install a non-Australian standard plumbing product.

PM (j): The innovative nature of the Kinglake project, the opportunity act as leaders in the area of sustainability and the unprecedented investment in social research on the project was commented on by the majority of team members who were proud and excited to be part of such a pioneering project.
You know we want to be leaders; we want to be working in the area of sustainability but yeah with reservations. I'm probably biased in terms of my own investment in it. If I let that go - if I was able to step aside of it would I do it again? I'd do it again but I'd do it differently.
I suppose the benefits are down the track. I don't know enough about Yarra Valley's area and its sizes of small towns and isolated areas where what we're doing would fit in, but I can definitely see the benefit for others.
...this is a pretty innovative project and it looks like a bit of a flagship type thing. It's exciting to be involved in those things.
What have I personally gained? [pause] I guess a sense of achievement for doing something different.
Well I've always said that I think it's really exciting that Yarra Valley Water is being prepared to put this amount of money into a piece of social research. Not in my experience have I ever had that opportunity to have that amount of funding to do something like this which I think is really important.
I think that part - I feel quite positive about being in an organisation that's really prepared to go out on the front foot and lead. So that part's exciting for me.
It worked well from the fact that Yarra Valley grasped the idea, grasped the opportunity to resolve what was quite a problem in terms of the sewerage treatment in a local area. They were able to do that. The fact that they embraced a unique idea, even the grey water treatment. It's a great idea.

PI (a): The Kinglake project presented a new way of working with residents where YVW staff and contractors work on resident's properties as opposed to a more public space. This is not only a new experience for YVW staff but also presented a dilemma in that there are no established processes and systems in place to support such interaction with residents. The lack of experience in working in this way means there have been mistakes made in interacting with residents on-site.
.[we] don't have the history of this kind of project to develop a communications plan about - for my specific role. But that's all part of the learning process.
I think because it's quite a different project to our normal capital projects where we plan an asset like a sewer park or pump station and this has so much more to it. It's sort of plumbing type work versus big construction type work. That's maybe where our standard - it didn't quite fit into our standard processes and it didn't get handed over.
I think it was a real eye opener for Yarra Valley because we don't typically do a lot of work on people's properties. We realistically never do any work inside their homes. Now all of a sudden we're inside their homes, in their properties trying to work with the owners in close proximity. A lot of our existing systems and processes probably don't allow for that interaction with the homeowner and the level of interaction we need.
There's a lot to it. It's not just a different technology in terms of urine separation and grey water systems; it's taking us inside a customer's property and inside a customer's house which we've never done that before. It's then the associated maintenance of the system.
...like I said to the customers all along, while you might be upset with us, you've got to understand this is new. We don't normally do this. Said to them all along, you wait to see us work out in the street. It's a totally different kettle of fish and they're like, yeah whatever. 'Now, you are guys really good and efficient at working out in the street. It's just that you don't know shit about working on properties'.

PI (b): The process of learning through the experience of installing systems and rectifying initial mistakes has meant that the first round of installations has been characteristically problematic. But through the experience of learning-by-doing a greater knowledge of the range of issues associated with trialing innovation has been gained.
... I suppose we're, guinea pigs, because some of the initial problems with the greywater systems. I think that's been sorted out, but those customers early on would have had to put up with those. The ones that are building later, hopefully, won't have the same issues.
So there are some things we are learning from as we go. That is probably not managed that way, it just happened to happen. Someone's got to start, someone's got to be first and you work your way through.
Because Yarra Valley Water as an organisation hasn't really done anything like this before, we'd all be on a bit of a learning curve. You can't really go in and plan ahead and say, well this is what we're going to be doing here when you've never done it before. I think that would be pretty arrogant. As much as you try to be positive and proactive when you're planning things, you have to just accept that a lot of the time things are reactive. You put things in place and you see how people respond to that. Based on that, okay well you can plan a bit further.
I think the best way to learn is when things go wrong. Having had a few technical things go wrong has definitely generated some learnings for us.
It's just the complexity of getting things on the ground. It should be easy to install and it is probably - the innovators are probably more conceptual people. For something to work you have to have a mixture of innovators and people who are on the ground that actually make things work. Sometimes they don't work and you need many things for them to happen to be successful.

PI (c): The challenge in installing novel systems in a greenfield project is that coordination is required between YVW, the homeowner, builder and plumber/s during the construction of the house. Communication and co-ordination between all parties was perceived as critical in installing new systems correctly.
The domestic builder is not used to dealing with a contractor like us doing an individual task like we were. There was the lap over between our work and the actual house plumber's work. You've got the Yarra Valley input coming from their large, very organised civil type construction work...They'd be having their toolbox talk and that sort of thing. It's a little bit foreign to the domestic builder.
We've learnt that it's not just the homeowner we've got to deal with. We're constructing a new house so we've got...a homeowner, a builder and a plumber and, in some cases, multiple plumbers if the builder uses one plumber for his below ground drain and then another plumber to do his above ground work.
The one thing that we have really settled on as a good way to go is that we prepare a property plan of our proposal, what assets we're going to put on the site, where we're going to locate them. We do that liaising with the homeowner so that they're happy with the locations. We then offer that to the builder and their plumbers so that everybody's working to the same plan.
The builders typically these days work on a very tight construction timeframe and they don't want anything to interrupt that...They don't care that the customers saving considerable dollars by using us to do a lot of the work. The builder's got his goggles on, he's got his project to deliver and that's it.
...the project was changing from a retrofit type of project to a greenfield kind of project and how we might be working in with builders and builders' plumbers and customers and all these different needs at the one time. I suppose our working in with those different parties was a bit fragmented.

PI (d): Maintaining good communications with the community was recognised as central to YVW's project implementation. Some team members felt that the skills of YVW's community engagement staff should have been utilised to a greater extent. It was commonly agreed that plumbing contractors should not be negotiating work with customers on behalf of YVW.
I think communicating with the community, trying to work with the community I suppose rather than separating yourself. You've got to be a part of the community you're working in and you get a bit more acceptance.
...work was going on but they hadn't kind of got back as often as people were obviously feeling the need. I said....use the community engagement people [YVW staff]....they don't have your expertise in engineering - but they can go and have conversations with people and make them feel...heard.
I think the construction contractor shouldn't be doing all the negotiating work with the customer because he's going to be looking what benefits him the most and trying to make the customer decide in his favour rather than, if we're there, we can influence the customer a little more and say, hey look no, you need to step back and have a think about this because once this goes in the ground, it's there forever. Are you planning a garden bed? what are you planning to do with the space?
...it became a bit like a snowball when more and more people were experiencing problems it was harder...to keep across all of that. So I think having a closer monitoring of all of that going on with a bit more help [with more community engagement staff involved] - might have offset some of the angst that people had.
I think we've still got a lot of...learning to do in here about the way we approach community engagement, feeling more comfortable with losing a bit more control and all those sorts of things. I put that down to just the residual cultural challenges but I'm really disappointed in that part of the project not being able to be done in the right way.
I think we probably assume too much and answer too many questions when we should be asking more questions of the people involved. So I think that drove us for a little while.

PI (e): The complexity of implementing the project meant that some YVW staff took on new responsibilities to meet the needs of residents and deliver the job. The approach by some team members was outcome focused rather than process focused, that sometimes meant going beyond conventional work descriptions, and thinking outside the square.
So where we would normally have a project manager who would do this and the contractor would do this - we're finding that we actually, our project manager actually has to be doing more and it's because of his willingness, to his credit, to take that on board, that it has got to this stage.
You know you can have rules and procedures and work descriptions of what you should be doing, but it's someone who actually doesn't work to that, but actually works to delivering the job and filling in all the gaps and taking responsibility....it's great to actually look back and see that. So I think they've done a fantastic job.
I still have that feeling you know that you can't go walking in people's houses, that type of thing...it's in difficult situations, in new situations where you actually need people to think outside the square and get things done; seeing people being able to deliver that. So that's the satisfying thing for me.
...normally compliance officers aren't making decisions with the contractors and don't have the authority to do that. We've had to move away from our normal model and be able to make changes on the fly and get things working for customers. It was probably one of the biggest changes I think that we made up there.
I found with the new technology while you might have a problem in the middle somewhere, it could be something downstream or even upstream of it that's influencing that problem. I suppose more or less looking outside the square that you're looking in.

PI (f): Management of plumbing contactors was viewed by many as being inadequately administered. The combination of substandard plumbing skills, subcontracting work to plumbers with little ownership over the project and the lack of adherence to basic plumbing code practices culminated in considerable rework of poorly installed systems.
...the management of the contractor on site was probably not as well managed as it could have been. There was a lot of re-work required of the early work that was done; that has caused a lot of the customer issues...
I don't know whether they didn't think about it or I don't know why and whether it was just an oversight; and they [planning staff] didn't realise that the plumbers didn't have that skill level...
So as soon as you move from the company it's, by how many steps removed are they? Well it was a contractor to us - and I think they used a subcontractor - so you know its three steps removed. And then there are different people doing different parts. So you really have to have one person and you really have to know them well. They have to be techno-proficient and they have to have some ownership as well and belief in it.
Well we let the contractor have a bit too much say in the way it was done. The Plumbing Code is pretty tight on water seal traps, that every fixture needs a water seal trap. For some reason the contractor thought that the toilet didn't need a water seal trap. Pretty obvious that it did. Once we started fitting them we found a lot of the problems - all the problems - dissipated.
It's a trial project for Yarra Valley Water. It's not a trial project for Schultz Plumbing. We need to probably put a lot more resource into it early days and see the benefit, reap the benefit the track.
It's a bit like a border collie rounding people up which as we often say we've just got to put our border collie outfits on and go off and do a round up...I think they're the sorts of risks that can really topple something over.

Appendix B – Summary report of interview references

The following summary report provides an overview of topics and issues discussed by YVW staff during structured interviews. The table below is structured to give the reader a summary of how many interviewees (number of sources coded) have discussed a particular topic or issue and how many times this has occurred (number of coding references). In addition the table also provides information on whether a particular topic or issue is related to other topics (Parent Node name)

Name	Number Of Sources Coded	Number Of Coding References	Parent Node Name
advocates questioning innovation	1	2	
applying learning	6	16	
appropriate mode of communication	6	25	
appropriate technology selection	4	12	
being honest about the challenges of a trial project	6	11	
changing role for YVW - coming into the household	5	9	
committing to the project	3	4	
community support	1	2	
complexity of retrofit	1	2	
complying to regulations	1	6	
conflicting perspectives on community engagement	1	3	
coordinating plumbing and building	3	8	
cross disciplinary skills and knowledge	2	7	
cumulative problems	4	11	
customer agreements for trial	4	12	
customer engagement	7	32	

dealing with bushfire victims	10	25	
decision making	4	12	Nodes\\project management
delivering on-time	1	1	
delivery verses long term benefits	1	3	
designing the system	1	7	
different from most projects	6	15	Nodes\\project management
early identification of problems	3	5	
effects of grief	1	2	
evaluating the project	2	3	
facing criticism	1	1	
financial cost of fixing problems	1	3	
first impressions last	1	2	
inaccurate cost estimates	2	2	
inconveniencing customers	7	12	Nodes\\customer engagement
increasing level of communication	1	2	
individual vs community consultation	7	27	
informing customers	10	35	
learning by doing	8	20	
learning from existing installations by others	4	7	
long term aspirations	1	2	

maintenance	3	6
managing contractors	8	46
managing risks	3	6
media	4	10
motivations for taking the system	5	20
negotiating with suppliers	1	3
new plumbing practices	2	4
new responsibilities for staff	6	12
new technology problems	10	22
odour issues	3	9
organisational support	1	2
ownership of the project	3	9
plumbing problems	8	17
pre-pilot	2	7
pride in trialing sustainable innovation	8	21
proactive customer engagement	3	6
project management	7	45
quality of installation	3	4
quantifying the benefits	2	2
reassuring customers	1	4

reflection	6	20	
reputation effected	2	2	
requires changing practices	4	7	
requires team effort	4	23	
retrofit program	1	1	
scale of installation	3	4	
securing contractual agreements with suppliers	1	1	
seeking different perspectives	1	1	
selecting a community to trial innovation	6	12	
social impacts of new technology	2	3	
social research	1	2	
speed of installation	4	9	
stakeholder expertise	4	15	
supporting institutions for innovation	1	3	
timing engagement	4	8	Nodes\\customer engagement
trust	2	4	
understanding new technologies	4	19	
unexpected problems	4	6	
variable acceptability	2	3	
YVW presence in the community	3	13	

Kinglake West Sewerage Project

Summary Report on

Evaluation of Learning Workshop

held on 10 August 2011
as part of the

Mutual Learning for Social Change
social research project

Prepared by the Institute for Sustainable Futures
for Yarra Valley Water

Contents

Overview

Yarra Valley Water has been engaged in a highly innovative and complex project, installing sustainable servicing systems in the Kinglake West community. The level of innovation and complexity in the project has meant that much has not gone according to plan. As part of a broader program of social research, YVW commissioned ISF to undertake a learning and evaluation process, to facilitate the articulation of organisational learning from the experience for Kinglake going forward, for other innovations within Yarra Valley Water, and for the sector more broadly.

This document is a summary of that process. Insights arising from the process are summarised in Table 1 below. The details that underpin those headlines are presented under each of the three core themes (customer engagement, project implementation and project management) in the pages that follow. Before the details, there is a summary list of actions identified by Yarra Valley Water staff as a result of the process. An overview of the learning and evaluation process is provided at the end of this document.

Summary of insights

Table 1 Map of significant themes, the categories they belong to, and the recommendations for action

		Kinglake	YVW	Sector
Customer engagement themes	Clarifying legal rights of YVW staff and residents ⇒ Ensure clear rights and obligations with supporting legal documentation	✓	✓	
	Informing residents on the challenges of trialing innovation (YVW & Water Sector) ⇒ Use relevant expertise within organisation ⇒ Focus on end-to-end customer experience		✓	✓
	Adopting appropriate communication tools ⇒ Track communications and review communications strategy regularly ⇒ Listen to community and make timely response			✓
Project implementation themes	Proactive Community Engagement ⇒ Have regular physical presence on site ⇒ Work in partnership with community, feedback both positive & negative implications	✓		
	Coordinating Plumbers, Builders and Home owners ⇒ Develop detailed property plan ⇒ Close management/supervision of on-site personnel with required skills	✓		
Project management themes	Processes for reflective feedback ⇒ Get external project evaluation/peer review, input from senior management ⇒ Have regular team meetings, identify key decision points and 'back out' clauses	✓		
	Taking ownership of the project, whose responsibility is it? ⇒ Establish Project Owner as well as Project Manager ⇒ Clarify accountabilities and interactions with established YVW processes	✓	✓	
	Understanding pros and cons of new technology ⇒ Have clear supply contracts, staff training, performance monitoring ⇒ Elicit community feedback, be flexible to change, pre-pilot to identify problems before upscale ⇒ Allow greater flexibility within existing organizational structures/processes		✓	✓
	Pre-piloting technologies to iron out the kinks ⇒ Checking references and research at beginning ⇒ Trial components separately if possible, respond decisively on findings		✓	✓

Action List

The boxes below show an integrated action list based on the workshop discussions, intended as a starting point for the Kinglake team to further develop learning and actions.

KINGLAKE PROJECT GOING FORWARD

Customer Engagement

Clarify understanding of YVW and residents' rights and obligations

⇒ Have a document with final ownership and responsibility to be signed as part of handover process. (led by Asset Creation and with Community Engagement team's help. Date: suggest by end of Sep 2011).
- Train staff to carry out one-on-one handovers. explain to customer and get it signed.

Improve customer engagement

⇒ Develop a user-friendly tracking/recording system to document customer interactions and issues. Community engagement team to get information on supporting software options, capabilities and costs – (date: suggest by late September 2011).
- Review customer issues at regular team meetings or other agreed ways to review interactions

⇒ Review and update the current communications strategy. (by led community engagement team collaborating with wider team – a 6-week timeframe)
- Prepare Communications Plan going forward, led by Community Engagement team.
- This will identify key milestones and mechanisms for providing information.
- Communicate spirit of partnership with community.
- Feedback all the information we gain from the project to the community – keep them informed in case of changes.
- Develop key messages and communication materials to support ongoing contact with customers to discuss next steps of the project. This could be co-ordinated by the CE team and set a deadline of end of September.

⇒ Regular review of our communication efforts and community needs – include in agenda of regular project team meetings (monthly meetings established by Jacquie Sharples)

Project Implementation

Improve delivery of work by contractors

⇒ Undertake formal review with contractors to discuss the learnings and what can be put in place to avoid the problems encountered by this project. (led by someone in Asset Creation??)

⇒ Establish process for closer management and supervision of on-site personnel, and dealing with all tradesmen on the property

⇒ Review development of more detailed property plan and resourcing to ensure this can be executed

Project Management

Improve internal communications

⇒ Set up fortnightly meetings with the project team chaired by asset creation

⇒ Regular project team meetings involving all aspects (community engagement, asset creation, planning and senior management representatives)

⇒ Regular input from senior management

Plan direction of project going forwards

⇒ Clarify the funding rules for the project and degree of flexibility to change tack.

⇒ Identify key decision points for the project's future – including:

- Evaluation of power consumption in greywater systems in 3-6 months time - what to do with the systems if energy bills are too high?
- Urine diversion and collection, how long should it go for?

Incorporate regular review and reflection

⇒ Make sure there is structured reflection around each decision/issue

FUTURE YVW INNOVATION PROJECTS

Identify special needs of managing innovation projects within existing YVW structures

⇒ Some innovative projects require a different approach in their delivery as opposed to more "mainstream" projects. Should we undertake some work to identify key challenges with these kinds of innovation projects and document the various steps/procedures we need to put into place?? Is it something that Sustainable Development could do in collaboration with Strategy and Communications?

Specific features to include in project design:

⇒ Establish Project Owner (PO) and Project Manager (PM) with responsibilities to make decisions now till the end of the project.

⇒ Establish arrangements for technical peer review of designs and plans, independent/external scrutiny and feedback, to build in transparency and robustness

⇒ Comprehensive reference checking and research at the very beginning of an innovative project's life cycle

⇒ Enable flexibility "loosening the reins"

⇒ Pre-trial technology on smaller scale

⇒ Examine context of project: size and significance to the business; customer sensitivities; criticality etc.

⇒ Have a long term assignment of the project team that are brought together from conception to completion

- Identify all relevant teams and experts within YVW
- Include operational staff from early on.
- Establish roles and requirements and ownership of various tasks
- Have planning discussions as early as possible

⇒ Develop a communications plan to structure the timing and messages of communication

⇒ Focus on customers: get them involved as early as possible; have open and transparent communication, find out their needs; include their feedback in overall evaluation process

INNOVATION IN WATER SECTOR

YVW to disseminate learnings to wider water sector through various channels

⇒ Develop a report and/or communicate key findings to water sector publications; attend conferences etc,

⇒ Identify promotional opportunities within water sector networks; develop a schedule and develop appropriate communication materials . (potentially a joint effort with Research and Innovation and Marketing and Communications)

⇒ Articulating community engagement learnings for use by others through conferences,

publications and group presentations (within the water sector) – paper to be prepared with CSIRO for industry publication (led by Planning).

- ⇒ Assess conference opportunities – (led by Francis Pamminger)
- ⇒ Promote experts in their fields to provide expert advice to others in the sector. Eg., presenting research at conferences, peer reviewed and industry publications or going on a 'road show' to share knowledge.
- ⇒ Use other channels be beyond conferences there is:
  - VicWater
  - Smaller utilities
  - IWA
  - YVW website under research publications

Work towards formation of peak water sector body for sustainable innovation

- ⇒ A state/national body that relies on shared knowledge and teamwork to achieve efficient trialling of innovations. This would reduce overlap and wasted resources in water sector organizations that essentially have the same objectives
- ⇒ Peak water bodies could pool resources /energy into these innovations
- ⇒ Develop documents/information based on UDT schemes
- ⇒ To develop stronger links within the water sector
- ⇒ Key individuals in these type of projects should be encouraged to promote key findings and challenges – networking is essential

Customer Engagement Themes

Clarifying legal rights of YVW staff and residents (YVW & Kinglake)

1. ***What did you do that worked well in managing this theme?***

- Customers did sign an agreement [1]
- Discussions with customers prior to signing an agreement
- Community meeting prior to setting out agreements and letting the community know that we were looking at reinstating the project

2. ***What supported us managing this theme? What were the important factors?***

- The document was reviewed by lawyers
- Document based on conditions of connection to pressure sewers (but there may be problems with this as customers were not actually signing on the same form outlining the conditions – see footnote).

3. ***What needs to change to make more of this good stuff happen?***

- Field staff need to have an understanding of what customers have agreed to
- Clarification of staff and customer rights in a legal document
- Make sure that customers are clear about what they are signing up to and that agreements are signed

4. ***What can we do to make that happen? Specific people, actions, dates***

- Project team needs to be established at commencement – work has started led by Jacquie Sharples to determine project team
- All parties involved need to understand the documentation and agreements made by customers and YVW staff
- Get legal advice
- Support the authority of field staff
- Have clear authority – a project owner (PO) could be someone who would have decision making ability, is across all the information and part of the project, is a go-to person and is where the 'buck stops'. (NB: this role does not currently exist at YVW). Potentially Sam Austin as project owner. (Steering Group could play a role here)
- Have a document with final ownership and responsibility to be signed as part of handover process. It has been agreed that we will carry out one-on-one handovers (led by Asset Creation and with Community Engagement team's help). Will explain agreement at this meeting and try to get it signed. Date – suggest by end of Sep 2011.
- Develop a user-friendly tracking/recording system to document customer interactions and issues e.g. use something like "Consultation Manager" or Darzin stakeholder tracking.

⇒ Action: community engagement team to get information about such software costs and capabilities – date: suggest by late September 2011.

- Ensure regular internal project team communications preferably regular meetings or other agreed ways to review interactions

[1] Customers signed an application form to connect to sewer. This was requested of the customer as acknowledgement of the 'conditions of connection' agreement setting out YVW and customer responsibilities.

Informing residents on the challenges of trialling innovation (YVW & Water Sector)

1. ***What did you do that worked well in managing this theme?***

- Communicating to residents that it is a new technology
- Ad hoc approach to informing them of the challenges – this was only done at a high level, we didn't go into specifics

2. ***What supported us managing this theme? What were the important factors?***

- Strategic input from the community engagement team
- Research learnings from external case studies
- Advice/expectations based on discussions from the suppliers (did/didn't help)
- Proximity of the area, it was 1 hour drive from Mitcham to Kinglake West
- Residents were willing and available to talk at most times
- YVWs commitment to innovation and facing challenges
- Identify and liaise with other organizations that have been involved in similar trials/innovations

3. ***What needs to change to make more of this good stuff happen?***

- Consistency in our key messages in both written materials and face to face conversation. Need to balance optimism (avoid scaring participants off) with reality
- Stop and think about what relates to the customer and how we communicate this
- Focus on the behavioural/cost impacts that will affect customers
- Pre-trialling the technology and implementation would give YVW a better understanding of impacts on customers – manage expectations
- Written documentation – signed documents after a verbal face to face conversation
- Expert advice to mitigate issues and challenges is needed from the planning stage
- More emphasis on end-to-end customer experience
- Peak water bodies could pool resources /energy into these innovations
    - Develop documents/information based on UDT schemes
- Rely less on info from suppliers; use more references and external checks

4. ***What can we do to make that happen? Specific people, actions, dates***

- Identify all relevant teams and experts within YVW, then have planning discussions as early as possible.
- Ownership is a must – consistency in project management will reduce confusion for both customers and YVW
- Plan discussions early
- Develop a communications plan to structure the timing and messages of communication
- Implement processes to include mandatory pre-trialling of technology, this avoids rushing things
- Honest transparent communication to customers as early as possible – get them involved. Find out what their needs are – Genuine engagement
- YVW to develop a report and/or communicate key findings to water sector publications; attend conferences etc,
- Key individuals in these type of projects should be encouraged to promote key findings and challenges – networking is essential
- There's a lack of real ownership in the project – there needs to be one person who has ownership so the message is controlled and the 'buck stops with them'

Adopting appropriate communication tools for community engagement (Water Sector)

1. ***What did you do that worked well in managing this theme?***

- Written materials - manuals, letters
- Face to face contact to build relationships
- Making ourselves readily available all hours
- Getting customers involved in manual development
- Timing of communication – something fitting at the right time
- Open 'expo-style' information session

2. ***What supported us managing this theme? What were the important factors?***

- Planning things out

3. ***What needs to change to make more of this good stuff happen?***

- Regular review of communications strategy
- Confirming scope and details of project before communicating
- Being very clear about what the project is – a trial or project
- We need to be more willing to take more risks and be transparent
- Listening harder to what the community says and wants and acting in a more timely way

4. ***What can we do to make that happen? Specific people, actions, dates***

Kinglake moving forward

- Review what the community needs
- Regularly review our communication efforts and community needs via regular project team meetings – monthly meetings has been established led by Jacquie Sharples

⇒ Action: Review and update the current communications strategy by led community engagement team collaborating with wider team –suggest a 6-week timeframe

YVW can influence others by

- Articulating community engagement learnings for use by others through conferences, publications and group presentations (within the water sector) – paper to be prepared with CSIRO for industry publication, led by Planning.
- Determining opportunities to give presentations, communicate through various formal channels. Future conference opportunities to be assessed (once project is fully complete). To be led by Francis Pamminger

Water sector

- Preparing appropriate communication strategies incorporating regular reviews

⇒ Action: ensure regular meetings to review customer issues

⇒ Action: engagement of key internal YVW support groups at project inception stage

⇒ Action: make contact with participating customers to seek their feedback about the project as part of the overall evaluation process.

Project Implementation Themes

Proactive Community Engagement (Kinglake)

1. ***What did you do that worked well in managing this theme?***

- Having a key contact on-site in which customers feel comfortable to deal with
- Community consultation night was well received
- Having a higher level of management meet customers when times got tough (eg. Andrew and Tony Kelly
- Providing monthly updates and plans gives a consistent message of support to residents
- Being physically present in the community

2. ***What supported us managing this theme? What were the important factors?***

- Having management push us to 'oil the squeaky wheel' quickly (eg. Resolve customer complaints)
- Community responded well to increased information and regular contact
- Trying a couple of different approaches to find out the one that worked eg. Xmas hamper, monthly newsletters

3. ***What needs to change to make more of this good stuff happen?***

- Engage the community pre-installation
- Heavy engagement of community at project milestones
- Let the community know how important this project is in the larger scheme of things, it makes them feel special
- Engage them in discussing both the positive and negative implications of the technology so we can cut through the 'grapevine gossip'
- Engage customers whether they have a problem or not

4. ***What can we do to make that happen? Specific people, actions, dates***

- A need for stronger focus on community consultation – 'Walk the Talk', this is also a way of protecting our 'brand'
- The business needs to make consultation a priority
- Spend the money to listen to the community, responding and acting on what they say
- Convince the community we're working in partnership, this means changing in response to community concerns. This means being adaptable and flexible. We have done this to a degree eg. allowing homes to install both a UDT and WC
- All the information we gain from the project we should be feeding back into the community – keep them informed in case of changes. Communications Plan going forward to be prepared, led by Community Engagement team. This will identify key milestones and mechanisms for providing information, e.g. bulletins.

⇒ Action: Revise community engagement plan and review efforts to date with customers. Develop key messages and communication materials to support ongoing contact with customers to discuss next steps of the project. This could be co-ordinated by the CE team and set a deadline of end of September.

Coordinating Plumbers, Builders and Home owners (Kinglake)

1. ***What did you do that worked well in managing this theme?***

- Preparation of a property plan of our proposal, what assets are going to site and where they will located
- Identified that Kinglake went from a retrofit type of project to a greenfied project

2. ***What supported us managing this theme? What were the important factors?***

- Input from YVW field staff

3. ***What needs to change to make more of this good stuff happen?***

- Analyse and identify what skills will be required to do the work on the ground
- Closer management and supervision of on-site personnel
- Need to deal with all tradesmen on the property
- On-site people need to have skills required to do the job

4. ***What can we do to make that happen? Specific people, actions, dates***

- Better selection of contractor that uses their own staff…
- More detailed property plan – look at resourcing to ensure this can be executed particularly given the significance of the project

⇒ Action: undertake formal review with contractors to discuss the learnings and what can be put in place to avoid the problems encountered by this project. This could be done by someone in Asset Creation??

Project Management Themes

Processes for reflective feedback (Kinglake)

1. ***What did you do that worked well in managing this theme?***

- External stakeholder reference group provided a pair of fresh eyes to evaluate project
- Dialogue internally did happen but was a bit ad-hoc
- Regular updates with Sam Austin and Tony Kelly helped us identify issues early and provided feedback. Regularity of meetings diminished in the middle of the project due to time constraints and the emergency to fix emerging problems

2. ***What supported us managing this theme? What were the important factors?***

- High level of goodwill by each project team member. This helped us give and receive feedback
- Level of interest and buy-in from senior management – they sought updates and provided input

3. ***What needs to change to make more of this good stuff happen?***

- Need someone who is completely removed from the project to scrutinize and provide feedback (whether its external to the project or external to YVW doesn't matter)
- ISF provided some feedback from customers that wasn't taken on-board immediately – information should have been passed onto the project team
- Regular project team meetings involving all aspects (community engagement, asset creation, planning and senior management representatives)
- Regular input from senior management – this started but dropped throughout the project
- Seek technical peer review of designs and plans for innovative projects. This provides transparency and robustness and is important for both YVW and water sector
- Clarify the funding rules for the project so we don't get 'trapped' going down a certain path.
- We need the maturity to make tough decisions eg. Pulling back from an appropriate technology solution

4. ***What can we do to make that happen? Specific people, actions, dates***

- Set up regular meetings with the project team (including everyone in the project)
    - although some aspects of the project are finished there are still issues that need to be sorted out.
    - Effectively immediately, fortnightly, involving all in the project team and chaired by asset creation
- Identify key decision points for the project's future
    - Eg. Power consumption of greywater systems, evaluate in 3-6 months time and decide what to do with the systems if energy bills are too high?
    - Urine diversion and collection, how long should it go for?
    - Make sure there is structured reflection around each of these decisions/issues
- To be established via Project Team meeting.

Taking ownership of the project, whose responsibility is it? (Kinglake & YVW)

1. ***What did you do that worked well in managing this theme?***

- Stepped up and took ownership of the project
- Provided community information and discussion
- Ownership in planning stages

2. ***What supported us managing this theme? What were the important factors?***

- Staff passionate about the project, new technology and sustainability focus
- Research project - CSIRO, YVW & RMIT
- Key strategy for YVW with technology providers

3. ***What needs to change to make more of this good stuff happen?***

- Establish a project team
- Engage operational staff early on. The GM of Infrastructure Services (David Snadden) signed off the future ownership and maintenance arrangements early on, however we should have kept him and his staff more involved as the project progressed. Should have involved them more in decision-making so they would eventually feel ownership of the project.
- Within the establishment of the project team , establish roles and requirements and ownership of various tasks

4. ***What can we do to make that happen? Specific people, actions, dates***

- Assess the need for a project team – planning needs to make the assessment upfront (Sam Austin)
- Assess criticality of the project
    - Does it follow normal processes
    - Is it a major project because of its size or significance to the business
    - or is different due to customer sensitivities
- Ownership would involve a project manager from start to end
- Establish Project Owner (PO) and Project Manager (PM) with responsibilities to make decisions now till the end of the project. Project Owner should be Sam Austin. Project Manager needs to be determined by Sam.
- The difference between a PM and PO is that a PO could move between managers and have final responsibility – this term, PO, does not exist within YVW at the present

⇒ Action: We are undertaking some innovative projects that probably require a bit of a different approach in their delivery as opposed to more “mainstream” projects. Should we undertake some work to identify key challenges with these kinds of innovation projects and document the various steps/procedures we need to put into place?? Is it something that Sustainable Development could do in collaboration with Strategy and Communications?

Understanding pros and cons of new technology (YVW & Water Sector)

1. ***What did you do that worked well in managing this theme?***

- Getting suppliers to sign a contract which covers us if anything goes wrong eg. Nubian had to give YVW replacements at their own cost for faulty systems
- Being a large organization, YVW has commercial power and could specify the volume, conditions etc.
- Rita's trip overseas, International visits and links with Currumbin
- Tapping into collective learning and years of experience
- Knowledge from an international network to support what the suppliers are telling you

2. ***What supported us managing this theme? What were the important factors?***

- Having a supplier contract – which met our expectations, gave us a help line and after hours service
- Supplier provided training to staff – and training material actually contradicted what the supplier said! We received trouble shooting and installation information
- We monitored the energy consumption of the greywater system (by shutting off the pump)

3. ***What needs to change to make more of this good stuff happen?***

- At the beginning of the process make sure the supply contract is iron clad
- Get everyone involved in the process from the beginning eg. the technical staff to check the technology early on
- Ask the technology people to present the systems in layman's terms to the rest of the team
- Ask for community feedback, experience can provide information on the pros and cons
- Be flexible eg. 'shift the goal posts' if need be. If the technology isn't appropriate change it

4. ***What can we do to make that happen? Specific people, actions, dates***

- Identify technical problems early, learn about them before large scale installation
- Have a long term assignment of the project team that are brought together from conception to completion
- The current organizational structure doesn't support these kinds of projects eg. the project team changes depending on the stage the project
- Need to have the best people for the duration of the project
- Taking on innovative projects requires 'loosening the reins' and reconsidering the existing organizational structure.
- Again, pilot new technologies on a small (1-2) basis before rollout to sort through installation & other technical issues. Also helps to confirm cost estimates.

⇒ Action: see immediately above.

Pre-piloting technologies to iron out the kinks (Water Sector)

1. ***What did you do that worked well in managing this theme?***

- This is speculative for the water sector based on YVWs learnings

2. ***What supported us managing this theme? What were the important factors?***

- N/A

3. ***What needs to change to make more of this good stuff happen?***

- Form a state/national body that relies on shared knowledge and teamwork to achieve efficient trialling of innovations. This would reduce overlap and wasted resources in water sector organizations that essentially have the same objectives
- Comprehensive reference checking and research at the very beginning of an innovative project's life cycle
- Pre-piloting technology to be a mandatory phase of the project - if there was time for a pre-pilot we could have collected data from the start
- Flexible deadlines (don't rush the project) to allow for pre-piloting to occur, as well as to effectively plan the processes of comms and construction
- Trial technology for each separate component and then trial them together. If this cant be done, closely monitor the technology – treat it as a pre-trial – and respond decisively based on findings

4. ***What can we do to make that happen? Specific people, actions, dates***

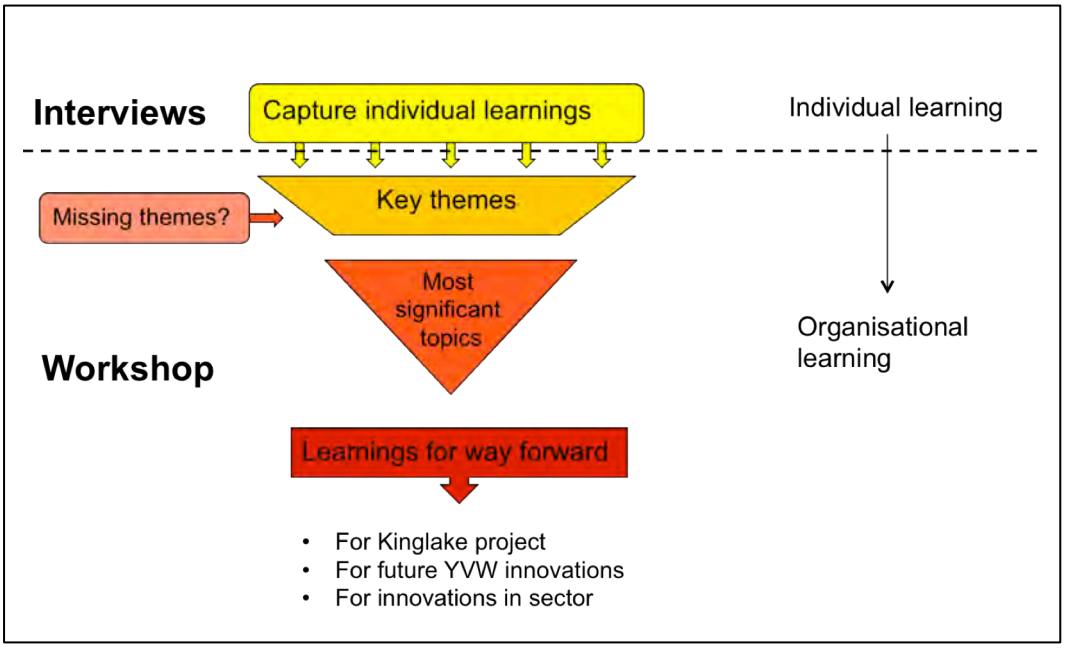
- Develop stronger links within the water sector
- Promote experts in their fields to provide expert advice to others in the sector. This may mean presenting research at conferences, peer reviewed and industry publications or going on a 'road show' to share knowledge.
- In sharing knowledge beyond conferences there is:
    - VicWater
    - Smaller utilities
    - IWA
    - YVW website under research publications
- Less internal pressure to achieve KPIs when our customers should be the main focal point

⇒ Action: identify promotional opportunities within water sector networks; develop a schedule and develop appropriate communication materials . Could be a joint thing with Research and Innovation and Marketing and Communications?

Overview of Process for Evaluation of Learning Task

Interviews were conducted with key participants in the Kinglake project. The interviews were transcribed and analysed to identify significant themes that were relevant to learning about implementing innovative water services. 23 key themes emerged under three categories: customer engagement, project implementation, and project management. The results of the analysis was provided as a briefing paper to participants as preparation for the workshop.

Figure 1: Schematic of Evaluation of Learning Task



At the workshop, participants assessed the relevance and significance of these themes to three future courses of action: *the Kinglake project going forward*; *implementing other innovations within Yarra Valley Water*; and recommendations for *implementing innovations in the water sector more broadly*. From this process, 9 themes emerged as the most significant. Each of these themes was investigated further by a pair of participants from different parts of Yarra Valley Water's business. They worked through an appreciative process to identify what had been done well, what supported those outcomes, what needs to change to make more of these good things happen, and what actions are required to realize this. Pairs then reported back to the group, and common themes emerged from the discussion. These themes are mapped in Table 1 below against the category they came from and for whom they were judged significant (i.e. where the recommendations for action lie).