

Milestone 7 - Final Report



GreySmart SWF PROJECT Number: 62M-2040

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Abbreviations

GSAT	GreySmart Assessment Tool
PBT	Persistence, bioaccumulation and toxicity
QSAR	Quantitative structural activity relationship
SWF	Smart Water Fund
ACCORD	Australasian Consumer, Cosmetic, Hygiene and Specialty Products Industry

Executive Summary

Greywater has the potential to be a significant water resource for Melbournians. However, currently there are a number of information and scientific research gaps in relation to safe and sustainable use of greywater. This document provides an overview of the GreySmart project.

The GreySmart project offers a consolidated, user friendly, communication and education package supported by research and meaningful interpretation which allows communities to practice truly safe and sustainable use of greywater. The project delivered:

- A review of the greywater literature to identify potential hazards and appropriate management strategies (Milestone 1)
- GreySmart Assessment Tool to scientifically assess if a household cleaning or personal care products is suitable for use (i.e. GreySmart) in the if greywater is to be used on the Garden (Milestone 3).
- *H₂OmeCalc* a web-based calculator to determine the best option for householders with respect of greywater, rainwater and potable water options (Milestone 4).
- A website (www.greysmart.com.au) providing a education and knowledge bank for greywater use across Australia (hosted by savewater) (Milestone 2 and 5, incorporating Milestone 3 and 4 outputs)
- A list of household cleaning or personal care products determined to be GreySmart (i.e. garden friendly) (Milestone 6 and 7)

Despite delays the public interface (website) has been met with a great deal of enthusiasm and has received media coverage in the January edition of House and Garden and will feature on the Garden Gurus television show later this month. The project has been broadly communicated to media and related industries and includes contact with water industry representatives across Australia; the Nursery and Garden Industry; Australian Plumbing Industry; Councils and the General public.

The Savewater relationship has proven to be a valuable partnership in the development and promotion of the GreySmart website. Their natural fit with the GreySmart message and their commitment to including GreySmart in future PR campaigns and promotions (including the Melbourne International Flower and Garden Show, Nursery and Garden Industry Australia (NGIA) promotional activity and their soon to be launched social media strategy) will ensure the longevity of the project well beyond its launch. The team at Savewater are actively promoting the site to water authorities and will continue to monitor and develop the website as required.

The systems developed and alliances that GreySmart have forged will ensure the continued growth, support and patronage of the GreySmart for many years to come. A one-stop-shop for greywater and rainwater supply to householders has been delivered successfully to all Australians. There is also international interest in GreySmart. Recently Atura was approached by World leading expert in water recycling (Dr Bahman Shiekh) to utilise our expertise to assist a similar project that funding is being sought for in the USA.

It is recommended that the Smart Water Fund team remain in close contact with savewater! They will be able to provide updated information on the website statistics and any additional promotional activity plans and results as they are now the manager of this website.

It is recommended that the testing protocol for Laundry products be finalised so that a comprehensive suite of information is available to householders who wish to undertake source control when utilising Greywater in and around their homes. Additional funding should also be sought to revise the website in 2 years and update the product assessment.

With Savewater Alliance, as the host for www.GreySmart.com.au it will ensure the continued success of GreySmart.

1. Background

With depleted water storages and a sustained period of drought (the last 13 years), greywater is being utilised by Melbournians as a temporary drought relief measure. Australian Bureau of Statistics reports suggest that 54% of all Australian households use greywater, with over 40% of Victorians reporting greywater as the main source of water for the garden (ABS, 2007). These figures are a significant increase over those recorded in 2001 and this trend is likely continue while water restrictions are in place and extreme weather conditions occur more frequently. Recent high rainfalls and inflow into catchment storages (2010) have alleviated water restrictions temporarily, however, the lessons from the last decade should still be implemented to ensure future water supplies and efficient use; both from a water and energy perspective. It is also likely that greywater use will become a more permanent water resource as water prices increase and individual householders seek to reduce their ecological footprint.

There are a number of barriers and risks associated with the current pattern of *ad hoc* greywater use and there are a number of information and scientific research gaps in relation to the safe and sustainable use of greywater. Currently, greywater use is largely done without scientific assessment of the environmental impact and there is little knowledge of the strategies to mitigate the impact of greywater through household personal care and cleaning product selection and control measures related to the associated environmental risks.

In addition, current greywater use largely involves temporary hosing and bucketing which achieves far from optimal collection and distribution of greywater. If greywater use is to develop beyond being a temporary drought relief measure, there is a need to increase the uptake of permanent diversion and treatment systems. Householders require information to determine if permanent greywater systems are the best option for them based on their specific circumstances such as garden type and area, the number of people in the household and the cleaning and personal care products they use around the home.

This GreySmart project addresses these research and knowledge gaps through a user friendly, communication and education package which allows householders to practice safe, reliable and sustainable use of greywater.

The purpose of this report is to provide a final evaluation of the GreySmart project and to assess outcomes in terms of original project objectives and goals, benefits and risks and return on investment.

2. Introduction

Project description

GreySmart adopts an innovative approach allowing providers, installers and users of greywater to access this information in an easy to understand practical format. The focal point is a website incorporating interactive web calculators, household personal care and cleaning products assessed as GreySmart, and a focused knowledge bank for greywater use in Victoria and across Australia. After completion of a detailed project plan (Milestone 1) and a detailed risk assessment, the project comprised five steps:

- Develop website structure and finalise co-hosting arrangement (Milestone 2)
- Develop product assessment system based on Australian Guidelines for Water Recycling (NRMMC and EPHC, 2006) for determining if household personal care and cleaning products were GreySmart (Friendly to the garden and environment) (Milestone 3)
- Develop an user friendly interactive web based calculator for the householder to assess if greywater and rainwater diversion/capture and use is suitable for their home (Milestone 4)

- Analyse around 100 household products (Milestones 6 and 7)
- Develop a communications plan (Milestone 5)

Website structure and co-hosting

After completion of a detailed project plan and the detailed risk assessment, the first step of the project was to develop a web hosting arrangement that would secure the life of the GreySmart website beyond SWF funding. Arrangements have been made for the continued operation of GreySmart by a third party, the Savewater!® Alliance (www.savewater.com.au). The formation of this partnership lends considerable value to the GreySmart project in terms of web expertise and web hosting infrastructure; in addition to the exposure that a high traffic and well established water conservation website will guarantee for the project. There is great synergy between Savewater!® Alliance and GreySmart and this will ensure the long term viability of GreySmart

Arrangements to host the GreySmart website until at least August 2012, have been established between Atura (formerly Arris) and the Savewater!® Alliance. A formal agreement between Atura and the Savewater!® Alliance took place on 1st October 2009. This was a major step in addressing and virtually eliminating a significant project risk, which was that the GreySmart website would be developed but not be able to secure ongoing support.

The website structure was developed to incorporate a number of components which provide a comprehensive greywater knowledge package:

- Home
- H₂Ome*Calc*
- GreySmart products
- Working safely with greywater
- Greywater technology
- Regulations and approved systems
- Suppliers and rebates
- Gardening with greywater
- About GreySmart
- Contact us

Product assessment system

The GreySmart assessment method was developed from the Australian Guideline for Water Recycling (NRMCC and EPHC, 2006) and complies with toxicity values from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000). The methodology was peer reviewed by leading greywater experts and three OzWater'10 conference reviewers (See Appendix Section 13 for the OzWater paper and detailed logic behind the GreySmart Assessment Tool - GSAT). All feedback and comments were incorporated into the final versions of papers and reports. Once the GreySmart Assessment Tool (GSAT) was developed, the methodology was used to assess all publicly available data on laundry detergents. Of the 143 detergents assessed from literature data only 15 could possibly achieve the GreySmart – Garden friendly rating and another 7 were GreySmart with care. The assessment indicated that the GreySmart ranking system was robust and that there were some detergents which will meet the assessment criteria. The methodology was then used to assess the range of household products (81 products) analysed during Milestone 6 and 7.

Web based calculator

During initial discussion and development of the GreyCalc module it was proposed to incorporate a rainwater tank yield calculator, to provide a more integrated water planning tool for householders. This

proposal was accepted by project stakeholders and functionality of the GreyCalc Model was upgraded to produce **H₂OmeCalc**; a tool to evaluate the integration of greywater and rainwater with mains water supply for the householder. In addition, the model was developed to provide a tool that could be used throughout Australia (with extra funding from Savewater!® Alliance), not just in Victoria.

The development of **H₂OmeCalc** builds on recent work by Dr Stevens for the Master Plumbers Association (MPMSAA et al., 2008) and used data and information collated in this study. Greywater demands and availability were based on data from estimates of greywater volumes from the Australian Government Department of Climate Change and Energy Efficiency, water efficiency ratings for showers and toilets and state guidelines for greywater reuse (DoH WA, 2005; DEUS, 2007; ACT Health, 2007; MPMSAA et al., 2008). Rainfall and climate data for calculation of irrigation demands and rainwater tank yields were sourced from the Bureau of Meteorology.

The modelling approach utilises a pseudo daily time step in which daily rainfall profiles for a climate zone are scaled to monthly average rainfall data for a specific postcode. Monthly climate data for over 18,500 Australian postcode locations were used (BOM, 2009) in conjunction with annual rainfall profiles for four climate zones (<http://www.bom.gov.au/silo/>). Appropriate climate zones were identified by utilising normal rainfall climate zone data from the Bureau of Meteorology and an extensive testing of **H₂OmeCalc** outputs when using different climate profiles. Other information compiled for householder use includes information on potential reductions or increases in rainfall during extreme dry or wet months respectively. See Appendix Section 14 for detail of **H₂OmeCalc** and www.greysmart.com.au for the web based calculator.

The module was developed as a spreadsheet tool and this format was used for beta testing. Beta testing occurred at a number of phases of the project by a number of organisations. Smart Water Fund, the Savewater!® Alliance, members of the general public and other water industry researchers tested the model for both functionality and user friendliness. Algorithms and data sources were then translated to a web based tool - **H₂OmeCalc**.

Analyse household products

A number of NATA accredited laboratories were contacted to provide the water quality analysis required for product assessment. Analysis required for assessment is:

- Conductivity at 25°C (µS/cm)
- pH
- Total Alkalinity as CaCO₃ (mg/L)
- Bicarbonate Alkalinity as HCO₃ (mg/L)
- Carbonate Alkalinity as CO₃ (mg/L)
- Total Kjeldahl Nitrogen as N (mg/L)
- Nitrate Nitrogen as N (mg/L)
- Nitrite Nitrogen as N (mg/L)
- Total Nitrogen as N (mg/L)
- Total Phosphorus (mg/L)
- Calcium (mg/L)
- Magnesium (mg/L)
- Sodium (mg/L)
- Total Cadmium (mg/L)
- Total Boron (mg/L)

Initially, biodegradability testing was to be included in the series of analysis. However, the two universities that could possibly develop the methodology to undertake biodegradability testing had little experience in the area and the testing was not NATA accredited. Additional research into the biodegradability test used by to assess detergents also indicated that it had been developed for

degradation with sewage water to assess degradation in the sewage treatment process (where detergents usually end up). This test was not considered appropriate for degradation in soils and more research is required to develop an appropriate biodegradability test method for greywater in soils. An even better alternative to the biodegradability test is that organic chemicals used in detergents and personal care products should be easily assessed for persistence, bioaccumulation and toxicity (PBT) using quantitative structural activity relationship (QSAR) and data from the literature (USEPA, 2009; Mackay et al., 2009; Howard and Muir, 2010). This could be easily integrated into the GreySmart Assessment Tool (GSAT).

Communications plan

Throughout the project communications support was provided with the majority of communications required upon launching the website; www.greysmart.com.au.

The website went live on the 8th of November 2010 and is also accessible from the savewater Alliance website at www.savewater.com.au.

Initially communication was planned with Australasian Consumer, Cosmetic, Hygiene and Specialty Products Industry (ACCORD). However, Atura was informed not to discuss the project directly with Accord as it may have implications for the relationships some water authorities have developed with the organisation. Whilst this relationship has no direct impact on the project, it was developed so as to protect the integrity of the project.

Communications varied from the originally proposed plans as a result of the partnership with the Savewater Alliance and the original support which was to be provided by Fentons to contact and follow up with media. The relationship between Fentons and SWF altered during the course of the project and this support was no longer available.

The partnership with the Savewater Alliance increased the reach of the project to become Australia wide and has provided an additional resource for spreading the GreySmart message.

Electronic Information packs were compiled and distributed with support from the savewater!® Alliance to SWF water authorities, savewater!® Alliance water authorities and Melbourne Metro councils which included:

- 'How to use this information' guidelines
- Media releases (2 versions)
 - Detergent Review media release
 - H2OmeCalc media release
- Statement and 'on hold' message ideas (3 versions)
- Style Guide and Logos – print and website versions
- Short intro / newsletter suggestion (for print or web based media)
- List of media being contacted

In addition to this media releases, and images, were prepared and sent to mainstream media including:

- Local metro newspapers / mags (Vic)
- Mainstream Newspapers (The Age, Herald Sun, MX)
- Gardening & sustainable living magazines and websites
- Gardening & sustainable living contacts in Radio stations

Industry associations and educators (such as nursery, plumbing, turf academic & research groups) were also informed of the project and provided updated information at launch.

Major achievements have included:

- Media uptake:
 - House and Garden (Jan 2011 issue – ¾ of a page (p. 168),
 - Garden Gurus (airing Jan 29th, 2011 on channel 9; <http://www.thegardengurus.tv/tv/>); and an
 - Town and Country Farming Magazine article (out w/c 13/12/2010 – pending receipt)

- Website support with links to GreySmart from the following websites
 - savewater.com.au, atura.com.au, recycledwater.com.au, [HotFrog](http://HotFrog.com.au), sewl.com.au, wannonwater.com.au, smartwater.com.au, sgwater.com.au, nambucca.nsw.gov.au - it is still too early to get a good picture on the uptake at this stage.

- Savewater Alliance support:
 - Savewater will launch GreySmart at Melbourne International Flower and Garden Show (MIFGS) in late March 2011 with an event (invitation to a cross section of industry representatives), brochures printed and onsite signage for the duration of the show.
 - GreySmart will also be an important part of the Social Media Strategy launched by savewater! in January. A follow up email will be sent by savewater! Alliance to all of their members early in the New Year to maximise the benefit of the January publicity.
 - savewater! news included an article on GreySmart and was emailed to approximately 26,000 recipients on the savewater database, of which it is expected just under half this number will view the email (based on previous statistics).

- Plumber Uptake
 - MPMSAA has expressed interest in using the GreySmart site as a training resource for Green Plumbers

- Water Authority promotional activity:
 - Feedback from Savewater suggests that the water authorities are keen to incorporate promotion of the site into their printed and online communications.

3. Objectives/Goals

GreySmart objectives were to:

- To develop a credible and user friendly website that integrates all aspects of sustainable greywater management for householders;
- To develop a product assessment method for greywater friendliness based on sound science and the Australian Guidelines for Water Recycling (NRMMC and EPHC, 2006)
- To identify environmentally friendly products to minimise environmental risk posed by the use of greywater by householders and enhance the quality of wastewater treatment plant influent; and
- To actively engage householders in the selection of household products. This will be measured by the number of visits to the website and website visitor feedback.

In addition GreySmart will minimise on and off-site environmental and health impacts from greywater as a result of increased education and awareness; and provide substantial savings to homeowners. The website will also show the world that Victoria and the organisations behind the Smart Water Fund are leaders in promoting and managing household greywater use.

The benefits of GreySmart were identified in the original project plan as;

- Reduced loss of garden plants during drought, water savings and improved investment in greywater systems
- Assist in mainstreaming greywater as a water resource
- Provide a focal point for the collection of product information on 'greywater friendly' products
- Long term sustainable use of greywater with no off-site impacts.
- More sustainable use of greywater

4. Key Steps/Milestones

Milestone descriptions

The following is a summary description of the seven milestones of the GreySmart project, updated to incorporate changes identified during the course of the project. All Milestones also included reporting to Smart Water Fund.

Milestone 1 – Project design, data and research

Develop a detailed project plan and communication plan, including the following details:

- Project description;
- Milestone description, methodology and timelines;
- Data collation;
- Detailed project risk assessment;
- Project KPI's.

Milestone 2 – GreySmart Website Concept Development

- Identify suitable hosting or co-hosting opportunities for the GreySmart website including contact with smartgardenwatering.org.au proponents (Dr Peter May and Mr Geoff Connellan), the Alternative Technology Association and Sustainable Gardening Australia.
- Secure ongoing funding for GreySmart beyond the SWF project funding.

Milestone 3 - Assessment framework

- Develop a scientifically robust greywater assessment framework to establish criteria for GreySmart and GreySmart with care household cleaning and personal care products.
- Identify accredited laboratories and associated costs for the subsequent analyses of products (Milestones 6 and 7).
- Utilise existing data to confirm the assessment framework approach.

Milestone 4 – Development of H₂OmeCalc (GreyCalc), verification and testing

- Develop, verify and test H₂OmeCalc (was GreyCalc in original project plan) and incorporate
 - Grey water supplies (including buckets and bathwater)
 - Greywater demands (including detailed irrigation requirements for different plant types, mulch depth and climatic variability)
 - Rainwater tank yield calculation (at appropriate time step)
 - Financial assessment
 - Australia wide application
 - Assessment of extreme wet or extreme dry conditions
- Beta test H₂OmeCalc and incorporate feedback.
- Integrate H₂OmeCalc into GreySmart website.
- Draft GreySmart Approved logo.

Milestone 5 - Launching of GreySmart Website (Salaries and Promotion Materials)

- Launch of GreySmart as a fully functioning live website.
- Project promotion and marketing of the website.

Milestone 6 – Product testing (Phase 1)

- Analyse and assess household products for listing on the GreySmart website (50 Products).

Milestone 7 – Product testing (Phase 2) and Final Reporting

- Analyse and assess a further 50 household products (to include a cross check of analysis from previous sampling Phase) for listing on the GreySmart website.
- Compile a final report for SWF, evaluating the GreySmart project.
- Seek voluntary submissions of products for testing.

Methodology

The GreySmart project utilised a variety of research and communications methods to assure successful outcomes (Figure 1). Scientific literature review was used to examine existing rainwater tank models and to select an appropriate time step to ensure acceptable accuracy of the **H₂OmeCalc** outcomes. Water company and regulatory authority literature was used to identify modelling assumptions for flows and volumes of household appliances and Bureau of Meteorology data used for rainfall climate profiles and monthly rainfall averages. The product assessment methodology was developed from previous research and based on the AGWR (NRMMC and EPHC, 2006). The methodology was reviewed and approved by greywater experts and **H₂OmeCalc** functionality and usability was beta-tested by a variety of end users. All of these methodologies provided successful projects outcomes and provide a robust research background for the GreySmart website.

Communication tools used in the project were selected to optimise project outcomes. One of the key partnerships formed within the project was that with the savewater!® Alliance, which allows the ongoing funding and operation of the GreySmart website after Smart Water Funding. This partnership also provided additional funding for the development of **H₂OmeCalc** to incorporate national data resulting in a tool which now provides national coverage.

Partnerships with other industry organisations which were planned to develop throughout the course of the project were not as successful. Collaboration with the Green Plumbers and Master Plumbers Mechanical Services Association Australia (MPMSAA) was not as effective as hoped, primarily due to key contacts moving on from these organisations. Some collaboration with Australasian Consumer, Cosmetic, Hygiene and Specialty Products Industry (ACCORD) and Choice was expected during the course of the project but these alliances did not eventuate as the water authorities involved with the project wanted to utilise their contacts in this area.

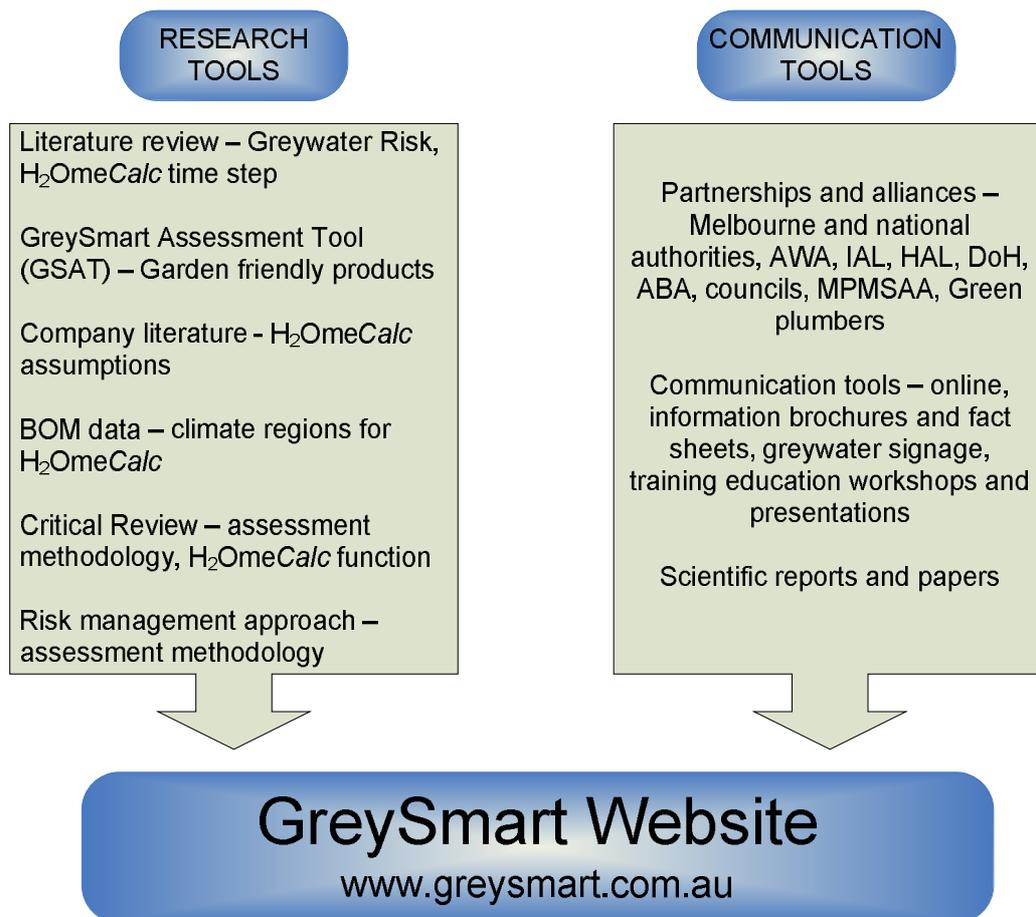


Figure 1 – Overarching methodologies for GreySmart project

Resources

The GreySmart project was undertaken by:

- Research and Development:
 - Dr Daryl Stevens, Ms Jodie Hannaford, Ms Cassie Harris, Dr Simon and Dr Clare Diaper (Atura Pty Ltd).
- Review and feedback on Milestone reports
 - Tara McCormack, Michelle Carson and Keith Johnson (SWF and SEWL).
- In partnership with Savewater!® Alliance for hosting the website and reviewing content and H₂OmeCalc.
 - Michael Smit
 - Amelia Nach (Public Relations)

The GreySmart Assessment Tool was reviewed by peers and presented at OzWater 2010.

H₂OmeCalc was reviewed by industry experts, presented at OzWater (2010), water authority staff associated with the SWF, the savewater!® Alliance and the general public.

The H₂OmeCalc logic was developed by Atura and coded by Chris Williams (Arris Pty Ltd – H₂OmeCalc code) and the web interface and website was designed by DVDesigns (Damon Vaughan and Sue-Anne Hocking) .

Communications of the project was initially handled by Fenton Communications through the SWF (Includes one radio interview by Dr Stevens). Communication for the promotion of the website and outcomes of the project has been handled by Atura (Jodie Hannaford) and Savewater! Alliance (Amelia Nach).

The final report on project evaluation was undertaken by Dr Daryl Stevens, Ms Jodie Hannaford and Dr Clare Diaper.

Timing

The original project plan started in March 2009 and the project was due for completion in June 2010 (Figure 2). However, delays in review and update of the detailed project plan, time required for initiating and confirming partnerships and alliances and anomalies in product assessment data generated from different sources meant that the launch of the website was delayed until November 2010. This launch does not include information on laundry detergent product assessment (the most relevant to most greywater users) as there are ongoing inconsistencies in the GreySmart assessment with other assessments completed by the water industry which still need to be resolved. The website launch was originally planned for October 2009.

Whilst these delays meant that the launch of the website was delayed, the additional time allowed extra functionality for components of the GreySmart website to be developed and for additional cross check in data from various sources.

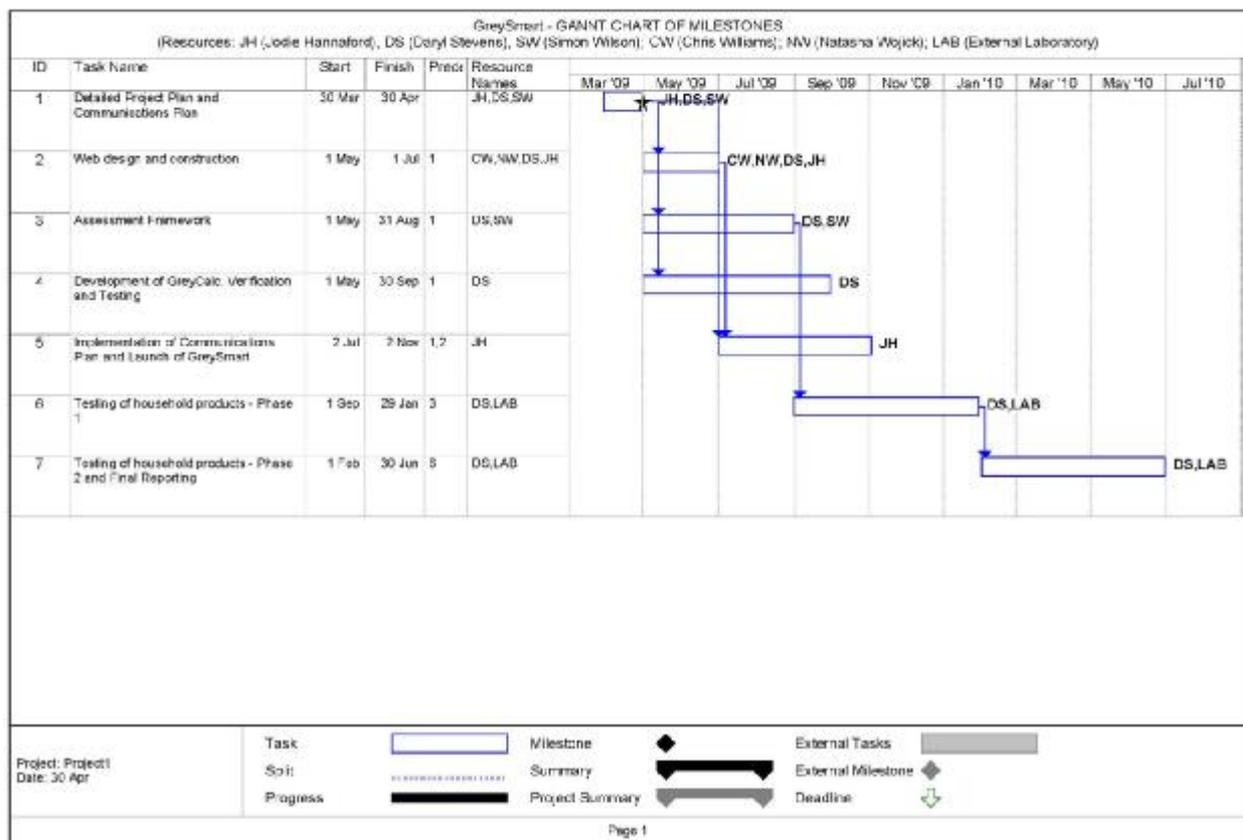


Figure 2 – Original Gantt chart for GreySmart project

The original evaluation report was to be completed 30th July 2010, a full nine months after the planned launch of the website. Due to project delays the website launch was delayed until November 2010. The delay has allowed improved functionality of components of the website to be developed, but does mean that evaluation of web statistics will not be included in this report.

Financial Summary

The total value of the project was \$276,660 with \$141,780 provided by the Smart Water Fund, \$50,000 provided by the Atura Pty Ltd, \$44,880 from South East Water and \$30,000 in kind from savewater!® Alliance (Table 1).

Throughout the project there were adjustments (agreed to by the SWF) to both the timing of milestone completion dates and, in some cases, minor changes were made to the Milestone requirements, but there have been no changes to Smart Water Fund budget. In order to cover some of the additional tasks identified in Milestones there were additional in kind contributions from the Grantee and the savewater!® Alliance in the development of web based calculator to a national tool, totalling \$70,000 (highlighted in Table 1).

Table 1 – GreySmart project financial summary

Milestone number	Milestone title	Completion Date	Amount from SWF	Amount from Grantee	Amount from other sources
1	Project plan	30/6/2009		\$10,000	\$44,880 (SEWL)
2	Website and co-hosting	30/10/2009	\$24,720	\$10,000	
3	Product assessment methodology	26/2/2010	\$33,900		
4	Web based calculator	5/11/2010	\$30,900	\$30,000	\$40,000* (Approx. Savewater! alliance)
5	Communications plan	4/1/2011	\$12,180		
6	Product testing Round 1	5/11/2010	\$20,040		
7	Product testing Round 2 and Final report	5/1/2011	\$20,040		
		TOTAL	\$141,780	\$20,000	\$84,880

*additional funds provided to cover develop of web based calculator to a national tool

Key Performance Indicators

Key performance indicators (KPIs) for all project Milestones have been addressed in detail in Smart Water Fund Milestone reports and so a summary only is provided here (Table 2). All Milestones had KPIs of; completion of milestone in accordance with SWF requirements and milestone report for SWF completed. These two common KPIs have not been included in the summary table.

Table 2 – Summary of KPIs for GreySmart project

Milestone	KPI	Comment
1	Completed Risk Management Matrix for SEWL in accordance with SEWL requirements	See Section 6
	Complete Communications Plan and Detailed	See Detailed Communication Plan

	Project Plan in accordance with SWF requirements Initiate process to register GreySmart trademark (Website name already registered)	Appendix Section 15 Trademark registered to Atura on 28 April 2009 (renewal 28 Apr 2019) Trademark 1296294
2	Confirmed web hosting arrangements Finalisation of a strategy to secure ongoing funding for GreySmart beyond SWF project funding Design, plan and framework for GreySmart website complete	Agreement with savewater!® Alliance signed Ongoing funding secured until August 2012 Framework designed and updated as project progressed
3	Finalised product assessment and testing methods trialled Support for the product assessment method by at least three leading greywater proponents	Methodology developed and published as conference paper Support from two greywater proponents and conference presentation
4	Agreement and support by a majority of Beta-testers regarding the usability and accuracy of GreyCalc.	Beta tested by scientists, the public, Smart Water Fund and the savewater!® Alliance
5	Completion and launch of GreySmart website	GreySmart launched in November 2010
6	50 household products tested and assessed for greywater friendliness	see Milestone 7
7	50 household products tested and assessed for greywater friendliness More than 20 additional voluntarily submitted products by manufacturers	A total of 91 samples (80 products) tested including repeat analysis between Phase 1 and 2 and water samples Not completed as this will happen in the months post launch of the website and when Laundry Products are allowed to be posted on the website product review.

The majority of KPIs for the project have been met or exceeded. KPIs not fully completed were Milestone 7 more than 20 additional voluntarily submitted products by manufacturers. Regarding the review of the assessment methodology, all reviewers approved of the ranking system developed for GreySmart and commented that it is of valuable information. The overseas review initially discussed was not sourced as US and EU practice and legislative culture is quite different to Australia at present.

Voluntary products submissions and assessment are not expected until launch of the website and when Laundry Products are allowed to be posted on the website product review.

5. Results & Outcomes

The GreySmart project has achieved and exceeded the objective of developing a credible and user friendly website that integrates all aspects of sustainable greywater management for householders. The website comprises of three main components;

- Household product assessment for GreySmart or GreySmart with care approval
- A household water resources calculator (*H₂OmeCalc*)
- Background information and knowledge on the Do's and don't of greywater use, regulations, suppliers and technologies

During the course of the project the decision was made to improve the functionality of one component of the website (*H₂OmeCalc*) to provide a tool that also incorporates rainwater use and is applicable Australia wide. The improvement in functionality extends the applicability of *H₂OmeCalc* and exceeds objectives and goals of the original project plan.

The household product assessment has been achieved through the development of a robust and scientifically verifiable assessment process based on the approach of the Australian Water Recycling Guidelines (NRMCC and EPHC, 2006). The methodology of assessment was peer reviewed by industry experts and presented at OzWater'10.

A strong collaboration with the savewater!®Alliance has developed as the project progressed, offering a site with a national audience and with ongoing funding and support beyond Smart Water Funding.

Due to the late launch of the website and the continued discussion about anomalies in laundry detergent product data from other sources, laundry detergent product information is not currently included in the website, although 40 laundry detergents have been tested and assessed. This is a key component of the data required for householders to make informed choices about the products they use in the home. A potential mitigative approach to encourage access to this data is to promote GreySmart as a tool for improving wastewater quality. This aspect of the project was not incorporated in original project objectives or communication plans. However, it has become obvious that GreySmart household personal care and cleaning products would also be beneficial for improving salinity, sodicity, pH and a number of other chemical parameter at the Sewage Treatment Plant; facilitating water recycling.

One aspect of the assessment framework which has not been addressed is the inclusion of a biodegradability test in analysis and assessment. In the original project plan AS 4351.1-1996 (Biodegradability - Organic compounds in an aqueous medium) was to be incorporated in analysis and risk assessment of household products. However, no accredited laboratory could be found to undertake this test and the appropriateness of the test method for soil application of greywater is questionable. Further research in this area is required, or adoption of modelling techniques to assess the persistence, bioaccumulation and toxicity of substances for the friendliness to the garden and environment.

6. Risk Management

A number of risks which could affect the success of GreySmart were identified in the original project plan (Table 3). The impacts of the majority of these risks have been mitigated through implementation of strategies identified at project initiation (Risks A, D, F and G Table 3). Risk B was mitigated through the collaboration with the savewater!® Alliance, which provides a national and ongoing connection to householders. Arrangements to host the GreySmart website until at least August 2012, have been established between Atura and the savewater!® Alliance. A formal agreement between Atura (formerly Arris) and the savewater!® Alliance took place on 1st October 2009. This is a major step in addressing and virtually eliminating Risk F. Communication of the project to other water industry organisations and associated groups will maintain GreySmart promotion to householders.

Current GreySmart products were selected by Atura as most likely to be GreySmart given previous research and were not discussed with manufacturers or biased in anyway. In addition, the collaboration with savewater!® Alliance provides credibility and independence to GreySmart.

The potential for litigation has been explored (Risk E). All material on the website has been referenced and there are two reports on the GreySmart Assessment Tool (GSAT) methodology and **H₂OmeCalc** which incorporate assumptions, logic and references. The disclaimer on the website for **H₂OmeCalc** reads 'This is a simple decision tool designed to give estimates for comparative purposes. It is necessary for the householder to get quotations and make their own decision based on the value they place on their garden etc. More information on the development of H₂OmeCalc and the assumptions used in the calculations can be the "Background and assumptions" section of the website.

Table 3 – Risks identified in original project plan

Ref	Description of Risk (Reference to appl. milestone)	Probability (H,M,L)	Impact (H,M,L)	Impact on Project (Description)	Mitigation Strategy
A	Lack of household product manufacturers volunteering products for assessment as greywater friendly (Milestone 6 and 7)	H	M	Advise to householders re selection of household products limited	Atura will purchase products for testing. Data from the literature could be used to identify some products as greywater friendly.
B	GreySmart does not reach householders (Milestone 5, 6 and 7)	H	H	Lack of utilisation of GreySmart website	Marketing the website has been identified as a key component of the project. Already there is commitment from key organisations (Green Plumbers, the Australian Building Association, water authorities) to promote and market the website. To facilitate this process there will be reliance on the Melbourne water retailers and SWF to assist in promotion where possible. Investigate collaboration with similar projects such as www.smartgardenwatering.org.au
C	GreySmart perceived as not independent when it becomes reliant on industry sponsorship for on going maintenance funding. (Milestone 5, 6 and 7)	M	M	Lack of utilisation of GreySmart website	Strict control and management of sponsorship will be undertaken to ensure that the independence of GreySmart is not compromised.
D	Insufficient data for GreyCalc (Milestone 4)	L	M	Limits data available to user of website	Data has been assessed through previous projects that Atura has been involved with and sufficient data is known to be available.
E	Litigation (Milestone 5, 6 and 7)	L	H	Financial cost due to litigation associated with information	All material on website to be referenced. A disclaimer will also be provided on the website. Legal advice will be sought by Arris. All components of greywater assessment for risk to

Ref	Description of Risk (Reference to appl. milestone)	Probability (H,M,L)	Impact (H,M,L)	Impact on Project (Description)	Mitigation Strategy
				supplied on GreySmart website.	environment will be scientifically defensible.
F	Ongoing cost of hosting and maintaining website beyond SWF funding. (Milestone 7)	M	H	GreySmart unable to continue beyond current SWF funding	Web hosting plan. Development of the GreySmart network of interested parties over the life of the project will assist in securing sponsorship. Development of an ongoing strategy for advertising and sponsorship throughout the project will ensure the continuation of the website.
G	Unable to secure GreySmart trademark (Milestone 5)	H	L	Website name registered, but not trademark. Process to register trademark has commenced.	No more mitigation possible. Initial feedback suggests that registering the trademark will be OK.

7. Discussion/Evaluation

The GreySmart project has achieved and exceeded the objective of developing a credible and user friendly website that integrates all aspects of sustainable greywater management for householders. The web calculator now incorporates a rainfall tank yield and the data to examine household water use throughout Australia, rather than just Victoria as was the original project plan.

The product assessment method for greywater friendliness was based on the Australian Guidelines for Water Recycling (NRMMC and EPHC, 2006) and has received support from greywater experts and the water industry. Of the products analysed and assessed 49 products were found to be GreySmart and 16 GreySmart with care. All GreySmart products appear on the GreySmart website except laundry detergents which will be uploaded with photographs and summary results following agreement from all Smart Water Fund partners.

It was originally planned to launch the GreySmart website in Oct 2009, as a spring launch was thought to be the best time to target householders, prior to summer months. A number of issues meant the launch was delayed November 2010 and in the interim period large scale water augmentation projects in Melbourne have come on-line or been approved (North South pipeline and Wonthaggi desalination plant). In addition, a wet winter has seen water restrictions change from Stage 3 to Stage 2. These changes to the water availability in Melbourne may impact the number GreySmart users. The delay in the launch of GreySmart website means the assessment of the number of visits to the website and website visitor feedback are not incorporated in the project evaluation.

8. Return on Investment (from original project plan)

The return on investment identified in the original project plan incorporated water, environmental and financial savings as follows:

- Approximately \$10-57 M/annum across Melbourne, if unsustainable use of greywater is eliminated
- Approximately \$2.5 M/annum saved in reinvestment in garden plants in Melbourne.
- Reduction in mis-investment by households.
- Reduction in flows to sewage treatment plants could also offset/delay future upgrades

The achievement of these savings is difficult to measure but provides some idea of the potential savings for gardeners as an outcome of the GreySmart project. In addition there are the water savings due to increased numbers of users of greywater. Due to the improvement in the functionality and national coverage of the GreySmart website and calculator these potential savings are vastly increased as they could be realised in all areas of Australia. Even if only a small percentage of these costs are realised, the return on an investment of \$141,780 for the SWF is excellent.

GreySmart provides an important 'safety net' for gardeners, and whilst water restrictions in Melbourne have been relaxed and new water augmentation projects have been approved, GreySmart now has national coverage and so can provide this non-financial return on investment Australia wide.

GreySmart provides all Australian water retailers with a site where they can direct customers, giving a national approach to greywater use. This will improve the level of service to all Australians and reduce the operating cost of water retailers dealing with enquiries and managing the updating of data on websites and other communications material.

9. Conclusion

The project has been very successful in terms of meeting the primary goal of the development of a credible and user friendly website that integrates all aspects of sustainable greywater management for householders.

The website has improved functionality and is applicable Australia wide, appropriate for use by all Australians. The final website product is strongly interactive and provides the user with an informative and engaging experience.

The website has applied research tools in a simple format to householders to allow them to make informed choices about rainwater and greywater options that are most appropriate for their home.

The website has been launched and ongoing promotion, monitoring of use and maintenance will be provided by savewater!® Alliance. The collaboration with the alliance has provided mitigation of many project risks initially identified.

Water industry drivers for influencing household product use vary, and during the course of the project the potential for GreySmart to also provide improved wastewater quality has been identified. This is an additional potential marketing approach.

Collaboration with all the industry bodies identified in the initial stages of the project was not as successful as originally envisaged. This was due to the SWF requesting we collaborate through their partners and industry contacts leaving work places.

10. Recommendations

There are a number of recommendations as outcomes of the project:

- Biodegradability testing be added to the GreySmart Assessment Tool. Biodegradability testing was not included in the product assessment methodology as an appropriate method could not be identified. An aspect of this assessment could be incorporated by assessing the organic components of products for persistence, bioaccumulation and toxicity (PBT) using quantitative structural activity relationship (QSAR) and data from the literature in most cases (USEPA, 2009; Mackay et al., 2009; Howard and Muir, 2010). Manufacturers would need to supply the CASRN numbers of organic substances in household products. Addition of the QSAR technique for assessment of organic substances helps future proof the GreySmart assessment tool.
- Incorporate feedback from users of the website as it is promoted and used
- Continued communication of GreySmart to water industry and associated bodies
- Washability testing feedback could also be included with GreySmart rating for additional information on selecting laundry detergents.

11. References

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12. Acknowledgements



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- the Savewater! Alliance (with the Help of DVD Designs) for developing the calculator look and design and for their invaluable support with integrating the project into the Savewater website.
- Chris Williams at Arris for their support in engineering the web functionality for **H₂OmeCalc** H₂Ome Calc.

13. Appendix – GreySmart Assessment Tool (GSAT)

See attached PDF: Details of GreySmart Assessment Tool.pdf

14. Appendix – H₂OmeCalc Logic and Rationale

See attached PDF: H2OmeCalc Assumption&Logic.pdf

15. Appendix - Detailed communication plan

Appendix A: Communication Plan

Milestone 5: Launch of GreySmart Website – Salaries and Promotion materials

Objective: Approved communications plan including launch of the GreySmart website (including the interactive web based calculator for grey water sources and uses) & Public Relations campaign.

Audience:	Action & Responsibility:	Responsibility	Timing:
Water Authorities	Update water authorities and begin process toward gaining commitment to incorporate GreySmart messages (including website reference) in a minimum of 3 communication channels from each metropolitan Authority; for example: <ul style="list-style-type: none"> • customer statement messaging, on hold phone messaging, newsletters & websites • while at conferences, trade shows, community events & activities • in local media advertising • Additional opportunities to be identified as project progresses. (KPI C12) 	Arris & savewater.com.au	End of April / May 2010 – for release in August / September 2010
Arris / web design team	Support design and content development of website to ensure marketing & communication opportunities are maximised (KPI C13)	Arris & savewater.com.au	March – June 2010
SWF	Develop launch plans including public relations campaign for approval from SWF (KPI C18) Long lead launch (including water authorities) Spring launch (Suggest release embargo until date TBC in August 2010)	Arris & SWF PR *	April for release in May 2010 (embargoed until late August 2010)
Householders	Prepare media release for general consumer publications – Press, magazines, radio, television - Target specific house and garden, green & sustainable living publications & shows (KPI C21)	Arris & SWF PR*	April for release in May 2010 (embargoed until late August 2010)
Water	Prepare copy & appropriate imagery for use	Arris	April for release

Authorities	in existing promotional avenues available (e.g.: statements / websites, newsletters, etc) (KPI C19) If stage 4 water restrictions in place: Prepare specific communication piece (e.g.: DL Flyer) for short term use of greywater and associated benefits for use by water authorities. (KPI C19a)		in May 2010 (embargoed until late August 2010)
Stakeholders and partners	Develop collaborative marketing plans with relevant stakeholders and partners as identified in Audiences (above) (KPI C20)	Arris & savewater.com.au	May - August 2010
Industry Associations and Educators	Promote GreySmart project at OzWater (March 2010). Draft articles for member email /newsletter editorial and inclusion on websites as required. Provide web link icons to enable easy recognisable link to GreySmart website (KPI C22)	Arris & SWF PR*	July - August 2010
Local Government / Councils	Prepare media release and distribute to Victorian Metropolitan councils. Include link to GreySmart website. Provide blurb to be included on rates notices & any other council publications (KPI C23)	Arris & SWF PR*	April for release in May 2010 (embargoed until late August 2010)
Recycled water Community	Post Link to GreySmart website on SWF website and www.recycledwater.com.au (KPI C24)	SWF & Arris	August 2010
SWF	Ensure appropriate site measurement reporting parameters to enable understanding of website performance. (KPI C25)	Arris	July 2010
All	Prepare SWF case study for uploading to the SWF website and distributing at training sessions/conferences (KPI C26)	SWF PR *	September 2010
Potential sponsors for future funding / project viability	Continue seeking connections with potential advertisers and funding bodies to enable further promotion of site and marketing opportunities. (KPI C26a)	Arris & savewater.com.au	NB: Ongoing for life of project

*SWF PR support includes copy preparation support and access to media databases

Appendix B: Draft: Action Plan (For website launch date of 7th November 2010)

Atura = Atura, SA = savewater!® Alliance, SWF = Smart Water Fund

Action Required	Who	Date Due	Comments
Prepare Communication timeline	Atura	9/9/2010	Updated - This is based on website being live on 7/11/2010.
Establish PR support available from SWF	Atura	10/9/2010	No SWF support available for PR other than the provision of media contact lists which we have received.
Prepare Draft Media Releases and associated copy for approval with focus on: <ul style="list-style-type: none"> H2OmeCalc Household Product Review 	Atura	9/9/2010	Done
Media Release approval received by Atura from SaveWater Alliance	SA	13/9/2010	JH sent this to SWF
Media Release & associated copy reviewed and approval for use provided to Atura from SWF (Cheyne)	SWF	20/9/2010	Updated – see new layout – logos for Atura & Savewater Alliance added at the bottom
Electronic Information pack compiled for savewater!® Alliance water authorities to include: <ul style="list-style-type: none"> 'How to use this information' guidelines Media releases x 2 Statement copy ideas x 3 Style Guide and Logos – print and website versions Short intro / newsletter suggestion List of media being contacted 	Atura & SA	24/9/2010	Draft version completed. Cale contacted non SWF water authorities with tailored message to suit savewater Alliance. Draft letter provided as guide. Atura contacted all SWF water authorities first (i.e.: 27/9/2010) – Melb Water, DSE, City West, SE Water & Yarra Valley Water
Prepare contact list of: <ul style="list-style-type: none"> SWF water authorities savewater Alliance Water authorities 	Atura & SA	28/9/2010	SA to contact all non SWF authorities. Atura received the SWF contacts from Cheyne. Sent Vic savewater! Alliance members info pack commencing on 28/9; sent non Vic Savewater members in November when H2Ome calc timelines confirmed
Prepare media / promotion contact list targeted at reaching householders via: <ul style="list-style-type: none"> Local metro newspapers / mags (Vic)# The Age# Herald Sun# MX# Gardening & sustainable living magazines and websites# Gardening & sustainable living Radio? 	Atura & SWF PR	20/9/2010	Amelia at Savewater provided feedback about proposed media list. Media releases distributed to media 8/12/2010

Prepare media / promotion contact list targeted at reaching householders via: <ul style="list-style-type: none"> • Councils – Vic Metro & Regional 	Atura	17/9/2010	Done for metro Melbourne. Also - Sent some guidelines re accessing a logo for use as a weblink to councils. Sent media pack 8/12/2010
Prepare contact list for industry associations and educators <ul style="list-style-type: none"> • Nursery groups# • Plumbing groups** • Turf groups # 	Atura	17/9/2010	Done and sent with custom intro paragraph along with the media release information. Sent media pack in 8/12/2010
Prepare some images if required for media opportunities <ul style="list-style-type: none"> • Photos • Website screen dumps 	Atura	17/9/2010	Images sourced.

Appendix C: Draft: Communication Timeline

Action Required	Responsibility	Date Due	Comments
Information pack provided to MS for distribution to savewater!® Alliance water authorities	Atura	25/9/2010	Done
Information pack provided to SWF water authorities	Atura	w/c 27/9/2010	Done
Information pack provided to savewater Alliance water authorities	SA	w/c 27/9/2010	Actioned by Cale – 28/9/2010
Media release dispatched to Melbourne Metro Councils	Atura	w/c 27/10/2010	Delayed due to website launch delay – sent 8/12/2010
Media release info dispatched to mainstream Media	Atura	w/c 27/10/2010	Delayed due to website launch delay – sent 8/12/2010
Media release info dispatched to industry associations & educators	Atura	w/c 27/10/2010	Delayed due to website launch delay – sent 8/12/2010

Comments:

- Initial point of contact for releases sent to mainstream media is to be Amelia to enable maximizing of media opportunities
- Materials have been developed to support the SWF project however many of these will be utilised by SaveWater

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16. Document Status

Version No.	Author	Date
1.0	Clare Diaper	12/11/2010
1.1	Jodie Hannaford	20/12/2010
1.3	Daryl Stevens	5/1/2011