

Smart Water Fund

Final Report

Grey water treatment and recycling system

Prepared by: Raj Manihar & Nicolette Davey, Baw Baw Shire Council

With the support of the Smart Water Fund

22 May 2012

Executive Summary

Baw Baw Shire Council, with funding from the Smart Water Fund, installed a greywater treatment and recycling system to showcase available technology and address community awareness of sustainable urban management.

Installation of the innovative grey water system at Council's Warragul depot offered a case study to show the costs involved with the installation and maintenance of a grey water system and the water saving capacity which the system provided.

Overall the installation of the system supported Council's aim to have water for toilet flushing at the Depot come from a sustainable and independent source. Water from the hand washing basin's in the depot is captured and treated to Class A quality. This water is subsequently used to flush both male and female toilets onsite.

The project provided the opportunity to educate the community about alternative options to conserve water and normalise the installation of this type of technology.

The project brought together a number of departments at Baw Baw Shire Council which contributed greatly to internal education of grey water recycling. It is hoped the experience gained will help inform future projects where grey water recycling may be appropriate.

Table of Contents

BACKGROUND	3
INTRODUCTION	4
OBJECTIVES	5
LITERATURE REVIEW	6
KEY STEPS / MILESTONES	0
MILESTONE DESCRIPTION	0
METHODOLOGY	0
RESOURCES	1
TIMING	0
FINANCIAL SUMMARY	0
KEY PERFORMANCE INDICATORS	0
FINDINGS, RESULTS AND OUTCOMES	1
FINDINGS	1
RESULTS	1
OUTCOME	1
RISK MANAGEMENT	2
POTENTIAL RISKS	2
STEPS TAKEN TO ADDRESS RISKS	2
DISCUSSION & EVALUATION	3
ANALYSIS OF PROJECT FINDINGS	3
BENEFITS AND LEARNING'S	3
LIMITATIONS AND ISSUES	3
RETURN ON INVESTMENT	4
CONCLUSION	5
RECOMMENDATIONS	6
ACKNOWLEDGEMENTS	7
APPENDICES	8
MAPS & DIAGRAMS	17
PROJECT LOCATION AND SITE MAP	17
COMMUNICATION MATERIAL	19
MEDIA COVERAGE	19
PHOTOGRAPHS	22
DOCUMENT STATUS	28

Background

Baw Baw Shire Council serves a rural municipality of approximately 40,000 residents located about 100 kilometres east of Melbourne. The Shire, which encompasses over 3,800 square kilometres, is the eighth fastest growing municipality in Victoria. Baw Baw Shire Council employs about 350 people delivering over 100 services to the community. Council is represented by nine Councillors from four wards.

Baw Baw Shire Council is committed to and adept at implementing environmentally sustainable projects and has won a variety of awards for efforts in adapting and mitigating climate change. Council's vision, "Challenge the boundaries, be the difference", is about empowering people and creating leaders and promoting innovation by not being constrained by what has been but being inspired by what can be.

In regards to the grey water treatment and recycling project, Baw Baw Shire Council identified a need to address the lack of community awareness around sustainable urban water management. The focus was particularly on the use of recycled grey water and the technologies available for grey water treatment.

Baw Baw Shire Council's aim for the project was to lead the community by making a commitment to save water and actively promote grey water recycling education to the wider community. To do this Council aimed to create awareness by stimulating community interest through the installation of an innovative grey water treatment and recycling system at its Warragul Depot.

The recycled water would be used for toilet flushing and achieved by treating the grey water coming from the council's hand washing basins to Class A quality. This treated water is collected in a storage tank for further use, i.e. toilet flushing.

The Shire promoted the grey water reuse and its uptake by engaging the community to obtain first hand experience by holding a community open day, providing information on the website, promoting grey water recycling at community information sessions and distributing media material.

By trialling this system the Shire was able to increase community awareness and ascertain the success and benefits of installing similar systems at other council sites.

The project is inline with the policy framework for sustainable urban water management outlined in the Our Water Our Future White Paper with respect to plans relating to both:

- recycling and using alternative water supplies; and
- reducing potable water consumption.

The project was considered successful as the system met class A water requirement and was completed within the given timeframe. Furthermore, the project would also be considered successful following Council conducting an education program for the recycling of grey water in the community.

Introduction

The purpose of the grey water treatment and recycling project was to increase community awareness about grey water treatment options and reduce potable water consumption.

Some of the identified benefits include:

- Increased water savings;
- Increased awareness about grey water reuse and treatment options to the wider community;
- Facilitation of the value that domestic water recycling is important and in the long term, increasing the commitment of the wider community to undertake 'fit for purpose' water use;
- Added accessible information to the wider community about grey water use through our website and community open days and information sessions;
- Increase training of Shires officers to facilitate the provision of consistent and supportive advice to the wider community;
- Likely implementation of similar systems into other properties across the Shire;
- Encourage other companies to develop grey water technology; and
- Environmental benefits through increase use of safer products.

The project was implemented at Council's Warragul depot (as opposed to other properties) to gain maximum exposure and influence to the wider community. The depot is frequently visited by the community and therefore an ideal platform to display this technology. Council wished to pursue a grey water treatment and recycling system which was safe, self contained and involved little maintenance or adjustment from the owner. It was essential to install a system that was user friendly to increase a greater likelihood of uptake by local residents and businesses. The project was also hoped to serve as a model to consider wider implementation of grey water recycling systems at other Council premises.

The grey water recycling system was installed alongside an existing rainwater collection tank which had been used to supply water for toilet flushing. The grey water system, along with the rainwater tank, enabled toilet flushing to be fully independent of potable water supplies all year round.

The context of the project was inline with Council's Environment Management Plan, however, it was necessary to monitor the energy required to treat the water with consideration for the system to be upgraded to be powered by solar in the future.

Objectives

The objective of the project was to address the lack of community awareness about sustainable urban water treatment, in particular the use of grey water recycling technologies.

In addition, the project intended to create a site where water used for flushing toilets was from a 100% sustainable source therefore requiring no potable water.

More importantly however, the project also intended to raise the profile of grey water treatment and recycling amongst Baw Baw residents and businesses. It also improved Council's knowledge of available grey water recycling technologies with the trial of the system to inform further projects where grey water recycling was an appropriate water saving option.

At the time, installation and ongoing maintenance of grey water treatment systems for the average small business or residential customer were too expensive. However, the project hoped to have a "roll-on" economic impact amongst the community whereby increasing awareness of the technology and promoting its ease-of-use would create demand and interest in grey water recycling products. Increased demand, production and competition could result in lowering the price of a system making it a more feasible option for the community and local businesses to install.

Literature Review

To the best of the Shire's knowledge, Baw Baw was the first to install a grey water treatment and recycling system in Victoria. Available information and experience from fellow local council authorities was therefore limited. At the time, there was a limited range of grey water treatment systems designed specifically for domestic use. The available systems were economically prohibitive despite being EPA-approved, environmentally sound and requiring low maintenance and relatively uncomplicated operation.

The project installed a state of the art filtration and treatment technology which was appropriate for the amount of water available for treatment and re-used at the site. It was also chosen for its user-friendly aspects in which it could be demonstrated to the community as a viable technology to be used domestically.

The project relied heavily upon the expertise of the Shire's appointed environment coordinator, who was fully informed of the grey water regulations, health, safety and environmental issues and availability of current grey water technology. The environment coordinator oversaw the development of the required site specific Grey Water Risk Assessment and the Grey Water Management and Monitoring Plan.

Development and implementation of the project was also informed by water management consultant, New Water, which provided advice in terms of both suitability and costs involved for grey water treatment and recycling.

In consultation with Council's health department, both a Septic Tank and Planning Permits were required and subsequently approved.

Key Steps / Milestones

Milestone Description

Milestone Number	Description	Due Date By	Status – Completed/ Green / Amber / Red *	Comparison with last month **	Comments
1	Funding agreement signed	30/4/2008	Completed		
	Application for planning permit	30/4/2008	Application submitted		Planning permit received.
	Invitation for quotation	19/09/2008	Spec developed		Send quotation document to 5 suppliers.
	Finalise supplier and award contract	30/12/2008	Supplier		Have received quotations, reviewing & established contractor.
	Issue of Purchase Order by Council	30/12/2008	PO released		
	Application for septic tank permit	27/12/2008	Application submitted & approved		Permit for new system has been submitted and approved.
	Risk Assessment as per Council procedure	30/5/2008	Completed		
2	Survey by plumbing company	17/10/2008	Completed		
	Delivery of the system	31/1/2009	Completed		System has been delivered – 14/01/2009
	Installation of the system	31/1/2009	Completed		Installed on the 21/01/2009 -- additional meter was installed on the greywater pipe.
	Commissioning of the system	31/02/2009	Completed		Was completed on the 4 th Feb 2009 – however waiting on water sampling for confirmation of sufficiently operating system.
3	Start and commissioning	31/02/2009	Completed		Was completed on the 4 th Feb 2009 – however waiting on water sampling for confirmation of sufficiently operating system.
	Maintenance and operation of the system	Ongoing	Completed		Compliance Certificate issued. BBSC's Environmental Unit issued

				Permit to Use, dated 23 March 2009. A leak was detected in the system in early September. Photographs were taken and requested the plumber, Aquablock plumbing. Leak fixed.
	Water sample test	Annually	Completed	Received water sample test from NATA on 12/06/09. Biological Oxygen Demand and Suspended Solids test all pass within EPA requirements for Class A water.
4	Promotional activity	Ongoing	Completed	<p>Communication activity conducted:</p> <ul style="list-style-type: none"> • Short story regarding the grey water system included in Baw Baw Shire Council's quarterly Community News. • Photograph and short description of the installed system available on the Environment page of Baw Baw Shire Council. • Environment team member interviewed on local Radio (Vision Australia and 3BBR) about BBSC's sustainability program, including the installation of the grey water system. • Powerpoint presentation to the AGM of local community group Baw Baw Sustainability Network which included photographs and description of installation. • Sustainable Open Day held at

				<p>Council Depot on Saturday 24, October. The grey water system was part of onsite tours during the day and included the funding support received from the Smart Water Fund.</p> <ul style="list-style-type: none">• Article about the Sustainable Open Day appeared in the Warragul Gazette on October 20, 2009, which included a mention of the grey water system.• Ongoing inclusion of GreyWater system and funding partner for the project in Council and presentations.
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Methodology

MILESTONES	COST DESCRIPTION	METHODOLOGY
1. Planning	Risk and System Assessment / Obtain Final Quote	Milestones were discussed in weekly meetings and reported to the fund in monthly reports over the course of the project.
	Grey Water Monitoring Plan & Implementation	A monitoring plan and implementation was developed in consultation with Council's Environmental Health Dept.
	Communications Strategy / Marketing Material Development	A communication strategy was developed in consultation with Council's communication coordinator and the environment team.
2. Approval Process	Septic Tank Permit, Baw Baw Shire Council Health Dept permit	Application was submitted to Council's Environmental Health Department and the permit obtained.
	Planning Permit, Baw Baw Shire Council Planning Dept permit	Application was made to Council's Planning Department and the permit obtained.
3. Installation and Maintenance of Grey water system	Purchase materials and contract an electrician and plumber (includes first year maintenance)	Council released a request for quotation the supply, installation and commissioning of a grey water treatment system
4 Promotional Activity	Education / Training / Media Article Release	Environment officer arranged media releases regarding the installation and other articles in Council's quarterly community newsletter.
	Website Launch	Environment officer in consultation with Council's communications team and website coordinator arranged a page dedicated to the greywater system including text and photos.
	Open Day 1 – National Water Week	Environment officer in partnership with officer's from the Shire's water authority and catchment management authority arranged an open kiosk in Warragul to educate the community about water conservation methods, including grey water.
	Baw Baw Shire Water Summit	No action
	Open Day 2 - Sustainable Open Day	Environment team with assistance from risk assessment officer and event and communications team arranged a Sustainable Open Day which showcased a number of sustainable features at Council's premises, including the Grey Water system.
	Community Presentations	Environment team includes the installation of the grey water system in all presentations to the community and Council.

Resources

MILESTONES	DESCRIPTION	RESOURCES A list of resources is given below.
1. Planning	Risk and System Assessment / Obtain Final Quote	Review of reuse options for household waste water – grey water pollutants and risks before finalising Council's risk assessment procedure.
	Grey Water Monitoring Plan & Implementation	Using the services of Council's Environmental Health Department to prepare monitoring plan and implementation.
	Communications Strategy / Marketing Material Development	Using the services of Council's communication coordinator to develop a communication strategy. Environment team largely responsible for leading the actions within the strategy with assistance from the communications team.
2. Approval Process	Septic Tank Permit, Baw Baw Shire Council Health Dept permit	Using the services of Council's Environmental Health Department to prepare monitoring plan and implementation
	Planning Permit, Baw Baw Shire Council Planning Dept permit	Using the services of Council's Environmental Health Department to prepare monitoring plan and implementation. Research and study grey water use around home according to EPA requirements. Research domestic wastewater management series and reuse options for household waste water. Attend Centre of Environmental Training concerning domestic grey water management for sustainable reuse training course in July 2008.
3. Installation and Maintenance of Grey water system	Purchase materials and contract an electrician and plumber (includes first year maintenance)	Using the services of Council contract and capital works Department to release a tender document for the supply, installation and commissioning of a grey water treatment system. Council installed Nubian Water System's Oasis grey water system for this project.
4 Promotional Activity	Education / Training / Media Article Release /	Environment team responsible for training staff at depot to monitor system if any alarms sound. Environment team produced in consultation with the communications coordinator a number of media releases about the grey water system installation.
	Website Launch	Using the skills of the online communication officer to upload website. Environment team responsible for development text and photographs for the website.
	Open Day 1 – National Water Week	Partnering with 2 external agencies to education the community including hiring of venue and preparation of education materials and handouts.
	Baw Baw Shire Water Summit	This could not be organised.
	Open Day 2 – Sustainable Open Day	Environment team with assistance from risk assessment officer and event and communications team to arrange and publicise the open day. Second open day to be organised in Oct/Nov 2010.
	Community Presentations	Development of powerpoint presentations for community meetings and networks.
5. Evaluation / Monitoring/ Close out Report	Data Merging and Final Reporting	Environment team in consultation with finance to prepare final report and evaluation.

Timing

MILESTONES	DESCRIPTION	COMPLETION DATE dd/mm/yy	APPLICATION CONTRIBUTION	TIMING
1. Planning	Risk and System Assessment / Obtain Final Quote	Mar-08	\$500	Task completed before due date.
	Grey Water Monitoring Plan & Implementation	Mar-08	\$1,000	Task completed before due date.
	Communications Strategy / Marketing Material Development	Apr-08	\$2,200	Task completed before due date.
2. Approval Process	Septic Tank Permit, Baw Baw Shire Council Health Dept permit	Apr-08	\$350	Approval obtained before due date.
	Planning Permit, Baw Baw Shire Council Planning Dept permit	Jun-08	\$556	Planning permit obtained before due date.
3. Installation and Maintenance of Grey water system	Purchase materials and contract an electrician and plumber (includes first year maintenance)	Aug-08	-	The contract for installation and commissioning of the grey water system was finalised before due date but supplier withdrew the proposal.
4 Promotional Activity	Education / Training / Media Article Release / Questionnaire	March 2008 - July 2009	\$1,500	Tasks undertaken between July 2009 and December 2009.
	Website Launch	Jul-08	\$1,750	Task completed August 2009.
	Open Day 1 – National Water Week	Oct-08	\$1,000	Task completed October 2009.
	Baw Baw Shire Water Summit	Oct-08	\$750	No action.
	Open Day 2 – World Environmental Day	Jun-09	\$1,000	Task completed October 2009. Another open day to be undertaken in Sept/Oct 2010
5. Evaluation / Monitoring/ Close out Report	Data Merging and Final Reporting	Jul-09	\$1,500	Task completed March 2010
	NATA testing	Dec-08 Jun-09	-	NATA testing was completed June 2009.

Financial Summary

MILESTONES	DESCRIPTION	MILESTONE COMPLETION DATE dd/mm/yy	GRANTEE CONTRIBUTION	SMART WATER FUNDING	COMMENTS	TOTAL ACTIVITY COST	ACTUAL EXPENSE INCLUDING GST
1. Planning	Risk and System Assessment / Obtain Final Quote	Mar-08	\$500	-	In kind contribution	\$500	\$500
	Grey Water Monitoring Plan & Implementation	Mar-08	\$1,000	-	In kind contribution	\$1,000	\$1,000
	Communications Strategy / Marketing Material Development	Apr-08	\$2,200	-	In kind contribution	\$2,200	\$2,200
2. Approval Process	Septic Tank Permit, Baw Baw Shire Council Health Dept permit	Apr-08	\$350	-	Refer attached sheet	\$350	\$350
	Planning Permit, Baw Baw Shire Council Planning Dept permit	Jun-08	\$556	-	Refer attached sheet	\$556	\$556
3. Installation and Maintenance of Grey water system	Purchase materials and contract an electrician and plumber (includes first year maintenance)	Aug-08	-	\$17,000	Refer attached sheet	\$17,000	\$21,241
4 Promotional Activity	Education / Training / Media Article Release / Questionnaire	March 2008 - July 2009	\$1,500	\$1,500	Refer attached sheet + in kind contribution	\$3,000	\$3,000
	Website Launch	Jul-08	\$1,750	\$500	Refer attached sheet + in kind contribution	\$1,750	\$500
	Open Day 1 – National Water Week	Oct-08	\$1,000	-	In kind contribution	\$1,000	\$1,000
	Baw Baw Shire Water Summit	Oct-08	\$750	-		\$750	\$0
	Open Day 2 – Sustainable Open Day	Jun-09	\$1,000	-		\$1,000	\$0

MILESTONES	DESCRIPTION	MILESTONE COMPLETION DATE	GRANTEE CONTRIBUTION	SMART WATER FUNDING	COMMENTS	TOTAL ACTIVITY COST	ACTUAL EXPENSE INCLUDING GST
5. Evaluation / Monitoring/ Close out Report	Data Merging and Final Reporting	Jul-09	\$1,500	-	In kind contribution	\$1,500	\$0
	NATA testing	Dec-08 - Jun-09	-	\$450	Refer attached sheet	\$450	\$129
TOTAL						\$31,056	\$30,476

Key Performance Indicators

KEY PERFORMANCE INDICATORS	KPI	ACTUAL PERFORMANCE
Compliance with EPA parameters with respect to treated water quality.	Yes	Yes
Project within the budget	Yes	Yes
Number of persons visited during Open days	20	40

Findings, Results and Outcomes

Findings

- The grey water system is useful for treating grey water from the wash basins at the Council depot to a Class A standard which is then used to flush toilets. Biological treatment requires a long period, approximately four to six months, before the biomass was activated.
- The treatment system meets all the EPA parameters and requirements of water quality testing.
- The grey water recycling and treatment system is capital intensive and unlikely to be taken up by the community for this reason.
- The operating and ongoing maintenance and service costs are very high in comparison to savings achieved at current pricing structures of mains water by water authority Gippsland Water.
- The supplier of the grey water treatment and recycling system allowed numerous contractors to construct and commission the system. However, the supplier ensured the maintenance and service costs could only be undertaken by themselves. This resulted in no competitive pricing and a very high annual maintenance cost which does not justify the cost benefit of installing the system.

Results

- The grey water treatment and recycling system meets EPA and local government septic tank permit requirements.
- The treated water quality meets required standards and specifications.
- Project was capital intensive with high ongoing maintenance and servicing costs.

Outcome

- Actual water saving: 41,000 litres until 3 March 2010
- Council promoted the installation of the system during a number of open days and community presentations between August and December 2009. The number of people who attended these open days and presentations is approximately greater 40 people. This figure does not take into account information regarding the system distributed via Council's website and media releases.
- The grey water treatment and recycling system is very capital intensive with high in ongoing service and maintenance costs. This outcome means it is unlikely to be replicated at other Council sites unless the price and ongoing costs of the system are reduced.

Risk Management

Potential Risks

1. Quality of grey water coming from hand wash basins in the toilets at the Council depot and entering the system for treatment; and quality of treated grey water from the system which may affect human health or if leaked contaminate storm water and soil.
2. Pricing structure of water by local water supplier Gippsland Water.
3. Water restrictions which affect the minimum litres of water needed for the system to operate effectively.

Steps taken to address risks

1. Regular tests of treated grey water undertaken six monthly and mandated as part of the service agreement with the supplier of the system. The system is maintained by an EPA-approved supplier only. The system recycles relatively small amounts of water and is re-used for toilet flushing only. This results in limited risk to human health as the water is not for any human consumption. Staff education and signs erected to encourage staff or visitors do not use any potential contaminants in the hand wash basins.
2. There is no ability to influence the pricing structure of water supply charges and costs from Gippsland Water.
3. No ability to control water restrictions.

Discussion & Evaluation

Analysis of project findings

The installation of a grey water treatment and recycling system as a trial at Council's depot allowed council to investigate the viability of grey water recycling. It was also possible to determine the process which the community would face if choosing to install grey water recycling for domestic purposes.

The research undertaken to determine the appropriate system was necessary ascertain the most appropriate system for the site chosen for the trial. The supplier of the system also provided adequate information which ensured the right system was installed for the site.

Benefits and learning's

Obtaining permits for the system was a straight forward process because only EPA-approved grey water recycling systems could be installed. This placed the onus on the EPA and Council's environmental health department to assess the application.

Limitations and issues

Despite extensive research by the environment team and chosen supplier, the amount of grey water produced at Council depot's hand washing basins is not great enough in litres to provide all the water necessary for toilet flushing.

One of the major issues of the project concerned the contract for ongoing maintenance and servicing of the system. The supplier, chosen by competitive tender, to install the system also controls maintenance and servicing costs. In order to keep the warranty of the system, Council is forced to use the supplier for maintenance and servicing and as there is no competition the pricing of this is very high. As a result, the ongoing maintenance and servicing costs of the system make the return on investment well over half-a-century. To improve this aspect of any further projects involving a grey water treatment and recycling system, the supplier must be mandated that maintenance and servicing can be undertaken by an alternative company, without losing the system's warranty.

Return on Investment

RETURN ON INVESTMENT	
Cost of the grey water system	\$21,241
Water savings per day	600 litres
Annual saving based on 6 working days	187,200 litres
Cost of water - cents per KL	\$156.13
Annual saving - \$\$\$	\$292.30
Return on Investment	72 years

The initial cost of the grey water system and ongoing maintenance costs results in a lengthy return on investment period which is unattractive. It would not be considered a viable option without funding and/or rebates attached to the installation.

As the price of grey water recycling systems reduce so will the time period of return on investment. However, the yearly maintenance cost of the system relative to the price of water per kilo litre continues to make the system financially unappealing. This is perhaps indicative of the pricing structure of mains water supply with service charges accounting for the majority of the utility bill. The price of water per kilo litre is relatively low which therefore means there is little incentive to reduce water consumption. The economics of the installation, taking into account initial outlay of the system, maintenance, water testing, water supply charges and cost of water per kilo litres, is not favourable.

Considering the small amount of water savings, comparable to other water conservation methods, the installation of a grey water system is better suited to larger volumes of water in order to see a return on investment.

Installation of a grey water system would have a greater return on investment and financial appeal if the price of the system and maintenance cost were smaller in relation to the price of water supply charges and per kilo litre costs.

Conclusion

Baw Baw Shire Council views the installation of the grey water recycling system at its Council depot in Warragul as a success. While there are financial limitations for the system to be replicated in a domestic house, the system provides:

- A visible education tool for Council staff and visitors about the effectiveness of grey water recycling;
- A perception that grey water recycling is becoming a main-stream or common practice amongst the community and that Council is leading its community in water conservation activities;
- Installing a grey water recycling system can be viable.

Recommendations

Implementation process

The installation of the grey water system was undertaken on schedule. Some delays were expected while waiting for water sampling to confirm the system was operating appropriately, but this did not result in missing milestone dates.

Recommendation:

- Flexible deadlines are needed while undertaking water sample tests. If tests do not pass EPA requirements for Class A water, additional time is needed to investigate the issue and re-test.
- Additional water samples are at a cost and need to be worked into the original budget.

Changes to Policy

To mainstream grey water recycling and treatment systems for domestic purposes, the ongoing cost of maintenance and servicing needs to be reduced. This is largely dependent on the contract entered into with the chosen supplier. As a result of Council's experience with the supplier, the ongoing costs meant there was limited cost benefit in the installation. It costs more to maintain the system than the water saved per kilo litre.

Recommendation:

- Contract with supplier of a grey water recycling and treatment system should include a clause that maintenance and servicing costs can be undertaken by an alternative company without losing the warranty on the system.

Community Education

Community education of grey water recycling and treatment systems needs to be ongoing as competitive in the market increases and the price of systems reduce. Fundamentally Council supports the installation of grey water recycling and treatment systems for domestic use. We continue to undertake community education beyond the milestones required for the funding, but at this stage we do warn our community that at present, and despite Government rebates, it can be cost prohibitive in some situations. However, grey water recycling is not about cost, it's about the ethos of supporting products which save water.

Recommendation:

- Ongoing community education is needed as the market and price of grey water treatment and recycling systems change.

Acknowledgements

Baw Baw Shire Council wishes to acknowledge the support from the following groups, organisations and people:

Council's Depot staff for their ongoing support and visual checks of the system to maintain its integrity;

Council's environmental health department for continual support, advice and liaison in arranging water test samples;

Council's risk management team for assisting and supporting the project to decrease risk;

Council's communications team for ongoing advice and assistance in promoting community open days and media coverage;

Aimee Felices at the Smart Water Fund for advice and consistent support in ensuring Council met milestones.

Appendices

Our Ref: 16908
Permit No: HSE0087/08

Ask For: LJ

27 November 2008

Baw Baw Shire Council
PO Box 304
WARRAGUL VIC 3820



Baw Baw Shire Council
PO Box 304
Warragul Victoria 3820
Telephone +61 3 5624 2411
Facsimile +61 3 5622 3654
bawbaw@bawbawshire.vic.gov.au

Dear Baw Baw Shire Council,

**Re: Approval to Install/Alter Septic Tank System
Building Regulation 801 - Unsewered areas**

At: 188 Normanby Street WARRAGUL VIC 3820

Please find enclosed a permit and approved septic tank design for the above-mentioned project.

Please take the time to read the Permit and Permit Conditions specified.

Please note in particular that:-

1. A Building Permit must be issued for the proposed development prior to the installation of the septic tank system.
2. The granting of this permit is consent by the relevant council for the purpose of assessing a building permit application which requires the installation of any waste water disposal system in an unsewered area or the construction of a building over an existing waste water disposal system as required by *Building Regulation 801*.
3. All works are to be carried out by a licensed plumber or drainer.
4. At least 24 hours notice is required prior to arranging required inspections of the installation and permit to use inspection.
5. Council must approve any necessary alterations from the approved plan prior to any works commencing.
6. This septic tank permit will expire if an application for a Building Permit is not decided within 12 months from the approval date.

Yours Faithfully

A handwritten signature in blue ink, appearing to read 'L. Johnson'.

Leanne Johnson
Regulatory Services

Note: this is not permission to build. A Building Permit must be issued prior to works commencing. A relevant building surveyor in deciding a building permit application must implement conditions of this permit.

**ENVIRONMENT PROTECTION ACT 1970
PART IXB—SEPTIC TANK SYSTEMS
Permit to Install / Alter Septic Tank System**



Permit Number:
HSE0067/08

Council Property No:
16908

Owner:
Baw Baw Shire Council

Plumber/Drainer:
M Roberts
C/- New Water Pty Ltd
3-4 Argent Place
RINGWOOD

Type of Septic Tank System:
Aqua Reviva Greywater Treatment System

Address of Property:
188 Normanby Street WARRAGUL VIC 3820

Standard Conditions

1. The septic tank system must be installed strictly in accordance with the attached approved plan, specifications, permit conditions and the Septic Tank Code of Practice;
2. No modifications or variations to the system may be made unless approved by the Responsible Authority.
3. The system must be constructed, installed and maintained in accordance with:
 - EPA Certificate of Approval CA106.1/07.
 - The current edition of the EPA's Code of Practice - Septic Tanks On-site Domestic Wastewater Management.
 - AS 1547 On-site domestic wastewater management and AS 3500 National plumbing and drainage code.
 - Council's Specifications and Guidelines.
4. Effluent from the system must not be discharged beyond the boundaries of the allotment.

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5. Extending the buildings served by the system may cause the above limits to be exceeded. A Permit to Alter a Septic Tank System must be obtained from Council before altering the system to cope with the increased flows.
6. The effluent area set aside for the system must be maintained as a permanent, dedicated area.
7. Buildings, driveways, concrete, tennis courts, swimming pools, fruit trees, garden beds, vegetable gardens, large trees and the like must not be placed in or on the effluent disposal area.
8. A copy of the maintenance reports and permit compliance assessment report must be submitted to Council within 14 days of each assessment being made.
9. The system must not be used until Council has issued a Permit to Use.
10. The permit to install is only valid for 24 months from the date of issue, unless construction of the system has commenced within that period.
11. Council must approve any alterations to an approved plan.
12. Stormwater must be diverted around the effluent absorption area to a Council approved point of discharge.
13. A copy of the plumber/ drainer Certificate of Compliance must be submitted before Council will issue a Permit to Use.
14. The system must be constructed in accordance with the approved plan and septic tank permit application conditions. In the event of any inconsistency arising between the application and the conditions of this permit, the conditions of this permit will apply.
15. Ensure the system complies with the setback distances as per table 4.6 Buffer Distances Table, Septic Tank Code of Practice 2003.

Site Specific Conditions

1. Suitable plants should be established within the effluent absorption area and maintained over the life of the system.
5. The system is approved for the following uses; dispersal of treated grey water for toilet flushing.
6. The system is approved to treat greywater from the shower/bathroom, laundry and hand basins. The system is not approved to treat blackwater or kitchen greywater.
7. All treatment and/or storage tanks/bladders must be fitted with an automatic overflow to sewer.
8. Each system must be fitted with an effective greywater collection point so that samples of treated effluent can be taken.

9. A permanent, clear, indelible and dated notice must be attached to the system in a prominent position that must include the manufacturer's name and contact details, the model name and model number of the system.
10. Treated effluent from the system must not exceed the following limits (90th percentiles):
 - 5-day Biochemical Oxygen Demand (BOD) - 10mg / L
 - Suspended Solids (SS) – 10mg/L
 - *E.coli* - 10cfu/100ml
11. Maintenance of the system must be carried out in accordance with the manufacturer's specifications: by the owner /occupier on a fortnightly basis; and by accredited service agent every six (6) months.
12. Filter media must be replaced if the annual system sampling and analysis does not meet the requirements outlined or if it is considered by the accredited service agent or municipal council to need replacing.
13. A sample of the treated effluent is to be collected and tested by a NATA accredited laboratory once every 12 months for:
 - Biochemical Oxygen Demand
 - Suspended Solids
 - Faecal Coli forms
14. Filter media must be inspected every six (6) months and topped up / replaced as required by the accredited service agent only.
15. The UV lamp must be replaced annually.

RESPONSIBLE AUTHORITY: BAW BAW SHIRE COUNCIL.

Signature of Responsible Officer

Date Permit Issued: 27 November 2008

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Appendix x: Approval to install issued from Baw Baw Shire Council environmental health department.

Plumbing Industry Commission
Compliance Certificate H5E0967/08

2212H BUILDING ACT 1993

Certifier's Name: Michael Booth Licence No: 15915 Certificate No: **4192307**

INSTALLATION ADDRESS:

Number / Lot / Street: 108 Macleay Street

Town / Suburb: WARRACOCK Post Code: 3820

Consumer's Name: Baw Baw Shire Council

DATE OF COMPLETION OF PLUMBING WORK:	INSTALLATION DATA
21-1-09	<small>(Circle appropriate numbers and insert any appliance/fixture details below. Tick a box through each work category/number which does not apply to this compliance certificate.)</small>
	ROOF PLUMBING (including above ground Stormwater Drainage) 0
	SANITARY PLUMBING 1
	SEPTIC TANK INSTALLATION 2
	DRAINAGE (Below Ground Sewer) 3
	DRAINAGE (Below Ground Stormwater) 4
	COLD WATER PLUMBING 5
	HOT WATER PLUMBING 6
	MECHANICAL SERVICES (includes Duct Fitting & Refrigeration) 7
	BACKFLOW PREVENTION (Medium & High Risk Only) 8
	RESIDENTIAL & DOMESTIC FIRE SPRINKLER SYSTEMS 90
	GREY OR RECYCLED WATER 91
	GASFITTING (Natural Gas Type A Installation) 92
	GASFITTING (LPG Type A Installation) 93
	GASFITTING (Other types of Gases) 94

BELOW GROUND SANITARY DRAINS

Do place a in this box to confirm that you have lodged an 'outside' property drainage plan with the relevant Water Agency (where a drainage plan is required by that Agency), 2212C Building Act 1993.

Where a consent to connect/buried underground sanitary drainage is required to be accepted from a Water Agency, please enter the Consent No below.

WATER AGENCY 'CONSENT TO CONNECT' NUMBER:

INSTALLATION DETAILS (including Scope of Work)

Nubian Grey Water System
 Back to Toilet with Greywater to Shower
 Wastes to Sinks with Drain

I certify that the above plumbing work complies in all respects with the plumbing laws (inc. passed or required laws) as defined in Part 12A of the Building Act 1993. Delete either a) or b) as appropriate:


a) The plumbing work was carried out by me or under my supervision.
 b) I have inspected and tested the work started by another licensed practitioner. Any necessary completion work was carried out by me or under my supervision.

Certifier's signature: [Signature]
 Date: 21/1/09

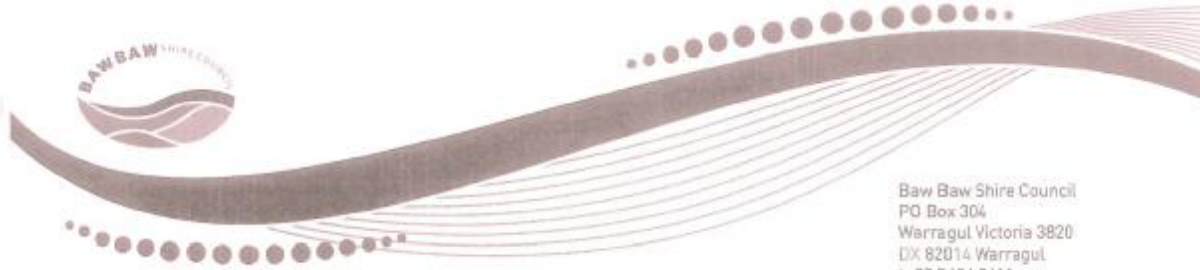
IMPORTANT NOTICE TO CONSUMERS:
 All work subject to a Compliance Certificate carries insurance to protect the consumer against defective work of the plumbing practitioner. You should retain your Certificate for six years as evidence of your cover. For further reference the attached sticker should be fixed to the inside of the property electrical meter box.

THIS COPY MUST BE GIVEN TO THE CONSUMER

Plumbing Industry Commission
 PH: 1800 015 129

Compliance Cert. No

 4 1 9 2 3 0 7

Appendix x: Compliance Certificate for installation of the Nubian grey water system.



Our Ref: 16908 Ask For: LJ
Permit No: HSE0067/08

Baw Baw Shire Council
PO Box 304
Warragul Victoria 3820
DX 82014 Warragul
t: 03 5624 2411
f: 03 5622 3654
e: bawbaw@bawbawshire.vic.gov.au
w: www.bawbawshire.vic.gov.au

23 March 2009

Baw Baw Shire Council
PO Box 304
WARRAGUL VIC 3820

Dear Sir or Madam:

Permit to Use Septic Tank System at: 188 Normanby Street WARRAGUL VIC 3820

Please find enclosed your approval to use the septic tank system at the above property. Enclosed for your information is a copy of the 'Septic Tank Owners Maintenance Guidelines'.

Please note that as a condition of approval:

1. Alterations to the system shall not be undertaken without prior approval from the Responsible Authority.
2. Malfunctions or failures of the system shall be reported to Council within seven (7) days.

If you have any further enquiries please contact Leanne Johnson on 5624 2411.

Leanne Johnson
Environmental Health Officer
Regulatory Services

BAW BAW SHIRE COUNCIL

PERMIT TO USE SEPTIC TANK SYSTEM

Permit Number:

HSE0067/08

Council Property No:

16908

Owner:

Baw Baw Shire Council

Owners Address:

PO Box 304
WARRAGUL VIC 3820

Plumber/Drainer:

Aquablock Plumbing
Unit 9, 756 Burwood Highway
FERNTREE GULLY VIC 3156



This is to certify that the septic tank system installed/alterd on the property at:

Address of Property:

188 Normanby Street WARRAGUL VIC 3820

Has been inspected and approved for use as being in accordance with the Permit granted by Council on the date shown below, subject to the conditions specified below.

Conditions

1. No modifications or variations to the system may be made unless approved by the Responsible Authority.
2. The system must be constructed, installed and maintained in accordance with:
 - EPA Certificate of Approval CA 106.1/07.
 - Ensure the system complies with the setback distances as per table 4.2 Buffer Distances, Code of Practice Onsite Waste Water Management, September 2008.
 - AS 1547 On-site domestic wastewater management and AS 3500 National plumbing and drainage code.
 - Council's Specifications and Guidelines.
3. Effluent from the system must not be discharged beyond the boundaries of the allotment.
4. The system is approved for wastewater flows not exceeding 720 per day.

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5. Extending the buildings served by the system may cause the above limits to be exceeded. A Permit to Alter a Septic Tank System must be obtained from Council before altering the system to cope with the increased flows.
6. The effluent area must be maintained as a permanent, dedicated area.
7. Buildings, driveways, concrete, tennis courts, swimming pools, fruit trees, garden beds, vegetable gardens, large trees and the like must not be placed in or on the effluent disposal area.
8. A copy of the maintenance reports and permit compliance assessment report must be submitted to Council within 14 days of each assessment being made.
9. Council must approve any alterations to an approved plan.
10. Stormwater must be diverted around the effluent absorption area to a Council approved point of discharge.
11. The system must be assessed for permit compliance by an accredited person or person acceptable to the Council every 3 years.

Site specific conditions:

- 1 Suitable plants should be established within the effluent absorption area and maintained over the life of the system.
- 2 Water saving devices and appliances should be fitted to all water fixtures.
- 3 The irrigation system must be permanently fixed with distribution pipes buried at least 150mm below the natural ground surface.
- 4 All irrigation pipework and fittings must comply with Australian Standard 2698 plastic pipes and fittings for irrigation and rural applications.
- 5 Vehicles and livestock must be excluded from the effluent absorption field.
- 6 A sample of the treated effluent is to be collected and tested by a NATA accredited laboratory once every 12 months for:
 - a) Biochemical Oxygen Demand
 - b) Suspended Solids

RESPONSIBLE AUTHORITY: BAW BAW SHIRE COUNCIL.

Signature of Responsible Officer: _____

Date: 23 March 2009

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Appendix X: Approval letter and Permit to Use from BBSC environmental health department.



EML (CHEM) PTY LTD A.C.N. 086 948 321 A.B.N. 05 076 948 321

Report No: N010628

Page: 2 of 2

Report prepared for: AquaBlock Villa Maintenance Pty Ltd

Date: 15 April 2009

Sample Description		Baw Baw	
Received Method		Received	
Date		6/04/2009	
EML Lab No.		EML-8933	
Analyte	Unit	Method	
B.O.D.(5)	mg/L	BOD5	<5
Suspended Solids	mg/L	1110A	18
Presumptive E.coli	per 100mL	ECOLI-MEM	<1

Notes:

- Blank space indicates test not performed
- LOR: Limit of Reporting, calculated from undiluted sample

Appendix X: First water sample test arranged by installer, AquaBlock, and undertaken by EML.

Maps & Diagrams

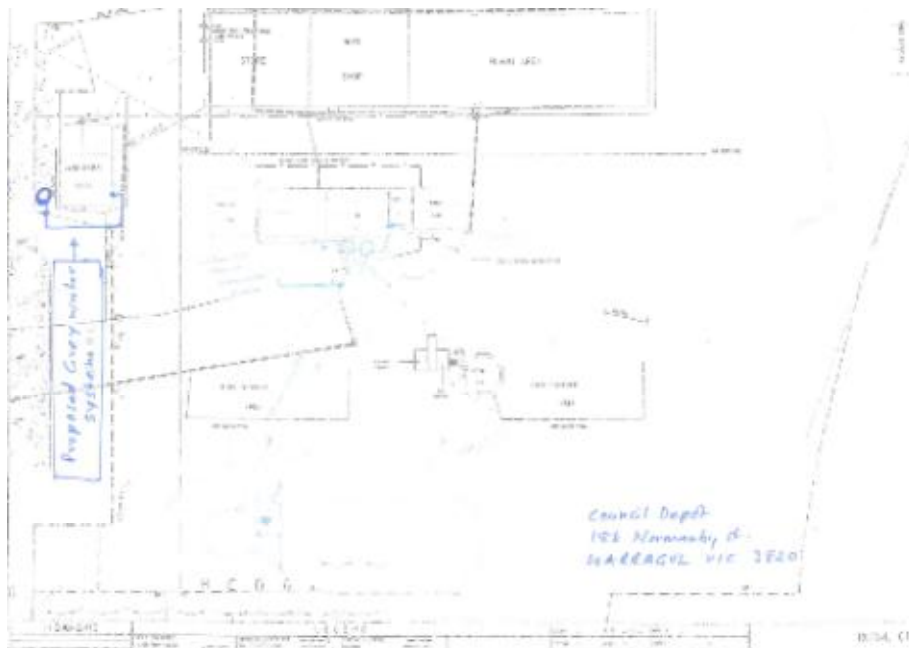
Project Location and Site Map

Baw Baw Shire Council Depot

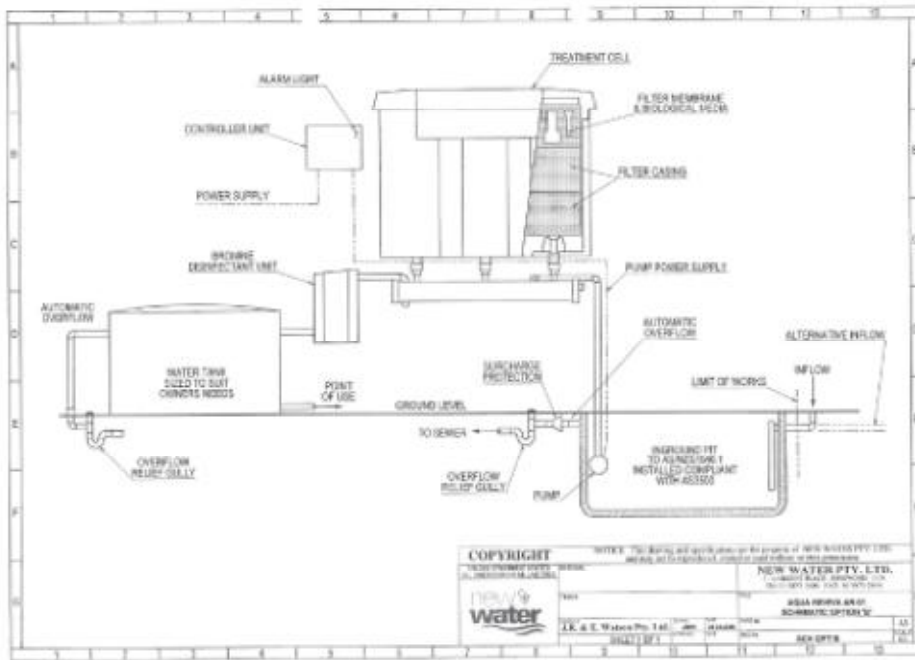
188 Normanby Street, Warragul, VIC 3820



Appendix X: Aerial photograph of placement of grey water system at Council Depot, Normanby Street, Warragul.



Appendix X: Proposed plans of placement of grey water system at Council Depot.



Appendix x: Plans of grey water system at Council Depot.

Communication Material

Media Coverage

Baw Baw Shire Council Newsletter – *Community News* – September 2009 Edition

Council Depot Green Machines

Baw Baw Shire Council is committed to taking a leadership role in promoting energy efficiency, water conservation and renewable energy generation.

Council has installed a new system at the Council depot to assist with reducing energy use and water consumption which is beneficial for both Council and the environment.

Firstly, a 5 kilowatts solar power system was installed. The new system was partially funded by Sustainability Victoria.

Plans are in place to install a 1 kilowatt wind power system and run comparison tests with the 1 kilowatt grid connected solar power system installed in 2008.

Data from wind and solar system tests will be compared to help with making a decision on the most efficient renewable energy system to be used throughout Baw Baw Shire.

In February this year, a grey water recycling system was also installed at the depot in an effort to promote water conservation and raise awareness about the effectiveness of water recycling.

For this system, funding was received through the State Government's 'Smart Water Fund'. The grey water system collects waste water from hand basins and the water is treated and re-used to flush toilets on site. Up to 1,200 litres of grey water may be recycled a day.

A community open day is planned for Saturday **24 October 2009** so residents can see first hand the economical benefits of the solar power system and grey water systems.

For more information about the community open day contact the Environment Team on 5624 2570 or visit www.bawbawshire.vic.gov.au



Grey Water System at Warragul Council Depot.

Waste Management Services Survey

Baw Baw Shire Council is seeking resident's feedback on the performance of Baw Baw Shire Waste Management Services.

You will find a copy of the survey with this newsletter or you can complete it online at bawbawshire.vic.gov.au under the Waste and Recycling tab. All fully completed surveys will go into the draw to **win a dinner for two**.

Please contact Shekar Atla, Waste Management & Contracts Coordinator on 5624 2444 or email shekar.atla@bawbawshire.vic.gov.au

Sign up for Enviro E-newsletter?

Baw Baw Shire Council is gathering names and email addresses for an Environmental E-newsletter.

If you would like to receive the latest environment news, tips for saving energy and water or to learn how to reduce your carbon footprint, sign up for the monthly environment e-newsletter.

To sign up email Baw Baw Shire Council Environment Officer: nicolette.davey@bawbawshire.vic.gov.au

UPCOMING ENVIRONMENT EVENTS

Sustainable Housing – Free Community Information Session
When: Tuesday 20 October, 6.00pm onwards
Where: GippsTAFE Warragul Campus
Learn how to incorporate sustainable housing concepts if you are building or renovating. For more information call GippsTAFE on 5622 8500 or Baw Baw Shire Council on 5624 2570.

Drouin Library Has Gone Green!
Celebrate renewable energy at Drouin Library
When: 21 October 2009, 2.00pm & 5.30 (Launch)
22 October 2009, 11.00am & 2.00pm
Information sessions on how to save energy by installing solar panels and water tanks will be held over 2 days. For more information call the Library on 5625 1564.

Sustainable Open Day
When: Saturday 24 October, 10.00am – 2.00pm
Where: Council Depot, 188 Normanby Street, Warragul
The CERES sustainability trailer will be there for the kids!
Come and see how solar panels, rainwater tanks and grey water recycling system are helping save energy, water and money!

WARRAGUL AND DRUIN GAZETTE October 20 2009 Page 18

BAW BAW SHIRE TO HOLD A SUSTAINABLE OPEN DAY

Baw Baw Shire Council is holding a sustainable open day at the council depot Normanby St, Warragul on October 24 from 10am to 2pm to celebrate environmental sustainability.

Baw Baw Shire mayor Ruth McGowan said the open day would be a great opportunity to see renewable energy technologies and water saving systems in action.

"Baw Baw Shire Council has installed a range of energy and water saving products at the depot. These include a 24W grid-connected solar panel system; a grey water recycling system; solar hot water and rain-water tanks."

"Council has been working diligently to reduce our greenhouse gas emissions and make our offices and buildings more efficient. The open day is a great opportunity to see first hand how renewable energy and water recycling can help save money and promote environmental sustainability."

"Non-for-profit community organisation CERES is also bringing their Sustainability Trailer - a hands-on interactive display which teaches kids and adults alike about re-

newable energy technologies." "The display includes a model house showing the effects of insulation, working micro-hydro power system, wind turbine, solar thermal system and a workstation showing the energy used for lighting and appliances."

Council staff and energy experts will be in attendance to answer any questions and information sheets will be available to take away.

Sustainable Open Day

Baw Baw Shire Council held its first Sustainable Open Day in October at the Council Depot in Warragul to celebrate environmental sustainability.

Environmental education organisation CERES brought their 'Energy Trailer' with plenty of hands-on interactive displays about renewable energy.

Council has installed a 5kW solar power system, rainwater tanks and a greywater system at the depot to reduce energy and water usage. Next year we hope Sustainable Open Day will be bigger and better!



Pedal power in action at the Sustainable Open Day

Baw Baw Shire Council Website – Grey Water System information after installation – September 2009

Water Conservation



Grey Water Recycling - Council Depot

A grey water treatment system has been installed at Council's Depot in Warragul. The system captures waste water from hand washing basins, treats the water to a 'Class A' standard which is then re-used to flush toilets onsite.

Up to 1,200 litres of gray water can be recycled a day. The system uses UV light to effectively disinfect the captured water and can safely be used for watering the garden, clothes and car washing. It is fully automatic and does not use harsh chemicals.


As water prices and local populations grow in Gippsland it is becoming ever more important to find ways to recycle water. The installation of the system is a positive step in conserving water and demonstrating the possibilities which grey water recycling offers.

During National Water Week, Council will hold an information day on October 24 for the community to see the grey water system in action.

Funding for the project was provided by the Victorian Government's Smart Water Fund.

For more informaton

Baw Baw Shire Council have a strong commitment to the environment and at any one time have a number of different programs the environmental team is working on. If you would like to know more please contact the Environmental Team on 5624 2411.

 [Give us your feedback](#)

Photographs

Installation of the grey water recycling and treatment system

Ground Preparation



Photo 1 & 2: Digging the trenches for the pipe work.

Pipe Work & Laying Slab



Photo 3: Laying the pipes

Installation of prefabricated greywater unit & pump well



Photo 4: Pipework from toilets to pump well back to greywater system



Photo 5: Pump Well.



Photo 6: Installation of the prefabricated greywater system

Completion and Final Pipe Works



Photo 7: Pipes to the toilet system from the greywater treatment plant and the meters.

Signage



Photo 8 & 9: Signage at hand wash basins in Depot toilets



Photo 10: Warning light and procedure at Depot



Photo 11: Signage in toilets

Sustainable Open Day – October 2009



Photo 12 & 13: Baw Baw Shire residents and Council staff inspect the greywater system at the open day.



Photo 14: Baw Baw Shire residents in front of Depot office with a range of sustainability information and posters including grey water recycling.



Photo 15: The CERES Sustainability Trailer, a community education resource including energy and water conservation.

Document Status

Version No.	Author	Date
1.0	Raj Manihar and Nicolette Davey	12 March 2010