DOMESTIC WASTEWATER MANAGEMENT SERIES

REUSE OPTIONS FOR HOUSEHOLD WASTEWATER

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1. INTRODUCTION

Victoria is experiencing increasing pressure on its finite water resources. This pressure, combined with increasing community interest in water conservation, has prompted many enquiries to EPA and local councils about reusing household wastewater.

This information bulletin provides advice about the regulatory, health and environmental issues associated with household wastewater reuse.

1.1 Purpose

This information bulletin:

- identifies household wastewater reuse practices that may (subject to site-specific circumstances) be acceptable and those that are unacceptable
- outlines the approvals that are required for acceptable reuse options
- identifies the risks that are inevitably associated with reusing household wastewater
- suggests measures to minimise these risks.

1.2 Water efficiency and wastewater reuse

Many people look at reusing household wastewater because of their interest in water conservation. EPA shares this concern. It believes that the best approach to water conservation is to reduce water usage and hence wastewater generation. In the home, there are many ways to do this. Initiatives include planting water-efficient gardens, installing water-efficient appliances and dual-flush toilets, and taking shorter showers. It is better not to generate wastewater in the first place, instead of trying to identify reuse options. If you want specific advice about water conservation in your home, you should contact your water authority.

Even though water consumption can be reduced, modern households typically generate significant volumes of wastewater. In urban areas, sewerage systems are provided to deal with wastewater. They use a network of pipes (sewers) to collect wastewater and transfer it to a central plant, where it is treated so it can be reused or sustainably returned to the environment in accordance with EPA requirements.

* This document replaces EPA Publication 812.1, released February 2006.

The ability of sewerage systems to safely and reliably manage wastewater is vital to protecting human health and environmental values in urban communities. Before efficient, physically separate water supply and wastewater collection systems were installed in cities, water-related diseases such as typhoid and cholera were common. In the developed world, these diseases are now rare, essentially due to the provision of efficient water supply and wastewater collection systems.

Given these benefits, we need to be cautious about proposals to divert untreated wastewater away from the sewer and reuse it at the household level.

The sewer system provides an opportunity to develop large-scale, efficient reuse schemes. Significant quantities of treated effluent from sewerage schemes are already reused across the State by application to land for uses such as irrigating pasture, golf courses, vineyards and turf farms. There is scope to increase this recycling and EPA is working with the water industry to achieve this. These schemes have the advantages (not available to householders) of using trained permanent staff to plan, operate and monitor them.

For new residential developments, the opportunity exists to install 'third pipe' systems, to take treated effluent from treatment plants to households for reuse. EPA encourages developers and planners to consider this option.

1.3 Scope

This information bulletin applies to reuse of wastewater generated by single households. It does not apply to reuse of industrial or commercial wastewater (which are addressed by EPA publication 464, *Guidelines for Environmental Management – Use of reclaimed water*).

This Bulletin outlines regulatory requirements, health and environmental risks, and risk minimisation procedures, but it does not consider detailed design requirements – it is not a design manual.

1.4 Using this information bulletin

This information bulletin is designed to assist members of the community interested in reusing household wastewater; environmental health officers and other local government staff involved in environmental issues; and plumbers and water industry staff.

Household wastewater reuse options fall into two broad categories:

- the diversion of untreated 'greywater' for immediate reuse
- the installation of systems to collect and treat household wastewater and reuse the resulting effluent.

Section 2 looks at the first category, while Section 3 examines the second.

2. GREYWATER DIVERSION

2.1 What is greywater?

Households generate significant quantities of wastewater that can harm public health and the environment if not managed properly. This wastewater (sometimes referred to as sewage) is generated in toilets, kitchens, laundries and bathrooms. Typically, each person in a house provided with piped water generates about 150 to 200 litres of wastewater per day. This wastewater can be divided into two separate waste streams:

- 'Blackwater' is the wastewater that is contaminated by faeces and urine arising from toilets and urinals.
- 'Greywater' (sometimes referred to as sullage) consists of all non-toilet wastewater. It includes wastewater from showers, baths, spas, hand basins, washing machines, laundry troughs, dishwashers and kitchen sinks.

Appendix 1 shows the pollutants typically present in greywater from different parts of the house and the associated environmental and health risks.

2.2 Greywater diversion in sewered and unsewered areas

In urban areas the sewerage system is the preferred way to handle household wastewater, including greywater. If households in sewered areas are interested in utilising greywater on their own property they should install an approved system to collect and treat greywater, and store and irrigate the resulting effluent in accordance with Section 3.

Nevertheless, EPA recognises that some householders are interested in seasonal diversion of untreated greywater during warm, dry weather. Sections 2.3 and 2.4 below describe regulatory considerations and risk management procedures for this practice.

This section focuses on the diversion of untreated greywater in sewered areas. In areas that are not sewered, households rely on individual wastewater treatment systems and it is already common practice to irrigate treated effluent from these systems. Householders in unsewered areas who divert untreated greywater should adopt the risk management measures in 2.4.

2.3 Regulation

Systems which collect, treat and reuse household wastewater from individual households must be approved by EPA for use in Victoria (following application by the system manufacturer) and be issued with a council 'septic tank permit' for each installation, as described in Section 3. A simple household diversion system, which does not treat the greywater, is not subject to these approvals.

Greywater has to be diverted from the wastewater source before it can be reused. A diversion valve is normally used to direct the wastewater away from the sewerage system to an irrigation system. People intending to do this should consult the relevant water authority before commencing the works. They should also consult their municipal council before installing a diversion system.

Work to install a greywater diversion system must be carried out by a licensed or registered plumber.

While there are no specific local or State government controls on household diversion systems, the wastewater reuse must not create a public health hazard, an environmental hazard or a nuisance. If it does, the owner/occupier of the property may expose themselves to a range of legal liabilities. These legal issues are examined in Appendix 2.

2.4 Managing health and environmental risks

Greywater is often contaminated with micro-organisms (bacteria, viruses and protozoa). It is these micro-organisms, many of which may cause disease, that present the greatest health concern associated with greywater reuse. While many bacteria cannot survive in a hostile environment like soil, some bacteria and viruses that cause disease are resilient and can often survive for long periods of time in this environment. The health risk posed by untreated greywater reuse can never be eliminated, but it may be minimised by careful management and responsible use.

The potential environmental impacts associated with greywater are due to the many pollutants it contains, such as particles of dirt, lint, food and human waste products (even greywater from laundries and bathrooms will contain some body fats, urine, faeces or blood), and chemicals derived from detergents and other cleaning agents. If the greywater is untreated these pollutants can build up in the soil, damaging the soil's structure, altering soil acidity/alkalinity balances and possibly harming plant growth.

The environmental impacts of untreated greywater reuse may not be confined to the property where it is being diverted. For example, saturating the soil could cause wastewater to percolate to the surface and run off into neighbouring property. The greywater may find its way into stormwater drains, rivers or streams, contributing to the pollution loads in these environments.

The following procedures should be implemented to reduce the health and environmental risks associated with diverting untreated greywater:

- Use greywater only during prolonged warm/dry periods, and limit volumes to those needed to meet plant water requirements.
- Ensure greywater does not contaminate any source of drinking water: extreme care must be taken to ensure there is no cross-connection between the greywater reuse system and the drinking water supply. Minimise the risk of cross-connection by colour coding pipework and installing a backflow prevention device.
- Ensure that the diversion system is 'fail-safe'; that is, greywater will automatically be diverted to the sewer if the greywater system blocks or otherwise malfunctions.
- Direct greywater to sewer during periods of wet weather.
- Do not divert kitchen wastewater, which has a high concentration of contaminants not readily broken down by soil organisms.
- Only divert the lowest risk greywater, such as the shower, bath, hand basin and laundry rinse water.
- Never divert greywater that could have gross faecal contamination – for example, water used to launder soiled nappies.

- Apply greywater to the garden by sub-surface irrigation. This will reduce human exposure to the water.
- Always wash your hands after gardening.
- Do not irrigate vegetable gardens supplying food crops that are eaten raw or undercooked, as this would pose an unacceptable health risk.
- Never store untreated greywater for more than 24 hours.
- Do not allow greywater to pool or stagnate, as this will attract insects and rodents, which may transmit disease.
- Never allow greywater to discharge beyond property boundaries, as this may create environmental and public health risks.
- Never allow greywater to discharge to a drain or waterway, as it is likely to be harmful to aquatic life.
- Never drink greywater or allow pets or animals to drink or have access to it.
- Only irrigate with greywater if the plants in the garden are healthy.
- Use low-phosphorus detergents.
- Reduce fertiliser use when irrigating with greywater.
- Do not allow the soil to become saturated. Carefully monitor the impact of the greywater on the irrigation area in order to minimise the risk of causing pollution.

3. TREATING AND REUSING WASTEWATER FROM SINGLE HOUSEHOLDS

Section 2 looked at the issues associated with diverting untreated greywater for immediate reuse. This chapter relates to systems intended to collect, treat and reuse household wastewater. It focuses on the requirements for these systems in sewered areas (in unsewered areas, effluent from individual household wastewater systems may be irrigated in accordance with EPA publication 891 (*Septic tanks code of practice)* and *Certificate of Approval CA 35/93 – Surface Irrigation*).

This section will help householders and regulators to make informed decisions about the acceptability of installing systems for onsite reuse of household wastewater in sewered areas. It should provide guidance for householders, regulators and the water industry.

The section describes the legislation and policies, technical requirements, and approval processes that apply to systems designed to collect, treat and reuse household wastewater in sewered areas. It applies whether they intend to reuse all or part of the wastewater.

3.1 Objective

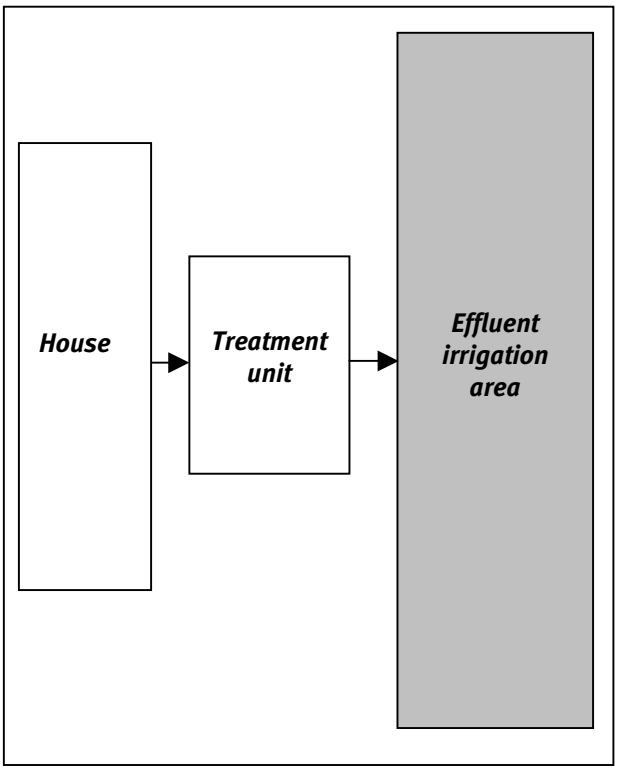
Households in sewered areas that reuse wastewater on their own premises should do this in a way that sustainably protects human health and the environment, with a risk level equal to (or less) than that associated with discharging to sewer.

Water balance calculations indicate that it is not possible to reuse the entire wastewater flow from a household (and hence comply with this objective) on typical urban allotments in Victoria. More detail is provided in 3.3 below.

3.2 Legislation and policy

3.2.1 Approval of household reuse schemes

An engineered system would be needed to collect and treat household wastewater, and reuse the treated effluent. Such wastewater systems serving individual households are regulated by Part IXB of the *Environment Protection Act 1970*. A household reuse system would typically include a wastewater treatment unit and a treated effluent irrigation area, as illustrated below:



The approvals needed for this type of system would be:

- the treatment unit – must be a type approved by EPA. Obtaining this approval is the treatment unit manufacturer's responsibility and should not concern individual householders (approved types of treatment unit are listed on EPA's website, www.epa.vic.gov.au)
- the irrigation scheme must comply with the requirements in this information bulletin
- the entire scheme (that is, including the wastewater collection, treatment and reuse components) must be approved by the local council and issued with a 'septic tank permit' before it is installed.

If a reuse scheme is proposed that differs from the above model, contact EPA and the local council to discuss the approval requirements.

3.2.2 Environmental policy

Different requirements apply to household wastewater management in sewered and unsewered areas:

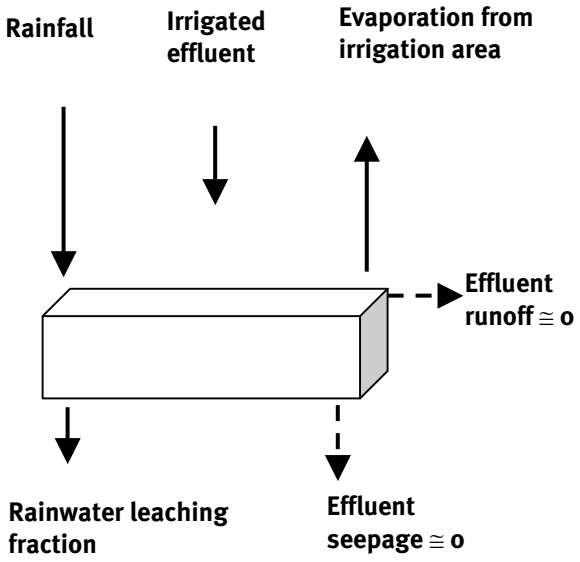
- Clause 32 of the *State Environment Protection Policy (Waters of Victoria)* require wastewater disposal in sewered areas to be via the sewer. Effluent reuse schemes that comply with this information bulletin, however, would achieve sustainable reuse, as opposed to disposal, and hence would not conflict with this requirement.
- Individual household systems in areas that are not sewered must comply with the *Septic tanks code of practice* (2003). Recognising the different circumstances in unsewered locations, the code allows the installation of household wastewater systems that only achieve partial reuse (and in fact may principally rely on disposal).

In both sewered and unsewered areas, household wastewater must be contained within allotment boundaries and not be discharged to drains or waterways. The treated effluent from household systems contains pollutants that can damage the environment and threaten aquatic ecosystems.

3.3 Sustainable reuse

Reusing household wastewater onsite is only acceptable as an alternative to discharging to sewer if the reuse is sustainable. This section describes such reuse.

The typical pathway for wastewater reuse is to apply treated effluent to land to irrigate plants. Sustainable reuse occurs when treated effluent is applied to meet plant needs over summer and is stored during winter, and there is negligible discharge of effluent to the environment. Schematically this may be pictured:



Effluent reuse must be reduced in very wet years. To ensure that reuse schemes can cope with wetter than average conditions, they must be designed to contain all wastewater in at least nine out of ten years. A contingency plan must also be developed showing how effluent will be managed in very wet years (refer to 3.4).

Schemes irrigating effluent at the maximum rates shown in the *Septic tanks code of practice*, *Certificate of Approval CA 1.2/03* and *Certificate of Approval CA 35/93 – Surface Irrigation* apply effluent at rates which exceed plant needs and result in a net loss of effluent to ground and/or surface water. These are not reuse systems and are not acceptable as an alternative to discharging to sewer.

3.3.1 Typical irrigation area and treated effluent storage needs

Designers of reuse schemes need to determine:

- the size of the irrigation area
- the volume of the storage used to hold treated effluent over the cool, wet months (the 'winter storage').

Table 1 shows the irrigation areas and winter storage volumes needed to completely reuse wastewater from a typical household, at a number of locations in Victoria.

The total area needed for a reuse scheme would be the sum of the following areas:

- the irrigation area, as shown in Table 1
- the area required for the winter storage
- the area needed for buffers (setbacks) between the irrigation area and the winter storage and property boundaries, buildings etc
- the area required for equipment such as disinfection unit, pumps and pipework.

Table 1 indicates that reuse of all wastewater from a household is not feasible on typical urban lots in Victoria

Table 1: Indicative irrigation area and winter storage requirements for sites in Victoria

Location	Assume flow = 1000 litres/day		Assume flow = 500 litres/day	
	Area (m²)	***Storage (m³)***	***Area (m²)***	***Storage (m³)***
Marysville	1800	280	900	140
Welshpool/Yarram	1500	260	750	130
South-East Melbourne	1200	240	600	120
Wodonga	1000	240	500	120
Bendigo	810	220	400	110
Werribee	730	220	360	110
Horsham	360	180	180	90
Mildura	260	120	130	60

1. The above irrigation area and storage requirements are indicative requirements, based on containing all wastewater up to the wettest year in 10. They were estimated using the water balance model described in EPA Publication 168, *Guidelines for wastewater irrigation*. Alternative water balance models may be used, but designers would have to justify their suitability and reliability.
2. The irrigation areas shown above (and the areas needed for winter storages) should be compared with typical urban lot sizes, for example 1000 square metres (older lots) or 800 square metres (new lots).
3. People in a house with piped water typically each generate around 150 to 200 litres of wastewater per day. That is, a household of four people would generate 600 to 800 litres of wastewater per day at this rate. The 500 and 1000-litre-per-day flow estimates are intended to cover low and high household wastewater generation rates, respectively.
4. The table shows the areas needed to irrigate 500 or 1000 litres of wastewater per day. However, the area needed to manage plant nutrients must also be calculated (see 3.3.2 below). This may be larger than the area shown above. Both the irrigation area and the area needed to manage nutrients must be calculated and the larger area must be used in the design of the reuse scheme.
5. As well as using the larger of the areas in the design, space would be required for the winter storage, buffers and equipment such as pumps and pipework. The complete wastewater treatment and reuse system would have to fit on the area not used for the house, outbuildings, driveways, courtyards, tennis courts, pools and so forth.

3.3.2 Confirming sustainable reuse

The designer of a reuse scheme must look at more than the irrigation area and winter storage volume. All the following issues should be considered when designing a truly sustainable reuse scheme:

- wastewater volume (that is, irrigation area and winter storage requirements)
- nutrients (matching the quantity of nutrients applied to the amount taken up by plants)
- salinity and sodicity (ensuring soil and plant health is protected, and salt build-up is avoided)
- soil (protecting the structure of the soil)
- surface water protection (stopping effluent running off and entering surface water)
- groundwater (preventing pollutants leaching from the irrigation area to groundwater)
- human and animal health (avoiding contact between wastewater and humans and animals)
- public amenity (avoiding odour and noise).

More information about these issues is provided in EPA publication 168, *Guidelines for wastewater irrigation*. A householder in a sewered area seeking to reuse wastewater onsite must show that its proposal would sustainably deal with the above issues.

3.3.3 Further issues

A number of other issues need to be considered in the design of a household reuse scheme:

- The wastewater must be treated to a 'secondary standard' and, if irrigated above ground, disinfected to protect public health, ensure that the irrigation area is not degraded and protect local amenity. Secondary treatment involves settling out solids and a biological stabilisation process. EPA publication 500, *Code of practice for small wastewater treatment plants*, describes secondary treatment technology.
- Winter storages must be designed to good engineering standards so that they minimise the risk of failure (a tank would normally be needed).
- Operation and maintenance: a reuse scheme must be effectively operated and maintained, so that it functions reliably over its entire lifetime.
- Biological solids ('sludge') build up in treatment plants and must be withdrawn at regular intervals (up to every three years, but may be considerably less). Designers should consider sludge management by, for example, providing access to the treatment plant for vehicles pumping out sludge.
- The system must be monitored to ensure it operates properly, and to identify any adverse impacts it causes. The operator should prepare a monitoring program based on the regular submission of independent laboratory results to the local council. Proponents of reuse schemes should appreciate that regular monitoring of the scheme (at their expense) will be needed over the system's lifetime.
- Contingency plans: reuse may have to cease if the system fails, or in very wet years. The operator must develop a contingency plan: for example, all wastewater could be directed to a sewer.
- Cost: a system is likely to cost at least several thousand dollars to install (but possibly more), and will incur continuing costs to operate, maintain and monitor (such as the costs for power to treat and pump wastewater). Another aspect of costing is water authority charges – a water authority may still apply an annual charge for making sewer available to an allotment, even if wastewater is completely reused on the site.

3.3.4 Checklist for reuse schemes

A householder in a sewered area considering reusing their wastewater must consider the following issues in the preparation of a management plan:

Develop an irrigation management plan as described in *Guidelines for Wastewater Irrigation* that addresses:	• Irrigation area and storage volume
	• Nutrients
	• Salinity/sodicity
	• Soil
	• Surface water
	• Groundwater
	• Human and animal health
	• Public amenity
Wastewater treated to secondary standard and, if used for surface irrigation, also disinfected	
Winter storage designed to good engineering standards	
Operating and maintenance procedures identified and documented (including sludge management procedure)	
Monitoring program documented	
Contingency plan prepared	

3.3.5 Partial reuse options

Much discussion of reuse schemes focuses on reusing the entire wastewater flow generated by a household instead of discharging it to the sewer. Using part of the household wastewater is another possible approach. For example:

- toilet waste ('blackwater') is discharged to an EPA-approved composting toilet, where the composted product is managed in accordance with the EPA certificate of approval for that system, and other wastewater (greywater) is directed to sewer. This type of system is acceptable in a sewered area, subject to local government approving the installation of a composting toilet.
- blackwater is discharged to sewer and greywater is reused onsite. Greywater is wastewater and, if this option were selected, the householder would have to demonstrate that the greywater recycling complied with this information bulletin in the same way as a scheme to reuse the entire wastewater flow.
- part of a household's wastewater is reused onsite, within the capabilities of the allotment, and the excess is discharged to sewer. The householder should demonstrate that partial reuse could be achieved in accordance with this information bulletin.

This list is not exhaustive and other approaches to reusing part of a household's wastewater may be identified. The requirement for any proposal to reuse part of a household's wastewater would be to show that the wastewater could be sustainably reused in accordance with this section. This would require the preparation of a management plan as described in 3.3.3 and 3.3.4.

3.3.6 Greywater reuse for toilet flushing

This Bulletin looks at reuse of treated effluent via application to land. A different approach to reuse is to recycle greywater inside the house for toilet flushing. A detailed discussion of this practice is beyond the scope of this bulletin. People wishing to look at this approach should contact their water authority for advice.

3.4 Approval process

The possibility of reusing wastewater onsite instead of discharging to sewer may occur when:

- a householder in a sewered area wants to convert to full/partial onsite reuse. This would require the installation of an onsite wastewater system that achieves sustainable reuse as described in this bulletin.
- a house is located in an unsewered area, to which sewer is being provided. The house's onsite system would have to be modified to achieve sustainable reuse of all wastewater in accordance with this bulletin if the householder wanted to avoid connecting to the sewer.

In both cases, the householder must apply to the local council for a septic tank permit before installing or modifying an onsite reuse system. The application should demonstrate how wastewater could be reused onsite, as described in this section. This would require the preparation of a management plan, addressing all the issues shown in the table in 3.3.4.

The local council would assess whether the application demonstrates to its satisfaction that onsite reuse could take place in accordance with this bulletin before deciding whether to issue a septic tank permit. If the council refused to issue a permit, the reuse scheme could not proceed.

Note that Section 180 of the *Water Act 1989* requires a council to refer a permit application for a site in a water authority's sewerage district to that authority, and to comply with any requirement the water authority sends to the council.

FURTHER INFORMATION

D Christova-Boal, P Lechte and R Shipton, 1995 *Installation and Evaluation of Domestic Greywater Reuse Systems*, Report No 3/1995, Victoria University of Technology.

EPA 1991, *Guidelines for wastewater irrigation*, EPA publication 168, EPA Victoria.

EPA 1997, *Code of practice for small wastewater treatment plants*, EPA publication 500, EPA Victoria.

EPA 2003a, *Septic tanks code of practice*, EPA publication 891, EPA Victoria.

EPA 2003b, *Guidelines for Environmental Management – Use of reclaimed water*, EPA publication 464, EPA Victoria.

Urban Water Research Association of Australia 1994, *Domestic greywater reuse: overseas practice and its applicability to Australia*, Report No. 73.

Urban Water Research Association of Australia 1996, *Model guidelines for domestic greywater reuse in Australia*, Report No. 107.

W van Dok 2000, *The Water-efficient Garden*, Water-efficient Gardenscapes, Glen Waverley.

APPENDIX 1: GREYWATER POLLUTANTS AND RISKS

Source	Typical pollution components	Likely risks and comments on risk management
Bathroom: (shower, basin and bath) generates approximately 55% of greywater.	• Faecal contamination and urine. • Chemicals derived from soaps, shampoos, dyes, mouthwash, toothpaste and cleaning products. • Hair, lint, body cells and oils, dirt. • Trace amounts of pharmaceuticals.	• Faecal contamination poses the greatest risk to human health from greywater use. Many bacteria and viruses that can cause human disease are able to survive for long periods of time in the environment. • Urine is generally sterile, unless a person suffers from a severe urinary tract infection, and as such presents little health risk. Urine contains ammonia, which may be beneficial to some plants. • Bathroom greywater is generally well diluted, reducing the immediate effects of chemicals in soaps, shampoos etc. However, there is a long-term risk that they could build up in soils and become detrimental to the soil, vegetation and groundwater. Using shampoos low in salt (sodium chloride) and cleaning agents low in phosphorus will reduce this risk. • In sewered areas, where the landscaped area may be insufficient to reuse all the greywater produced, the bathroom/ensuite wastewater should be the preferred source, as this has a lower chemical loading than laundry water. The microbiological component of this water means that it should be directed to subsurface irrigation.
Laundry: generates approximately 35% of greywater.	• Laundry detergents: - often contain ammonia and other forms of nitrogen, phosphorus and boron - often have high levels of sodium and salinity - may have high levels of alkalinity - may increase pH levels. • Bleaches and disinfectants may also be present in laundry wastewater. • Faecal contamination (and the associated bacteria and viruses) may be present in wastewater from laundry troughs used to wash nappies, incontinence pads and pets. • Laundry rinse water carries dilute soaps and dirt. • Hot water.	• Depending on the wash load, the risk of faecal contamination may be less for laundry water than for bathroom water. The installation of a diversion valve, which allows the user to select the means of disposal depending on the nature of the soiled items being laundered (i.e., to sewer or the garden), would assist in reducing the potential for microbiological contamination of the greywater diverted for reuse. • The detergents in laundry wastewater are a significant risk to plants and soil condition. Because detergents (and other pollutants) are concentrated in the washwater, risks can be minimised by directing the washwater to sewer and diverting rinse water for reuse. It may also be beneficial to use detergents that have low levels of salinity and alkalinity and do not increase pH. • While many of the contaminants found in laundry detergents are nutrients potentially beneficial to some plants, they will become detrimental to the soil and vegetation if they build up to excessive levels in the soil. • Bleaches and disinfectants which kill micro-organisms in the home also have the capacity to kill beneficial soil organisms. Bleaches and disinfectants should be used sparingly in all water diverted for garden irrigation. • Hot and warm water can scald plants and kill soil organisms that play vital roles in sustaining plant life. Cooling the water before it is dispersed in the garden will reduce this risk.
Kitchen: generates approximately 10% of greywater.	• May be heavily contaminated with food particles, cooking oils, grease, detergents and other cleaning agents such as caustic dishwashing powders.	• Kitchen wastewater should not be diverted for reuse: - Fats are not readily broken down by soil organisms and are likely to build up in the soil, so that it repels water. - There is a relatively high concentration of contaminants in kitchen wastewater. These may be harmful to plants, soils and groundwater if applied without extensive treatment.

APPENDIX 2: LEGAL ISSUES ASSOCIATED WITH DIVERTING GREYWATER

Is it legal to divert greywater from existing sewerage works?

Under the current statutory regime, householders can divert greywater for reuse, provided they obtain consents from the relevant authorities and use a licensed/registered plumber to carry out the works:

Water Industry Act 1994 and Water Act 1989

Reusing untreated greywater requires the installation of a device to divert the greywater from its source to a reuse application. For example, a diversion valve may be installed to direct wastewater away from the sewerage system to a subsurface irrigation area.

Section 63 of the *Water Industry Act 1994* and section 145 of the *Water Act 1989* state that consent must be obtained from water authorities before works connected to their systems are altered or removed. EPA recommends that householders considering diverting untreated greywater for reuse contact their water authority to discuss its requirements for granting this consent.

Environment Protection Act 1970

Section 53L of the *Environment Protection Act 1970* prohibits anyone constructing, installing or altering a 'septic tank system' on their property unless they first obtain a permit from their local municipal council. Section 53 M of the Act states that a municipal council can only permit onsite treatment systems approved by EPA to be installed. Section 53 defines a septic tank system as a system that treats wastewater from an individual household in any way, whether by chemical, biological or physical (including filtration) processes.

The coarse screening of untreated greywater, directly prior to its application to land for seasonal diversion (that is, during warmer weather) does not constitute 'physical treatment' within the definition of a 'septic tank system' in the Act. As such, a seasonal greywater diversion system incorporating coarse screening does not require EPA septic tank approval.

The reuse of untreated greywater without chemical, biological or physical treatment does not involve the installation of a 'septic tank system' as defined above and hence is not subject to the above requirements.

Building Act 1993

Section 221 D of the *Building Act 1993* states that specific classes of plumbing work may only be done by people licensed or registered by the Plumbing Industry Commission to carry out those classes of work (section 221 B (1) states that classes of plumbing work are defined by regulation). Regulation 13 of the *Plumbing Regulations 1998* defines work on systems conveying greywater as a class of plumbing work subject to section 221 D.

Legal issues associated with misusing greywater

There are a number of legal liabilities potentially associated with inappropriate greywater reuse, as set out below. This information is necessarily general and provided for guidance only: people seeking a full understanding of the legal issues

associated with greywater reuse should obtain their own professional legal advice.

Public health hazard

Wastewater management is regulated by the Environment Protection Act. The *Health Act 1958* may also be relevant where there is a nuisance that is dangerous to health or is offensive, in that it is noxious, annoying or injurious to personal comfort. A householder may create a nuisance if they allow greywater to run off their property onto neighbouring land or into rivers, creeks or the stormwater drainage system, or generate odours. The *Health Act 1958* makes it an offence to cause a nuisance and makes offenders liable to prosecution and penalty, or for a Notice to Abate the nuisance to be issued against them.

Pollution of water, air and land

Sections 39, 41 and 45 of the Environment Protection Act make it an offence to pollute water, air and land respectively. Greywater contains many chemical and biological pollutants that have the capacity to pollute water, air (via odours) and land, if the quality, quantity and distribution methods of the greywater are neglected.

Greywater users must ensure that their reuse practices do not cause pollution. People causing pollution may be liable to enforcement action, whether or not they intended to pollute. This means that greywater reusers must ensure that their operation is well managed, so there is no risk of causing pollution (in legal terms, the pollution offences are 'absolute liability' offences).

Potential impacts on neighbours

There are pollutants in greywater that may pose health and environmental risks. It would be completely unacceptable to discharge greywater to neighbouring properties, because of potential health impacts, odours, waterlogging and damage to vegetation. As well, allowing greywater to enter neighbouring properties could disrupt good relations with neighbours, by detrimentally affecting their enjoyment of their properties.

Anyone allowing their greywater to enter adjoining properties may be exposed to civil liabilities associated with private nuisance, trespass and negligence. People wanting a detailed understanding of these liabilities should obtain their own professional legal advice.