



# Stormwater Management

## for Wash Bays

EPA 517/04—April 2004

### Why do I need this information?

This information has been developed for owners and operators of permanent or temporary wash bay facilities. It will help you to identify and manage potential stormwater pollution problems at your site.

The people and businesses that may need to read this information include:

- car sales yards
- crash repair businesses
- mechanical servicing businesses
- public self-service carwash facilities
- heavy vehicle or machinery washdown stations
- charity carwash event organisers and participants.

The *Environment Protection (Water Quality) Policy 2003* requires that you undertake all activities in a way that ensures stormwater is protected from pollutants such as washwater, detergents, cleaning agents, grease, oil and general rubbish.

### What is stormwater?

Stormwater is rainwater that flows over outside surfaces into gutters and stormwater drains in the street. This water is not treated and flows directly to our creeks, rivers, groundwater and oceans. Stormwater should only contain clean rainwater and *no* pollutants.

### Benefits for you and your business

By addressing potential stormwater pollution problems at your workplace you:

- minimise the risk of environmental fines and prosecutions
- demonstrate compliance with the Environment Protection Authority's codes of practice
- improve your business profile
- make long-term financial savings by reducing costs and improving efficiency
- increase customer satisfaction and patronage
- improve environmental conditions for everyone.

## What legislation governs stormwater pollution?

The stormwater system is protected by a number of different laws including the *Environment Protection Act 1993* (the Act), the *Environment Protection (Water Quality) Policy 2003* (the Water Quality Policy), the *Local Government Act 1934*, the *Development Act 1993* and the *Public and Environmental Health Act 1987*.

The Water Quality Policy offers the most specific protection for the state's waters. It prohibits the pollution of the stormwater system and our natural waterways. The Water Quality Policy has general obligations with which every person, business and industry must comply, as well as specific obligations for particular activities. Failure to comply with any of these obligations may result in a \$300 fine, Environment Protection Order, and/or prosecution.

Clause 17 of the Water Quality Policy states that *a person must not discharge or deposit a pollutant listed in Schedule 4 of the Policy into a water or onto any land where it might enter any waters*. The pollutants listed in Schedule 4 that relate to wash bay activities include:

- washdown water from cleaning vehicles, plant or equipment
- cleaning agents
- detergents and their by-products
- engine coolant
- oil, grease and lubricants
- petroleum products
- rubbish.

For more information of the Water Quality Policy visit the EPA web site at [www.epa.sa.gov.au](http://www.epa.sa.gov.au) or telephone (08) 8204 2004.

## Identifying potential pollution problems.

Waste water and rainwater run-off from vehicle, machinery and equipment wash bays can pose a significant threat to the health of our natural waterways if they are discharged into the stormwater system. The large quantities of water and the types of cleaning products used can form a poisonous cocktail for our natural waterways.

Washwater contains dissolved pollutants from cleaning products and can easily deposit these in a stormwater drain. Likewise, the surface of a wash bay can retain pollutants, such as oil, grease or petroleum products, from spillages or leaks. When rain falls on the surface it dissolves or mixes with the toxins, washing them from the site and flushing the contaminated water into the gutters and stormwater drains.

Detergents or cleaning agents labelled as 'biodegradable' or 'phosphate-free' can reduce the environmental impact of contaminated washwater, but **only** if they are discharged to the sewer system where they are treated before being released into the environment. Wastewater containing phosphate detergents should also be directed to the sewer system.

The term 'biodegradable' refers to the ability of materials to be broken down by a group of biological organisms called decomposers. (The Australian Standard for a product to carry the label 'biodegradable' is that 80% of the mixture must be degraded within 21 days (AS1792—*Methods to Determine the Biodegradability of Surfactants*). Decomposers such as bacteria are present and necessary in a balanced, natural aquatic ecosystem; however, their ability to successfully break down pollutants is directly related to the quantity and quality of contaminated water being released into their environment. Sewage treatment facilities are designed to receive large volumes of wastewater with high concentrations of pollutants, and biodegradable material can decompose faster because biological decomposers are present in higher numbers. Therefore, whilst biodegradable products are a positive choice, you should consider the quantity and quality of polluted washwater draining from your site into the stormwater system.

Phosphate-free detergents are also less harmful to the natural environment than those that contain phosphate, but they too should be treated at a sewerage facility before being released into the natural environment. As an alternative to phosphate, manufacturers use a builder or a combination of builders that can include zeolite (aluminosilicates), sodium citrate and nitrilotriacetate (NTA). Discharging washwater with these contaminants directly to the stormwater system can have serious consequences. For example, some pollutants (alkyl phenols) are oestrogen mimics and have a detrimental effect on the reproductive ability of aquatic animals.

Detergents that do contain phosphate contribute to excessive algal growth (sometimes in the form of algal blooms), and the reduced availability of oxygen in water, leading to death for some aquatic organisms. Although phosphate occurs naturally, our soils and waters generally have low levels and the biological organisms available to break it down are limited. Adding extra phosphorous to waterways results in the growth of biological decomposers who require oxygen to survive. They deplete the dissolved oxygen available in water, again leaving less for other organisms and causing their death.

For best environmental practice, no washwater containing any cleaning agents or toxic pollutants should be discharged directly to the stormwater system, and rainwater should be restricted from flowing through the wash bay and into a stormwater drain.

Have a look at the types of detergents and cleaning agents being used in your wash bay. Is the surface of your wash bay clean of oil or grease deposits? Is any of the contaminated washdown water or rainwater draining into the stormwater system? Can you adopt new workplace practices to ensure this doesn't occur?

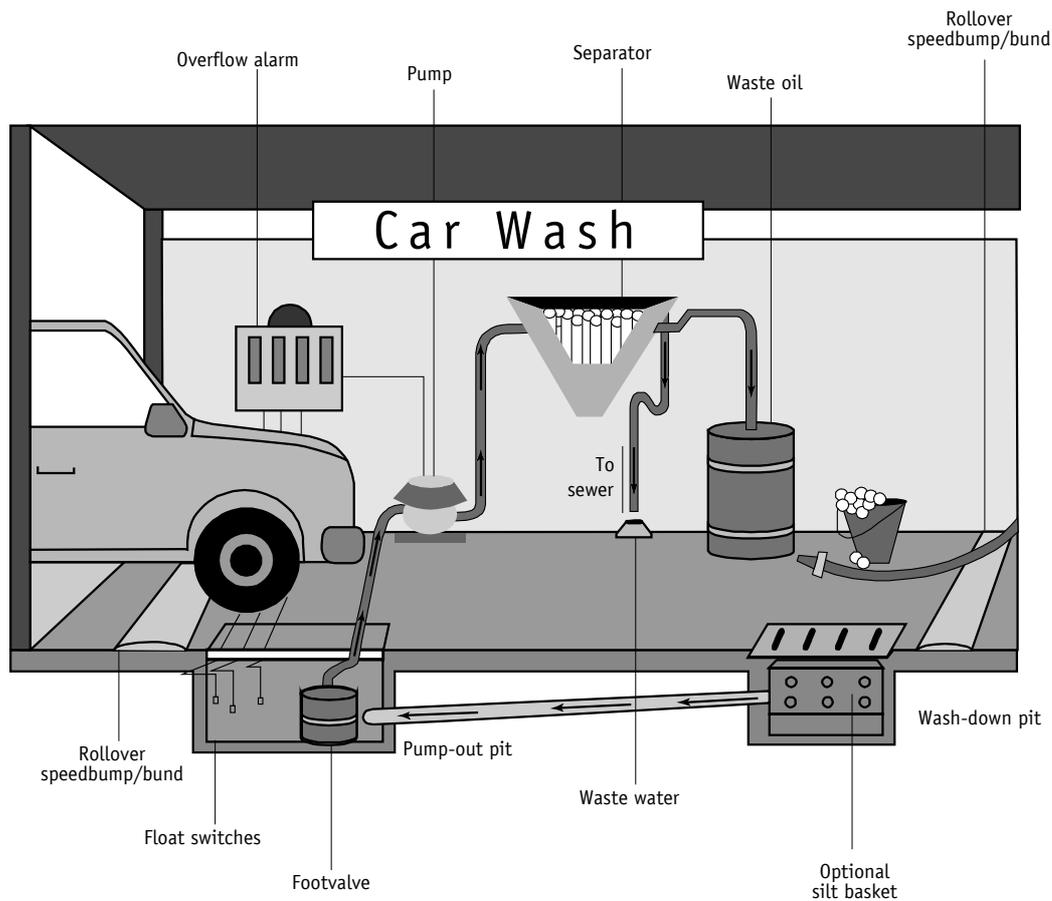
## **What can you do to prevent stormwater pollution?**

### ***Appropriate wash bay design***

A vehicle, machinery or equipment wash bay should be designed to exclude rainwater, and to retain, collect, treat and reuse, or dispose of all wastewaters. Installation of appropriate facilities during the design and construction phase will ensure protection of the stormwater system from contaminated wastewater (see figure1).

The following features should be included:

- **Roof**—a roof will prevent rainwater from entering the cleaning area and becoming contaminated, therefore negating the need to contain, treat and dispose of it as wastewater. The roof should have a one-metre overhang for every three metres of height above the bund to prevent wind-driven rain entering the wash bay; however, if this is impractical, walls or skirts can be used instead. The rainwater run-off can be collected in a tank for on-site reuse as washwater or garden water, or diverted directly to an appropriate stormwater discharge point.
- **Bunding**—installing speed humps at the entry and exit points of the wash bay will intercept and divert surface rainwater run-off away from the wash area. The bunds will also act as a barrier to contain contaminated wash water inside the wash bay.
- **Graded floor surface**—the wash bay floor should be graded to drain towards a collection point or channel.
- **Floor surface material**—the floor surface of a wash bay should be paved with a material that has low permeability, such as concrete. The concrete will facilitate wastewater collection and reduce the absorption of chemicals.
- **Appropriate size**—the wash bay itself should be of sufficient size to prevent any over-spray or splashes from cleaning activities escaping its confines.
- **Drainage**—the design should ensure that all wash water drains to a channel within the wash bay area. The wash bay floor and the drainage channel must have a minimum grade of 1:80.



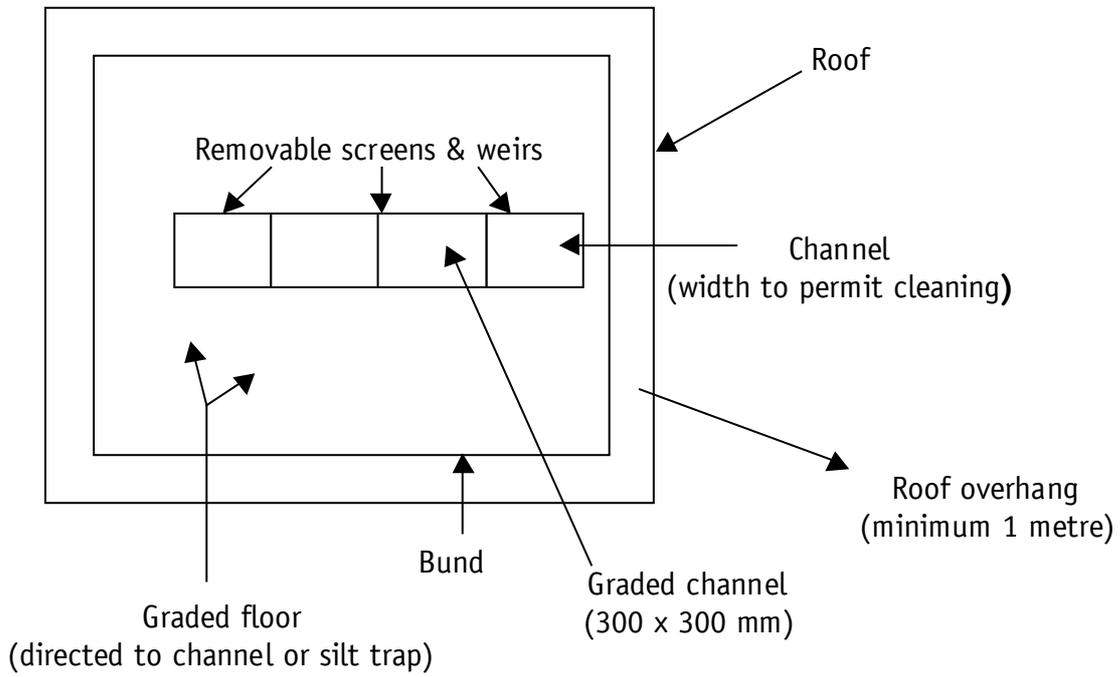
**Figure 1.** This picture shows the principal features of a well designed wash bay.  
*Source: Department of Environment and Conservation (NSW).*

### ***Effective wastewater disposal methods***

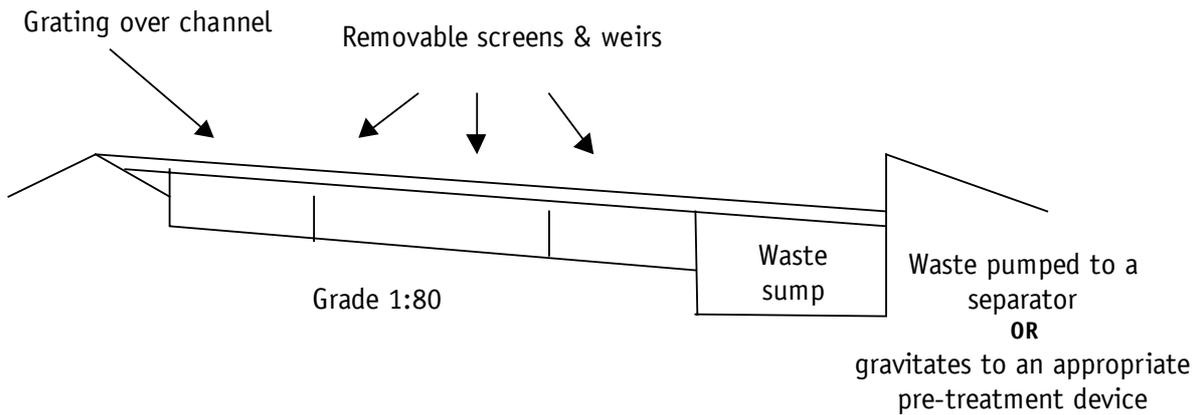
Pre-treatment: before final discharge, washwater should be processed through a series of treatment devices to removing or reducing pollutants. Pre-treatment devices should include:

- a graded channel fitted with weir(s) to trap rapidly settling solids and/or perforated screen(s) for retaining gross solids. The channel should be designed for easy cleaning and removal of trapped materials (see Figure 2 below).
- an approved suspended soils settling chamber where wastewater containing grease and oil that is within SA Water’s acceptance limits (e.g. road grime from vehicles exterior) can be collected
- a waste sump where wastewater containing grease or oils that exceed SA Water’s standard of acceptance (e.g. cleaning of chassis or engine bays) can be collected and then pumped by a positive displacement pump to an approved above-ground coalescing plate separator.
- an automatic pH correction system and safety shut-off valve where the pH of wastewater exceeds SA Water’s acceptable level (pH 6-10).

**Top view of wash bay**



**Cross-section view of channel**



**Figure 2.** Diagrammatical view of the technical features of a wash down area  
*Source: Industrial Wastes Vehicle Washing Policy, SA Water (1997)*

Disposal: after treatment, wastewater can be disposed of by:

- a licensed liquid waste collection contractor (look under 'Waste Reduction and Disposal Services' in the Yellow Pages). The discharge should be collected in an approved holding tank. Holding tanks can be installed subject to the following:
  - Arrangements are made between the wash bay operator, the local council and a licensed liquid waste collection contractor for the collection and disposal of wastewater; appropriate documentation is to be served on each occasion.
  - An audible and visible alarm must be installed in a conspicuous position to warn when the holding tank is 75% full. (The device should have a muting facility for the audible component.)
  - A suitable system or device must be installed which will shut off the reticulated water supply to the wash bay/cleaning area if the holding tank becomes filled to capacity due to a lack of maintenance pumping or the ingress of water.
- discharging directly to the sewerage system. **You must have a licence to discharge to the sewer:** contact SA Water Trade Wastes Section on 8207 1350. Before discharging, you should refer to your licence conditions and ensure the wastewater complies with SA Water's standard of acceptance. Wastewater containing organic solvents can only be discharged to the sewer after approval from SA Water.
- discharging to a septic tank effluent disposal scheme (STEDS). You must contact the local council to ensure the wastewater will be accepted.
- recycling the wash water through a unit which removes pollutants to allow reuse. It reduces the final volume of wastewater actually disposed of to the sewer, STEDS or liquid waste removal contractor.

## Options for unsewered areas

Wastewater from the wash bay could be directed to:

- a holding tank which is emptied as required by a licensed liquid waste contractor
- a dedicated vegetated or landscaped area, according to SAHC (South Australian Health Commission) standards
- an evapo-transpiration bed
- a shallow placement absorption field
- an evaporation lagoon or permanent water feature. The capacity of either of these storage basins should be equal to the total hydraulic loading (rainfall on the catchment plus washdown water) balanced with total evaporation on an annual basis.

### **Note:**

Any of the wastewater disposal options referred to above, other than by licensed contractor, would be subject to all the following criteria:

- sufficient land of a suitable type and location being available
- the use of a treatment system (including sediment traps and an oil separator) where effluent discharged from the treatment system must not have oil content greater than 10 mg/L
- the disposal area being located at least:
  - 100 metres from any river, creek or other natural watercourse (whether modified or not); or a channel (which can include, a drain, gutter or pipe) identified as a blue line on a current series 1:50,000 Department of Environment and Natural Resources topographic map, or by an on-site inspection

- 100 metres from any bore, well, dam, lake
- 100 metres from the mean high water mark.

## **General site maintenance**

Wash bays should be regularly swept or otherwise kept clean of waste. Ideally the wash bay should be cleaned by sweeping using dry absorbents, which will negate the need to dispose of large volumes of wastewater.

## **Council approval**

If you decide to build a wash bay you will require approval from a sewerage authority and you may need building or other approvals from council. Check with your local council in all cases before commencing so you are clear about their requirements.

## **Temporary washdown areas for building & construction sites**

Vehicles and other equipment on construction sites may need to be washed frequently. The washdown water from this equipment contains sediment (soil, clay, gravel and sand), detergents and automotive fluids, all of which pollute our creeks, rivers and beaches.

Allowing these pollutants to enter the stormwater system and our natural waterways is an offence under the Water Quality Policy. Building site supervisors should ensure that an appropriate vehicle and equipment cleaning area is available on site. The following is a guide for the design and operation of a bunded temporary wash area for a building site:

- Slope the wash area for wastewater collection into a sedimentation basin. This allows the sediment to settle to the bottom of the basin and the wastewater to evaporate. It can be made using sandbags or hay bales. Alternatively, if there is a large volume of wastewater to be collected, a blind sump (no outlet) should be installed.
- Use phosphate-free, biodegradable soaps in small amounts. Avoid the use of solvents to clean vehicles.
- Use as little water as possible by initially spraying the vehicle with a trigger-hose and then scrubbing it with cloth rags and squeegees.
- If the wash bay requires a sump arrange for a licensed liquid waste contractor to collect the wastewater from the sump and dispose of it appropriately. Alternatively, obtain permission from SA Water Trade Wastes to pump the wastewater to the sewer.
- Educate employees and subcontractors on pollution prevention measures and the importance of protecting the stormwater system from pollution.

## **Home & charity car washing activities**

Home or charity car washes should be conducted on a grassed or gravelled area, or over a spill-safe mat. Care should be taken to use biodegradable phosphate-free soap.

Under the Water Quality Policy you may be fined for washing your car on the street in certain circumstances. If you wash a muddy car with a hose and detergent on the street or a concrete (or similar) driveway you may be fined. If the car is only slightly soiled and it is rinsed on the street using a bucket without detergent, a fine may be avoided. However, when you wash a vehicle you must also obey the current level of water restrictions. For more information on water restrictions visit the SA Water web site at [www.sawater.com.au](http://www.sawater.com.au) or telephone 1800 130 952.

Ideally, you should wash your car using a bucket and/or trigger hose on a grassed or gravel area which allows the water to soak into the ground. Alternatively, you could use a commercial car wash that directs wastewater to the sewer, via pre-treatment facilities.

## References

City of Knoxville 2001, *Best Management Practices (BMP) Manual*, City of Knoxville Engineering Department, Tennessee, United States of America.

Environment Protection Authority (SA) 2004, *Disposal of Soap and Detergents*, EPA, South Australia.

SA Water 1997, *Industrial Wastes Vehicle Washing Policy*, South Australian Water Corporation, South Australia.

Stormwater Pollution Prevention Projects 2002, *Fact Sheet No.8 Stormwater Management Guidelines for General Car Body Washing in Car Yards*, Patawalonga, Torrens, Northern Adelaide and Barossa and Onkaparinga Catchment Water Management Boards, South Australia.

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## FURTHER INFORMATION

### **Legislation**

Legislation may be viewed on the Internet at: [www.parliament.sa.gov.au/dbsearch/legsearch.htm](http://www.parliament.sa.gov.au/dbsearch/legsearch.htm)

Copies of legislation are available for purchase from:

Government Information Centre  
Lands Titles Office, 101 Grenfell Street  
Adelaide SA 5000

Telephone: 13 23 24  
Internet: [shop.service.sa.gov.au](http://shop.service.sa.gov.au)

### **For general information please contact:**

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