

DRAFT

Code of Practice for

Industrial, Retail and Commercial Sites

V.31

NB. Insert Fire Sprinkler, Air Cond, Stormwater Info Series References.

Insert Key Reference listing

Review Maintenance, Cleaning and Enviro Record/Reporting Sections

Final Formatting/Editing/Images

This is the first EPA Code of Practice and statewide policy tool to introduce water sensitive urban design, specifically, design objectives for stormwater management, in South Australia. The Code includes mandatory requirements for water sensitive urban design for all new development and redevelopment. It also details how it can reasonably and practically be implemented on existing operations.

This is also the first EPA Code of Practice to combine Water, Air, Noise and Soil best environmental management practices and standards in the one regulatory tool.

In the absence of an Australian Standard, the Code has reflected European standards for oil separator devices, including class specifications in order to assist industrial, retail and commercial operators in making informed decisions.

The management of fire sprinkler test water and air conditioning wastewater are also addressed for the first time in an EPA Code of Practice to improve understanding of pollutant impacts and therefore management practices across the board.

This Code should be reviewed and updated every two to three years to reflect, among other things, developments in Air, Noise and Site Contamination.



Code of Practice for Industrial, Retail and Commercial Sites

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FOREWORD

South Australia is very fortunate to have stunning beaches, extensive estuaries, wetlands and many kilometres of freshwater creeks and rivers.

However, the State's ecosystems are under enormous and increasing pressures. Our unique Gulfs (St Vincent and Spencer) and the River Murray are already straining to support valuable commercial and industrial operations, such as fishing, aquaculture, irrigated horticulture, recreation and tourism. They are also the repository for billions of litres of stormwater runoff from inland urban and rural areas.

As South Australia's population grows, the target is 2 million by 2050 and the effects of climate change take hold, the health of our waters will significantly deteriorate over the next 20 years unless, as our best scientific information tells us, we invest in their protection.

Some of the consequences of a business as usual approach are:

- Loss of biodiversity, including seagrass beds.
- Lost opportunity for stormwater reuse.
- Reduced production from the commercial and recreational fisheries and aquaculture industries. Commercial fisheries alone are currently worth X million per year and recreational fisheries are worth X million per year.
- Negative impacts on South Australia's agricultural sector, currently worth about x million per year.
- Increased risks of algal blooms affecting South Australia's \$4.2 billion per year tourism industry.

To date, South Australia has led the way with world-renowned projects for stormwater capture and reuse. However, we must apply the lessons learnt from these projects into everyday decision making. In particular, our efforts on improving the quality of stormwater runoff must improve dramatically and not just at the catchment level but on individual allotments.

This requires a collective effort and responsibility must be shared between government, industry and the community at large. This Code of Practice is the result of a decade of accumulated stormwater pollution prevention knowledge, driven and gathered by the previous Catchment Water Management Boards (now Natural Resources Management Boards) in partnership with Local Government and the South Australian Environment Protection Authority.

I look forward to the implementation of this Code of Practice and encourage all industrial, retail and commercial operators to abide by it for the benefit of all those who live, work or play on South Australian waters.

Helen Fulcher

Chief Executive, South Australian Environment Protection Authority

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GLOSSARY

ANZECC	Australia New Zealand Environment Conservation Council
<i>activity</i>	includes the storage or possession of a pollutant
<i>air</i>	includes any layer of the atmosphere
<i>bund(ing)</i>	An embankment, mound, graded slope, grated drain with a sump or wall with no external drain built to contain spills
<i>blind sump</i>	a low area that collects liquids with no external drain
<i>emergency management plan</i>	a plan prepared by an organisation to provide a swift, efficient, and cost effective response to medical, fire, care and shelter, and communications needs after disasters such as product spills, earthquakes, explosions, or fires
<i>environment</i>	means land, air, water, organisms and ecosystems, and includes- <ul style="list-style-type: none"> a) human-made or modified structures or areas; and b) the amenity values of an area
<i>environmental authorisation</i>	a works approval, licence or exemption
<i>environmental harm</i>	any harm or potential harm to the environment (of whatever degree or duration) and includes- <ul style="list-style-type: none"> a) an environmental nuisance; and b) anything declared by regulation (after consultation under section 5A of the <i>Environment Protection Act 1993</i>) or by environment protection policy to be environmental harm
<i>environmental incident record</i>	details location, time, date, nature, source and management strategies undertaken regarding environmental (harm) incidents
<i>environmental management system</i>	a systematic approach to dealing with the environmental aspects of an organisation's operation. It is a 'tool' that enables an organisation of any size or type to control the impact of its activities, products or services on the natural environment
EMS	environmental management system
<i>Environment Protection Order</i>	an Environment Protection Order issued under Division 2 of Part 10 of the <i>Environment Protection Act 1993</i>
<i>general environmental duty</i>	under the <i>Environment Protection Act 1993</i> , a person must not undertake an activity that pollutes, or might pollute the environment unless

	the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm
<i>Land</i>	means, according to context: <ul style="list-style-type: none"> a) land as a physical entity, including land covered with water b) any legal estate or interest in, or right in respect of, land
<i>licence</i>	a licence under Part 6 of the <i>Environment Protection Act 1993</i> to undertake a prescribed activity of environmental significance
<i>licensed waste depot</i>	waste depot licensed under Part 6 of the <i>Environment Protection Act 1993</i>
<i>listed pollutants</i>	these pollutants (outlined in Schedule 4 of the <i>Environment Protection (Water Quality) Policy 2003</i>) must not be discharged or deposited into waters or onto land from which it is likely to enter waters
<i>listed waste</i>	has the same meaning as in Schedule 1 Part B of the <i>Environment Protection Act 1993</i>
<i>material safety data sheet (MSDS)</i>	information sheets that manufacturers are required to provide about products outlining the composition, applications and precautions that need to be taken when using the products
<i>musts</i>	a requirement in this code, which if ignored, is likely to lead to a breach of the Environment Protection Water Quality Policy
<i>non-point source pollution</i>	The accumulative effect of numerous small pollution sources, resulting in a potentially large environmental impact but one that is not as evident as a single point source
<i>NPS</i>	non-point source pollution
<i>pollutant</i>	<ul style="list-style-type: none"> (a) any solid, liquid or gas (or combination thereof) including waste, smoke, dust, fumes and odour; or (b) noise; or (c) heat; or (d) anything declared by regulation (after consultation under section 5A of the <i>Environment Protection Act 1993</i>) or by an environment protection policy to be a pollutant, but does not include anything declared by regulation or by an environment protection policy not to be a pollutant
<i>sewer</i>	The pipe network used for the common collection of untreated wastewater generated on individual properties in centres with large human populations

<i>sewage treatment works</i>	Works for the treatment of wastewater collected by sewers
<i>septic tank effluent drainage system</i>	A system for the common collection, treatment and disposal of wastewater outflows from septic tanks located on individual properties in some country towns (STEDS)
<i>shoulds</i>	indicates a recommended practice
<i>stormwater</i>	rainwater runoff
<i>swale</i>	A grass-lined channel used to reduce flow, remove gross pollutants and absorb run
<i>waste collection facility</i>	means a facility that is designed and constructed to receive the contents of a holding device for black or greywater
<i>waste transfer (reception) stations</i>	structure designed to temporarily store wastes, prior to removal by a waste transporter, in an environmentally responsible manner (such as waste oil, oil absorbent materials and garbage)
<i>waste transporter</i>	a mobile service provider contracted to remove wastes. Services are obtained through long-term contracts or ad-hoc arrangements
<i>waste water</i>	waste principally consisting of water and includes washdown water, cooling water, effluent, irrigation runoff and contaminated stormwater
<i>waters</i>	As defined in s4 of the Environment Protection (Water Quality) Policy 2003. Includes all surface and underground waters, the public stormwater disposal system and irrigation drainage channels

1 INTRODUCTION

Scientific monitoring shows that South Australians have to reduce their reliance on rain-dependent water sources such as the River Murray and the Mount Lofty Ranges reservoirs in order to sustain the current and future population. To do this, stormwater harvesting will need to increase. Recycled water in various forms has valuable uses, particularly in agriculture, horticulture and some areas of industry. However, it must be fit for the intended purpose and pose no risks to the environment, or to public health and safety. The current plan is to have the capacity to turn 75GL of stormwater across the State into fit for purpose water by 2050.¹ The quality of stormwater is therefore critical in determining its suitability as an alternative water supply.

Water quality in coastal, estuarine and inland waters is greatly affected by how the surrounding area is used. Stormwater from developed urban and rural areas have increased the amount of nutrients, heavy metals, organic matter and microbiological loads discharged into waters. These pressures have significantly influenced several of the state's estuaries, coastal and river waters.

Pollution in coastal waters may put recreational users at risk, particularly swimmers. This could result in beach closures for public safety. Pollution may also reduce the attractiveness of the water and can cause algal blooms and fish kills. The loss of more than 50km² of seagrass along the Adelaide metropolitan coast has been attributed to this pollution.

Every South Australian has a responsibility to ensure that they avoid polluting stormwater. This Code of Practice is a tool to encourage and enforce best environmental management practices.

Industrial, retail and commercial development is characterised by:

- Large impervious areas.
- The presence of a wide range of industrial chemicals and pollutants and other potential pollutants.

For these reasons, industrial, commercial and retail areas often discharge large volumes of stormwater containing a wider, more variable range of pollutants than stormwater from residential areas (see Table 1.0). Common pollutants include: litter, wash down water, sediments, nutrients, pesticides, pathogens (bacteria and viruses), oil, grease and heavy metals.

Once these pollutants contaminate stormwater they reduce the capacity for that stormwater to be recycled or at the very least increase the costs associated with treating the stormwater thus minimising its economic viability for reuse.

Most stormwater pollutants can be avoided simply through improved facility design, housekeeping practices and awareness.

¹ Water For Good Plan, 2009, South Australian Government.

Table 1.0 Relationship between industry class and basic pollutant group

ANZSIC Class	Litter	Sediment	Oil, Grease, Hydrocarbons	Organic Toxicants	Other Toxicants
Food Beverage & Tobacco Manufacturing					
Textile Clothing Footwear & Leather Manufacture					
Wood & Paper Product Manufacture					
Printing, Publishing & Recorded Media					
Petroleum Coal Chemical & Assoc. Product Manufacturing					
Non Metallic Mineral Product Manufacturing					
Other Manufacturing					
General Construction					
Construction Trade Services					
Basic Material Wholesaling					
Motor Vehicle Retailing and Services					
Transport & Storage					

2 SCOPE OF THIS CODE OF PRACTICE

This Code of Practice applies to all operators of industrial, retail and commercial sites, including mobile operators and operators utilising leased facilities. The Code of Practice provides direction for stormwater management but in the interests of business efficiency also addresses other facets of environmental management, such as noise, air and site contamination by providing critical references. Residential, building and construction sites are covered in separate Codes of Practice.

3 ENVIRONMENT PROTECTION REGULATORY FRAMEWORK

Environment Protection Authority (EPA) codes of practice do not contain offence provisions, but they fit within a framework of regulatory tools (refer Figure 1) that can be used by the EPA. When an EPA Code of Practice is linked to an Environment Protection Policy (EPP), compliance with the requirements of a code (the things that you **must** or **must not** do) can be enforced by an Environment Protection Order. It is an offence under the *Environment Protection Act 1993* (the Act) if you don't comply with an Environment Protection Order.

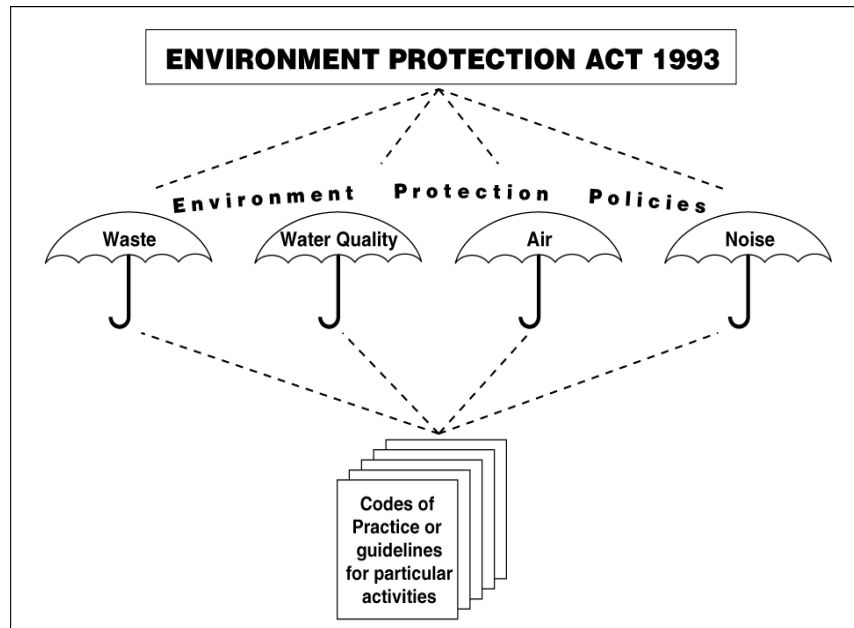


Figure 1. Relationships between the Environment Protection Act, Environment Protection Policies, Codes of Practice and Guidelines

3.1 The Environment Protection Act

At the top of the hierarchy, the *Environment Protection Act 1993* provides for the protection of the environment and defines the authority's functions and powers. The Act promotes ecologically sustainable development and the use of the precautionary principle to minimise environmental harm. It requires polluters to bear an appropriate share of the costs and responsibilities of protecting the environment from their activities. The Act makes you responsible for minimising harm to the environment resulting from your actions.

3.2 Environment Protection Policies

Environment protection policies (EPPs) are the second level of environment protection legislation—they can be developed for any area to secure the aims of the Act. The *Environment Protection (Water Quality) Policy 2003* (Water Quality Policy) is an example of a recently developed EPP.

The principal aim of the Water Quality Policy is to achieve the sustainable management of waters by protecting or enhancing water quality while allowing economic and social development. In particular, the policy seeks to:

- (a) ensure that pollution from both diffuse and point sources does not reduce water quality and
- (b) promote best practice environmental management.

EPPs may contain mandatory provisions that are enforceable under the Act, either as offences or by the issuing of an Environment Protection Order (EPO). EPPs may also refer to, or require compliance with, codes of practice - as is the case with this Code of Practice.

3.3 EPA Codes Of Practice

A Code of Practice is designed to assist in the compliance with the general environmental duty and therefore fulfill obligations under the Act and associated environment protection policies. It does this by closely examining an industry or activity, its various aspects and impacts and through a process of negotiation formulates reasonable and practical outcomes and recommended practices to achieve such outcomes. These are outlined as 'Musts' and 'Shoulds', which are defined as follows:

'must', the use of the word 'must' indicates a requirement in this code, which if ignored, is likely to lead to a breach of the Environment Protection Water Quality Policy.

'should', the use of the word 'should' indicates a recommended practice or example of how to achieve the 'musts'.

Before a Code of Practice can become enforceable, the EPA must consult with people, organisations, and industries likely to be affected by it. The EPA must consider the views expressed by those consulted and pass them on to the responsible minister.

This Code of Practice will be linked to the Environment Protection Water Quality Policy 2003. The requirements outlined in this code will be enforceable by the issuing of an EPO under s93 of the *Environment Protection Act 1993*. Failure to comply with an order is a breach of the Act and constitutes a criminal offence. Future links to other environment protection policies, such as air and waste, may be created

3.4 EPA Guidelines and Information Sheets

EPA guidelines and information sheets are advisory rather than regulatory documents—they provide guidance. While in some cases they may talk about laws, they are not enforceable in their own right. They are 'how to' documents that include technical information and may further explore the recommended methods of undertaking an activity as outlined in a Code of Practice.

3.5 EPA Licences

The Act states that an environmental authorisation or licence is required before certain activities of environmental significance can be undertaken. These activities are outlined in Schedule 1 of the Act.

If the EPA grants an authorisation, it may impose conditions necessary or expedient for the purposes of the Act. **Where a Code of Practice exists for an activity of environmental significance, the requirements of the Code or “musts” will, if appropriate, form conditions of licence.** However, due to the higher environmental risks associated with these activities, additional conditions of licence may also be applied, for example, some of the recommended practices within a Code or “should” statements and those relating to reporting or monitoring requirements.

The EPA has recently begun to offer business a new type of licence which streamlines licence conditions, combines multiple sites into one licence and provides recognition for licensed businesses who are working to become more sustainable.

EPA Sustainability Licences feature environmental sustainability agreements. These allow industries to voluntarily commit to actions above minimum compliance requirements.

3.6 The Importance Of Other Legislation and Advice

The environmental legislation administered by the EPA is only a part of the legislation that regulates industry. There are also obligations under public health, occupational health, safety and welfare, dangerous substances, primary industries and transport legislation.

Many provisions contained in other legislation and codes of practice promote practices that have environmental benefits. You are required to comply with the mandatory provisions of other legislation. It is important to note that the EPA cannot enforce legislation outside its authority—this is the responsibility of the relevant authority.

A number of industries have developed their own code of ethics and/or environmental accreditation schemes and handbooks. The Environment Protection Authority encourages the development of such tools and promotes the use of this Code of Practice to assist with their development and/or review.

4 UNDERLYING PRINCIPLES OF THIS CODE OF PRACTICE

4.1 Environmental Planning

Environmental planning is concerned with future operations, while an environmental or risk management system is concerned with what is happening now. One of the most important functions of environmental planning is finding the best use for each location and the best location for each use. Many, if not all, environmental management practices from a Code of Practice should be considered during the environmental planning stages of development proposals, during development assessment and construction phase. In doing so, you can ensure your operations will comply with the Code of Practice from the start and avoid the cost of future modification or retrofitting.

Water consumption, stormwater and wastewater management can all be planned for through the implementation of water sensitive urban design (WSUD). Water sensitive urban design is a set of techniques to minimise the impacts of any development on the natural water cycle and maximise opportunities for reuse. The aim of WSUD is to have no further decrease in water quality or change in the quantity of runoff during and after development occurs.

Government environmental planning authorities include Local Councils, Planning SA, the Department of Water Land and Biodiversity Conservation, the Coast Protection Board, the Department of Primary Industries and Resources, and the Environment Protection Authority. These authorities have planning policies and guidelines that relate either directly to industry, or indirectly, e.g. coast protection measures. It is likely that this Code of Practice will be a key guiding document for the establishment of policy for assessing development by many of these authorities. Before seeking approvals for new development, you are advised to consult with these agencies on their policies and prepare the application accordingly.

4.2 Environmental or Risk Management Systems

In most cases, you will already be in operation and so the opportunity for advanced environmental planning has passed. In this case, the application of a Code of Practice is more complex, but often a necessity to avoid further environmental harm and achieve compliance with legislation. A useful and commonly applied tool for incorporating environmental management practices (like those outlined in a Code of Practice) into existing operational structures is an environmental management system (EMS). An EMS helps you to determine what you are doing that is damaging the environment and how you can prevent it in the future. The most generally accepted process for an EMS is outlined in Figure 2.

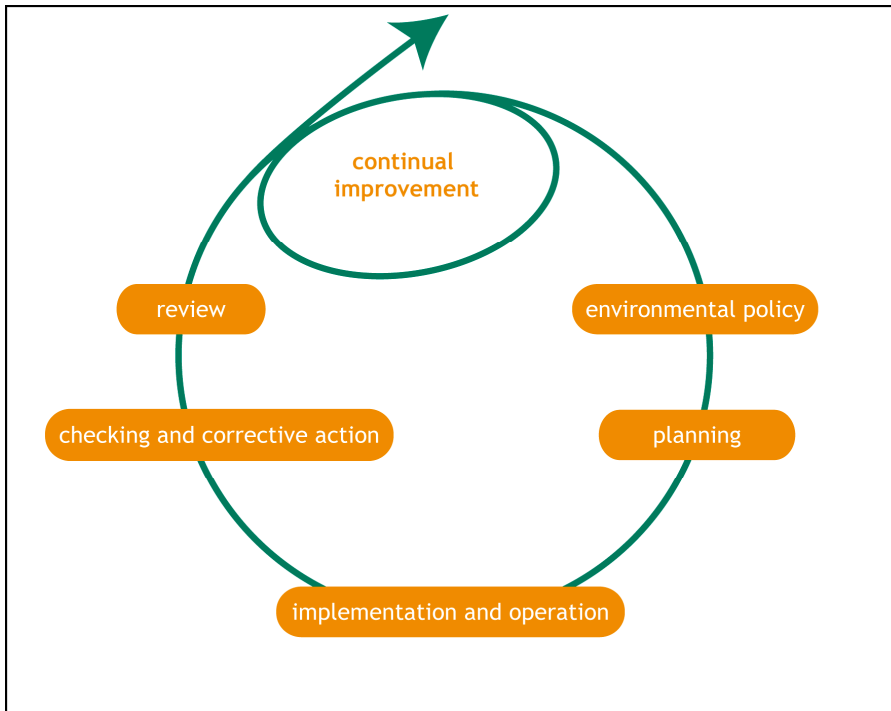


Figure 2 Environmental management system process (Source: Small Business Environmental Management Solutions, 2002, Business SA)

Risk management (RM) is a key business process within both the private and public sectors around the world. Sound and effective implementation of risk management polices and procedures are part of best business practice as well as a means of improving operational activities. It is the connective element between managing environment, health, safety and economic aspects of business.

There are international and national standards that can be followed for environmental management systems (e.g. ISO 14001) and risk management systems (e.g. AS/NZS 4360). These are designed to be implemented in any business, regardless of size, location or income. There are numerous handbooks and more simplified tools such as ecomapping to help businesses with the concepts of EMS and RM.

This Code of Practice will assist businesses in developing and implementing one or both systems. Both management systems apply a similar hierarchy for decision making upon which the Code is based and which is summarised in Figure 3.

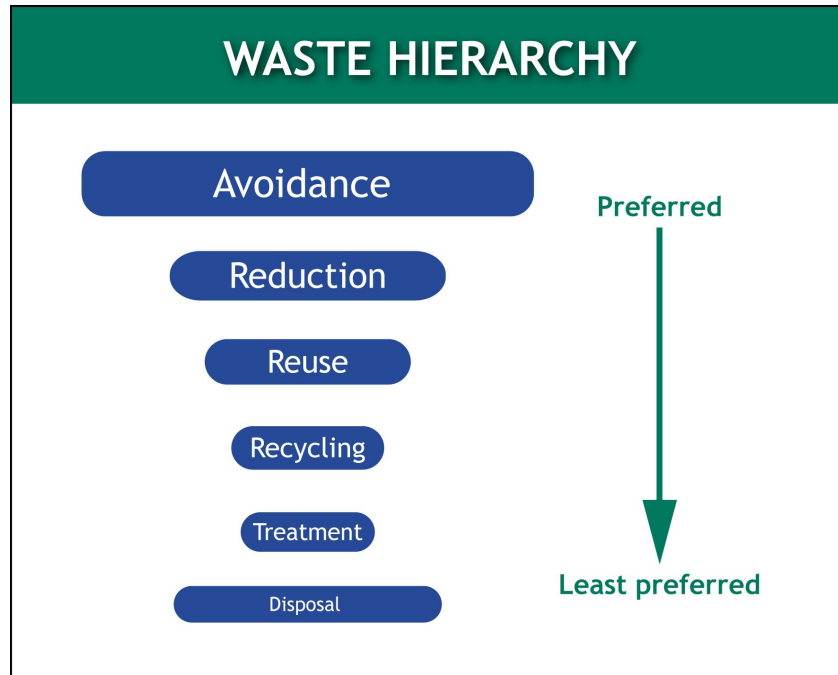


Figure 3 Waste management hierarchy

It is better to avoid the impact or risk than to look for methods of management. Most importantly, it is more likely to be ecologically and economically sustainable to do so.

- AVOIDANCE** don't produce the impact or risk in the first place
- REDUCTION** reduce the amount of impact or risk by changing the way you go about the activity
- REUSE** some products and materials can be reused with minimal processing, e.g. use durable alternatives to disposables, use waste materials from one process as the raw material for another
- RECYCLING** break down products into their constituent materials and reprocess this into new articles
- TREATMENT** remove impact or risk using chemical or physical methods—decreases the environmental impacts
- DISPOSAL** transfer impact or risk to another location under controlled conditions for long-term storage (no further use).

Businesses wanting to investigate ways to implement environmental or risk management systems are advised to seek the services of specialist consultants in this field.

5 HOW TO USE THIS CODE OF PRACTICE

The Code of Practice is separated into the most common activities or issues (Section 6), which can cause environmental harm if not managed appropriately. It is the intent that users of the document assess the nature of their operation, by considering:

- what types (and scale) of activities are performed and
- what types of wastes are produced.

Following these determinations, the Code of Practice can then be used as a reference for determining best environmental management practices. More tailored industry or activity specific information is referenced in Section 6.8.

Each section of the code provides:

- a summary of the activity or issue and environmental concerns
- **‘musts’**: the use of the word ‘must’ indicates a requirement in this code, which if ignored, is likely to lead to a breach of the Environment Protection Water Quality Policy
- **‘shoulds’**: the use of the word ‘should’ indicates a recommended practice
- key notes and references that may assist or further clarify.

‘MUST’ requirements throughout the Code are generally designed to establish an optimum outcome(s) with an **AND/OR** alternative that provides for an assessment of risk of the activity being performed and subsequent flexibility in determining the method of control to be used. Methods for reducing risk are outlined as **‘SHOULD’S’** and are therefore only recommended practices. These recommendations may be methods not suitable for application in all instances and the Environment Protection Authority encourages operators to devise their own methods for their particular circumstance.

The Environment Protection Authority is primarily concerned with prescribing environmental outcomes and not methods of achieving such outcomes. Operators are encouraged to use their experience, knowledge and ingenuity within their own industry to develop tools to avoid pollution, provided environment protection standards are retained. The use of this Code of Practice as a reference tool in establishing leases, contracts, environmental management systems and standard operating procedures is encouraged.

6 ENVIRONMENTAL MANAGEMENT PRACTICES

6.1 Industrial, Retail and Commercial Facility Development

Industrial, retail and commercial development substantially changes the dynamics of water within catchments. Under natural conditions, a large amount of rainfall soaks into the ground to replenish groundwater and provide a source of water for plants. Once impervious or hard surfaces, such as roads and roofs, and efficient drainage systems are introduced to a catchment, the opportunities for infiltration are greatly reduced. This results in more water being discharged at higher flow rates into creeks and rivers, carrying with it a large range of stormwater pollutants and increasing the potential for in-stream erosion.

Development of industrial areas using conventional approaches will continue to have negative impacts on our waterways and coastal environments. During the design of new facilities, modification and/or significant maintenance of existing infrastructure, there is a unique opportunity to employ water sensitive urban design techniques in order to avoid, minimise and reduce environmental harm.

DEVELOPER MUST (REQUIRED OUTCOME):

1. ensure that the necessary development application process is followed.

KEY NOTE

In South Australia, planning and development are regulated by the *Development Act 1993* and the *Development Regulations 1993*.

Contact your local government authority for further information on development regulations and planning policies for industrial, retail and commercial sites.

In accordance with Section 37 of the Development Act and Regulation 24 of the Development Regulations (Part 5), planning authorities are required to refer certain types of development applications to other agencies, known as 'prescribed bodies', for specialist advice. The EPA is one of these prescribed bodies.

Any conditions applied to a development approval are important as they are legally binding—that is, they provide statutory force to the prescribed environmental protection measures.

2. provide a preliminary investigation that may take the form of a site history report identifying historical and current land uses prepared by an experienced site contamination consultant identifying:

- historical land uses
- current land uses and
- stating that the investigation has been carried out in accordance with the National Environment Protection (Assessment of Site Contamination) Measure 1999.

KEY NOTE

Development, including land division, should not occur where site contamination has been identified or is suspected unless the site(s) has/have been assessed and remediated as necessary to ensure its suitability for proposed purpose. This preliminary investigation will assist in determining if a potentially contaminating land use has occurred on the land and if further assessment of the site contamination is necessary. A site contamination consultant, as defined in the Environment Protection Act 1993, means - a person other than a site contamination auditor who, for fee or reward, assesses the existence or nature or extent of site contamination.

3. provide a site contamination audit report where there is reason to suspect that the subject land is, or has the potential to be, contaminated (due to a potentially contaminating land use having taken place there).

KEY NOTE

Development, including land division, must not occur where site contamination has been identified or is suspected unless the site(s) has/have been assessed and remediated as necessary to ensure its suitability for proposed purpose.

4. provide a statement or plan demonstrating that the location of the facility will comply with the EPA's *Guidelines for Separation Distances*
OR
provide noise and air quality measures where the development cannot comply with the EPA's *Guidelines for Separation Distances*.

KEY NOTE

The EPA's *Guidelines for Separation Distances* identifies the minimum separation distances required between developments that may result in noise, odour, or polluting air emissions, and sensitive land uses (residential, pre-school, primary school).

5. ensure noise level for proposed development, as predicted at any potential noise affected premises, does not exceed the relevant indicative noise level less 5 dB(A) (refer to Table 6.1.1). In addition, if the noise affected premises are situated in a Rural Living or Residential land use category, the predicted noise level from the proposed development must not exceed 52 dB(A) during the day and 45 dB(A) at night, or a maximum noise level of 60 dB(A) at night.

Table 6.1.1

Land use category	Indicative noise factor (Day 7am - 10pm) dB(A)	Indicative noise factor (Night 10pm - 7am) dB(A)
Rural Living	47	40
Residential	52	45
Rural Industry	57	50
Light Industry	57	50
Commercial	62	55
General Industry	65	55
Special Industry	70	60

6. ensure industrial, retail or commercial facility is fit for the purpose of permitted operations, and avoids, as far as is reasonable and practicable, the release of pollutants to the environment through water sensitive urban design
BY
 structurally separating work areas (refer to Key Note)
AND
 providing purpose-built structural pollution controls to manage individual work areas, carparks and any other impervious areas
AND
 capturing, containing and treating stormwater for reuse

KEY NOTE

water sensitive urban design (WSUD): offers an alternative approach to the traditional conveyance of stormwater where water is directed via pipes and waterways, ultimately to the beach, river or reservoir. WSUD is the integration of urban design, site layout/design and building design, with constructed elements that can provide on-site stormwater quality treatment and may enable its reuse.

work areas: includes those areas where pollutants could be stored, used, transferred, manufactured, sprayed, spilled or generated through cleaning or washing practices. For most industrial, retail and commercial sites, work areas will comprise all parts of the site other than carparks and landscape areas.

structural pollution controls: includes bunding, storage tanks, interceptor and treatment devices for waste and stormwater.

7. ensure design objectives for stormwater management as set by the relevant local government authority are adhered to
OR
 in the absence of design objectives, observe the water sensitive urban design stormwater objectives outlined in Table 6.1.2.

Table 6.1.2

Pollutant	Water Sensitive Urban Design Stormwater Objectives. Post-construction stormwater runoff should be treated to remove:*
Suspended Solids (SS)	80% reduction in mean annual load
Total Phosphorus (TP)	45% reduction in mean annual load
Total Nitrogen (TN)	45% reduction in mean annual load
Litter (Gross Pollutants)	70% reduction in mean annual load
Flows	Maintain discharges for the 1.5 ARI at pre-development levels.

*These are the best practice performance objectives set out in *Urban Stormwater: Best Practice Environmental Management Guidelines*, CSIRO 1999.

8. demonstrate compliance with the water sensitive urban design stormwater objectives by providing a report from an industry-accepted performance-measurement tool (refer to KEY NOTE).

KEY NOTE

There are many water sensitive urban design elements that can be incorporated into a development or existing site to ensure these objectives are achieved. The best option for your industrial, retail or commercial development will depend on the scale and site characteristics. For details on WSUD elements refer to SHOULDs and KEY REFERENCES in this section.

It is important that the element selected is appropriate in the context of the type and scale of the development. Wetlands are not appropriate for small retail premises; and a rainwater tank alone will usually not be sufficient to treat the needs of an industrial development.

For most industrial, retail and commercial developments it is advisable to engage a specialist water sensitive urban design professional to assist in the selection and design of a WSUD treatment to suit the proposed development.

To demonstrate compliance with the water sensitive urban design stormwater objectives set out in this Code, a developer must provide a report from an industry-accepted performance-measurement tool. Currently, the following stormwater modelling systems are being used and are considered acceptable:

STORM: most relevant to small scale developments. Available free for use by people with no formal training at www.storm.melbournewater.com.au

MUSIC (Model for Urban Stormwater Improvement Conceptualisation): most relevant to larger scale and complex developments. Available to buy from www.toolkit.net.au/Tools/MUSIC

XPSTORM: most relevant to larger scale and complex developments. Available to buy from www.xpsoftware.com/products/xpstorm

These are tools that can estimate and predict the water-quality outcomes (treatment performance) of various WSUD elements. This means that stormwater quality performance of different development proposals can be assessed and compared using a common measurement system.

The EPA can provide a list of businesses that have staff qualified to assist you in the design and assessment of your proposal using industry accepted measurement tools.

It is expected that, in the future, new science and planning approaches will require the water sensitive urban design stormwater objectives to be updated to reflect new information, requirements and practices. Accordingly, the design objectives in this Code will be regularly reviewed.

9. comply with the Stormwater Pollution Prevention Code of Practice for the Building and Construction Industry.

10. not commence construction noise with an adverse impact (refer to Key Note) on amenity on:
- a Sunday or other public holiday, and
 - any other day except between 7am and 7pm.

KEY NOTE

A particular construction operation may occur on a Sunday or Public Holiday between 9am and 7pm or may commence before 7am on any other day to:

- *avoid an unreasonable interruption of vehicle or pedestrian traffic movement, or*
- *if other grounds exist that the EPA or administering agency determines to be sufficient (such as extreme forecast temperature).*

Consent should be obtained from the EPA or administering agency prior to carrying out work outside of the times detailed above. Construction activity results in noise with an **adverse impact** on amenity if the measurements taken in relation to the noise source and noise affected premises show:

- that the source noise level (maximum) exceeds 45dB(A); or
- that the source noise level (maximum) exceeds 60dB(A).

KEY REFERENCES

EPA: Development Applications - EPA Role

www.epa.sa.gov.au/businesses/environmental_planning/development_applications_-_the_epas_role

Planning SA: Development Applications

www.planning.sa.gov.au/index.cfm?objectid=BE2EB871-96B8-CC2B-66E34108978E935A

Planning SA Advisory Notice 20 (Site Contamination)

<http://143.216.252.11/publications/715p.pdf>

National Environment Protection (Assessment of Site Contamination) Measure

www.ephc.gov.au/nepms/cs/con_sites.html

EPA: Guidelines for Separation Distances 2007

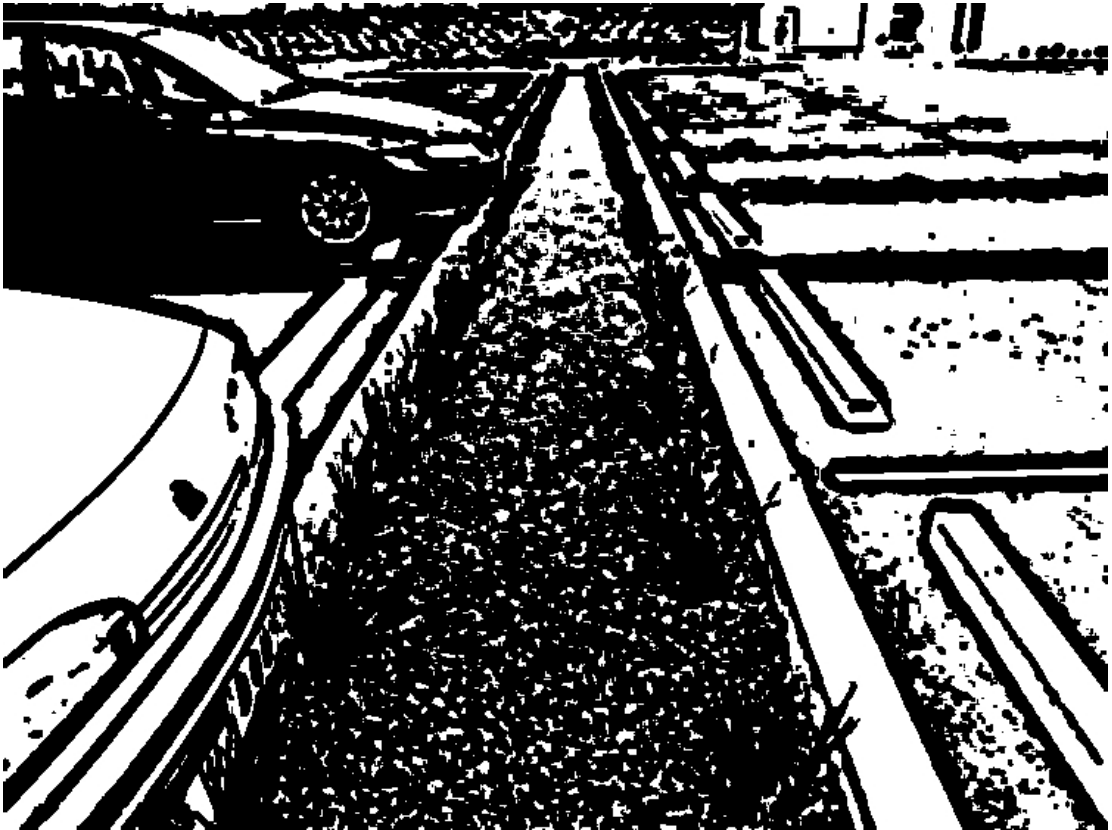
www.epa.sa.gov.au/xstd_files/Industry/Guideline/sepguidepcd.pdf

EPA: Guidelines for the use of the Environment Protection (Noise) Policy 2007

www.epa.sa.gov.au/xstd_files/Noise/Guideline/guidelines_noise_epp.pdf

Planning SA: Water Sensitive Urban Design

www.planning.sa.gov.au/index.cfm?objectid=6724E1F7-F203-0D46-A83932DEECD178C



DEVELOPER SHOULD (RECOMMENDED PRACTICE):

- a) identify natural drainage lines, possible pathways and discharge locations for runoff from minor and major storm events.
- b) identify any external catchments draining through the site and assess flood conveyance requirement.
- c) assess site topography to determine feasible water sensitive urban design strategies. Only steep sites will have sufficient relief to enable end-of-pipe stormwater treatment, whereby underground pipes can be 'daylighted' to deliver water to a vegetated treatment system. Most other sites will require stormwater to be treated before it enters the underground drainage system.

KEY NOTE

Daylighting is the redirection of a water stream into an above-ground channel. Typically, the goal is to restore a stream of water to a more natural state. Daylighting is intended to improve the riparian environment for a stream which had been previously diverted into a culvert, pipe, or a drainage system.

- d) once the opportunities and constraints of the site have been assessed, a preliminary drainage strategy and/or layout can be developed.
- e) achieve structural separation by roofing work areas.
- f) if roofing is not reasonable or practical, achieve structural separation by containing runoff from work areas and treating water either for reuse in industrial, retail or commercial processes or managed aquifer recharge. High-intensity rainfall events may reduce the feasibility of storing this water and discharge following treatment, to the stormwater system may be necessary.
- g) Avoid small spaces behind or beside buildings that could potentially be used for informal storage or disposal of materials.

KEY NOTE

If work areas are not separated, Water Sensitive Urban Design measures designed to treat the typical range of pollutants in urban stormwater may be overloaded by industrial, retail and commercial pollutants. Achieving structural separation has the benefit of enabling the site to support a range of future industrial, retail and commercial activities without significant site redesign. Where the risk associated with a particular work activity is compatible with simple and generic means of treating stormwater to best practice pollution targets, structural separation may not be necessary.

- h) use harvested stormwater from roofs and non-work areas for toilet flushing, washing product, vehicles, equipment and parts, cooling water, fire protection, dust suppression and landscaped irrigation.

- i) paint or stencil all stormwater drains to indicate that they lead to the local creek, river or beach. This is particularly important for tenanted sites and sites frequented by visiting contractors.
- j) control the activities that are undertaken in areas connected to stormwater drains.
- k) direct wash-down wastewater to storage (which is subsequently pumped out by a licensed waste contractor) or directed to sewer with an SA Water Trade Waste Permit.
- l) establish which water sensitive urban design strategy for stormwater runoff will be employed (it may be one or a combination).

KEY NOTE

Typical Water Sensitive Urban Design Strategies include:

Demand Reduction

Rainwater Tanks

Rain Gardens, Green Roofs, Infiltration Systems

Pervious Pavements

Urban Water Harvesting and Reuse

Gross Pollutant Traps

Bioretention Systems

Swales and Buffer Strips

Sedimentation Basins

Constructed Wetlands

- m) configure stormwater management system onsite to allow for shut-down and containment in the event of an emergency spill. Water and other substances used to control fires can be contaminated by the liquid substances used and stored on site, leading to water pollution if the fire water is not contained. Stormwater inlets and outlets can be designed with a shutoff and containment mechanism, using available storage in the stormwater pipes. Generally, a shut-off valve or gate should be installed at the lowest invert point.
- n) not use radios that can be heard off the construction site before 7am.
- o) commence any particularly noisy part of the construction activity after 9am, such as use of masonry saws or jackhammers.
- p) take care when dropping materials from a height, for example, into or out of a truck, or when loading or unloading scaffolding.
- q) locate noisy equipment (such as cement mixers and masonry saws) so that their impact on neighbouring premises is minimised (whereby maximising the distance to the neighbouring premises, using structures or elevations to create sound barriers).

- r) shut or throttle down equipment (such as backhoes, cranes, bobcats, loaders and generators) whenever they are not in actual use.
- s) ensure that noise reduction devices such as mufflers are fitted and operating effectively.
- t) adopting off-site or other alternative processes that eliminate or lessen resulting noise.
- u) ensure that equipment is not operated if maintenance or repairs would eliminate or significantly reduce noise.

6.2 Environmental Management Systems

All industrial, retail and commercial operations have some impact on the environment. All operators have a responsibility to ensure that whatever level of impact, that impact is managed appropriately and pollution is avoided where possible. An environmental management system provides a structured way of planning and implementing environment protection measures.

OPERATORS SHOULD (RECOMMENDED PRACTICE):

- (a) develop, implement and review (annually) an environmental management system to achieve high environmental performance standards for all operations undertaken.
- (b) establish facility specific environmental management practices (where multiple facilities are owned) beneath an overall Environmental Management System (EMS) to ensure practices are relevant to the individual characteristics of that facility's operation.
- (c) incorporate relevant best environmental management practices from this Code of Practice and/or from environmental management system into contractual (or non-contractual) conditions of using the facility.
- (d) have users, customers, contractors, employees and members provide written acknowledgment that they understand and will abide by environmental management system obligations before undertaking any work or activity on your facility.

KEY REFERENCES

Small Business Environmental Management Solutions
www.epa.sa.gov.au/pdfs/sbes.pdf

International Environmental Management Standard ISO 14001
www.standards.com.au

Australia and New Zealand Risk Management Standard AS/NZS 4360
www.standards.com.au

6.3 Storage and Handling of Liquid Product and Waste

It is well understood that allowing toxic or hazardous chemicals into the environment can kill plants and animals in waterways, affect human health and persist in the environment for many years, but what about seemingly safe liquids like foods? Food products have a high carbon content which encourages the rapid growth of aquatic microorganisms that consume carbon. As these organisms process the carbon they also consume oxygen, resulting in a rapid depletion of life-giving oxygen in the water and the death of fish and other oxygen dependant organisms. Food substances also add nutrients to waterways, as do plant fertilisers and some cleaning products. Nutrient build up can lead to algal growth also resulting in fish kills due to oxygen depletion. Many substances, such as oils, also smother water plants, the water surface and shorelines.

KEY NOTE

If you store, use or transport toxic or hazardous liquids or dangerous goods, there are additional legal requirements and standards with which you need to comply. Fuels and oils if handled incorrectly, and in the wrong environment can become volatile resulting in harm to both life and property. Diesel is classed as non-flammable, however petrol is classed as a dangerous good and extreme care should be taken when handling. SafeWork SA should be contacted for advice on requirements for handling of petroleum products www.safework.sa.gov.au (refer to **KEY REFERENCES**).

OPERATORS MUST (REQUIRED OUTCOME):

1. not keep, sell or convey petroleum products unless authorised to do so under a SafeWork SA licence.
2. ensure there are no stormwater drains inside buildings or roofed areas.
3. ensure all liquid storage containers/tanks, piping, handling areas, dispensers, delivery points and process tanks are located within secondary containment areas that are constructed to avoid environmental harm to soil, air and water. Double walled tanks are considered acceptable secondary containment.
4. if secondary containment areas are located outside and are not roofed, ensure contaminated rainwater is collected and is not disposed of to stormwater or soil. Use a licensed liquid waste contractor or seek permission from SA Water Trade Waste for disposal to sewer.

KEY NOTE

Secondary containment areas contain spills and leaks to prevent liquid escapes to the environment - secondary containment design considerations are addressed in ***EPA Guideline Bunding and Spill Management***. Of all components of the liquid storage and handling system, inadequate secondary containment is the most likely cause of water pollution and soil contamination.

5. display standard operating procedures which outline environmental management practices for all fuel storage, handling and dispensing facilities
6. install trigger delivery nozzles with an automatic cut-off on fuel bowsers
7. purchase fit for purpose spill control equipment and store in prominent locations with instructions for use clearly displayed. Ensure equipment is accessible (i.e not locked) at all times. Service and replenish regularly.
8. ensure, when it is safe to do so, all liquid spills are cleaned up immediately and not hosed down stormwater drains. Professionals should be engaged immediately for large and/or hazardous liquid spills such as petroleum.
9. dispose of used absorbent spill control materials less than 0.1 m³, or 100 kg containing light to medium grade hydrocarbons to a licensed waste depot
10. if the quantity of used absorbent material exceeds 0.1 m³, or 100 kg, or the liquid absorbed is other than light-to-medium grade hydrocarbons or the liquid includes 'Listed Wastes' as set out in Schedule 1 Part B of the EP Act then the material should be directed to a licensed waste depot for appropriate treatment and/or disposal.

OPERATORS SHOULD (RECOMMENDED PRACTICES):

- (a) remove all Underground Storage Tanks that are no longer being used for the originally intended purpose (i.e. storage of petroleum products or other hazardous materials) as soon as reasonably practicable.
- (b) engage a suitably qualified and experienced site contamination consultant to assess the site to determine if there has been any impact to soil or groundwater and to recommend remediation if necessary.

KEY NOTE

The SA EPA is in the process of developing a Code of Practice on the design, installation and management of **Underground Storage Systems**. In the interim, the EPA recommends compliance with the Victorian **EPA Guidelines on the Design, Installation and Management Requirements for Underground Petroleum Storage Systems** and referral to the EPA Guideline **Assessment of Underground Storage Systems**.

- (c) ensure diesel fuel delivery nozzles are designed to minimise the foaming of diesel and thus avoid blowbacks
- (d) supply fuel collars (donuts) for drip containment on fuel dispenser nozzles
- (e) educate employees, customers, users and members on liquid storage, handling and spill management practices through initiatives such as signage, newsletters and training programs.
- (f) appoint a dedicated person(s) to regularly inspect the integrity of containers, labels, secondary containment, spill prevention sensors and equipment.
- (g) reconfigure stormwater management system onsite to allow for shut-down and containment in the event of an emergency spill. Water and other substances used to control fires can be contaminated by the liquid substances used and stored on site, leading to stormwater pollution if the fire water is not

contained. Stormwater inlets and outlets can be designed with a shutoff and containment mechanism, using available storage in the stormwater pipes. Generally, a shut-off valve or gate should be installed at the lowest invert point.

KEY REFERENCES

EPA Guideline: Bunding and Spill Management

www.epa.sa.gov.au/xstd_files/Waste/Guideline/guide_bunding.pdf

EPA Guideline: Assessment of Underground Storage Systems

www.epa.sa.gov.au/xstd_files/Site%20contamination/Guideline/guide_uss.pdf

EPA Guideline: Disposal of used Hydrocarbon Absorbent Materials

www.epa.sa.gov.au/pdfs/guide_hydrocarbon.pdf

SafeWork SA: Dangerous Substances Information Sheet

www.safework.sa.gov.au/uploaded_files/DS_INFO_SHEET_2009.pdf

SafeWork SA Safeguards: Petroleum Products Class 3.1 Motor Spirit

www.safework.sa.gov.au/uploaded_files/ppr1i.pdf

Department for Transport, Energy and Infrastructure: Refuelling Guidelines

Error! Hyperlink reference not valid.

VIC EPA: Guidelines on the Design, Installation and Management Requirements for Underground Petroleum Storage Systems

www.epa.vic.gov.au

Australian Standards: 1940(2004), 2507, 2714, 3833,3780, 3846 Australian/New

Zealand Standards: 2243.10, 4081, 4452, 4681

www.saiglobal.com/

6.4 Storage and Handling of Solid Product and Waste

Uncovered stockpiles of fertilisers, sand, mulch, gravel and other solid material are potential pollutant sources to waterways. As are storages of timber, scrap metal, drums, waste skips or litter bins. There are techniques for stockpiling and storage that will prevent environmental harm to land, water and air. The most common pollutant sources from industrial, retail and commercial premises include litter blown out of overfilled waste bins, waste oil leaking from compressors and waste oil drums, leachate and drag out from uncontained stockpiles. All of which when carried by stormwater into creeks and rivers end up in our coastal waters where we swim and fish.

OPERATORS MUST (REQUIRED OUTCOME):

1. ensure there are no stormwater drains inside buildings or roofed areas.
2. ensure all material stockpiles, where there is a possibility for leachate or drag out, are located within secondary containment areas that are constructed to avoid environmental harm to soil, air and water.
3. if secondary containment areas are located outside and are not roofed, ensure contaminated rainwater that is collected is not disposed of to stormwater or soil. Use a licensed liquid waste contractor or seek permission from SA Water Trade Waste for disposal to sewer.
4. manage stockpile drag-out from vehicular movements, including property driveways and exit points.
5. ensure that maximum stockpile heights be in the range of 3–5 metres. These limits are largely based on stockpile manageability, dust impacts, stability, potential impact to underlying infrastructure and fire risk. The height of stockpiles should generally be lower than surrounding structures. Please seek advice from the EPA for greater stockpile heights.
6. ensure waste skips and wheelie bins are not over filled, bungs are sealed and lids kept closed at all times when not in use.
7. not clean secondary containment devices, waste skips or wheelie bins where the wastewater can enter the stormwater system. Depending upon the contaminant load of the wastewater, direct to landscaped areas or to sewer (with SA Water Trade Waste approval) or for removal by a licensed liquid waste contractor.

KEY NOTE

The storage requirements for stockpiles need to be based on the material type and the associated risks they pose. These criteria will in turn determine what pollution controls are required to prevent or minimise any adverse impact. For example, inert waste such as asphalt, green waste, some construction and demolition waste, untreated timber and wood waste may require simple housekeeping management practices where as soil, fertilisers, mulch and sand will require secondary containment such as roofed or drainage controlled concrete bunds. Avoid placing storage areas near surface watercourses, flood zones and groundwater recharge areas.

KEY REFERENCES

EPA Guideline: Stockpile Management Waste and Waste Derived Fill For Recycling and Reuse April 2009

www.epa.sa.gov.au/xstd_files/Waste/Guideline/guide_bunding.pdf

EPA: Guidelines for Separation Distances 2007

www.epa.sa.gov.au/xstd_files/Industry/Guideline/sepguidepcd.pdf

OPERATORS SHOULD (RECOMMENDED PRACTICES):

1. when considering stockpile stability, size and management, the issues that should be considered include:
 - relevant sub-surface geology and geotechnical characteristics
 - structure of the base and sub-base including ability to protect groundwater and
 - susceptibility to dissolution from rainwater or materials held in the stockpile
 - likelihood of stockpile failure due to:
 - poor design and management including excessive height and side slope gradients
 - decreased internal friction caused by water inundation or gas generation or other pressure on or within the stockpile.
 - proximity to extraneous sources of ground vibrations including railway lines, or other heavy vehicle movements or building activities
 - materials handling procedures to prevent stockpile collapse
 - topography of the land where the stockpile is placed
 - climatic conditions.
2. use controls such as barriers, covering, minimised storage timeframes and good housekeeping to help mitigate potential impacts from vermin. Outdoor stockpiles of materials can harbour vermin such as rodents and mosquitoes which may lead to the risk of diseases.
3. not store materials that can produce heat through degradation (such as organic wastes and other putrescible wastes) for long periods. Stockpiles should remain

- well aerated to reduce any risk of overheating and spontaneous combustion. Regular internal stockpile temperature monitoring and control can provide information to assist with better management.
4. depending on the size and composition of the stockpile, provide sufficient spacing between stockpiles to allow access in case of emergency and to help prevent the spread of fire. This spacing should at least be equal to the height of the stockpile or adequate for emergency vehicle access, whichever is the greater.
 5. depending on the size and composition of the stockpile, not store flammable or combustible liquids and hazardous wastes near to waste stockpiles. Similarly, maintenance and activities that can produce sparks such as welding should be conducted away from waste storage areas.
 6. comply with the General Guidelines for the Outdoor Storage of Used Tyres issued by the South Australian Fire Service's Fire Safety Department. Tyre storage in buildings needs to comply with the Building Code of Australia, Part E of Book 1. Refer to local council for further details.
 7. persons storing waste should ensure they are meeting any specific requirements for building design, fire fighting equipment, monitoring, management and training as required by Australian Standards (where relevant), planning and fire authorities.
 8. consult the *EPA Guidelines for Separation Distances (2007)* to ensure appropriate separation distances to assist in the minimisation of the potential for adverse impacts such as odour, dust, noise and other impacts on amenity.
 9. secure the site to prevent unauthorised access but allow for entry of emergency vehicles.
 10. ensure each stockpile has adequate spacing to allow access for vehicles and materials handling, and attending and reducing the impact of emergency situations such as fire. Areas between stockpiles should be kept free of obstruction and allow easy movement of emergency vehicles.
 11. use clear signage demarcating the various materials or waste storage areas.
 12. ensure stockpiling of materials is not a process of continual growth, but is a balanced and systematic approach to materials input, processing, output, storage, reuse or sale and removal offsite, to demonstrate responsible and sustainable management for recycling and reuse.
 13. develop management plans and implement to address any increased risks that extended storage periods may present if required and should still be contingent on the existence of a market.
 14. consider waste storage and stockpiling as a temporary measure. There should be no stockpiling for speculative purposes; an immediate market should exist for a material being stored for recycling or reuse.
 15. consider the installation of a wheel wash facility to reduce stockpile drag-out through vehicular movement.

6.5 Un-Roofed Areas of Property (including Car Parks, Driveways)

If not managed effectively, un-roofed work areas such as vehicle parking areas, outdoor storage areas, loading zones, internal road networks and driveways can be the most high-risk areas for contaminating stormwater. Consider all of the hard-paved and concrete surfaces in industrial, retail and commercial precincts and imagine the daily oil leaks from vehicles, litter dropped by consumers, overflowing grease and oil from waste drums and hydraulic fluids leaking from lifters and loaders. Then imagine the next big rainfall event which will wash all those same pollutants into the stormwater drain and out to the beach.

OPERATORS MUST:

1. ensure pollutants, to the maximum extent practicable, generated through maintenance operations are captured, contained, treated and reused or disposed of to a waste transporter or other appropriate waste management facility (e.g. sewer)

OR

treat pollutants generated through maintenance operations to a standard suitable for aquatic or land-based discharge by ensuring the discharge does not contravene water quality criteria applicable to those waters or cause environmental harm.

OPERATORS SHOULD (RECOMMENDED PRACTICES):

- a) ensure industrial, retail or commercial facility is fit for the purpose of permitted operations, and avoids, as far as is reasonable and practicable, the release of pollutants to the environment through water sensitive urban design
BY
structurally separating work areas (refer to Key Note)
AND
providing purpose-built structural pollution controls to manage individual work areas, car parks and any other impervious areas
AND
capturing, containing and treating stormwater for reuse

KEY NOTE

water sensitive urban design (WSUD): offers an alternative approach to the traditional conveyance of stormwater where water is directed via pipes and waterways, ultimately to the beach, river or reservoir. WSUD is the integration of urban design, site layout/design and building design, with constructed elements that can provide on-site stormwater quality treatment and may enable its reuse.

***work areas:** includes those areas where pollutants could be stored, used, transferred, manufactured, sprayed, spilled or generated through cleaning or washing practices. For most industrial, retail and commercial sites, work areas will comprise all parts of the site other than carparks and landscape areas.*

***structural pollution controls:** includes bunding, storage tanks, interceptor and treatment devices for waste and stormwater.*

- a) paint or stencil all stormwater drains to indicate that they lead to the local creek, river or beach. This is particularly important for tenanted sites and sites frequented by visiting contractors.
- b) educate employees, contractors and visitors on appropriate practices to avoid stormwater pollution.
- c) control the activities that occur in areas with direct discharge to stormwater drains.

KEY NOTE

Cigarette butts account for 46 percent of all litter collected nationally on Keep Australia Beautiful National Litter Index. Australians smoke about 32 billion cigarettes each year. It is estimated that about seven billion butts finish up as litter, releasing hazardous chemicals, including cadmium, lead and zinc, into the environment. Cigarette butt litter is a persistent threat to the environment - they can take as long as three years to break down in sea water.

- d) achieve structural separation by roofing work areas.
- e) if roofing is not reasonable or practical, containing runoff from unroofed areas and utilising one or a combination of water sensitive urban design techniques (refer Key Note) should avoid stormwater pollution. Discharge following treatment, to the stormwater system is an acceptable pollution avoidance strategy if reuse and other alternatives are not reasonable and practical. For example, if high volume and frequency rainfall results in storage impracticalities.

KEY NOTE

Which Water Sensitive Urban Design technique will be suitable for your unroofed areas will depend upon the nature of the pollutants likely to be generated. Further structural separation of the pollutant source and more complex treatment processes may be necessary in some circumstances i.e. for dedicated washbays. Where the risk associated with a particular work activity is compatible with simple and generic means of treating stormwater to best practice pollution targets, structural separation may not be necessary and existing stormwater drainage lines can simply be retrofitted.

Typical Water Sensitive Urban Design Strategies include:

- Demand Reduction
- Rainwater Tanks
- Rain Gardens, Green Roofs, Infiltration Systems
- Pervious Pavements
- Urban Water Harvesting and Reuse
- Gross Pollutant Traps
- Bioretention Systems
- Swales and Buffer Strips
- Sedimentation Basins
- Constructed Wetlands

- f) use harvested stormwater from roofs and non-work areas for toilet flushing, washing product, vehicles, equipment and parts, cooling water, fire protection, dust suppression and landscape irrigation.
- g) for car parks and other trafficable areas, divert all stormwater runoff into a stormwater interceptor device capable of removing litter, sediment and oil products. The device should include a high flow by-pass system. Refer to Table 6.1.3 for guidance on selecting the class of oil separating device.

Table 6.1.3

Risk	Type of area	Discharge runoff to	Separator Class	Type
Low	Roof runoff	Rain tank, WSUD then stormwater system	Avoid passing through separator unless sized accordingly	n/a
	Residential, commercial and domestic areas where only litter and trash is expected	WSUD then optional separator then stormwater system	Gross pollutant removal	Bypass
Med	Small carparks (that don't discharge to sensitive areas)	Separator, WSUD where suitable then stormwater system	Class 2	Bypass
	Carparks > 800 m ² or 50 car spaces	Separator, WSUD where suitable then stormwater system	Class 1	Bypass with alarm
	Surface areas frequented by fork trucks, haulage trucks, heavy machinery at mines, heavy and light industries, council depots, airport aprons, marinas, seaports, carparks, shopping centres, transport depots, loading areas, council depots, tunnels, industrial estates and	Separator then stormwater system	Class 1	Bypass with alarm

High	recycling yards.			
	Power stations, transformer switchyards, electrical substations, windfarms, refuelling zones at mines, rail depots, airports, waste transfer stations, re-fuelling areas	Separator then stormwater system	Class 1	Full retention separator with alarm
	Retail fuel forecourts, service stations.	Separator then stormwater system	Class 1	Full retention "forecourt" separator with alarm
	Industrial sites with vehicle wash water or drainage that contains dissolved oils, detergents or degreasers or other trade effluents	Must be directed to sewer. May need oil separation. Check with SA Water first.	Class 1 or 2	n/a

- h) avoid using vast amounts of water to clean shopfronts and forecourt areas by dry sweeping, collecting and disposing of solid wastes or wet clean by using a mop and bucket or wet vacuum and discharging the wastewater to sewer.
- i) reconfigure stormwater management system onsite to allow for shut-down and containment in the event of an emergency spill. Water and other substances used to control fires can be contaminated by the liquid substances used and stored on site, leading to stormwater pollution if the fire water is not contained. Stormwater inlets and outlets can be designed with a shutoff and containment mechanism, using available storage in the stormwater pipes. Generally, a shut-off valve should be installed at the lowest invert point.
- j) avoid small spaces behind or beside buildings that could potentially be used for informal storage or disposal of materials.

KEY NOTE

Full retention separators treat the full flow that can be delivered by the drainage system.

By-pass separators fully treat all flows generated by rainfall rates of up to 5mm/hr. Flows above this rate are allowed to by-pass the separator. These separators are used when it is considered an acceptable risk not to provide full treatment for high flows, for example where the risk of a large spillage and heavy rainfall occurring at the same time is small. They are especially suitable for situations where the main requirement is to trap spillages.

Forecourt separators are full retention separators specified to retain on site the maximum spillage likely to occur at a service station.

The Class of a separator is determined on risk. See Table 6.1.3 for guidance.

Class 1 separators are designed to achieve a concentration of less than 5mg/L of oil under standard test conditions (as outlined in European standard BSEN 858-1) and should be used when the separator is required to remove very small oil droplets, such as those arising from car park run-off.

Class 2 separators are designed to achieve a concentration of less than 100mg/L oil under standard test conditions (as outlined in European standard BSEN 858-1) and are suitable for dealing with discharges where a lower quality requirement applies and for trapping spillages.

A European standard (BSEN 858-1) for the design and use of prefabricated oil separators should be used as there is currently no equivalent Australian standard.

KEY REFERENCES

UK EPA Pollution Prevention Guideline: Use and Design of Oil Separators in Surface Water Drainage Systems

www.sepa.org.uk/pdf/guidance/ppg/ppg03.pdf

This guideline refers to Sustainable Drainage Systems (SuDS) which in Australia is called Water Sensitive Urban Design (WSUD). While the guidelines provide useful information, SA Water and your Local Council should be consulted before any separator is installed.

6.6 Vehicle, Plant and Equipment Maintenance

If not managed effectively maintenance operations such as mechanical repairs, and servicing can result in contamination of soil, groundwater and stormwater. It is important to perform these activities in purpose built structurally separated roofed work areas where the risk of environmental harm can be minimised. Pollutants such as motor oils, brake fluids and dust, coolants and battery acid when carried by stormwater can affect the quality of our seafood, the places we swim and the water we drink and use in our homes. Oil is particularly dangerous because it takes only one litre of oil to make one million litres of water (equivalent to half the size of an Olympic swimming pool) unsafe for aquatic and marine life.

OPERATORS MUST:

1. take all reasonable and practical measures to ensure pollutants generated through maintenance operations are captured, contained, treated and reused or disposed of to a waste transporter or other appropriate waste management facility (e.g. sewer)

KEY REFERENCES

EPA Guideline: Bunding and Spill Management
www.epa.sa.gov.au/pdfs/guide_bunding.pdf

EPA Information Sheet: Stormwater Management for Auto Servicing and Mechanical Repair Workshops
www.epa.sa.gov.au/xstd_files/Water/Information%20sheet/water_autoservicing.pdf

EPA Guideline: Disposal of used Hydrocarbon Absorbent Materials
www.epa.sa.gov.au/pdfs/guide_hydrocarbon.pdf

SafeWork SA Safeguards: GS 70 Lead/Acid Batteries and Battery Charging
www.safework.sa.gov.au/uploaded_files/g70i.pdf

SafeWork SA Safeguards: GS 6 Degreasing Equipment
www.safework.sa.gov.au/uploaded_files/g6i.pdf

OPERATORS SHOULD (SOME EXAMPLES OF HOW TO ACHIEVE “MUSTS”):

- (a) provide a fit for purpose roofed maintenance area which is structurally separate from the rest of the property and contains in-built pollution control mechanisms to protect air, water and land resources.
- (b) restrict activities relating to maintenance to designated work areas away from stormwater drains.
- (c) use secondary containment devices, such as bunding and spill trays to enclose maintenance areas and prevent pollutant escape.

- (d) ensure land is protected from contamination by performing maintenance works on sealed surfaces or over ground sheets.
- (e) maintain and regularly clean machinery, to quickly identify potential leaks.
- (f) control airborne sprays so they cannot land on areas where rain can wash them down the drain.
- (g) dispose of waste oil, oil filters, oily rags, coolant and batteries with a licensed waste contractor who can recycle these waste products.
- (h) purchase fit for purpose spill control equipment and store in prominent locations within maintenance area with instructions for use clearly displayed. Service and replenish regularly.
- (i) ensure all personnel are aware of what to do in the event of spills.
- (j) appoint a dedicated person(s) to regularly inspect the integrity of containers, labels, secondary containment, spill prevention sensors and equipment.
- (k) train users in all aspects of environmental management related to the performance of maintenance operations.



6.7 Vehicle, Plant and Equipment Cleaning

The wash down water produced when cleaning can produce pollutants such as nitrates, phosphates and other chemical pollutants. If these wastes are released into the aquatic environment they may result in oxygen depletion that in turn produces toxic algal blooms. Oil, grease and coolants are also common. If the heavy metals found in these wastes make their way into aquatic environments they can be consumed by shellfish, snails, worms and other bottom-dwelling organisms and passed up the food chain to fish, birds and humans. Heavy metals that are not incorporated into living tissue remain in the sediments or water column.

OPERATORS MUST:

1. not perform vehicle, plant or equipment cleaning that results any wash down water entering any waters (including the stormwater system)
2. make use of purpose built wash bays with waste containment and wastewater controls

OR

undertake measures to avoid the discharge of washdown water that reflect the risk of environmental harm from the activity being performed (refer to Should section for options).

KEY REFERENCES

EPA Guideline: Bunding and Spill Management

www.epa.sa.gov.au/pdfs/guide_bunding.pdf

Stormwater Management for Washbays

http://www.epa.sa.gov.au/pdfs/water_wash.pdf

Disposal of Soaps and Detergents

http://www.epa.sa.gov.au/pdfs/soaps_detergents.pdf

OPERATORS SHOULD (RECOMMENDED PRACTICES):

- (a) ensure vehicle, plant and equipment engines are running smoothly. This reduces the amount of unburnt carbon in the exhaust that can accumulate on vehicle surface requiring more cleaning (as well as reducing air pollution)
- (b) check product labels and use low nitrogen and phosphorus detergents for cleaning
- (c) use high pressure water instead of chemicals to remove grime
- (d) use spill control equipment (absorbent saucages and wash down mats)to control wash down water containing cleaning chemicals
- (e) dispose of wash down water in bucket to sewer/septic systems or landscaped areas

- (f) mix the minimum amount of detergent required to remove grime in a bucket.
Don't apply detergents directly onto brushes or the vehicle.
- (g) use warm water instead of cold water leads for greater cleaning efficiency
- (h) ensure compliance with water use restrictions, attach a trigger nozzle to the hose so it can be turned off when not in use.

BUSINESSES SHOULD:

- (i) educate employees, customers, users and members on environmental management practices through initiatives such as signage, newsletters and training programs
- (j) provide designated wash bays with waste containment and wastewater controls
- (k) supply for purchase or hire, equipment that minimises the generation and escape of pollutants.

6.8 High Environmental Risk Industrial, Retail and Commercial Activities

There are certain activities that are most likely to cause environmental harm if not managed effectively. Many of these require an environmental authorisation or licence under the EP Act to conduct over certain thresholds, loads or volumes. However, even when these activities are conducted below these thresholds there remains a significant risk to the environment. Use this section to locate more detailed information for activities that relate to your specific industrial, retail or commercial business.

OPERATORS MUST:

1. construct and use fit for purpose work areas with air, noise, soil and water controls for pollution avoidance

OR

undertake reasonable and practical measures to avoid , contain, reuse or dispose of pollutants that reflect the risk of environmental harm from the activity being performed (refer to list below for detailed requirements.)

ACTIVITY REFERENCE:

Guideline for Establishment and Operation of Cattle Feedlots in South Australia

www.epa.sa.gov.au/xstd_files/Waste/Guideline/cattle.pdf

Guideline for Animal Processing Works

www.epa.sa.gov.au/xstd_files/Waste/Guideline/guide_animal.pdf

Guideline for Carpet and Upholstery Cleaning

www.epa.sa.gov.au/xstd_files/Waste/Guideline/guide_carpet.pdf

Guideline for Copper chromated arsenate (CCA) timber waste—storage and management

www.epa.sa.gov.au/xstd_files/Waste/Guideline/guide_cca.pdf

Guideline Concrete Batching

www.epa.sa.gov.au/xstd_files/Industry/Guideline/guide_concrete.pdf

Guideline Exhaust ventilation in commercial and institutional kitchens

www.epa.sa.gov.au/xstd_files/Air/Guideline/guide_exhaust.pdf

Guideline Ventilation of fibreglass works

www.epa.sa.gov.au/xstd_files/Air/Guideline/guide_fibreglass.pdf

Guideline Environmental Management of Foundries

www.epa.sa.gov.au/xstd_files/Air/Guideline/guide_foundries.pdf

Guideline Joineries – dust and noise control

www.epa.sa.gov.au/xstd_files/Air/Guideline/guide_joineries.pdf

Guidelines for responsible pesticide use

www.epa.sa.gov.au/xstd_files/Water/Guideline/guide_pesticides.pdf

Guideline Pressure water-blasting activities

www.epa.sa.gov.au/xstd_files/Waste/Guideline/guide_pressure.pdf

Guideline Spray painting booths: Control of noise and air emissions

www.epa.sa.gov.au/xstd_files/Noise/Guideline/guide_spraypaint.pdf

Guideline: Waste tyres

www.epa.sa.gov.au/xstd_files/Waste/Guideline/guide_tyres.pdf

Guidelines for wineries and distilleries

www.epa.sa.gov.au/xstd_files/Industry/Guideline/guide_wineries.pdf

Guideline Abrasive blast cleaning

www.epa.sa.gov.au/xstd_files/Industry/Guideline/guide_abrasive.pdf

Guidelines for establishment of intensive piggeries in SA

www.epa.sa.gov.au/xstd_files/Industry/Guideline/pigguide.pdf

Guidelines Wind farms environmental noise

www.epa.sa.gov.au/xstd_files/Noise/Guideline/windfarms.pdf

Stormwater management for mobile concrete cutters

6.9 Environmental Incident Reporting

Environmental harm can be minimised if environmental incidents are reported immediately so that action can be taken at the earliest opportunity. Reporting incidents to the Environment Protection Authority, in some circumstances, is also a legislative requirement.

OPERATORS MUST:

1. comply with Section 83.(1) of the *Environment Protection Act 1993*

KEY NOTE

Section 83. (1) states “Where an incident occurs so that serious or material environmental harm from pollution is caused or threatened in the course of an activity undertaken by a person, the person must, as soon as reasonably practicable after becoming aware of an incident, notify the Environment Protection Authority of the incident, its nature, the circumstances in which it occurred and the action taken to deal with it”

In most cases, concerns about pollution should be referred to the source or person causing the problem in the first instance. The EPA’s incident reporting (non-emergency) and complaints telephone number is 8204 2004.

E-mail notification to the EPA is acceptable on epainfo@epa.sa.gov.au but must include:

- name, address and daytime telephone number of person reporting the incident
- incident details (please indicate if the incident is still occurring at the time this notification is lodged)
- date and time of incident
- details of source of pollution—business name, address, etc.
- location of incident (not always the same as address).

Note: The EPA may not be able to act on complaints lodged more than two business days (Monday to Friday) after the incident occurs. Caller’s details are confidential to the EPA, but details may be given to the local council if the incident is within its jurisdiction.

The Department for Transport, Energy and Infrastructure is responsible for the management of the Marine Oil Spill Response program in South Australian waters. The 24 hour emergency contact number is 0401 124 170.

OPERATORS SHOULD (SOME EXAMPLES OF HOW TO ACHIEVE “MUSTS”):

- (a) prepare Environmental Incident Records when there has been a release of solid, liquid or gas (or a combination thereof) during operations that is not

ordinarily expected to occur despite the existence of a proper maintenance program and procedures due to the following:

- plant or equipment breakdown or malfunction;
- power generation failure;
- pipe or pipeline breakage;
- storage container fracture;
- bund fracture, leakage or overflow;
- a physical or chemical reaction;
- transportation vehicle breakdown, or malfunction;
- using plant or equipment for a purpose for which it was not designed;
- operating or maintaining plant, vehicles or equipment in an improper manner; or
- failure to process, handle, move or store goods and or materials in a proper manner

(b) retain Environmental Incident Records for a period of two years from their creation

(c) include in an Environmental Incident Record:

- the location of the incident
- the time and date of the incident
- a description of the release (substance, estimated volume)
- the source of the release (if known)
- management strategies undertaken
- the name and contact details of the recorder.

6.10 Environmental Record Keeping

Keeping records of spills, leaks and other discharges can help a facility run more efficiently and cleanly. Records of past spills contain useful information for improving Best Management Practices (BMPs) to prevent future spills. Typical items that should be recorded include the results of routine inspections, and reported spills, leaks or other discharges.

OPERATORS SHOULD RECORD:

- (a) the date, exact place, and time of material inventories, site inspections, and sampling observations.
- (b) Names of inspector(s) and sampler(s)
- (c) Analytical information, including the date(s) and time(s) analyses were performed or initiated, the analysts' names, analytical techniques or methods used, analytical results, and quality assurance/quality control results of such analyses.
- (d) The date, time, exact location, and a complete characterisation of significant observations, including spills or leaks.
- (e) Notes indicating the reasons for any exceptions to standard record keeping procedures.
- (f) All calibration and maintenance records of instruments used in storm water monitoring.
- (g) All original strip chart recordings for continuous monitoring equipment.
- (h) Records of any non storm water discharges.

KEY NOTE

Records keeping is a basic business practice and is applicable to all facilities. If a separate record keeping system for tracking BMPs, monitoring results, etc., is not currently in place at a facility, existing record keeping structures can be easily adapted to incorporate this data.

Record keeping is a simple, easily implemented, and cost effective management tool. Complete, well organised records can help ensure proper maintenance of facilities and equipment and can aid in determining the causes of spills and leaks; thus, record keeping can protect water quality by helping to prevent future leaks and spills.

7 HOW-TO RESOURCES

Links to non-EPA sites do not imply any official EPA endorsement of or responsibility for the opinions, ideas, data or products presented at those locations, or guarantee the validity of the information provided. Links to non-EPA servers are provided solely as a pointer to information on topics related to environmental protection that may be useful to EPA staff and the public. Information on Litter Control, Hydrocarbon separators, Gross Pollutant Traps, Swales and Buffer Strips may be found under Factsheets below. Links may change over time but were correct at time of publication.

Links to the relevant website are listed.

EPA Stormwater Management series

<http://www.epa.sa.gov.au/guidelines.html>

[Auto Dismantlers](#)
[Auto Servicing and Mechanical Repair Workshops](#)
[Car Yards](#)
[Concrete Cutters](#)
[Crash Repairers](#)
[Disposal of Soaps and Detergents](#)
[Disposal of Swimming Pool Backwash Water](#)
[Fruit & Vegetable Processing](#)
[Garden Shops](#)
[Home and Mobile D-I-Y Handyperson](#)
[Landscape Gardening and Garden Maintenance](#)
[Laundries and Dry Cleaning Premises](#)
[Marinas, Boat Sheds and Slipways](#)
[Masonry and Related Industries](#)
[Mortuaries](#)
[Metal Fabricators](#)
[Mobile Car Detailers](#)
[Mobile Concrete Cutters](#)
[Mobile Dog Washing Units](#)
[Mobile Mechanics](#)
[Mobile Waste Bin Cleaners](#)
[Painters](#)
[Printers](#)
[Radiator Repair Premises](#)
[Retail Food Businesses](#)
[Roof Restorers](#)
[Service Stations and sites with Underground Storage Tanks](#)
[Shopping Centres](#)
[Small Business and Industry](#)
[Transport Companies](#)
[Wash Bays](#)