

## Assessment of retail petrol stations

### Introduction

This Guideline will assist a relevant authority (as defined by the *Development Act 1993*) to undertake an environmental assessment of proposals for retail petrol stations.

The information contained in this Guideline is in lieu of the advice that was given by the EPA in responses to referred development applications prior to removal of the activity from Schedule 21 of the *Development Regulations 2008*.

### Assessing environmental issues

The potential impacts of retail petrol stations are associated not only with the storage and transfer of fuel on site, but also with a range of activities associated with retail petrol stations, including tyre and service bays, car wash and cleaning facilities and retail and fast food outlets.

#### Air quality and noise

Air quality issues include odours from the filling of underground and above ground fuel storage systems when the vapours in the tank are vented to atmosphere, the escape of fumes at individual bowsers, and odours from fast food outlets.

Integrated petrol station complexes may operate twenty four hours per day, seven days per week and may comprise various noise sources including truck and car movements, fuel deliveries and rubbish collection, operation of fuel pumping equipment, refrigeration and air conditioning plant, vehicle wash bays and vacuuming facilities, and fast food/restaurant facilities.

#### *Petrol vapour emissions*

Emissions in the form of volatile organic compounds emitted from storage systems holding hydrocarbons (other than diesel and LPG), as well as from deliveries from road tankers contribute to air pollution.

Vapour recovery systems are designed to reduce petrol emissions into the atmosphere from storage systems. As a minimum, a Stage 1 vapour recovery system is to be fitted to storage tanks (apart from diesel and LPG), including the underground storage tank vent pipes being fitted with a pressure vacuum relief valve to minimise loss during unloading and storage of fuel.

For further information, refer to the NSW Department of Environment Climate Change and Water document entitled [Standards and best practice guidelines for vapour recovery at petrol service stations \(2009\)](#).

### *Odour from fast food outlets*

Odour emissions from fast food outlets can be minimised by their capture in exhaust ventilation systems and discharge from the building as per the requirements of the EPA guideline [Exhaust ventilation in commercial and institutional kitchens \(2011\)](#).

### *Noise*

The applicant will also need to demonstrate that relevant indicative noise levels specified in Clause 5 of the *Environment Protection (Noise) Policy 2007*<sup>1</sup> are not exceeded at the nearest sensitive receiver, both during the day and at night. This may require a report from an acoustic engineer stating that noise from all of the fixed and transient noise sources on site will meet the *Environment Protection (Noise) Policy 2007* at the nearest sensitive receivers. If the noise from all of the activities on the site do not meet the *Environment Protection (Noise) Policy 2007* at the nearest sensitive receivers then the acoustic report should recommend measures to achieve this.

Some sources of noise such as particularly loud vehicles and patron behaviour can be difficult to predict. As these noises may cause sleep disturbance or annoyance, consideration should be given to this when assessing the suitability of a proposed site for a retail petrol station, even if predicted noise levels meet the applicable criteria in the *Environment Protection (Noise) Policy 2007*.

### **Landfill sites**

When considering a site for a retail petrol station consideration needs to be given to the presence of any historic or currently operational landfills.

There are a range of inherent risks associated with landfills including adverse impact on the environment and human health due to landfill gas, odour, litter, vermin, dust, and leachate.

The EPA guideline, [Environmental management of landfill facilities \(municipal solid waste and commercial and industrial general waste\) \(2007\)](#), recommends a minimum separation distance of 500m between development and a landfill boundary, including from historic, currently operational and future designated landfill areas, not just the active tipping face. The buffer should be maintained for the life of the landfill<sup>2</sup>. Maintaining a 500m separation distance will reduce the likelihood of impacts from the landfill, including the accumulation of landfill gas in structures.

A proposed retail petrol station within 500m of a landfill should proceed only on the basis of a landfill risk assessment undertaken by a site contamination consultant or a site contamination auditor. Any development within the buffer should be assessed and determined as suitable and compatible. The EPA Information Sheet, [Landfill gas and development near landfills – advice for planning authorities and developers \(2012\)](#) contains further information.

### **Waste management**

Waste generated is likely to include empty storage containers and packaging, general litter, by-products of any vehicle maintenance (including petroleum products, coolants, degreasing agents, sediment, rubber particles, detergents), and other hazardous materials.

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<sup>1</sup> The *Environment Protection (Noise) Policy 2007* seeks to set noise goals and provide a consistent approach to noise issues in the assessment of development applications.

Clause 5 of the Noise Policy identifies indicative noise levels considered to be acceptable in various land use categories, including industrial and commercial. Clause 20 of the Noise Policy sets out the process the relevant authority should use when assessing development applications.

<sup>2</sup> The life of the landfill includes the period after closure and capping, and continues for as long as the landfill has the potential to create off site impacts to the environment (particularly due to landfill gas emissions or leaching to groundwater), which may be decades after the landfill has closed.

The development should include:

- provision for implementation of the waste management hierarchy (avoidance, minimisation, reuse, recycling, recovery, treatment, disposal) as identified in the *Environment Protection (Waste to Resources) Policy 2010*.
- dedicated covered areas for all non-toxic solid waste materials
- dedicated covered and bunded areas for all toxic waste materials
  - liquid wastes should be contained and / or treated before transport off-site by an EPA-licensed transporter
  - solid toxic wastes should be removed from the site regularly by an EPA-licensed transporter.

The EPA guideline, [Bunding and spill management \(2012\)](#), contains further information on design, capacity, operation and maintenance of bunds.

### Water quality

There are a number of pollutants found in retail petrol stations including oil, grease, lubricants and petroleum products, engine coolant, detergents and their by-products that have potential to contaminate stormwater. Food waste and litter must also be considered if a fast food outlet is proposed. Under the *Environment Protection (Water Quality) Policy 2003* contaminated stormwater is defined as 'wastewater' and should be managed as such.

Design of the service station is critical to minimising the potential to contaminate stormwater.

#### *Stormwater - Forecourt design*

On retail petrol station sites, potentially contaminated stormwater runoff will be generated from hard surfaced forecourt areas including re-fuelling areas, parking areas, footpaths, loading areas, and other trafficable areas.

The forecourt of a retail petrol station can be divided into two parts, which should be managed differently:

- Refuelling and fuel delivery area

The forecourt containing the bowsers and fuel delivery points poses a high risk to water quality. The forecourt should have a canopy to minimise the entry of stormwater and be hard surfaced. The covered forecourt should be protected at the canopy line from the entry of surface waters from the uncovered forecourt area by either a grade change or grated drains, or a combination of both. Canopies should extend beyond the bunded area by 1m each 3m in height.

Any liquids spilt within this area should be directed to:

- a blind tank (a minimum 10,000 litres in size to collect the contents of a fuel leak from one fuel tanker compartment) fitted with a high level visible and audible alarm system, which is emptied as required by an EPA-licensed waste contractor. Any material including sludge and oily waste collected within the blind tank must be removed by a waste transporter licensed by the Environment Protection Authority to carry such material to an appropriate waste facility; or
- a Class 1 full retention oil water separator with high level visible and audible alarm, sized appropriately for the catchment area of the site<sup>3</sup> plus a fuel leak from one fuel tanker compartment, prior to discharge to the Council stormwater system.

<sup>3</sup> It is recommended that a Class 1 full retention forecourt oil separator be designed to meet the British Standard, *BS EN 858-1:2002 Separator systems for light liquids (eg oil and petrol). Part 1: Principles of product design, performance and testing, marking and quality control*. For further information on full retention oil separators and the British Standard contact the EPA.

- Parking areas, footpaths, trafficable areas

Parking areas, footpaths and trafficable areas are of a lower risk than the refuelling and fuel delivery area, but stormwater falling on these lower risk areas may still become contaminated. It would be preferable for this stormwater to be treated prior to discharge to the Council stormwater system. Treatments may include:

- diverting stormwater to any Class 1 full retention oil water separator with high level visible and audible alarm that is being used in the refuelling and delivery area
- a Class 1 retention by pass separator equipped with coalescer unit and high level audible and visible alarms, sized appropriately for the catchment area of the site
- a suitably designed, sized, and maintained bio-filtration system (also known as bio-retention systems and raingardens) to retain and slowly filter stormwater. For further information refer to the Cooperative Research Centre for Water Sensitive Cities [Adoption guidelines for stormwater biofiltration systems – summary report](#) (2015).

#### *Stormwater - Water sensitive urban design*

Water sensitive urban design is an approach to urban planning and design that seeks to integrate the management of the total water cycle to minimise the impacts of development, protect water quality, make more efficient use of water, reduce the cost of water infrastructure, and address flooding.

Water sensitive urban design could be used in many parts of a retail fuel outlet including treatment of roadways and footpaths with bio-filtration systems or capturing roof water & using this for toilet flushing. Further information on water sensitive urban design can be found at:

<https://www.sa.gov.au/topics/housing-property-and-land/building-and-development/land-supply-and-planning-system/water-sensitive-urban-design>

<http://www.watersensitivesa.com>

<http://www.environment.sa.gov.au/files/sharedassets/public/water/water-sensitive-urban-design-policy-gen.pdf>.

#### *Wash bays*

Wash bays should be designed in accordance with the EPA Guideline [Stormwater management for Wash Bays 2004](#)

#### *Underground petroleum storage systems*

Leakage from underground petroleum storage systems is a significant issue that can have impacts on soils and groundwater and cause site contamination, as well as safety implications.

To prevent leaks the underground petroleum storage systems (including tanks and piping) should be designed and installed to meet the requirements of Australian Standard AS 4897-2008 *The design, installation and operation of underground petroleum storage systems*. AS 4897-2008 describes equipment requirements to ensure tanks and piping are non-corrodible, requirements for cathodic protection where steel tanks and piping are proposed, and requirements for secondary containment for tanks and piping where they are proposed.

AS 4897-2008 also describes requirements for leak monitoring systems in order to detect leaks from any portion of the tank or piping and include requirements for systems such as automatic tank gauging, statistical inventory analysis, interstitial monitoring, line leak detection for pressure piping, and groundwater monitoring.

Other relevant Australian Standards include:

- AS 1940-2004 *The storage and handling of flammable and combustible liquids*
- AS 1692-2006 *Steel tanks for flammable and combustible liquids*
- AS 4977-2008 *Petroleum products - pipeline, road tanker compartment and underground tank identification*

- AS 4976–2008 *Removal and disposal of underground petroleum storage tanks.*

### *Above ground fuel storage systems*

If petroleum products are to be stored in aboveground storage tanks the storage tanks need to be appropriately bunded and, where practicable and economically viable, roofed.

### **Construction management**

Construction activities undertaken as part of a development can detrimentally affect the environment and community health. Air emissions, noise, site contamination, stormwater, and waste need to be managed to prevent impacts on nearby land uses and the natural environment.

Construction of the retail petrol station may require the removal and disposal of existing underground tank infrastructure. Due to the likelihood of leakage from underground tanks this should be undertaken in accordance with relevant standards and guidelines and may require site contamination investigations to be undertaken.

To reduce the environmental risk and harm from leaking underground petroleum storage systems, industry best practice described in a number of Australian Standards should be followed when decommissioning eg *AS1940–2004: Storage and handling of flammable and combustible liquids* and *AS4976–2008: Removal and disposal of underground petroleum storage tanks.*

The relevant authority may require a construction environmental management plan from the proponent. A construction environmental management plan describes how activities undertaken during the construction phase of development will be managed to avoid or mitigate negative environmental impacts on site and how the environmental management requirements will be implemented.

For further information on the impacts of construction activities and preparing a construction environmental management plan refer to the EPA's guideline, *Construction environmental management plans.*

## **Disclaimer**

This publication is a guide only and does not necessarily provide adequate information in relation to every situation. This publication seeks to explain your possible obligations in a helpful and accessible way. In doing so, however, some detail may not be captured. It is important, therefore, that you seek information from the EPA itself regarding your possible obligations and, where appropriate, that you seek your own legal advice.

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## **Further information**

### ***Legislation***

Legislation may be viewed on the Internet at: <[www.legislation.sa.gov.au](http://www.legislation.sa.gov.au)>

Copies of legislation are available for purchase from:

Service SA Government Legislation Outlet  
Adelaide Service SA Centre  
108 North Terrace  
Adelaide SA 5000

Telephone: 13 23 24  
Facsimile: (08) 8204 1909  
Website: <[shop.service.sa.gov.au](http://shop.service.sa.gov.au)>

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