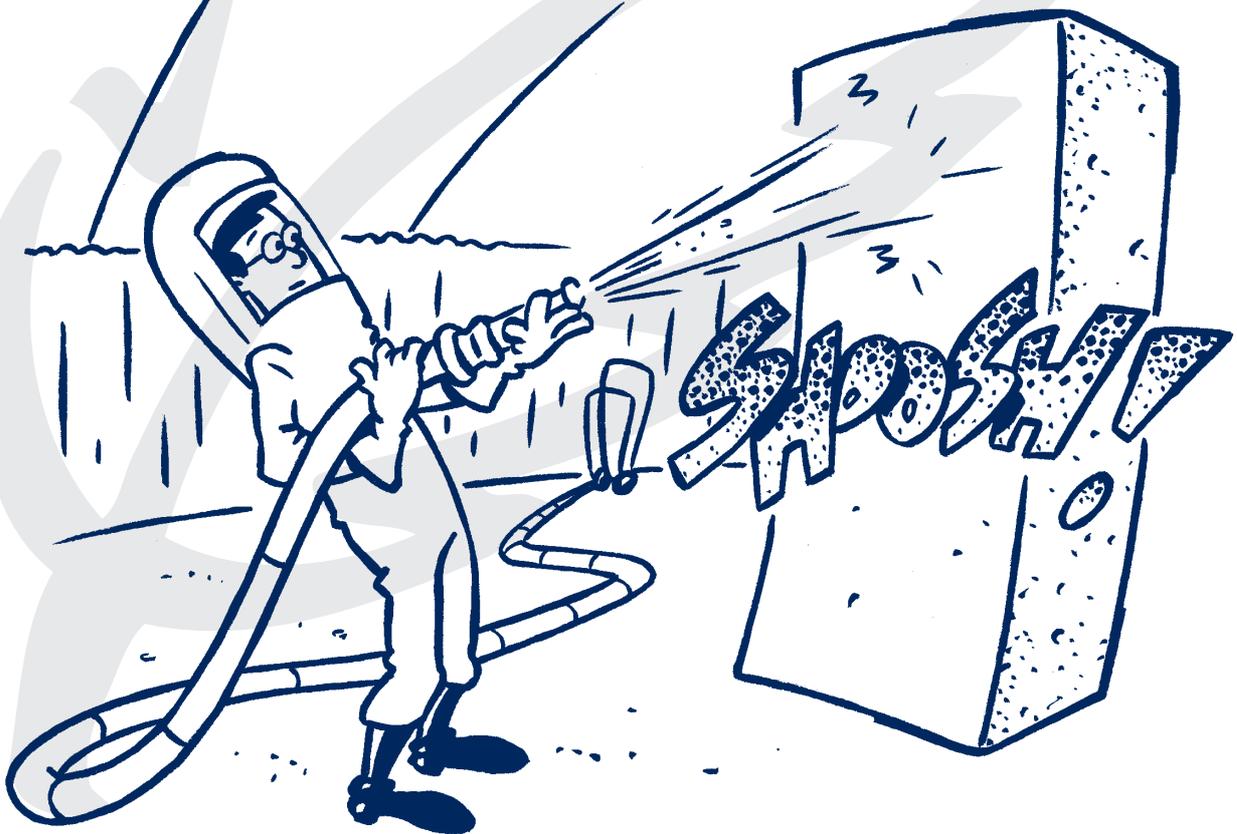


Pollution Solutions

ABRASIVE BLASTERS

JULY 2000



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Explanatory Notes for Operator's Environmental Guide (OEG)

Purpose of the OEG

The *Environmental Protection Act 1994* states 'A person must not carry out an activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm (the "general environmental duty")'. This clause applies to all persons in Queensland.

Under the *Environmental Protection Act 1994* and *Integrated Planning Act 1997* Local Government licenses and approves businesses that have the potential to cause environmental harm – Environmentally Relevant Activities (ERAs). Abrasive Blasters are level 1 ERAs listed in the *Environmental Protection Regulation 1998*.

All ERAs must have an a development permit and/or environmental authority (licence) which lists the conditions of operation to prevent pollution. However setting these conditions is only part of the story. Businesses should know how to meet these conditions (compliance) and to go beyond (best practice).

This Operator's Environmental Guide (OEG) – *Pollution Solutions for Abrasive Blasters* - has been developed to assist abrasive blasters to achieve their general environmental duty as above. That is, to achieve compliance with the *Environmental Protection Act 1994* and progress towards best practice environmental management.

The OEG was developed jointly by the Brisbane City Council and representatives of the abrasive blasting industry.

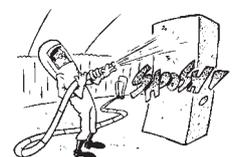
Limitations of the OEG

Council has written this OEG as a guide only. It does not form part of the licence conditions. Complying with this document does not necessarily exempt the licensee from prosecution or ensure compliance with the *Environmental Protection Act 1994, Regulation and Policies* (Air, Water, Noise and Interim Waste).

Licences may contain conditions that vary from the requirements of the OEG. These are often included because of site specific requirements or because of the nature of the activity. Whether your operational performance meets the conditions of your development permit and/or environmental authority (licence) will be the main determinant of compliance.

The control measures in the OEG are recommendations only. **It remains the responsibility of each operator and employee of the business to satisfy the general environmental duty** applicable to that business. The operator should carefully consider the information in this OEG and put in place measures that help to achieve this objective.

This OEG represents accepted industry practice at the time of issue and is therefore subject to change. Please note the date recorded on the front.



How to use the OEG

This OEG is based on three central concepts. These are explained below and each operational process is defined according to these concepts.

Environmental Outcomes

are outcomes, or goals, that Council considers it is important to achieve if the environment is to be protected. **The Environmental Outcomes are highlighted in bold text.** You should try to satisfy the general environmental duty. The environmental outcomes in the OEG, however, do not ensure that this duty is achieved and should be considered in conjunction with your development permit and/or licence conditions.

Compliance

means the control measures that Council recommends as the minimum required to meet the environmental outcome for the abrasive blasting industry.

In some cases, a number of compliance control measures may be listed for one process. In these cases, you are advised to aim for the control measure or combination of control measures that is most likely to achieve the environmental outcome for that process.

Alternatively, you may be able to meet an environmental outcome in a manner that is not listed in this OEG. It is recommended that in these instances the alternatives be discussed with a Council Officer prior to implementation.

Although this guide lists some solutions, Council encourages operators to develop alternative ideas or innovations that are consistent with the environmental outcomes and other relevant requirements.

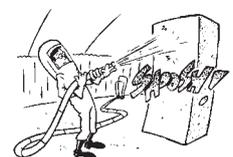
Best practice

means the control measures that are considered to be above the minimum requirements. They are not compulsory. Best practice incorporates concepts such as cleaner production, waste minimisation, recycling and reuse. Use of best practice control measures may help to improve industry standards and progress towards best practice in the industry. Best practice measures are marked with a  in the text.

In some cases, a business may be required to use a best practice control measure, rather than compliance, if an authorised officer believes that it is necessary to achieve an environmental outcome.

The best practice options listed are not fully inclusive; they only indicate what options may be available. Other best practice options not listed in this OEG may be used.

Importantly, this OEG takes into account changing industry standards, technology improvements, scientific knowledge and community expectations.



ENVIRONMENTAL DUTY

Develop environmental commitment and sound environmental performance

- Develop a commitment to being good neighbours and to preventing or minimising pollution.
- Ensure all staff are aware of the development permit and/or licence conditions and the relevant methods and procedures contained in this OEG.



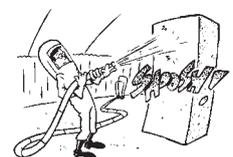
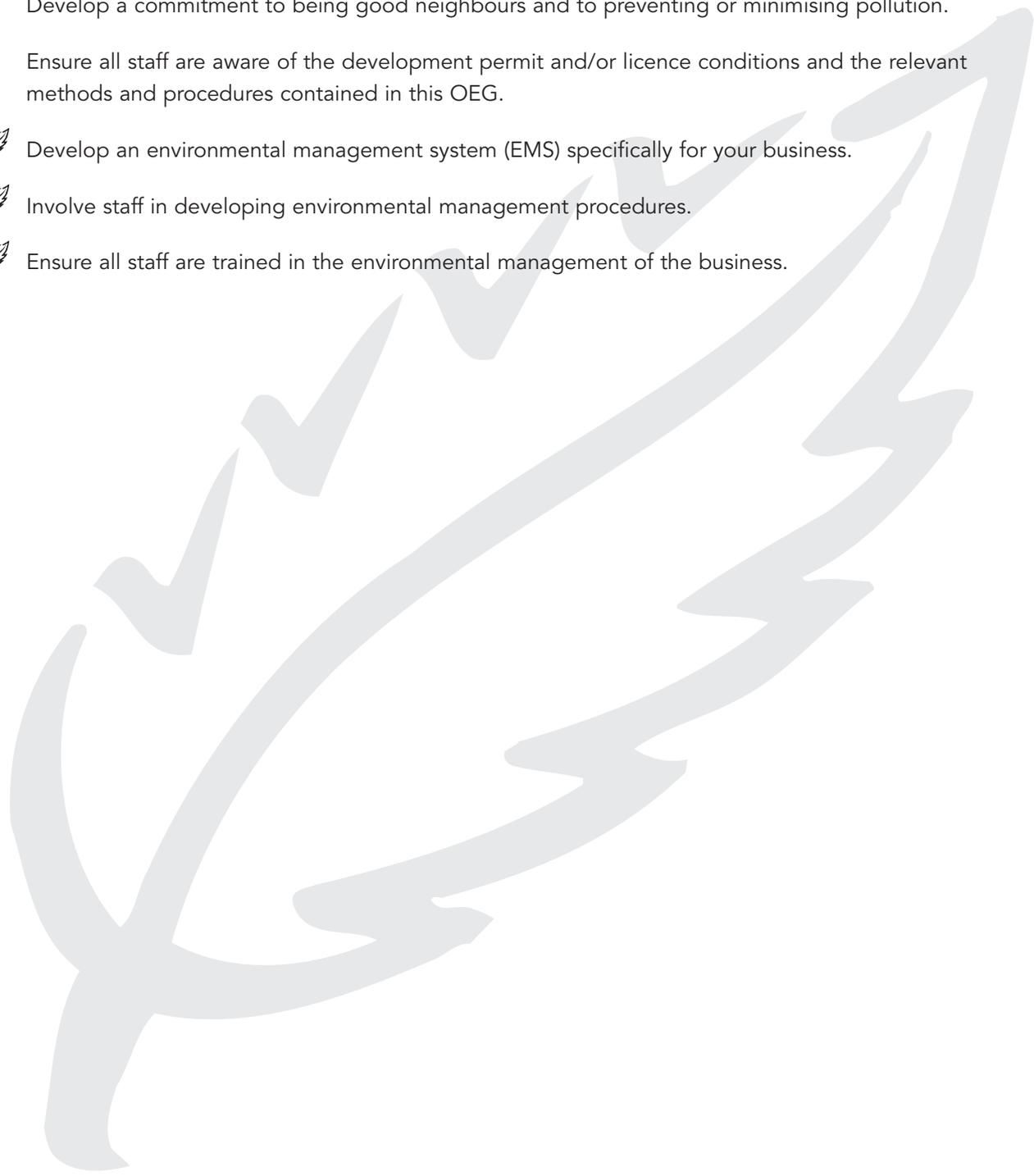
Develop an environmental management system (EMS) specifically for your business.



Involve staff in developing environmental management procedures.



Ensure all staff are trained in the environmental management of the business.



ENVIRONMENTAL MANAGEMENT

Implement environmental policies and practices

- The object of the *Environmental Protection Act 1994* is to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (ecologically sustainable development).

Environmental Management Program (EMP)

Achieve compliance for non-conforming activities

- Operators who are currently unable to comply with the requirements of licence conditions and the OEG may be required to submit an EMP for approval.
- An EMP is a binding agreement between your business and Council that sets out the areas where your business needs to improve to achieve compliance, and the time frame to achieve them. This allows you to operate your business although you may not fully comply, as long as Council has a firm arrangement with you to rectify problem areas in a mutually agreed time.

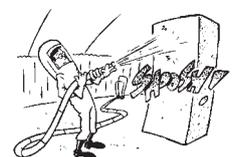
Environmental Management System (EMS)

Maintain compliance with licence conditions and implement best practices



Develop an EMS to ensure environmental performance and compliance with licence conditions and the OEG. An EMS provides a systematic method for meeting environmental outcomes, licence conditions and the ways or procedures for meeting and exceeding compliance. It allows for:

- better practices
- monitoring of, and reporting on, performance
- training of staff
- keeping of relevant records
- complaint response
- emergency and incident response

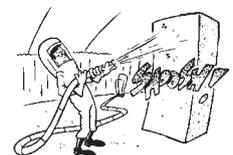


Plan to protect your environment and reduce your business risks



An EMS addresses noise, air quality, waste and any other relevant environmental issues associated with processes that could reasonably pose a significant risk to the environment, if not appropriately controlled, monitored and/or managed.

- For low risk activities, the EMS should be kept concise with control measures, checklists and records (e.g. development permit, waste disposal) maintained.
- In higher risk activities, licence conditions and procedures generally require more detail in an EMS. In some cases, preparation by an environmental consultant is recommended.
- The basic objectives are to increase business performance and reduce environmental risks through good management practices. Key components in the EMS include:
 - monitoring and reporting
 - records
 - training of employees
 - complaint response
 - emergency and incident responses.



ABRASIVE BLASTING PROCESSES AND MANAGEMENT

Abrasive Blasting

Abrasive blasting is generally conducted in a blast chamber, blasting yard or, when blasting 'immovable' structures and/or machinery, on location using mobile blasting machinery.

Minimise air and land contamination from spent abrasives and dusts containing heavy metals

- Where possible conduct abrasive blasting in a totally enclosed carrier, vented to atmosphere via a dust collector.
- Open air blasting is only permissible where the object is too large or too heavy to fit in a booth, or is a fixed structure. Objects with a dimension greater than **2.5 M x 2.5 M x 3.0 M** are considered large (Refer to Open Abrasive Blasting section).



Ilmenite is a recommended abrasive for outdoor work.

Minimise the generation of hazardous wastes

- Listed below are the constituent limits for abrasive media. **Never use any material with constituents which exceed these limits.**

2.0% free silica	0.1% lead	0.1% beryllium
0.5% cobalt	0.1% arsenic	1.0% tin
0.1% antimony	0.5% nickel	0.1% cadmium

Minimise hazardous wastes, waste disposal costs and the costs of abrasives

- Avoid using abrasives such as copper and zinc slags. These abrasives may contain a high level of heavy metals that are toxic. Beware the waste may require treatment at a hazardous waste facility.



For blast cleaning objects use recyclable and more environmentally benign abrasives such as garnet, chilled iron grit, cast steel grit, or cast iron shot.



Use corrosion inhibitors that are:

- compatible with surface coating requirements
- biodegradable
- free from chromates, nitrates and nitrites.

CAUTION!: Inhibitors commonly contain zinc that can contaminate stormwater and land if uncontrolled.



Wet and Water Blasting

Prevent air, soil and water contamination from hazardous wastes

- Conduct all wet abrasive and water blasting in a bunded area or enclosure with an impervious surface.
- Collect wastewater in a holding tank for:
 - disposal to sewer under conditions of a Trade Waste Permit
 - disposal via a licensed waste removalist
 -  treatment and reuse.
- Contain and remove all waste from wet abrasive and water blasting before it:
 - dries and becomes airborne
 - is washed away to drains and waterways
 - causes land contamination or harm to the environment.

Dry Blasting

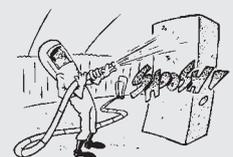
Minimise contamination of air, soil and water with hazardous wastes

- Undertake all dry-blasting activities on a bunded and controlled surface to prevent ground, water and stormwater contamination. This will help in collecting spent abrasives and other debris.
-  Minimise dry blasting areas through planning and managing work activities.
-  Use vacuum recovery systems on small work areas to minimise dust emissions and health risks.

In-Chamber Abrasive Blasting

Minimise contamination of air, soil and water from hazardous blast debris

- The blast chamber must be totally enclosed and vented to atmosphere through an effective dust collector, preferably a fabric filter dust collector.
- The discharge of dusts to atmosphere must not contravene requirements set by the *Environmental Protection Act 1994*, *Environmental Protection Regulation 1998* or *Environmental Protection (Air) Policy 1997*.
- Properly maintain the dust collector in accordance with the manufacturer's recommendations.
- Incorporate an audible or visible warning device in the filter arrangement to alert the operator if the filters fail.
- Design the chamber to enable continuous or frequent recovery of spent abrasives.



- Collect all particulate waste generated within the blast chamber. Store it in a secure location before disposal to an approved waste facility.
- Contain chamber dust by:
 - keeping the doors closed while the blasting operations are taking place
 - keeping the doors closed for a suitable duration after the blasting operations stops to allow the residual dust to be extracted from the booth.

Note: The operator of any commercial abrasive blasting plant must ensure that their machinery and equipment satisfy the above conditions.

Open Abrasive Blasting

Minimise dust and noise nuisance to neighbours

- Separate open abrasive blast cleaning operations from adjoining land uses by the following buffer distances:

Type of Operation	Buffer Distance
• Wet abrasive blasting	50 metres
• Dry abrasive blasting	200 metres

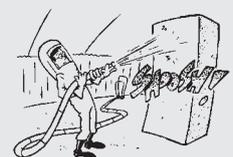
- Buffer distances may be reduced:
 - when physical constraints restrict achieving such distances **and**
 - the operator can demonstrate that debris, contaminants or noise from abrasive blasting operations will not cause an environmental nuisance.

Prevent emissions of toxic dust containing lead

- Test for the presence of lead based paints on all painted structures to be blasted:
 - Conduct representative tests or samples that characterise the **whole** of the structure being blasted. Keep a record of this information.
- For the removal of lead-based surface coating comply with the Australian Standard AS2761.

Minimise contamination of soil and water with hazardous wastes

- Open blast cleaning will only be permitted for removing lead-free surface coatings when it is impractical to clean items in a booth. Buffer distances described above must be maintained.
- Conduct all open-air abrasive blasting on a bunded and controlled surface to prevent ground, water and stormwater contamination.
- The structure/item being blasted must be:
 - fully enclosed (sides and top) with screening materials, or
 - fully screened (sides only) to a height 2 metres above the structure and
 - blasted in a downward manner where practicle.



- Open work areas in established blast yards contain previous abrasive blasting and/or spray painting residues. For open work areas use control measures to prevent land and off-site contamination:
 - upgrade the areas to controlled surfaces if they are used for blasting or spray painting
 - control on-site stormwater runoff, dusts and any leachate to ground water
 - remove spent abrasive and/or paint residues from surface area and treat the residues as solid wastes
 - Discuss with Council the environmental management of these work areas and any proposed upgrades, (e.g. enclosures or buildings) before the commencement of works.
- Collect all spent abrasive and other debris. Store securely in a bunded and covered area prior to disposal.
- Keep records of abrasive media purchased and the amounts disposed of to a licensed waste disposal facility.

Note: Spent abrasive may require testing (e.g. TCLP test) to check whether it is suitable for disposal in a lined landfill or whether it requires treatment in the hazardous waste treatment facility.

CAUTION!: Under the Environmental Protection Act 1994, land contamination is prohibited by any person, unless it has been approved by the Chief Executive Officer of the Environmental Protection Agency (EPA). The EPA can require the clean up of contaminated land particularly if there is a health or environmental risk.

Surface Coating and Spray Painting

Surface coating or spray painting must be carried out with sufficient controls to ensure minimal emissions of overspray (particles) and volatile organic compounds (VOCs) to the environment. Such controls can normally be achieved by using a fully enclosed booth with suitable filters or water scrubbers, sufficient stack height and adequate air velocity (Refer to Appendices 1 and 2).

A three-sided booth may be acceptable where adequate controls can be achieved by:

- conducting the spraying process close to the exhaust vent
- locating the booth away from doors and windows.

Paint Mixing

Ensure clean and safe work environment

- Conduct paint mixing and batch preparation in a well-ventilated area.



Extract vapour through a filtered extraction system such as the spray booth ventilation system. Position the vapour extraction inlet to draw vapours away from the operator.



Spray Painting and Surface Coating

Minimise VOC emissions, use of paints, thinners, filter mat and booth maintenance costs.

- Spray painting of objects with a dimension smaller than 2.5 M x 2.5 M x 3.0 M must be conducted in a spray booth meeting the requirements specified in Appendix 1.
- Conduct surface coating of objects too large for a spray booth on a controlled surface which is either:
 - fully enclosed (sides and top) with screening materials or
 - fully screened (sides only) to a height 2 M above structure.
- Controlled surfaces are to be approved and subjected to upgrade.
- Efficient spray equipment (transfer efficiency > 65%) such as high volume low pressure (HVLP) spray guns and airless spray guns must be used for all spraying outside of a spray booth.
- To demonstrate the safe use of paints containing isocyanates used in coating large objects outside a spray booth:
 - use a full enclosure
 - maintain adequate buffer distances
 - undertake periodic monitoring for particles and airborne isocyanates
 - keep records of controls and monitoring for Council inspection.
- Clean up and collect paint residues (e.g. zinc-based paints) from spray painting surfaces and store for disposal as regulated solid waste.

Ensure proper functioning of the spray booth.

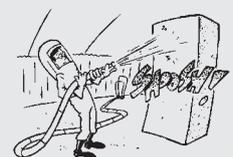
- Properly and regularly maintain filtering equipment as per manufacturer's advice and specifications to maintain effective operation.
- Points to watch:

Water Scrubber

- sprays must function correctly
- make up water float level must be correct
- manometer must be fitted to indicate negative pressure between the entrainment and distribution plates
- follow supplier's recommendations on addition of water and chemicals

Dry (Fibre) Filter

- filter must fully cover support frame spaces
- dial gauge or manometer must be fitted to indicate static pressure drop and replacement of filters
- spare filters must be kept on the premises.



Prevent contamination of water and surrounding land

- Accumulated sludge from water washed booths must be either:
 - entirely disposed of as trade waste under the conditions of a Trade Waste Permit
 - collected as solid fraction, dried and bagged before disposal by a licensed waste removalist.

Minimise VOC emissions and contamination of soil and water with hazardous wastes

- Collect paint residues, waste paints, thinners and solvents in sealed containers for either:
 -  recycling
 - disposal by a licensed waste removalist.
- Train staff to minimise overspray when surface coating.

Note: The above control measures are the minimum requirements for surface coating or spray painting operations. Under some circumstances such as large-scale operations in sensitive areas, and where complaints have arisen from the operation, more stringent standards may be applied.

Spray Equipment Cleaning

Minimise VOC emissions, solvent and labour costs

- Use a gun wash station or similar for cleaning spray equipment. Scrape the paint cup free of any residual paint with a spatula before cleaning the equipment with solvent.

Minimise VOC emissions and the generation of hazardous liquid wastes

- Store all contaminated and spent solvents used for cleaning equipment in sealed drums for recycling either internally (where cost effective) or via a reputable solvent recycler.
- Collect waste solvents and sludges that are unsuitable for recycling, for disposal as regulated waste.

Note: Allowing the waste solvents to evaporate and subsequently disposing of the residue as solid waste exposes workers to unnecessary health risks and must be discontinued.

Prevent contamination of soil and water

- Direct water contaminated with paint debris to a settling tank. Store until the particulate matter settles out. Allow the clear water to discharge to sewer or have it removed from the premises on a regular basis.
- Remove sludge from the settling tank for disposal to landfill with approval.

Minimise VOC emissions from evaporation and spillage

- Store all volatile solvents (paint thinners and gun wash) in covered containers fitted with taps to avoid the need to pour solvents.



STORAGE OF POTENTIAL CONTAMINANTS

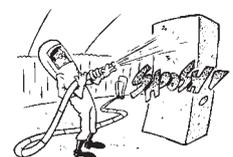
Minimise accidental spills and prevent contamination of soil, stormwater, ground-water and/or air



- Store chemicals and other materials that may contaminate soil, stormwater, groundwater and/or air in a manner that prevents or minimises the impact of any accidental spills or releases. This means:
 - potential liquid contaminants stored in a secure, covered area away from through traffic. Such contaminants may include disinfectants, fuels, oils, detergents, poisons, cleaning solvents, alkaline or acidic solutions;
 - storage areas provided in an impervious bunded area or compound to contain any leakage or spillage. The capacity of the compound shall be at least the capacity of the largest tank or package in the compound. (Bunding may not be required where the storage is inside a workshop or similar area and the operator can demonstrate that any spills will not escape the area and contaminate stormwater or surrounding ground.); and
 - where dangerous goods (as defined by the ADG Code) are stored in quantities in excess of minor storage (Refer to the Note below), the capacity of the compound shall comply with the requirements of the relevant legislation, Australian Standard and/or Code of Practice.
Relevant Australian Standards may include:
 - AS 1940 *The storage and handling of flammable and combustible liquids*
 - AS 2022 *Anhydrous ammonia – Storage and handling anhydrous ammonia*
 - AS 2714 *The storage and handling of hazardous chemicals - Class 5.2 substances (organic peroxides)*
 - AS 3780 *The storage and handling of corrosive substances*
 - AS 3833 *The storage and handling of mixed classes of dangerous goods in packages and intermediate bulk containers*
 - AS 4081 *The storage, handling and transport of liquid and liquefied polyfunctional isocyanates*
 - AS 4326 *The storage and handling of oxidising agents*
 - AS 4452 *The storage and handling of toxic substances*

Note: Storage of materials in excess of minor storage quantities may require approval, licensing and full compliance with the above standards. Contact Council or the relevant dangerous goods administering authority for further information.

- Storage must be:
 - away from any heating or ignition sources
 - adequately ventilated, either naturally or mechanically, according to the nature of the substance and its use.



Reduce volatile emissions

- Store volatile liquids (e.g. solvents, thinners) in closed containers that are kept closed when not in use. This will avoid unnecessary exposure of volatile liquids.
- Keep Material Safety Data Sheets (MSDS) for all liquid and powder products used or stored on site. In case of an emergency an MSDS is the most effective means of assessing risk.

CAUTION!: Some classes of materials may react dangerously if mixed or stored together. Incompatible materials must be segregated to minimise the possibility of any reaction. Read and follow all directions on labels. Refer to the materials' Material Safety Data Sheet (MSDS) or contact the manufacturer for further information.

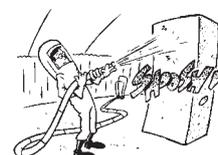
Respond promptly to spills and leaks

- Keep clean-up equipment, absorbent materials, and any materials for neutralising or decontaminating spills on the premises. Train staff in the use of these materials.
- Clean-up spills or leaks immediately. Contaminated materials are not to be reused and must be appropriately contained and packaged for transport for either recycling or disposal by a licensed waste removalist.

Minimise chemical risks



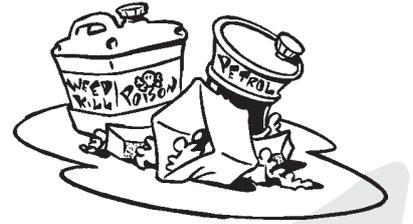
- Fit containers of chemicals (e.g. solvents) with taps to enable pumping instead of pouring.
- Position trays under chemical container taps to catch any spillage or drips. Ensure the tray's material is compatible with the chemical.



WASTE MANAGEMENT

Reduce wastage of material resources and landfill space

- Minimise all wastes produced by site activities.



Recycle and reduce waste disposal costs



Disposal of wastes should be viewed as the last option in environmental management strategies. The life of material resources may be extended by recovery, reuse and recycling.



Implement a waste recycling (reuse) system for non-hazardous solid wastes using separate containers for individual waste streams (Refer to Solid Wastes section).

- Label waste containers clearly and locate them in convenient areas to encourage use. Mixing wastes may make them unsuitable for reuse or recycling.

Protect soil, stormwater and groundwater quality

- Always store solid wastes under cover so contaminants cannot be washed to stormwater by rain.
- Never dispose of waste on site.



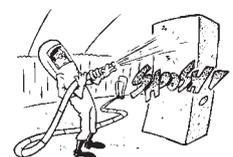
For general cleaning of workshop surfaces use wet/dry vacuum cleaners with dust filters instead of sweeping and hosing with water.

Prevent landfill hazards

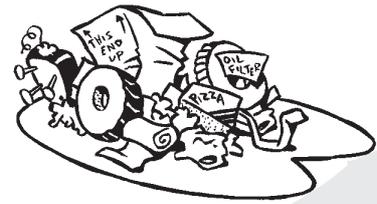
- Material put into industrial bins will generally go to landfill. Do not dispose of gas cylinders, asbestos-containing materials or synthetic-mineral fibres into an industrial bin.
- Put solid inert waste only in industrial bins. Dispose of other wastes through a licensed waste removalist.

Protect air quality

- Incinerating waste on site is prohibited.



SOLID WASTES



Hazardous Wastes (regulated)

Prevent contamination of landfill, soil and water

- Regulated wastes (eg paint residues, and 'contaminated' and non-recyclable spent abrasives) are those that have been identified as unsafe for municipal or refuse landfill disposal. These wastes are listed in Schedule 7 of the *Environmental Protection Regulation 1998* (refer to Appendix 2) and must be disposed of by a licensed waste removalist.
- Keep proof of proper hazardous wastes disposal for presentation to Council officers upon request. Proof includes:
 - Hazardous waste disposal facility docketts
 - Waste manifest documents
 - Licensed waste transport receipts

Non-hazardous Wastes

Conserve material resources, landfill space and reduce waste disposal costs



The following solid wastes are recyclable. They should be collected in separate containers for disposal at a waste recycling and reprocessing facility:

- clean cardboard and paper
- aluminium cans, drink bottles
- plastics
- steel drums, drained steel cans
- metal parts
- rags (can be laundered and reused)

Ensure appropriate disposal of non-recyclable solid wastes

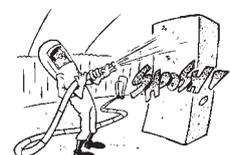
- Always dispose of non-recyclable solid waste at a licensed general waste disposal facility eg. local government service or approved waste removalist.

Prevent contamination of landfill and groundwater with hazardous wastes

- Empty all containers or vessels containing paints thinners, acids, solvents, and other chemicals or potential contaminants before disposing via the industrial bins.

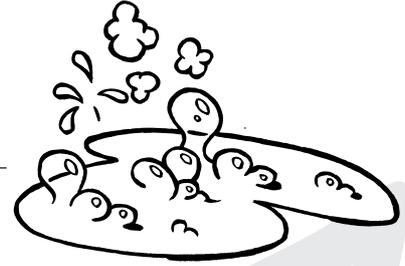
Prevent air contamination by harmful dusts

- Bag floor sweepings and other dusty wastes before disposing via the industrial bins.
- Only transport general solid wastes in your own vehicle or by a licensed waste transporter.



LIQUID WASTES

Non-sewerable Wastes (regulated)



Prevent contamination of landfill, soil and water

- Non-sewerable (regulated) wastes are those that have been identified as unsafe for sewer disposal. These wastes are outlined in Schedule 7 of the *Environmental Protection Regulation 1998* (refer to Appendix 2) and must be disposed of by a licensed waste removalist.
- Keep proof of proper disposal of non-sewerable wastes for presentation to Council officers upon request. Proof includes:
 - hazardous waste disposal facility docket
 - waste manifest docket
 - licensed waste transport receipts.



Separate out recyclable liquid wastes for collection by a licensed waste removalist. Recyclable liquid wastes include solvents, thinners and waste oil.

Sewerable Wastes

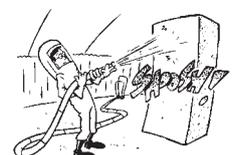
Ensure compliance with licence conditions (Trade Waste Permit)

- Obtain a Trade Waste Permit from Council prior to discharge of any trade waste to the sewer. The permit establishes the discharge conditions for the waste.
- Water-miscible solutions are generally accepted under a Trade Waste Permit. This may include dilute organic wastes.
- As a guideline the minimum treatment required for discharge to sewer is an oil/silt interceptor trap.
- Washdown waters must either be directed to the sewerage system under the conditions of the Trade Waste Permit, or collected for recycling or disposal by a licensed waste removalist. This includes wastewater from washing vehicles.

Prevent contamination of landfill, soil and water



On-site treatment and reuse of wastewater (e.g. washdown waters) can be used to replace or reduce disposal of wastewater to sewer. The systems of treatment and nature of reuse must not cause pollution or be hazardous to persons (refer to Appendix 5).



STORMWATER MANAGEMENT

Prevent contamination of soil, stormwater and local watercourses

Stormwater flows untreated to your local creek or waterbody.

- Prevent stormwater from entering or leaving work areas where it may become contaminated with grease, oils, chemicals, particulates, paint residues, 'contaminated' and non-recyclable spent abrasives or solvents.
 - Cover and bund such areas where necessary, to avoid the incursion of stormwater and prevent hazardous and trade wastes from contaminating the surrounding soil and stormwater system.
- Prevent wastewater containing contaminants (such as ammonia, disinfectants, solvents and detergents used for cleaning areas) from contaminating stormwater or the ground. Do not hose workshop floor, vehicles or machinery parts on to the surrounding soil or the stormwater drains.
- Store wastes undercover so that contaminants cannot be washed to stormwater by rain.

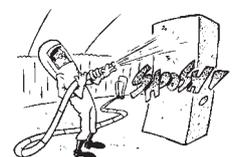


Avoid sewerage system overload

- Do not direct stormwater to the sewerage system. It is an offence under the *Sewerage and Water Supply Act 1949*.
- Contain any contaminated stormwater (e.g. in a holding tank or pit) and:
 - Dispose of by a licensed waste removalist
 -  treat on-site to an appropriate standard for discharge
 -  treat on-site for recycling or reuse (refer to Appendix 3).

CAUTION!: *Contaminating stormwater and other Queensland waters may result in an 'on the spot' fine or prosecution under the Environmental Protection Act 1994.*

The Environmental Protection (Water) Policy 1997 prohibits the discharge of 'certain things' into a roadside gutter, stormwater or a water, or to a place where it could be reasonably expected to move or to be washed into a roadside gutter, stormwater or a water. Discharges to stormwater must comply with the Environmental Protection (Water) Policy 1997.

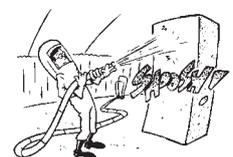


AIRBORNE WASTES

Dust Control

Maintain and protect local and regional air quality, soil and waters

- Control dust and abrasive material to minimise particle movement off-site. They may contain hazardous materials and contaminate air, soil and waters.
- Regularly collect and place in a sealed bag floor sweepings, dust, powder waste or absorbent clean up materials, before disposing in a covered waste bin.
-  Use wet/dry vacuum cleaners with dust filters for general cleaning of the workshop floor surface instead of sweeping and hosing with water.



NOISE MANAGEMENT



Prevent nuisance and unreasonable noise

- The activity must not cause an 'unreasonable noise' as defined in the *Environmental Protection (Noise) Policy 1997*.
- Avoid using extension telephone bells and public address systems. If considered necessary maintain at the lowest possible audible level. Also ensure that music does not cause an environmental nuisance.
- Ensure that silencers fitted to air compressors, pumps, fans and blowers and other noisy machinery are effective.
- Enclose or acoustically screen noisy equipment that does not comply with *Environmental Protection (Noise) Policy 1997* to muffle noise. Such equipment or operations should be located away from noise sensitive land uses.



When purchasing new equipment give preference to equipment with efficient noise-reduction devices installed.



Close windows and roller doors facing noise-sensitive premises and seal all unnecessary openings.

- Regularly maintain all equipment and vehicles and attend promptly to any loose parts, rattling covers, worn bearings and broken components. This should be addressed through a regular maintenance schedule and correct staff training.
- Reduce structural-borne noise and vibration by mounting equipment on vibration isolating platforms, rubber mats, or by increasing the mass weight of equipment.



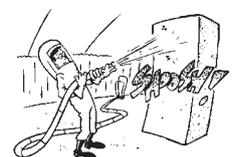
Fit mechanical ventilation systems (e.g. air conditioners, fans) with noise-proof ducting and acoustically designed intake and exhaust openings.



Use the layout of the buildings and the natural topography as noise barriers where possible. Cost-effective landscaping improvements (e.g. fencing, mounds, and plants) can be implemented to reduce noise emissions and therefore noise complaints.

Note: Premises causing ongoing noise problems may be required to introduce other noise control measures, including noise monitoring and reporting.

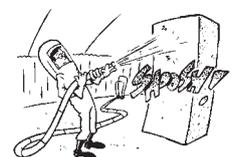
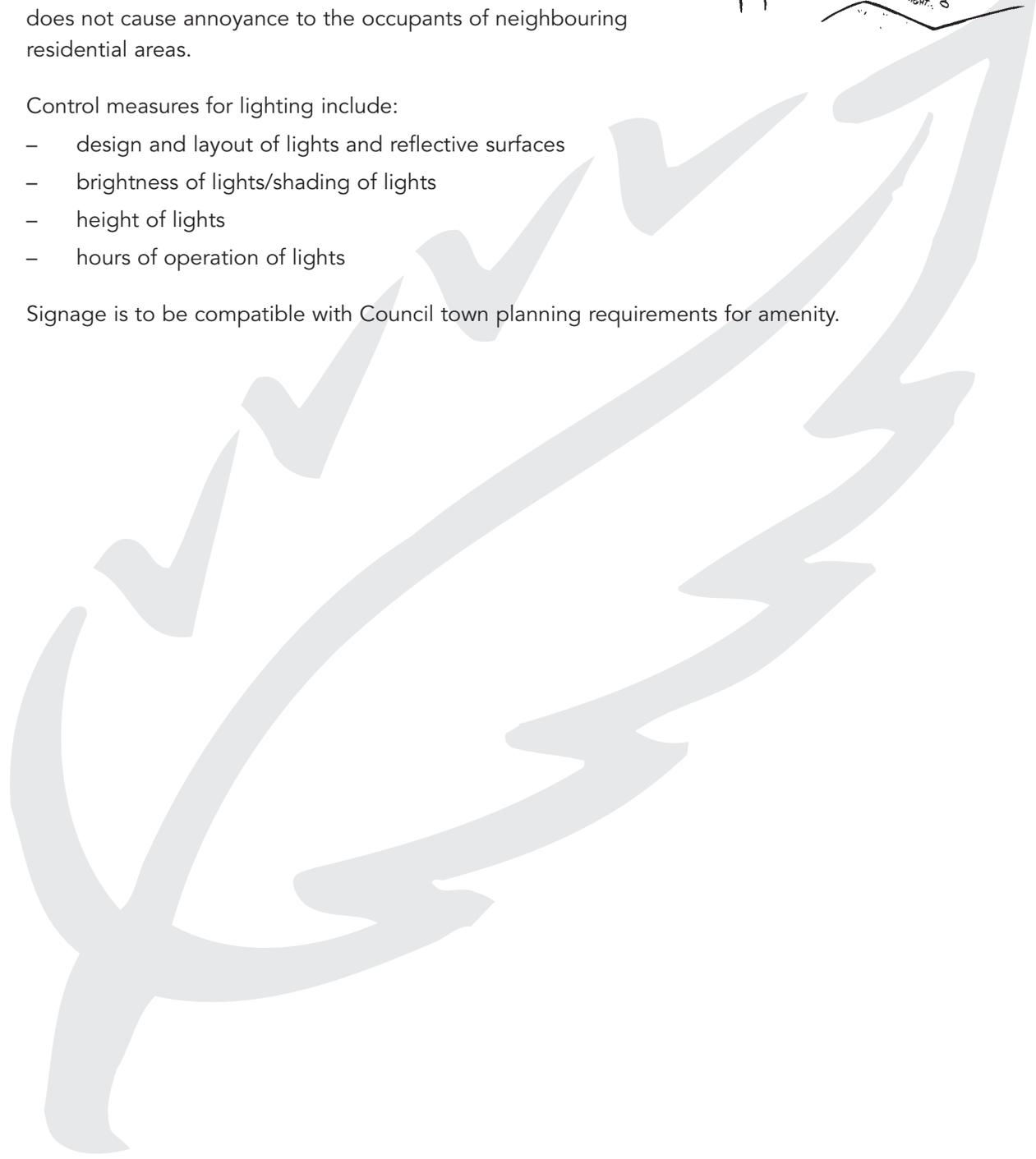
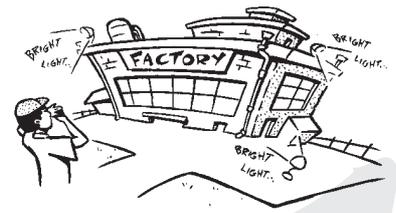
Operators should also be aware of the cumulative effects of noise levels on the receiving environment, and where practical, take appropriate steps to reduce noise levels from their operation, particularly before 7am and after 6pm.



VISUAL AMENITY

Prevent environmental nuisance

- Ensure that lighting of the premises for security or any other reason does not cause annoyance to the occupants of neighbouring residential areas.
- Control measures for lighting include:
 - design and layout of lights and reflective surfaces
 - brightness of lights/shading of lights
 - height of lights
 - hours of operation of lights
- Signage is to be compatible with Council town planning requirements for amenity.



APPENDIX 1 – SPRAY BOOTH REQUIREMENTS

- Spray painting must be conducted in a fully enclosed booth that has an exhaust fan and a filtration system with a particle removal efficiency of at least 90%. The following table lists preferred filtration methods.

APPLICATION RATE	FILTRATION SYSTEM	FILTRATION EFFICIENCY
0-4 litres per hour	Dry (fibre) filter, water scrubber	> 90%
> 4 litres per hour	Water scrubber, activated carbon adsorption & dry (fibre) filter	> 90%

Overspray from large production can rapidly block dry filter pads, therefore where paint application rate is more than 4 litres/hour a water scrubber is the preferred filtration system.

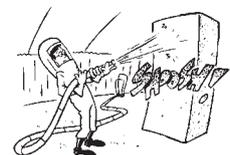
- Exhaust gases must be discharged vertically through a stack with:
 - an internal diameter of not less than 0.5 metres **and**
 - either 8 metres high above the ground or 4 metres higher than the highest ridgeline of the surrounding buildings within 15 metres of the stack, whichever is higher.

Exit velocity of the exhaust gases must not be less than 10 metres per second. The stack must be fitted with an effective rain protection device that does not inhibit the vertical flow of gases.

A monitoring port must be installed at the exhaust stack. Refer to *Australian Standard AS4323.1 (1995) - Stationary Source Emissions. Method 1: Selection of Sampling Positions.*

The above conditions may be adjusted for particular circumstances if warranted by the risks involved. Large continuous spray painting operations and operations very close to sensitive areas may be required to install more advanced filtration system (e.g. activated carbon filter) to reduce the total volatile organic compound (VOCs) levels in the exhaust gases. These operations will be assessed on a case by case basis.

- For spray booth design requirements, refer to Aust. Standard (AS/NZS 4114.1 and 4114.2:1995) for *Spray Painting Booths* and check with the Queensland Division of Workplace Health and Safety.



APPENDIX 2 – POWDER COATING BOOTH REQUIREMENTS

Guidance on the construction of Spray Booths for Powder Coating should be taken from the specifications as detailed within AS 'Safe Application of Powder Coatings by Electrostatic Spraying'.

The design of the powder-coating booth should be such that airborne powder must not escape from the booth into the workplace. The following table lists general requirements.

AVERAGE AIR VELOCITY THROUGH EACH BOOTH OPENING	STACK REQUIREMENTS		FILTRATION EFFICIENCY
	HEIGHT	EXIT VELOCITY	
< 0.40 M/S	<ul style="list-style-type: none"> • 8 metres above the ground or • 4 metres above the highest ridgeline of the buildings (which ever is highest) 	> 10 m/s	> 90%

Where two or more spray guns are operated simultaneously, the booth apertures through which the powder is sprayed should be located directly opposite each other and should not be located within 600 mm of each other when measured horizontally.

Exhausted air/powder coat mix collected within the spray booth should be removed from the booth through a filtration system. This filtration system should consist of a cyclone filter and/or a wet scrubber, textile or cartridge filter.

Exhausted air quality from stacks venting spray booths will be required to comply with the standards prescribed by the *Environmental Protection (Air) Policy 1997*.

Consideration must be given to hazards due to dust explosion and fire associated with the application of powder coating.

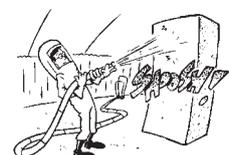
Consideration should be given to adjacent buildings and structures when designing exhaust stacks, to ensure that the dispersal of effluent does not adversely impact on the amenity of, or cause an environmental nuisance to persons occupying such buildings or structures.

A monitoring port is to be installed within the exhaust stack.

Spare filters should at all times be kept on site. Weekly inspections of the filtration system should be completed to ensure that the system is not leaking.

Leaks are to be repaired immediately and maintenance records kept by the operator. Filters should be wrapped in plastic bags prior to disposal to prevent escape of dust.

Booths should be positioned within the work area so as they are not affected by any air draughts flowing through the building, thereby potentially affecting the overspray capture efficiency within the booth.



APPENDIX 3 – DEFINITIONS

Bund

An impervious embankment or wall of brick, stone, concrete, or other approved material that may form part or all of the perimeter of a compound. For example, a bund may be used to contain spills from a fuel tank.

Environmental Harm

An adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value and includes environmental nuisance, *Environmental Protection Act 1994*.

Environmental Management Program (EMP)

A specific program that, when approved, achieves compliance with the *Environmental Protection Act 1994* for the matters dealt with by the program by:

- (a) reducing environmental harm
- (b) detailing the transition to an environmental standard

Environmental Management System (EMS)

Is a systematic approach to managing the environmental aspects of an activity. As a minimum for the lower risk activities administered by Council, an EMS would entail documenting standard operating procedures for the aspects of the activity that may result in environmental harm or nuisance.

Environmental Nuisance

Any unreasonable interference or likely interference with an environmental value that is caused by noise, dust, odour, light, an unhealthy, offensive or unsightly condition because of contamination, or another way prescribed by regulation, *Environmental Protection Act 1994*.

Environmental Value

- (a) A quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or
- (b) another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation, *Environmental Protection Act 1994*.

General Environmental Duty

A person must not carry out an activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm.

Material Safety Data Sheets (MSDS)

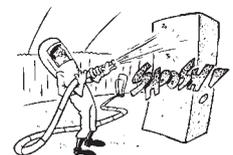
Information sheets on products that manufacturers are required to provide. They outline the composition, applications and precautions that need to be taken in using such products.

Regulated Liquids Wastes

Those wastes that have been identified as unsafe for sewer disposal due to their chemical nature (eg flammable). These wastes are outlined in Schedule 7 of the *Environmental Protection Regulation 1998*.

Regulated Solid Wastes

Those wastes that have been identified as unsafe for landfill disposal. These wastes are outlined in Schedule 7 of the *Environmental Protection Regulation 1998*.



Stormwater

Rainfall that runs off hard surfaces, such as roofs, roads and car parks, or off ground that has become saturated. Stormwater flows untreated to local creeks.

Trade Waste

Liquid wastes from any business, industry, trade or manufacturing process approved for sewer disposal other than domestic sewage

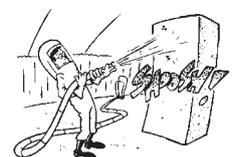
Unreasonable Noise

An unreasonable noise is one which:

- (a) causes unlawful environmental harm because of:
 - its characteristics
 - its intrusiveness
 - the time at which it is made
 - where it can be heard
 - other noises ordinarily present at the place where it can be heard
- (b) is not declared to be reasonable in and Environmental Protection Policy.

VOCs (Volatile Organic Compounds)

Evaporated organic solvents e.g. hydrocarbons or alcohols, or unburnt liquid fuels, which are known or suspected to have environmental or health effects. Examples of VOCs include solvents, thinners, acrylic lacquers and fuels.



APPENDIX 4 – SCHEDULE 7 - REGULATED WASTES

Abattoir effluent	Heterocyclic organic compounds containing oxygen, nitrogen or sulphur	Pharmaceutical substances
Acids and acid solutions	Hydrocarbons (oxygen, nitrogen or sulphur)	Phenolic compounds (other than solid inert polymeric materials)
Adhesives (other than solid inert polymeric materials)	Industrial plant wash down waters	Phosphorus
Alkalis and alkaline solutions	Infectious substances	Pickling liquors
Antimony	Inks	Polychlorinated biphenyls and related substances
Arsenic	Inorganic cyanides and cyanide complexes	Polymeric lattices
Asbestos (all chemical forms)	Inorganic sulphur compounds	Poultry processing wastes
Azides	Isocyanate compounds (other than solid inert polymeric materials)	Quarantine waste
Barium	Laboratory chemicals	Reactive chemicals
Batteries	Lead	Reducing agents
Beryllium	Lime neutralised sludges	Resins (other than solid inert polymeric materials)
Biocides	Lime sludges	Saline effluent and residues
Boiler blowdown sludge	Materials or equipment contaminated with infectious substances	Selenium
Boron	Mercaptans	Silver compounds
Cadmium	Mercury and anything containing mercury	Solvent recovery residues
Caustic solutions	Metal finishing effluent and residues	Surfactants
Chlorates	Methacrylate compounds (other than solid inert polymeric materials)	Tallow
Chromium	Nickel	Tannery effluent and residues
Contaminated soils	Oil interceptor sludges	Tars and tarry residues
Copper compounds	Oil water emulsions and mixtures	Tellurium
Cytotoxic wastes	Oils	Textile effluent and residues
Detergents	Organic solvents	Thallium
Distillation residues	Oxidising agents	Timber preservative effluent and residues
Dyes	Ozone depleting substances	Treatment tank sludges and residues (including sewage tank sludges and residues)
Electroplating effluent and residues	Paint sludges and residues	Tyres
Filter backwash waters	Perchlorates	Vanadium
Filter cake sludges and residues	Pesticides	Vegetable oils
Fish processing waste	Petroleum tank sludges	Vehicle wash down waters
Fly ash		Wool scouring effluent & residues
Food processing waste		Zinc compounds

APPENDIX 5 – ON-SITE TREATMENT AND REUSE OF WASTEWATER OR STORMWATERS

- a) The operator should consult with the Council regarding any system for the collection, treatment and reuse of wastewater (e.g. washdown waters) or stormwater that may be contaminated. This needs to be approved by Council to ensure the method and level of treatment is adequate and safe.
- b) It is generally necessary to test and monitor treated waters to demonstrate effectiveness of the system for Council approval.
- c) Consideration must be made of:
 - volumes to be treated
 - handling and storage
 - key contaminants
 - types of treatment
 - disposal of wastes (e.g. sludge)
 - safety and hygiene
 - testing and frequency.

