

2.2 Maintenance practices

2.2.8 Maintenance of vehicles, plant and equipment (including washing)

Description

The storage and maintenance of vehicles, plant and equipment can contaminate stormwater with pollutants such as petrol, diesel, kerosene, coolants, solvents, brake fluid, motor oils, lubricating grease, sediment and heavy metals. The washing of vehicles, plant and equipment can also produce highly contaminated wastewater that should not be directed to stormwater or groundwater.

Applicability

The following management practices are applicable to maintenance activities undertaken by government agencies, construction and maintenance companies, operators of automotive workshops and residents that maintain their own vehicles.

The US EPA (2001) highlighted the automotive repair industry as a significant generator of hazardous waste. Common activities at these premises include cleaning of engine parts, changing of vehicle fluids and replacement and repair of equipment.

These maintenance activities are undertaken in urban and regional areas; however, in high-density urban areas, the potential environmental impacts are more pronounced due to the greater concentration of vehicles and higher proportion of impervious surfaces (US EPA, 2001).

Recommended Practices

The Light Industry Project, the Motor Trade Association of Western Australia's Green Stamp Programs and the Centre of Excellence in Cleaner Production can provide training, support and further information. Refer to the Additional Information and Examples / Case Studies sections.

The following management practices are recommended by VSC (1999), US EPA (2001) and MTA of WA environmental guidelines (October 2004).

Storage

- ✓ Store vehicles, plant and equipment in secure, bunded and undercover areas where possible.
- ✓ Schedule and record the results of regular plant inspections.
- ✓ Designate parking areas for each vehicle to facilitate leak tracing.
- ✓ Develop procedures for identifying, reporting, repairing and cleaning up leakages.

Cleaning plant and equipment

- ✓ See the MTA WA's Environmental Guidelines *Cleaning Vehicles, Cleaning Up Spills, Degreasers and Detergents, Mobile Mechanical Repairers, Oil Separators, Parts Washers and Purchasing Spill Kits* for more information.
- ✓ Clean plant and equipment regularly and routinely.

- ✓ Install suitable signage, identifying the use of specific areas and prohibiting the disposal of liquid wastes to the stormwater system. Stencilling around all stormwater drains/inlets is also recommended (e.g. 'Rainwater only – flows to the river').
- ✓ Stormwater must be separated from wastewater. Ensure that all 'wash-down' activities are conducted in a dedicated wash bay. Wash bays should be covered and bunded where appropriate. Wash bays that are connected to sewer and have an area greater than 20 m² *must* be covered.



Figure 1. Green Stamp automotive premises, Balcatta. Under-cover, bunded wash-down area, with parts washer, wastewater treatment equipment and drums for recyclable materials. (Photograph: Department of Environment.)



Figure 2. Green Stamp automotive premises, Balcatta. Vehicle wash-down area, with collection drain for wastewater treatment. (Photograph: Department of Environment.)

- ✓ An Industrial Waste Permit is required to connect and discharge wastewater to sewer. Further information is available from the Water Corporation by telephoning the Customer Service Centre on 13 13 95 or via <www.watercorporation.com.au/indwaste>.
- ✓ Wastewater from wash bays may require pre-treatment, such as silt traps and oil separation systems, prior to being discharged into wastewater systems (e.g. sewer or septic). For example, wastewater from degreasing operations must pass through an approved oil separation system before being discharged to sewer.
- ✓ Use grassed areas where infrequent on-site cleaning of mildly soiled vehicles is required and a wash bay is not easily accessible. No degreasing or parts cleaning should occur outside of designated cleaning areas. Mobile services should not degrease engines, unless the wastewater can either be captured for approved disposal by a licensed waste contractor or can be collected and pre-treated via an oil separation system before approved disposal to sewer (in accordance with an approved Industrial Waste Permit) or septic.
- ✓ The wash bay's water supply may be supplemented with stormwater (e.g. rain water from roofs).
- ✓ Design a contingency plan for accidental chemical spills, and clean up spills immediately. Refer to MTA WA's guideline, *Cleaning Up Spills*. For large spills, contact the Department of Environment's Emergency Pollution Response Unit on (08) 9222 7123 (after hours 1800 018 800). Further information is available via <<http://emergency.environment.wa.gov.au>>.

Refuelling areas

- ✓ Use concrete paved areas because bitumen deteriorates as a result of fuel or oil spillage. The area's design should contain all spills and ensure spillages cannot enter the stormwater system. See the MTA WA's Environmental Guidelines *Bunds and Bunding, Cleaning Up Spills, Oil Separators, Preventing Oil Pollution* and *Purchasing Spill Kits* for more information.
- ✓ Design a contingency plan for chemical spills and train staff in the correct use of spill absorbents and clean up procedures. For large spills, contact the Department of Environment's Emergency Pollution Response Unit on (08) 9222 7123 (after hours 1800 018 800). Further information is available via <<http://emergency.environment.wa.gov.au>>.
- ✓ Clean up spills using 'dry' methods. Maintain kits containing dry clean up material (e.g. absorbents) and directions for its use adjacent to, or within, refuelling areas. Post signs to instruct operators not to 'top off' or overfill fuel tanks.
- ✓ Inspect fuel areas daily to identify any leakages.
- ✓ Ensure underground fuel tanks are subject to regular testing for leakages (e.g. pressure testing).
- ✓ Do not hose the refuelling area during cleaning activities, unless the resultant wastewater can be directed towards an oil separation system.

Vehicle maintenance

- ✓ Where possible, perform vehicle maintenance indoors.
- ✓ If maintenance work is performed outdoors, designate a specific area, keep it clean at all times and use 'dry' clean up practices.
- ✓ Update the facility's schematics to accurately reflect all plumbing connections.
- ✓ Floor drains should be sealed off during maintenance activities.
- ✓ Keep drip trays or containers under the vehicles at all times during maintenance. The captured liquids should be disposed of through an approved system and / or recycled.
- ✓ Train staff in the correct use of spill absorbents and clean-up procedures. Spills should be cleaned up immediately. For large spills, contact the Department of Environment's Emergency Pollution Response Unit on (08) 9222 7123 (after hours 1800 018 800). Further information about emergency response is available via <<http://emergency.environment.wa.gov.au>>.
- ✓ Rags or absorbent cloths should be used to clean up small spills, dry absorbent material for larger spills, and a mop for general cleaning (i.e. not to clean up any spills). Mop water can be disposed of via the sink or toilet.
- ✓ Reinforce proper waste disposal practices by undertaking employee training. Ideally, training (as well as risk assessments, procedures, audits, reporting, etc.) would be undertaken as part of an environmental management system for the site (see Section 2.5.1).
- ✓ Promptly transfer used fluids to drums or hazardous waste containers for recycling or disposal by a licensed waste contractor.
- ✓ Do not pour liquid waste down the floor drains, sinks or outdoor stormwater drains / inlets.

- ✓ Drain all fluids from any end-of-life vehicles being kept on-site for scrap metal and / or parts.
- ✓ All cleaning activities should be conducted in a centralised area to facilitate the capture, treatment and/or disposal of wastewater and other hazardous liquids.
- ✓ Replace chlorinated organic solvents with non-chlorinated ones like kerosene or mineral spirits or water-based products.
- ✓ A licensed waste contractor should be used to remove used solvents from site either for recycling or approved disposal. Alternatively, solvent thinner recycling systems can be used on the premises, reducing purchase and disposal costs.
- ✓ Store all new and used batteries on sealed ground, in bunded undercover areas.
- ✓ When degreasing and cleaning parts, use water-based cleaning agents in preference to those that are solvent-based. Steam cleaning and pressure washing may also be used instead of cleaning agents.
- ✓ See the following MTA WA's Environmental Guidelines for more information: *Bunds and Bunding, Cleaning Up Spills, Coolant Management, Degreasers and Detergents, Managing Body Repairer Wastewater, Mobile Mechanical Repairers, Oil Separators, Parts Washers, Preventing Oil Pollution, Purchasing Spill Kits and Solvent Thinner Recycling Systems.*

Benefits and Effectiveness

The US EPA (2001) noted in relation to vehicle maintenance that 'fluid spills and improper disposal of materials result in pollutants, heavy metals and toxic materials entering ground and surface water supplies, creating public health and environmental risks. Alteration of practices involving the clean up and storage of automotive fluids and cleaning of vehicles and vehicle parts can help reduce the influence of automotive maintenance practices on stormwater run-off and local water supplies' (p. 10).

Specifically, pollution prevention practices and good 'housekeeping' practices for the maintenance of vehicles, plant and equipment as addressed in this guideline should result in:

- Reduced loads of pollutants entering stormwater and shallow groundwater (particularly fuels, oils, solvents, sediment and heavy metals), thereby minimising the risk to the health of receiving waters.
- Reduced potential for organisations managing these premises to be subject to complaints from stakeholders or enforcement by environmental regulators.
- Reduced need for scheme/mains water because of stormwater reuse (e.g. at wash bays).
- Reduced need for downstream, end-of-pipe, stormwater treatment devices (as the practices in this guideline are all source controls).

Challenges

The following challenges may need to be addressed to improve implementation:

- The facilities and time needed to perform maintenance work indoors may make this practice impractical or unappealing.
- It may be difficult to contain spills from vehicles that are brought on-site after working hours.
- Procedures and training materials for employees must be continually updated.

- Installation and maintenance of structural controls for pre-treatment of wastewater discharges and stormwater discharges can be expensive.
- There could be some reluctance to invest in fixed infrastructure (e.g. wash bays) when operating out of leased premises.
- Some facilities can be limited by the lack of local service providers with respect to hazardous waste removal, maintenance of wastewater treatment infrastructure, or provision of equipment to recycle hazardous substances.

Cost

Given the numerous management practices covered by this guideline and the need to select and tailor these practices for each site, meaningful cost information cannot be provided.

Additional Information

Refer to Section 2.2.10 for stormwater management on commercial and industrial premises. Refer to Section 2.3.4 for information about education and participation campaigns for commercial and industrial premises. For information on stormwater management at work depots, see Section 2.2.6.

The Examples / Case Studies part of Section 2.3.4 has information about the South East Regional Centre for Urban Landcare's Clean Drains - River Gains campaign to reduce nutrients and other contaminants in receiving water bodies. For further information, contact the South East Regional Centre for Urban Landcare (SERCUL), 69 Horley Road, Beckenham WA 6107, via <www.sercul.org.au> or by telephoning (08) 9458 5564.

The Motor Trade Association of Western Australia's Green Stamp program provides environmental assessments, training and support, including simple environmental management plans, case studies and environmental guidelines for automotive businesses and practices. Resources include the *Environmental Products and Services Directory* and guidelines such as *Asbestos Use and Disposal*, *Building New Premises*, *Bunds and Bunding*, *Cleaning up Spills*, *Cleaning Vehicles*, *Coolant Management*, *Degreasers and Detergents*, *Environmental Policy*, *Mobile Mechanics*, *New Environmental Laws*, *Oil Separators*, *Parts Washers*, *Preventing Oil Pollution*, *Purchasing Spill Kits*, *Solvent Thinner Recycling Systems*, *Wastewater Management for Body Repairers*, *Environmental Assessments for Body Repairers* and *Environmental Assessments for Mechanical Repairers*. Refer to the Examples/Case Studies section, below. Further information is available via <www.greenstamp.com.au> or by telephoning (08) 9345 3466.

The Light Industry Project is a network of industry, State and local government, community groups, education and training providers. The project aims to provide small to medium-sized businesses with on-ground support, positive incentives and resources. Different levels of training and support are available, depending on the needs of particular businesses and industry sectors. Further information is available by telephoning (08) 9374 3301 or via <www.environment.wa.gov.au> and <www.wastewise.wa.gov.au>. The Light Industry Project office is at the Swan Catchment Centre, 80 Great Northern Highway, Middle Swan WA 6056.

The Centre of Excellence in Cleaner Production, Curtin University of Technology, Western Australia, provides training, support and resources including checklists and environmental guidelines. Refer to <<http://cleanerproduction.curtin.edu.au>> or telephone (08) 9266 4520.

Refer to relevant Water Quality Protection Notes, available from the Department of Environment via <www.environment.wa.gov.au>, or by telephoning (08) 9278 0300. For example:

- *Mechanical Servicing and Workshops* (Water and Rivers Commission, 2002);
- *Mobile Mechanical and Cleaning Services* (Draft) (DoE, 2004);
- *Washdown of Mechanical Equipment* (WRC, 1998);
- *Industrial Sites Near Sensitive Water Bodies* (WRC, 1999);
- *Chemical Spills – Emergency Response Planning* (WRC, 2002);
- *Stormwater Management at Industrial Sites* (WRC, 2002);
- *Toxic and Hazardous Substances – Storage and Use* (WRC, 2002).

Refer to the *Environmental Management and Cleaner Production Directory for Small and Medium Businesses* (DoE and SRT, 2004). Relevant Sections include Section 1.3 Training and Support, Section 2.0 Fuel and Chemical Storage, Section 3.2 Auto Dealerships (Car Yards), Section 3.3 Automotive and Mechanical Repair and Section 3.10 Industrial Cleaning. The Directory lists Western Australian, interstate and international environmental management and cleaner production resources. Available via <www.environment.wa.gov.au> and <www.swanrivertrust.wa.gov.au> or by telephoning the Swan River Trust on (08) 9278 0900.

Examples / Case Studies

Green Stamp Program - Motor Trade Association of WA

The Green Stamp Program was developed by the Motor Trade Association of Western Australia and the Western Australian Department of Environment, with funding assistance from the Waste Management and Recycling Fund. It originated in 1997 after the then Department of Environmental Protection released a set of Codes of Practice for three sectors of the automotive retail industry. The Department found that this approach had little or no impact on changing behaviour and believed that an industry-based approach may be more successful. The Motor Trade Association of Western Australia in conjunction with the Department developed a range of sector-specific environmental resources and initiatives. As the program developed, so too did the concept of developing an accreditation system for the industry to promote those businesses demonstrating industry best practice. The program currently consists of one full-time coordinator that manages the program's broad range of activities, including site assessments, environmental seminars, distribution of environmental guidance notes and directories, certification and promotion of Green Stamp Accredited businesses.

The program has identified and focused on several key areas considered essential to reducing the environmental impact of the automotive industry. These areas are:

- Storage practices associated with chemicals and other hazardous substances;
- Pre-treatment of wastewater from the workshop prior to approved disposal;
- Spill management to prevent pollution of ground and stormwater systems;
- Correct disposal of waste products (preferably to recycling or reuse);
- Air quality management;
- Energy and resource conservation; and
- The development and implementation of environmental management plans.

Solvent recovery system, Western Australia

A Western Australian panel and paint repair workshop that repairs approximately 160 vehicles per month invested in a solvent recovery system in the mid-1980s. The system produces recycled solvent suitable for use in gunwash (for cleaning spray equipment), metal primers and polyester resins. The purchase of new solvents for gunwash has been reduced from approximately 200 L per month to approximately 20 L per month. This has resulted in reduced on-site pollution risk due to the storage of smaller volumes of solvents on the premises. The recycling system has also reduced the volume of waste solvent requiring disposal to zero. The savings from reduced new solvent purchases and zero waste disposal costs have resulted in an annual saving of \$3,792. More information can be obtained from the MTA of WA's Green Stamp website, under Eco-efficiency Case Studies: Solvent Recycling (<www.greenstamp.com.au>).

Vehicle maintenance facilities in California

The Clean Bay Business Program in Palo Alto, California, regulated vehicle service facilities via licensing, education, inspections and the provision of incentives for good performance (Lehner *et al.*, 1999). When premises were first inspected under the program in 1992, only 4% of 318 facilities complied with regulations relating to discharges to stormwater and sewer. By the end of 1992, this percentage had risen to 41% and by 1998 it had risen to 94%. In addition, violations of regulations that specifically protect *stormwater* drains fell by 90% between 1992 and 1995. The program also found and eliminated 78 direct discharges to stormwater (e.g. washwater discharges).

The initial per-facility cost of running the Clean Bay Business Program was approximately US\$300, with a cost of US\$150 per annum for each subsequent year. The cost of improving stormwater management that was incurred by the *businesses* is unknown.

Other case studies

Australian and international case studies are also available from:

- The Centre of Excellence in Cleaner Production, Curtin University of Technology, Western Australia. Refer to <<http://cleanerproduction.curtin.edu.au>> or telephone (08) 9266 4520.
- Section 1.6 - Case Studies in the *Environmental Management and Cleaner Production Directory for Small and Medium Businesses* (DoE and SRT, 2004). Available via <www.environment.wa.gov.au> and <www.swanrivertrust.wa.gov.au> or by telephoning the Swan River Trust on (08) 9278 0900.

References and Further Information

Department of Environment and Swan River Trust 2004, *Environmental Management and Cleaner Production Directory for Small and Medium Businesses*, DoE and SRT, Perth, Western Australia. Relevant sections include Section 2.0 Fuel and Chemical Storage, Section 3.2 Auto Dealerships (Car Yards), Section 3.3 Automotive and Mechanical Repair (including washdown) and Section 3.10 Industrial Cleaning. The Directory is available via <www.environment.wa.gov.au> and <www.swanrivertrust.wa.gov.au> or by telephoning the Swan River Trust on (08) 9278 0900.

Green Stamp Program / Motor Trade Association of Western Australia, which includes Environmental Guidelines for a range of activities undertaken by automotive businesses. Cited October 2004 <www.greenstamp.com.au>.

Lehner, P.H., Aponte Clarke, G.P., Cameron, D.M. and Frank, A.G. 1999, *Stormwater Strategies: Community Responses to Run-off Pollution*, Natural Resources Defence Council, New York, New York. Cited at <www.nrdc.org/water/pollution/storm/stoinx.asp>.

United States Environmental Protection Agency (US EPA) 2001, *National Menu of Best Management Practices for Storm Water Phase II*. United States Environmental Protection Agency on-line guideline. Cited at: <www.epa.gov/npdes/menuofbmps/menu.htm>.

Victorian Stormwater Committee (VSC) 1999, *Urban Stormwater - Best Practice Environmental Management Guidelines*, CSIRO Publishing, Melbourne, Victoria.

Water and Rivers Commission 1998, *Washdown of Mechanical Equipment*, Water Quality Protection Note, August 1998, Water and Rivers Commission, Perth, Western Australia.

Water and Rivers Commission 2002, *Chemical Spills – Emergency Response Planning*, Water Quality Protection Note, Water and Rivers Commission, Perth, Western Australia. Available via <www.environment.wa.gov.au> or by telephoning the Department of Environment on (08) 9278 0300.

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Water and Rivers Commission 2002, *Stormwater Management at Industrial Sites*, Water Quality Protection Note, Water and Rivers Commission, Perth, Western Australia. Available via <www.environment.wa.gov.au> or by telephoning the Department of Environment on (08) 9278 0300.

Water and Rivers Commission (2002), *Toxic and Hazardous Substances – Storage and Use*, Water Quality Protection Note, Water and Rivers Commission, Perth, Western Australia. Available via <www.environment.wa.gov.au> or by telephoning the Department of Environment on (08) 9278 0300.