



Chemical Storage and Spill Response Guidelines

SD-066

Supporting Document – Applicable to Infrastructure & Place

Divisional Management System

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1. Purpose and scope

The purpose of this guideline is to provide guidance with regard to chemical storage and spill management on Infrastructure and Place (IP) project sites. The storage and/or use of liquid substances poses a potential risk of environmental harm if not managed appropriately. Establishing and maintaining designated chemical storage and handling areas minimises the risk of pollution to land and waters.

This guideline applies to all types of chemical storage on site including, but not limited to, designated bulk fuel or chemical storage, diesel generators, gas cylinders, temporary fuel containers for mobile plant and any areas on site where chemicals may be used.

This guideline includes references to some of the relevant legislative and regulatory requirements but is not intended to replace them. It is not intended to replace any requirements identified as part of the EIA process.

2. Definitions and acronyms

All terminology in this document is taken to mean the generally accepted or dictionary definition with the exception of the following terms which have specifically defined meaning:

CEMP	Construction environmental management plan
CLM Act	<i>Contaminated Land Management Act 1997</i>
EIA	Environmental impact assessment
Environment Manager	The Alliance or Contractor Environment Manager
EPA	New South Wales Environment Protection Authority
MSDS	Material Safety Data Sheet
OEH	NSW Office of Environment and Heritage
PIRMP	Pollution incident response management plan
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
TfNSW	Transport for New South Wales
TSR	TfNSW Standard Requirement

3. Accountabilities

The Director Planning, Environment and Sustainability is accountable for this guideline. Accountability includes authorising the document, monitoring its effectiveness and performing a formal document review.

Project directors are accountable for ensuring the requirements of this document are implemented within their area of responsibility.

Project directors who are accountable for specific projects/programs are accountable for ensuring associated contractors follow this document to the extent they are required under the TfNSW Standard Requirements (TSR).

Contractors are accountable for following this document, where this guideline forms a part of their contract.

4. Legislative requirements and due diligence

The POEO Act is the principal statute for protection of the environment and regulation of pollution. The CLM Act regulates the investigation and clean up of land contamination.

When using and storing liquid chemicals (including fuel), contractors must be aware of their obligations to:

- store, handle, manage and use liquid chemicals in accordance with applicable legislative requirements, Australian/ISO Standards, and relevant guidelines ensuring that water and land does not become contaminated/polluted
- prevent spills and leaks to the environment
- dispose of waters appropriately
- notify the regulatory authority, local council or EPA, if material harm to the environment occurs or if contaminated land poses a significant risk of harm.

Legislation and regulations relevant to the storage and handling of chemicals and waste are presented in Table 1 below. Significant penalties exist for breaches of the legislation/regulations. This can be in the form of notices for cessations of work, remediation of contamination, monetary fines, prosecutions and imprisonment.

Table1: Regulations and Guidelines of Chemical Storage in NSW

Substances	Relevant Regulation
Dangerous goods	<ul style="list-style-type: none"> • Dangerous goods are regulated under the <i>Occupational Health and Safety Act 2000</i> and the <i>Occupational Health and Safety Regulation 2001</i>. • OEH regulates transport of dangerous goods on public roads (<i>Road and Rail Transport Act 1997</i>, which applies the Australian Code for the Transport of Dangerous Goods by Road and Rail to NSW) • WorkCover NSW Code of Practice for the Storage and Handling of Dangerous Goods • Sample- Australian Standards • <i>AS 1940- The storage and handling of flammable and combustible liquid</i> • <i>AS 2714- The storage and handling of hazardous chemical material- Class 5.2 substances (organic peroxides)</i> • <i>AS 3833- The storage and handling of mixed classes of dangerous goods in packages and intermediate bulk containers</i> • <i>AS 3780- The storage and handling of corrosive substances</i>
Hazardous substances	<ul style="list-style-type: none"> • WorkCover NSW has a range of publications relating to the occupational health and safety of hazardous substances • Refer to Dangerous Goods Australian Standards
Underground petroleum storage system	<ul style="list-style-type: none"> • OEH – underground storage tanks are required to comply with the <i>Australian Institute of Petroleum Code of Practice The Design, Installation and Operations of Underground Petroleum Storage Systems CP4-2002</i>
Group A liquid wastes (as defined in Division 2 of Schedule 1 of the POEO Act)	<ul style="list-style-type: none"> • OEH- transport, tracking and disposal under the Protection of the Environment Operations (Waste) Regulation 2005

Substances	Relevant Regulation
Pesticides	<ul style="list-style-type: none"> • OEH enforces proper use of pesticides (<i>Pesticides Act 1999</i> and <i>Pesticides Regulation 1995</i>) • WorkCover NSW has occupational health and safety requirements for the use of pesticides and where they are classified as dangerous goods, regulates their storage and handling
Liquid chemicals	<ul style="list-style-type: none"> • OEH's Storing and handling liquids: Environmental Protection – Participant's Manual (2007) • OEH's Environmental Compliance Report – Liquid Chemical Storage, Handling and Spill Management Part B (Review of Best Practice and Regulation 2005)
Substances that harm or are likely to harm the environment	<ul style="list-style-type: none"> • Under Section 116 of the POEO Act, it is an offence if a person wilfully or negligently causes a substance to leak, spill or otherwise escape in a manner that harms or is likely to harm the environment. In such circumstances, a person may be potentially subject to a Tier 1 prosecution by the NSW Office of Environment and Heritage. Tier 1 offences can attract penalties of up to \$5 million for corporations, and up to \$1 million and/or 7 years imprisonment for individuals.

5. Site management

The inappropriate/inadequate storage and handling of any liquid chemical has the potential to lead to spills or leaks to the environment and result in pollution of water and/or land. In addition, inappropriate/inadequate storage and handling of volatile liquids can lead to air pollution. The legal requirements and site management principles are the same whether liquid substances are being used or stored at a single location or as part of a mobile service.

Site management should be undertaken in accordance with the following guiding principles:

- provide training and information to all personnel, and particularly those handling chemicals, on how to prevent spills or leaks and how to respond to spills or leaks
- establish designated locations for storing and handling chemicals to reduce the risk of pollution as well as the cost of preventing and cleaning up pollution should a spill occur.
- ensure that spill response materials and resources are available at site to respond quickly in the event of a spill
- regularly inspect storage and handling areas. A site chemical checklist should be developed and documented the PIRMP or equivalent
- ensure pre-start checks and regular maintenance of equipment is undertaken.

Chemical management procedures should be incorporated in the CEMP.

6. Chemical storage

When storing any quantity of liquid substances on site, contractors should consider:

- types of storage to be established on site
- locations of storage
- mitigation measures to be implemented to prevent pollution
- any additional requirements specific to the substance and quantity (e.g. AS-1940-2004 apply to the storage of Class 3 flammable liquid).

6.1. Types of chemical storage

6.1.1. Bulk storage

Bulk storages are very large volumes (i.e. >1000 litres) of liquid chemicals used as raw material or manufactured as products at chemical plants. This type of chemical storage is generally not required on IP project sites.

6.1.2. Packaged storage

Liquid chemicals used on project sites are routinely delivered and stored in packages ranging from containers from a few litres to 200 litres drums, and intermediate bulk containers can have a holding capacity up to 1000 litres.

6.1.3. Waste storage

Liquid chemical wastes from paints and plant maintenance are generally stored in tanks or drums and need to be assessed and classified in accordance with the POEO Act and the NSW EPA Waste Classification Guidelines (2008) before disposal. Liquid waste can contain corrosive materials, oil and grease, nutrients and heavy metals.

6.1.4. Other liquid chemicals

Liquid chemicals used in the maintenance, repair and operation of mobile plant and equipment, such as fuels, lubricating oils, hydraulic oils and cleaning agents are delivered to site as packaged items.

6.1.5. Used packages

Used packages are partially used fuel cans, drums and paint containers on site. They are common used for mobile plant maintenance and refuelling.

6.1.6. Gas cylinder storage

Gas cylinders can be hazardous due to both physical and chemical properties of the compressed gases. On site gas cylinder storage may include flammable gas, toxic gas, oxidizing gas and non-flammable/toxic gas.

6.2. Locating chemical storage and handling areas

Chemical storage and handling should be undertaken in designated areas that are located to minimise the potential for land and/or water pollution to occur, preferably within site compounds.

1. Locations with a high risk of water and/or land pollution (to be avoided):
 - areas adjacent to water courses, stormwater drainage systems or other immediate pathway to sensitive environments
 - above waterways or sensitive environments (e.g. bridges, culverts, piers and wharves)
 - areas with sloping surfaces or flow paths (e.g. drainage lines) that lead to waterways, sensitive environments or off-site
 - areas prone to runoff, flooding or inundation during heavy rainfall
 - areas with high groundwater levels or aquifers

- bare ground or unsealed/pervious surfaces (note: crushed concrete, gravel, DGB surfaces are not considered to be impervious)
2. Locations with a low risk of water and/or land pollution:
- inside a designated building/structure that can serve as a secondary containment area so that spills can be contained
 - on sealed/impervious surfaces with suitable secondary containment measures and covered roofing to exclude rain water
 - on level ground at least 50m from any waterway, aquatic habitat or sensitive environment.

6.3. Management and mitigation measures

The following mitigation measures are designed to prevent, reduce or eliminate the discharge of chemicals to the environment.

6.3.1. Secondary containment

Chemicals and other hazardous liquids should be stored in areas or containers with secondary containment measures. Secondary containment refers to any means used to contain liquids in the event that the primary container (liquid storage container) or transfer mechanism fails, or spills/leaks from any other cause. Secondary containment can include:

- bunding – raised, impermeable barriers forming the perimeter of secondary containment areas (walls, speed humps, guttering, curbing, rubber barriers)
- encasement – bulk fuel container, flammable liquid cabinet and diesel generator with built in secondary containment
- grading of sealed surface areas to form a contained area
- other requirements identified by the relevant guidelines or MSDS.

The effective volume of the secondary containment for tank storage needs to be at least 100% of total volume of the largest tank, plus enough additional capacity to contain rain or fire-fighting water. As a guide sufficient capacity should be allowed to cope with a one-in-twenty-year 24-hour storm.

For multiple container or drum storage, containment stores must have sufficient capacity to contain at least 25% of the total volume of the containers being stored and have adequate additional capacity to contain rain water or fire fighting water.

An area is not a secondary containment area if there are any drains within it that allow liquid to escape from the contained area.

6.3.2. Spill response materials

Spill response materials are designed to absorb or direct the flow of liquids that have spilt onto land or into water. Spill response materials must be available and readily accessible in the event of a spill and should be:

- Appropriate to the type of chemical and the environment (e.g. must be hydrophobic for use in water)
- Sufficient to contain the spill or to direct the spill away from waters, land, sensitive environments or drains.

Other resources that may be required in the event of a spill should also be considered, such as plant to create earth embankments and pumping and containment equipment.

6.3.3. Water management

Storage areas should be roofed where possible to prevent rainwater entering the secondary containment area. If this is not possible mitigation measures should be implemented to minimise the accumulation of rainwater inside the secondary containment and manage the disposal of potentially contaminated water.

Surface stormwater should be diverted away from storage and handling areas. If this is not possible, any stormwater entering such areas must be collected, monitored and tested for applicable quality parameters before appropriate discharge or disposal (refer to Water Discharge and Reuse Guideline SD-024).

6.3.4. General

Accessibility and appropriate security measures should be considered to prevent unauthorised access by the public and non-authorised personnel.

Storage and handling areas should be clearly identified with appropriate signage, including instructions for delivery personnel.

Storage and handling areas should be regularly checked for any signs of spills and to ensure the capacity of secondary containment is maintained.

6.4. Additional mitigation measures

In addition to the general mitigation measures identified above, specific measures should be considered for particular areas, activities and chemical types.

6.4.1. Packaged material storage

- Packaged material stores should be located with adequate separation from site boundaries and ignition sources. Drums and other containers are to be stored (stacked) in such manner that if the drums or other containers rupture or topple, the content will not spill outside the secondary containment.
- All products should be sorted, labelled and the MSDS should be available near the storage area. Products that are potentially dangerous when combined or mixed should not be stored in close proximity to each other.

6.4.2. Used package and waste storage

- Used packages (drums and containers) and containers storing waste liquids must be sealed.
- Labels of containers must be retained until the containers are washed, rinsed or removed from site.
- Accurate records of all wastes stored are to be kept to ensure early disposal.

6.4.3. Site liquid handling and refuelling

- Mobile liquid transfer points should be provided with suitable containment (bundling, drip trays) and spill response materials.

- All nozzles and valves used during the transfer of liquid between bulk fuel transport vehicle and storage containers must be fitted with shut-off valves to prevent overflow.
- Transfer pumps must be provided with emergency shut-down devices.
- All hoses must be purged before uncoupling.
- Overfill protection devices must be regularly inspected at least once weekly.

6.4.4. Gas cylinders storage and handling

- MSDS must be available, used to identify chemical and physical hazards and any requirements of the MSDS must be implemented.
- A risk assessment must be carried and recorded out to identify hazards and the need for any additional control measures.
- Relevant site personnel, including all sub-contractors need to be given information, and training about the hazards from gas cylinders and safe storage and handling.
- Objects must not be stored on top of gas cylinders.
- Full and empty cylinders are to be stored separately and clearly marked.
- Gas cylinders must be stored in an upright position.
- Ensure gas cylinders are prevented from falling or being knocked over by securing cylinders using a racking system or using a non-abrasive coated chain.
- Ensure gas cylinders are stored at least 3m away from combustible materials and sources of ignition.
- Gas cylinder stores must be located outdoors in a secure cage protected from sunlight.

7. Incident management and spill response

Incidents resulting from the storage and handling of chemicals may include leaks, spills, fires, explosions and the release of vapours. Their scale ranges from minor localised events (small scale spills and leaks which can be dealt with by site personnel using spill management procedures) to significant events (site emergencies which require an urgent response, and may involve the emergency services).

Procedures for responding to and managing chemical spills should be documented in the CEMP and PIRMP or its equivalent. The plan should include:

- procedures for dealing with fire/spills/containment
- diagram showing locations of chemical storage and emergency response equipment
- contact details of responsible personnel
- contact details for emergency services.

7.1. Incident response

The following are general procedures for managing a chemical spill:

- Report the spill incident immediately to site supervisor, Occupational Health and Safety Manager and Environment Manager
- Contact the NSW Fire and Rescue immediately on 000 if the spill presents a significant risk of harm to people or the environment

- Stop the spill at source as first priority provided it is safe to do so
- If the spill is not contained, apply spill response materials to contain and absorb the spill and to direct away from waters, drainage lines or sensitive environments. Flow paths should be blocked and the spill contained within the site boundaries
- Chemical spills should never be hosed by water, any water that comes into contact with the spill should be treated as contaminated wastewater
- Where possible, areas contaminated by spills should be covered during rainfall to the extent that it does not compromise clean-up activities
- Ensure that any used spill response materials (contaminated waste) are disposed appropriately
- Investigate the cause of each spill to determine and implement preventative actions to reduce the risk of a similar incident occurring.

7.2. Incident reporting

IP considers any chemical discharge to the environment (soil, air or water) to be an environmental incident that requires reporting to IP as per Environmental Incident Classification and Reporting PR-105.

8. Related documents and references

Related documents and references

Environmental Incident Classification and Reporting PR-105

Water Discharge and Reuse Guideline SD-024

NSW OEH Australian Code for the Transport of Dangerous Goods by Road and Rail to NSW

WorkCover NSW Code of Practice for the Storage and Handling of Dangerous Goods

NSW OEH Storing and handling liquids: Environmental Protection – Participant's Manual (2007)

NSW OEH Environmental Compliance Report- Liquid Chemical Storage, Handling and Spill Management Part B (Review of Best Practice and Regulation 2005)

AS 1940:2017 – The storage and handling of flammable and combustible liquids

AS 2714:2008 – The storage and handling of hazardous chemical material – Class 5.2 substances (organic peroxides)

AS 3833:2007 – The storage and handling of mixed classes of dangerous goods in packages and intermediate bulk containers

AS 3780:2008 – The storage and handling of corrosive substances