

## Chapter 26

# Waste and resource management





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## 26. Waste and resource management

Chapter 26 provides an assessment of the waste likely to be generated from the Moorebank Intermodal Terminal (IMT) Project (the Project), during construction and operation of the Project. This chapter also provides an assessment of the likely use of any resources that could be in short supply (e.g. water, energy, fuels and construction materials) and outlines the proposed measures to avoid, minimise and/or mitigate waste generation and resource use.

Table 26.1 identifies the Commonwealth Department of the Environment (DoE)'s Environmental Impact Statement (EIS) Guidelines and the Secretary for the NSW Department of Planning & Environment (NSW DP&E)'s Environmental Assessment Requirements (NSW SEARs) that are relevant to waste and resources.

Table 26.1 Relevant Commonwealth EIS Guidelines and NSW SEARs

Requirements	Where addressed
<b>Commonwealth EIS Guidelines under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)</b>	
<ul style="list-style-type: none"> <li>Details regarding water supply, waste water management, sewerage management, stormwater management and any other relevant public works.</li> </ul>	<p>Section 26.2.2 and section 26.4 (and also Chapter 8 – <i>Project development phasing and construction</i>)</p> <p>Stormwater management is covered in Chapter 16 – <i>Hydrology, groundwater and water quality</i></p>
<ul style="list-style-type: none"> <li>The EIS must include assessment of all the likely impacts of the action on the environment. In particular section 528 of the EPBC Act defines the environment as being:               <ul style="list-style-type: none"> <li>b) Natural and physical resources.</li> </ul> </li> </ul>	<p>Potential impacts and management associated with resources in short supply are discussed in section 26.4.</p>
<b>NSW SEARs under the NSW <i>Environmental Planning and Assessment Act 1979</i> (EP&amp;A Act)</b>	
<ul style="list-style-type: none"> <li>None specifically mentioned</li> </ul>	N/A

### 26.1 Assessment approach

Section 26.2 identifies and assesses the typical waste streams that would be generated during construction and operation of the Project. At this stage the assessment is qualitative only – estimates of generated wastes by type and quantity will be determined during detailed design and presented in the Stage 2 State significant development (SSD) approval(s). Measures to manage and mitigate waste are outlined in section 26.3.

In addition, the assessment provides a broad overview of resource requirements, including energy, materials and water resources, likely to be consumed during the construction and operation of the Project. Again, the assessment of resources is qualitative only, with a view to further assessment during subsequent approval stages.

Waste generation and resource use would be similar for the northern, central and southern rail access options and associated IMT site layouts, and therefore the impact assessment applies to all three rail access options.

### 26.1.1 Cumulative assessment

In accordance with the NSW SEARs, this EIS includes a cumulative assessment of the waste and resource use from the Project in combination with development on the Sydney Intermodal Terminal Alliance (SIMTA) site and other planned developments within the surrounding region. The findings of the cumulative assessment are provided in Chapter 27 – *Cumulative impacts*.

## 26.2 Waste generation

Construction and operation of the Project would likely be undertaken in a phased manner, commencing with Early Works in 2015 through to Full Build in 2030. The construction activities occurring during each Project development phase are identified in Chapter 8 – *Project development phasing and construction*. Waste generated from the Project can be broken into two main streams:

1. solid waste; and
2. effluent, sewerage, wastewater and trade waste.

These waste streams are described below.

### 26.2.1 Solid waste

#### During Early Works and construction phases

During construction of the Project, the following solid waste would be generated:

- demolition waste from the removal of Department of Defence (Defence) buildings and structures, including potential asbestos material;
- green waste from vegetation removal;
- hazardous solid waste, restricted solid waste, unsuitable excavated material and unexploded ordnance (UXO) during remediation and earthworks activities (as further detailed in Chapter 8 – *Project development phasing and construction* and Chapter 15 – *Contamination and soils*); and
- sewage, litter, paper and general recyclable waste from construction worker activities.

Details of the activities that would generate this waste are described in Chapter 8 – *Project development phasing and construction*.

#### During operation

Wastes generated during operation of the Project would include:

- green waste from landscaped areas;
- waste associated with maintenance of plant and equipment (e.g. old parts, packaging waste and cleaning waste); and
- office and administration waste such as paper and food waste.



### 26.2.2 Effluent, sewage, wastewater and trade waste

During the Early Works, construction and operation of the Project, effluent and sewage would be generated from the onsite facilities that accommodate personnel. This includes construction facilities, import/export (IMEX) and interstate equipment and maintenance facilities, administration buildings and standard toilet blocks located throughout the Project site. In addition, wastewater may also be generated by vehicle and train washdown facilities (if required).

A sewerage network would be constructed to service the IMEX and interstate facilities and warehousing. The system would include connections to the Sydney Water sewerage system (subject to Sydney Water consent) as well as a potential onsite sewage treatment and water recycling plant.

The discharge of trade wastewater from the Project site would be discussed with Sydney Water, with potential discharge subject to a trade waste agreement (permit or licence).

No grey water or contaminated stormwater would be released directly as groundwater recharge or into stormwater; nor would it be allowed to run into creek waters. Releases would be appropriately treated via onsite stormwater treatment systems (including biofiltration, swales, detention systems and sedimentation basins) designed in accordance with relevant guidelines (as identified in section 7.11.5 of Chapter 7 – *Project built form and operations*). Further details of stormwater drainage approaches are provided in Chapter 16 – *Hydrology, groundwater and water quality*. Grey water recycling and stormwater re-use would be encouraged wherever possible.

## 26.3 Management and mitigation of waste

### 26.3.1 Early Works and construction

A waste management plan would be prepared as part of the overall construction environment management plan (CEMP) for each construction phase, including Early Works. This would outline the key principles of relevant waste guidelines, and the waste management hierarchy of reduction, re-use, recycling and recovery. Further details of waste management measures are provided in Table 26.2 and also Chapter 9 – *Sustainability*, Chapter 14 – *Hazards and risks*, Chapter 15 – *Contamination and soils* and Chapter 16 – *Hydrology, groundwater and water quality*. The implementation of these management measures would reduce construction waste such that no significant waste impacts are expected during the Project Early Works and/or construction.

### 26.3.2 Operation

During the operation of the Project, a waste management plan would be implemented to govern the overall use of materials, categorisation of wastes, and re-use and recycling process.

The Project would be designed to maximise opportunities for future waste recovery through re-use and recycling during operation. The design would allow for storage areas for waste containers such as bins or skips. Materials that could be recycled include batteries, cross ties, paper and electronic equipment.

Waste streams would be minimised and eliminated as far as practicable, including for hazardous wastes. All wastewater, chemicals and solid wastes would be contained, segregated and treated or disposed of in accordance with the relevant regulations. Potential hazardous wastes are further described in Chapter 14 – *Hazards and risks* and Chapter 15 – *Contamination and soils*.

Waste control measures would be incorporated into the design and operating procedures as necessary to ensure emissions from the Project comply with all relevant Commonwealth, State and local government regulations.

A number of additional waste minimisation and waste management measures and principles would be implemented as part of the overall waste management system/plan, some of which are described in Table 26.2 below.

### 26.3.3 Mitigation measures

Table 26.2 identifies the proposed mitigation and management measures that have been adopted for the Project and which would be integrated into the Early Works, construction, operation and detailed design processes.

Table 26.2 Key waste minimisation and management measures

Project activity	Mitigation measures
Early Works and construction	<ul style="list-style-type: none"> <li>The waste hierarchy would be investigated and implemented where possible with avoidance of waste, re-use and recycling incorporated into construction methodologies.</li> </ul>
	<ul style="list-style-type: none"> <li>Consideration would be given to the selection of materials for use in construction to minimise waste generated throughout their lifecycle.</li> </ul>
	<ul style="list-style-type: none"> <li>Where practicable, construction materials that contain minimal embodied energy would be preferred.</li> </ul>
	<ul style="list-style-type: none"> <li>Opportunities would be explored where practicable to recycle or re-use materials arising from demolition works, with a preference for onsite re-use where possible (or recycling through an appropriate recycling contractor).</li> </ul>
	<ul style="list-style-type: none"> <li>Where possible, site disturbance and unnecessary excavation would be minimised.</li> </ul>
	<ul style="list-style-type: none"> <li>Formwork would be re-used where possible.</li> </ul>
	<ul style="list-style-type: none"> <li>Sewage waste would be disposed of by a licensed waste contractor in accordance with Sydney Water and NSW Office of Environment and Heritage (OEH) requirements.</li> </ul>
Operation	<ul style="list-style-type: none"> <li>The waste hierarchy would be investigated and implemented where possible with avoidance of waste, re-use and recycling incorporated into the design, purchasing and procurement.</li> </ul>
	<ul style="list-style-type: none"> <li>Consideration would be given to the selection of materials for use in operation to minimise waste generated throughout their lifecycle.</li> </ul>
	<ul style="list-style-type: none"> <li>Materials used onsite would be recycled where possible, including steel, batteries, electronics and paper.</li> </ul>
	<ul style="list-style-type: none"> <li>Future recovery of waste would be encouraged through site design, including provision for storage areas and appropriate paths for waste containers.</li> </ul>
	<ul style="list-style-type: none"> <li>Dedicated recycling storage areas and recycling bins would be located throughout the Project site, with clear signage and convenient access for waste recycling service providers. This would include bins for paper, plastics, glass, metals and compost.</li> </ul>
	<ul style="list-style-type: none"> <li>A separate bunded storage area would be established for liquid wastes (e.g. oils), along with drainage to grease trap if required.</li> </ul>
	<ul style="list-style-type: none"> <li>A waste management system would be developed to include calculations of anticipated waste volumes from the office, landscaped areas, refuelling facilities and warehousing and distribution activities for ongoing comparison and monitoring.</li> </ul>



Project activity	Mitigation measures
	<ul style="list-style-type: none"> <li>Onsite waste management infrastructure would, as a minimum, cater for the following three waste streams: <ul style="list-style-type: none"> <li>&gt; recovered waste (for re-use or recycling);</li> <li>&gt; residual waste (for disposal or alternative waste technology); and</li> <li>&gt; hazardous waste (wastes that are toxic, corrosive, flammable, explosive or reactive).</li> </ul> </li> <li>Water efficient fixtures and fittings would be installed at all times where possible, including in all basins, washdown areas and offices and general amenities areas.</li> <li>Where possible, rainwater harvesting and surface water runoff management would be utilised for watering of gardens and landscaping.</li> <li>The use of grey water and black water recycling systems would be investigated. Recycling water would most likely be used for toilet flushing and/or landscape irrigation.</li> <li>Where possible, fire test water from the Project site would be collected for re-use. Washdown water from vehicle and train washdown facilities (if required) would also be collected for re-use.</li> <li>Where practicable, water meters would be installed on all major water uses (air conditioning cooling towers, irrigation, domestic hot water, amenities, washdown, rainwater collection and recycled water system).</li> <li>Water reduction targets would be established for office areas, in line with the National Australian Built Environment Rating System (NABERS) Water protocol for office buildings (assume 4.5 stars) (refer discussion in Chapter 9 – <i>Project sustainability</i>).</li> </ul>

## 26.4 Use of resources and mitigation

Consumption of some resources (such as energy, water and materials) has the potential to have detrimental effects on the environment and can also put price pressures on remaining resources. Accordingly, the following sections identify the key resources required during the Early Works, construction and operational phases of the Project. Measures to reduce and minimise the use of these resource are also identified below.

### 26.4.1 During the Early Works and construction phases

#### *Materials*

As the Early Works would not involve major construction or earthworks, the use of materials would be relatively minor and limited to building materials for site offices, as well as plants, mulch and seedbanking materials.

The Project would require a wide range of materials during the main construction phases, including spoil, steel, plastics, paints, concrete, ballast, aggregate and timber. Plants and mulch would also be required for landscaping.

All opportunities to utilise recycled building materials in the overall structure of the Project would be explored. Development of the design would seek to use construction materials that have been made with a post-consumer recycled content of 50% or greater.

Table 9.4 in Chapter 9 – *Project sustainability* identifies further initiatives to minimise the use of materials and, where possible, use recycled building materials for the Project.

*Energy and fuel use*

The Early Works and main construction phases would require the use of energy and fuels to power plant, equipment and transport vehicles. Measures to minimise the use of energy and fuel during these phases would be investigated and implemented where appropriate. This may include using non-renewable sources such as petroleum, diesel, natural gas and liquefied natural gas.

*Water*

The use of water during the Early Works phase would be largely limited to staff facilities, washing of plant and equipment, dust suppression during contaminated land remediation, and watering of new plantings within the conservation area.

During the main construction phases, water would be required for dust suppression, compaction and pavement stabilisation during earthworks, concrete batching, washing of plant and equipment, watering of landscaped areas, fire-fighting (if required) and staff facilities.

Where practicable, water would be re-used onsite, including water stored in sediment basins.

**26.4.2 During operation***Energy and fuel use*

Operation of the Project would require the use of energy in the form of:

- electricity to power operations such as cranes, administration buildings, maintenance facilities and warehouse buildings, gates, lights and security; and
- natural gas to serve administration buildings and maintenance and repair facilities for space heating, water heating and minor domestic purposes.

Fuels in the form of petroleum, diesel and liquid natural gas (LNG) would also be required for the operation of equipment, machinery and trains, and light and heavy vehicles. Rail-mounted gantry (RMG) cranes are proposed to be electric-powered equipment, while in-terminal vehicles (ITVs) are proposed to be powered by LNG.

A number of specific sustainability measures relating to energy and fuel are discussed in Chapter 9 – *Project sustainability*. With the implementation of these initiatives, the Project's operation is not expected to have a significant impact on the availability of energy and/or fuels.

*Water*

Water would be required for the operation of the IMEX and interstate terminals, warehousing and associated facilities such as the equipment and maintenance facility and administration. Water would also be required for landscaping, office use (including toilets, drinking water and hand washing) and the fire-fighting system.

Potable water use throughout the facility would be minimised through a number of sustainability initiatives as detailed in Chapter 9 – *Project sustainability*. This could include measures to reduce potable water consumption through efficient technologies, installation of water re-use systems, and monitoring and management of water usage.

Water would also be required for vehicle, locomotive and container washdown. This water would preferably be supplied from a combination of recycled water, rainwater and the mains water network.

Water sensitive urban design (WSUD) principles would be investigated and implemented throughout the Project site to improve stormwater runoff quality and reduce the use of potable water. This could include rainwater capture and harvesting for use on gardens and landscaping. Rainwater would also be used for toilet flushing and any vehicle/train washdown facilities (if required). Grey water could also be treated and re-used on the Project site.

Rainwater harvesting for re-use can be sourced from roofed areas and from on-ground stormwater runoff. Roof water would require adequate first flush treatments and could be directed to one or a number of holding tanks for re-use as process water, toilet flushing or irrigation of landscaped areas. On-ground stormwater could be directed to in-ground storage facilities and re-used for landscape irrigation.

A comprehensive outline of resource reduction measures is contained in Chapter 9 – *Project sustainability*. With the implementation of the measures outlined in that chapter, and the additional measures listed in Table 26.2 above, the Project's operation is not expected to have a significant impact on water supply in the region.

## 26.5 Summary

The key aspects of the waste and resources assessment are as summarised below:

- The Project would generate waste throughout the Early Works, construction and operational development phases. Waste generation and resource use would be similar for the northern, central and southern rail access options and associated IMT site layouts.
- Waste generated from the Project can be broken down into two main streams:
  - > solid waste (i.e. demolition waste, green waste, hazardous waste and sewage, litter, paper and general recyclable waste); and
  - > effluent, sewage, wastewater and trade waste.

Waste generation would be minimised as much as possible and a waste management plan would be prepared and implemented for Early Works, construction and operation. The waste management plan would be based on the waste management hierarchy of reduction, re-use, recycling and recovery.

Resources required during Early Works, construction and operation would include energy and fuels, construction materials and water. A number of resource reduction measures are proposed as part of the Project and no significant resource supply or use impacts are predicted. Actions include: reusing/recycling materials and wastes within the Project to minimise landfill; use of practices that maximise opportunities for waste recovery; appropriate separation, treatment and/or disposal of solid, liquid and hazardous waste; and use of WSUD.

Table 26.3 provides a summary of potential sources of waste and resource use likely to be associated with the Project during the Full Build for each rail access option.

Table 26.3 Summary of waste and resource use at Full Build for each rail access option

Sources of waste and resource use	IMT layout and associated rail access connection option		
	Northern	Central	Southern
Green waste generated from landscaping/maintenance	•	•	•
Waste generated from maintenance of plant and equipment	•	•	•
Office and administration waste	•	•	•
Effluent, sewage, wastewater and trade waste	•	•	•
Electricity to power IMT operations	•	•	•
Natural gas serve buildings, maintenance and repair facilities	•	•	•
Water use for IMEX and interstate terminals and associated facilities	•	•	•

Key: • = impact, - = no impact