Chapter 14

Hazard and risk

14 Hazard and risk

14.1 Introduction

This chapter summarises the potential impacts in terms of hazard and risk associated with the construction and operation of the proposal, including an assessment of whether the proposal is categorised as a potentially hazardous or offensive industry for the purposes of the State Environment Planning Policy 33 – Hazardous or offensive development (SEPP 33).

Clause 3 of the SEPP 33 states:

***'Potentially hazardous industry** means a development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality—*

(a) to human health, life or property, or

(b) to the biophysical environment,

and includes a hazardous industry and a hazardous storage establishment.'

Clause 4 of the SEPP 33 states:

***'Hazardous industry** means a development for the purposes of an industry which, when the development is in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the development from existing or likely future development on other land in the locality), would pose a significant risk in relation to the locality—*

(a) to human health, life or property, or

(b) to the biophysical environment.'

A Preliminary Hazard Analysis (PHA) has been prepared and is included as **Technical report J**. The PHA details all potential hazards and risks and analyses the consequences of potential incidents and the likelihood of such events occurring.

The methodology for the PHA involved:

- A screening assessment involving classification of each of the potentially dangerous goods stored at and transported to and from the site and a review of the quantities of dangerous goods against relevant guideline thresholds
- Determining the level of risk assessment necessary for each dangerous good through a workshop
- Conducting a risk assessment according to the level determined during the workshop and recognising the potential offsite impacts and mitigation measures.

The PHA was prepared in line with the following:

- SEPP 33
- Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines (Applying SEPP 33) (DoP, 2011)
- Multi-level Risk Assessment, Assessment Guideline (Department of Planning and Infrastructure, 2011)
- Hazardous Industry Planning Advisory Paper (HIPAP) No. 4, Risk Criteria for Land Use Safety Planning (DoP, 2011)
- HIPAP No. 6, Hazard Analysis (DoP, 2011).

The chapter also assesses whether the proposal would be categorised as a potentially offensive industry for the purposes of SEPP 33, drawing on the assessment of potential pollution in other parts of the EIS (for example, noise and odour).

Clause 3 of the SEPP 33 states:

***'Potentially offensive industry** means a development for the purposes of an industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would emit a polluting discharge (including for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land, and includes an offensive industry and an offensive storage establishment.'*

Clause 4 of the SEPP 33 states:

*'**Offensive industry** means a development for the purposes of an industry which, when the development is in operation and when all measures proposed to reduce or minimise its impact on the locality have been employed (including, for example, measures to isolate the development from existing or likely future development on other land in the locality), would emit a polluting discharge (including, for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land in the locality.'*

14.2 Existing environment

The proposal site is located within an area characterised by mostly industrial and transport infrastructure. The site is located next to waste facilities, such as:

- The SUEZ Eastern Creek Waste Management Centre comprising the now-closed landfill site and operational resource recovery facility, located to the north and north-east
- The operational Global Renewables waste management facility located immediately to the east.

To the west of the site is the M7 motorway and Eastern Creek industrial area and to the south of the site is the Warragamba Pipeline Corridor and the Austral Bricks facility. Hazards and offensive pollutants have the potential to impact neighbouring properties near the proposal or along haulage routes.

The nearest residential area is located around 1km to the south of the site in Horsley Park, with the Minchinbury residential area located around 3km to the north-west. Horsley Park Public School is located over 2km south of the site and a childcare centre is located within the Eastern Creek industrial area about 1km to the west of the site.

14.3 Assessment of potentially hazardous development

The storage and transportation of dangerous goods has the potential to cause hazards, such as fires, spills and explosions, if not managed appropriately. The following sections assess the potential risks from the storage and transportation of dangerous goods during construction and operation of the proposal.

14.3.1 Construction

The majority of hazard and risks are acknowledged during operation of the proposal. However, there are potential hazards and risks during construction. These include:

- Handling of contaminated soils – addressed in **Chapter 11 Soils and water** and **Technical report G Geotechnical Investigation Report and Contamination Investigation**
- Spills of dangerous goods during construction
- Construction vehicle or machinery incidents.

The CEMP will include measures to avoid these hazards and risks during construction.

14.3.2 Operation

The State Environment Planning Policy 33 – Hazardous and Offensive Development (SEPP 33) seeks to recognise and assess whether a proposed development for the purpose of industry or storage is potentially hazardous, as defined earlier.

The Applying SEPP 33 Guidelines note that the permissibility of a proposal to which the policy applies is linked to its safety, and the merits of proposals should be properly assessed in terms of offsite risk before being determined.

Dangerous goods and screening analysis

Under the Applying SEPP 33 guidelines, a development is considered potentially hazardous and requires a PHA if the storage or transport of hazardous materials exceeds specific screening thresholds outlined in Hazardous and Offensive Development Application Guidelines: Applying SEPP 33.

The NSW EPA describes dangerous goods as

'*substances and objects that pose acute risks to people, property and the environment due to their chemical or physical characteristics'*.

The proposal will require use of dangerous goods and will create dangerous goods as by-products throughout the operation of the EfW facility. A screening analysis was carried out which compared the quantities of dangerous goods necessary for the proposal against the thresholds. This is shown in **Table 14.1**. The quantities used in the screening assessment are estimates and will be refined during detailed design of the proposal.

Table 14.1: Dangerous goods used or created as a by-product from the EfW facility and screening

Dangerous good	Use onsite / by-product	Class	Quantity	Screening limit	Above or below threshold
Hydraulic oil	Hydraulic and lubrication oils are necessary consumables for the ongoing operation and lubrication of the grate, cranes, turbine and other mechanical equipment used at the facility.	3	~1t	2t and 3m from boundary	Below
Lubrication oil		3	~1t	2t and 3m from boundary	Below
Activated carbon	Added to the flue gas where it absorbs dioxins and furans, gaseous mercury, and other components	4.2	50t	1t	Above
Ammonia (ammonium hydroxide, 25% concentration)	Used in the Selective Non-Catalytic Reduction (SNCR) process where ammonia is injected into the boiler to reduce nitrogen oxide emissions in the combustion process	8	100t	50t	Above
Propane/acetylene	Necessary for welding repairs during maintenance operations	2.1	<100kg	100kg	Below
Phosphine	Associated with the incineration of phosphorous-rich waste, such as bone meal. The formation is slow and is usually avoided through proper ventilation of the IBA storage bays. This is a rare issue and has only been recorded in energy recovery facilities that contain an animal crematorium. This facility will not have an animal crematorium.	2.3	~350mg/hr	100kg	Below. By-product slowly produced by maturation of IBA
Hydrogen (gaseous)	Created from a reaction between IBA and the water used to cool IBA and prevent dust generation. This is due to the presence of aluminium and its reaction with regenerated water.	2.1	~7kg/hr	100kg	Below. By-product slowly produced by maturation of IBA

Dangerous good	Use onsite / by-product	Class	Quantity	Screening limit	Above or below threshold
Sodium hydroxide	Used within the wet scrubber to reduce acid gases and other flue gas components	8	50t	25t	Above
Hydrochloric acid	Used in water treatment regeneration.	8	1t	25t	Below
Flue Gas Treatment residues (FGTr)	FGTr is the name given to any residues that are extracted from the process after the addition of flue gas treatment reagents. FGTr is a combination of spent reagents and the leftover entrained ash within the flue gases that did not become deposited in the boiler section.	6.1	360t	0.5–2.5t	Above
Diesel	While diesel is not classified as a dangerous good, it can add to the fuel load if in fire, and hence must be considered when assessing the site.	N/A – however it is a C1 combustible liquid	140t	N/A	N/A
Lime (Calcium hydroxide)	Added to the flue gas where it neutralises acidic components. This is also not a dangerous good.	N/A	200t	N/A	N/A

There are four dangerous goods which exceed the thresholds, including:

- Activated carbon: the proposal will have 50t onsite, which exceeds the screening limit of 1t.
- Ammonia: the proposal will have 100t onsite, which exceeds the screening limit of 50t.
- Sodium hydroxide: the proposal will have 50t onsite, which exceeds the screening limit of 25t.
- Flue gas treatment residues (FGTr): the proposal will have 360t onsite, which exceeds the screening limit of 0.5–2.5t. The FGTr will also exceed the transportation thresholds.

The proposal will exceed the above thresholds, so the proposal is considered potentially hazardous as per SEPP 33, and a PHA is needed.

Assessment of hazards

As part of the PHA, the design team carried out a multi-level risk assessment and hazard identification study (HAZID) assessment on 28 February 2020 and 6 March 2020. The purpose of these two workshops was to determine what level of analysis is necessary for each potential hazard/risk in line with the multi-level risk assessment (DPI, 2011).

Fire in the waste bunker, formation of hydrogen in IBA, activated carbon dust explosion, diesel spill and bund fire and ammonium hydroxide dispersion hazards required a risk assessment following the criteria set out by HIPAP4 – *Risk Criteria for Land Use Safety Planning*. This risk assessment is undertaken for scenarios that have potential offsite consequences. For the remaining hazards, a qualitative level (Level 2) assessment was carried out.

All identified hazards are assessed in **Table 14.2**.

Table 14.2: Hazards, the required level of analysis and impact assessment

Identified hazard	Impact assessment
Fire in tipping hall	There are multiple scenarios that could result in a fire within the tipping hall (smouldering waste within a waste truck, a truck breakdown or a truck crash). The exact controls to mitigate against these types of events will be developed as the design progresses. In general, the design will include fire detection within the tipping hall, operational response plans to fires, truck breakdowns or truck crashes, automatic fire suppression systems, manual fire intervention systems and fire hydrant systems. The site can accommodate emergency vehicle access. As the tipping hall is enclosed, and with the above management methods proposed, there are not expected to be any offsite impacts.
Fire in waste bunker	The main cause of a fire occurring in the waste bunker would be from smouldering waste tipped into the bunker, waste left for extended periods which self-heats from decomposition processes or sparks from the shredder. Section 4.6 and Appendix H of the PHA provide a detailed assessment of fire in the waste bunker. The waste bunker will be equipped with a variety of fire safety systems, including continuous temperature monitoring, to recognise and control or suppress a potential fire within the bunker. This includes water cannons specified with thermal imaging and automatic targeting. Management and operational working methods to prevent a fire occurring will also be employed. The containment of a fire within the bunker hall will also prevent any impacts offsite.
Build-up of flammable gas in waste bunker	When waste decomposes, there is the potential for methane and other flammable gases to form in the waste bunker, causing a fire. To avoid this, waste will only be stored in the bunker for five days, which is not enough time to allow these flammable gases to build up. In addition, the facility is designed to operate under inward pressure, so that the furnace draws in air from the tipping hall and waste bunker. Any methane in the waste bunker will be drawn to the furnace where it can be combusted safely. This design will avoid the risk of flammable gas causing a fire in the waste bunker.
Dust explosion in tipping hall and bunker	Dust will be generated in the tipping hall from the large volume of waste movement. This has a risk of causing a dust explosion. The design for the tipping hall will avoid horizontal surfaces where possible, to prevent dust build-up. As part of the ongoing management plan during operation, the vacuum cleaning system is to be used, to reduce the likelihood of dust build-up. These measures will reduce the risk of a dust explosion in the tipping hall and prevent offsite impacts.
Formation of phosphine and hydrogen in IBA	The composition of waste being burned and method of cooling the IBA has the potential to cause both phosphine and hydrogen to form – both dangerous goods. The facility will not be accepting any animal remains, and therefore it is unlikely that phosphine will be present as a by-product in the IBA. If not managed appropriately, these dangerous goods could cause fires within the IBA building as they have low flammability limits. Proper ventilation of the IBA building is considered enough to mitigate the consequence of any build-up of unexpected phosphine. The IBA bunker will be designed so that gases produced by IBA will be drawn into the furnace and incinerated. IBA will be transported offsite in open air tankers to ventilate the IBA and prevent the build-up of hydrogen. (Refer to section 3.2.5 of the PHA). In addition, the IBA building will have hydrogen gas sensors and monitors which include alarms that tell staff when to manually activate the ventilation system if necessary.

Identified hazard	Impact assessment
Reaction between acid and base	Acids and bases will be required for the water treatment and flue gas treatment, such as sodium hydroxide, as explained below. The exact chemicals for water treatment will be selected as the design progresses and incompatible chemicals will not be stored in the same bunded area. Acids and bases will be stored in line with AS 3780-2008 and in line with obligations under section 5 of chapter 7 of the *Work Health and Safety Regulation 2011*. This includes the specific requirements of containing and managing spills under subdivision 2.
Sodium hydroxide	An interaction between sodium hydroxide and ammonia hydroxide could generate corrosive products, gas, heat and toxic products. These substances are incompatible and will not be stored in the same bunded area or in compounds that share a common drainage system. The bund for sodium hydroxide will be at least 100% of the capacity of each silo where the chemical is stored. Further, the transport of sodium hydroxide to the site is to be within a sealed tanker, and transfer into the tank is to be self-contained (through sealed piping).
Release of lime (calcium hydroxide)	While not classified as a dangerous good, a loss of control of lime (calcium hydroxide) has the potential to cause injuries as a mass powder substance. Calcium hydroxide will be stored in a silo so it is not released into the atmosphere, so will avoid impacts to the environment and offsite impacts.
UPS batteries fire/explosion	The site will include uninterruptable power supply (UPS) batteries in case of a power loss and to allow for continuous operation. The battery system will be either lead acid batteries or lithium-ion batteries. Lead acid batteries can produce hydrogen and can create an explosive atmosphere. The batteries will be stored in a battery room which is properly ventilated and designed so that hydrogen does not build up. Hydrogen detection equipment may be installed to detect any build up. The risk associated with lithium batteries is an overloading of the battery and a subsequent fire. Standard mitigation and protection measures will be applied, including a battery management system, to prevent the overloading of the battery.
Activated carbon dust explosion	Activated carbon could cause a dust explosion in two scenarios: within the storage silo or when it is being used within the baghouse as part of the flue gas treatment. To prevent a dust explosion in the baghouse, the flue control system will have a setpoint to avoid excess dust. All equipment will be maintained to avoid creating sparks during the process. The storage silo for the activated carbon will have temperature monitoring systems and gas suppression. The gas suppression bottles will be stored sufficiently far away from the silo, to reduce the likelihood of damage in an explosion. Further hazard assessments as required by specific activated carbon storage standards like AS/NZS 4745-2012 will be carried out. The exact design of the storage silos and the operational considerations to avoid dust explosions during filling of the silos will be developed as part of the design process. The measures outlined above are considered to reduce the residual risk of a dust explosion so far as reasonably practicable.

Identified hazard	Impact assessment
Diesel spill and bund fire	Diesel is required for auxiliary burners and a back-up diesel generator. The diesel will be stored in line with AS 1940-2017 and be contained within a bunded area that can hold 110% of the capacity of the storage tank. The PHA calculated the potential heat radiation impacts if the storage silo failed and a diesel bund fire started. The heat radiation would be felt at the site boundary, and people would have to move further away from the site to avoid being impacted. Through compliance with AS 1940-2017 the offsite risk of a diesel spill or bund fire is considered sufficiently mitigated as low as reasonably practicable.
Release of ammonium hydroxide	Ammonium hydroxide is used in the Selective Non-Catalytic Reduction (SNCR) process where ammonia is injected into the boiler to reduce nitrogen oxide emissions in the combustion process. If the storage of ammonium hydroxide failed, the worst-case results show a dispersion of toxic cloud at a Short-Term Exposure Limit (STEL) of 35 parts per million (ppm) at a height of 5m as far as a kilometre downwind from the site. The likelihood of this risk occurring has been estimated using a series of conservative assumptions and is below the risk criteria set out by HIPAP 4. There is an extremely low likelihood of such an event occurring (refer to Section 4.4, 5, 6 and 7 of the PHA). The storage area will be designed in line with AS 3780-2008 and be contained within a bunded area that can hold the capacity of the storage silo. Storage silos will have real-time level sensors to monitor and recognise leaks from the control room.
Flammable atmosphere of ammonium hydroxide	Ammonia can create a flammable atmosphere. The calculations in the PHA determined that the space within the silo which the ammonia is stored is likely to always be flammable and will be classified as a hazardous area zone. The design of the storage area and nearby electrical systems will consider potential ammonia leakage and be classified as appropriate hazardous zones in line with relevant standards.
Interference with aircraft	The proposal will produce a heat plume from the stack, which has the potential to pose risks to passing aircraft. The Civil Aviation Safety Authority (CASA) completed a preliminary assessment of the proposal. The assessment concluded that the plume from the stack (about 75m high) will not infringe the Obstacle Limitation Surface (OLS) for Western Sydney Airport. Western Sydney Airport Corporation (WSA Co) was also consulted about the proposal. Discussions confirmed that the proposal plume will not intrude into the protected airspace of WSA. The stack will also be lit in line with Federal Aviation Administration guidelines. Airservices Australia and Western Sydney Airport Corporation were notified about the proposed height of the stack on 23 April 2020. An Airservices assessment was carried out for Sydney, Bankstown, Camden and Richmond aerodromes, and Westmead Hospital heliport completed on 22 May 2020. Airservices Australia stated that they have no objection to the proposed plume rise from the proposal. Odour from waste facilities has the potential to attract wildlife, increasing the risk of wildlife strike for aircraft. The National Aircraft Safeguarding Framework recommends a 13km radius of an airport as a potential risk for wildlife strikes (advised by Guideline C-Managing the Risk of Wildlife Strikes in the Vicinity of Airports). The proposal site is outside of this 13km radius. As the entire EfW process is contained within the proposed buildings, odour emissions that could potentially attract wildlife will be avoided. So, there is no increase in risk of wildlife strike from the proposal.

Identified hazard	Impact assessment
Release of FGTr (onsite)	The FGTr contains a variety of elements, heavy metals, and toxins which will be held onsite and contained within a silo. The most credible scenario for the release of FGTr onsite is a failure of the hose during transfer of the FGTr from the silo to the sealed vehicle. The tankers will securely connect to the silo via a hose connection and FGTr will be deposited from the silo into the tanker in a controlled manner. During operation, spill management procedures will be followed, and ongoing maintenance of systems would be carried out to limit failure. This will reduce the risk of this scenario having an offsite impact as low as reasonably practicable.
Release of FGTr (during transportation)	The FGTr contains a variety of elements, heavy metals, and toxins which will be transported to an offsite treatment plant. The FGTr will be transported in sealed pneumatic tankers designed in accordance with AS/NZS 1210, which will provide protection in the event of a crash. If the truck transporting the FGTr crashes, this could lead to FGTr dispersion and has the potential to adversely impact people and biodiversity. Air dispersion modelling was undertaken (Appendix F of the PHA) and the results show that even with conservative assumptions, the impacts to sensitive human receptors, even at a distance of 20m, are expected to be negligible. Spilled FGTr could impact the flora and fauna. For the FGTr to reach the Cleanaway Hazardous Bulk Treatment Facility, the trucks must cross Reedy Creek and Ropes Creek. If a crash occurs near these waterways there is a risk of FGTr impacting fauna and flora in these creeks. The proposed haulage route is the shortest route to the treatment facility, so the impact is mitigated as low as reasonably possible. The final route will be confirmed in the detailed design and will consider community submissions pre-approval and the HIPAP 11 – Route Selection study post-approval.
Transformer bund fire/explosion	The site will require an oil-filled transformer which could cause a fire or explosion risk. Transformers are used frequently for industrial activities and have well-defined standards. The proposed transformer will be designed to comply with the relevant standards, which is considered enough to mitigate any risks.

While there will be dangerous goods stored onsite which could be subject to fire, explosion, or toxic release, these dangerous goods are well-understood and there are industry standards for storing and managing these goods which will be applied as part of the proposal.

There were five hazards identified as having potential to pose significant offsite risks:

- Fire in the waste bunker
- Formation of hydrogen in IBA
- Activated carbon dust explosion
- Diesel spill and bund fire
- Release of ammonium hydroxide.

Specific measures are listed in **Section 14.6** to mitigate these hazards. The PHA concludes that the identified risks can be readily and commonly mitigated, so the proposal is not within the criteria for a hazardous industry as defined in clause 3 of SEPP33 or as described in the Applying SEPP33 Guidelines.

14.4 Assessment of potentially offensive industry

14.4.1 Construction

Construction of the proposal has the potential to discharge pollutants offsite in the form of noise, dust and surface water contamination. Assessments of these impacts in other parts of the EIS have concluded that they can be managed with standard construction environmental management measures.

14.4.2 Operation

SEPP 33 seeks to recognise and assess whether a proposed development for the purpose of industry or storage is potentially offensive.

The Applying SEPP 33 Guidelines note that the permissibility of a proposal to which the policy applies is linked to its pollution control performance, and the merits of proposals should be properly assessed in terms of offence caused by pollution before being determined. The SEPP 33 Guidelines also note that potentially offensive industry, as defined earlier, could be regarded as development that would need a pollution control licence (EPL). If the licence conditions could not be met, the proposed development would be considered offensive and would not normally be permissible. Conversely, if the proposal could meet licence conditions, it would normally be permissible.

The proposal will have to receive an EPL. The scope of matters likely to be regulated by the EPL includes:

- Air quality and odour
- Noise
- Waste
- Water quality
- Contamination.

Table 14.3 summarises the environmental impacts of the known matters drawing on other assessments in the EIS, to demonstrate that the proposal can operate within impact assessment criteria and can be regulated by an EPL.

Table 14.3: Environmental matters likely to be regulated by an EPL

Matter	Assessments	Summary of impact assessment
Odour	Technical report A: Air Quality and Odour Assessment Report	The facility will receive putrescible waste which has the potential to generate odour. The design of the facility will minimise the release of odour by enclosing the waste receival hall and using fast-acting roller shutter doors for vehicle access. The facility will be developed with several pollution control systems, including using an inward pressure gradient for the tipping hall and waste bunker which causes air to be drawn into the combustion process. When boilers are not operating, a filtration system in the receival hall will be used to manage odour. The advanced flue gas treatment systems will also be used to prevent the flue gas from causing adverse odour or pollution impacts. An assessment of the potential impacts on air quality and odour is included in **Chapter 8 Air quality and odour** and **Technical report A Air quality and odour assessment report**. The results indicate that odour levels due to the proposal will be at or below the applied odour assessment criteria at all assessed receptors.
Air quality	Technical report A: Air Quality and Odour Assessment Report	All predicted impacts associated with emissions from the proposal are within the applicable emission limit values and impact assessment criteria, apart from cumulative ground level PM2.5 and PM10 concentrations, due to the existing background levels which already exceed the criteria (as occurs across much of New South Wales). Where background levels already exceed criteria, the EPA's approved methods allow for an alternative assessment approach which considers the change in the number of days when an exceedance is recorded as a result of the proposal. The assessment concluded that the proposal would not increase the number of days for which exceedances would be recorded for PM2.5 and PM10 concentrations, and that impacts would not be discernible or measurable.

Matter	Assessments	Summary of impact assessment
Contamination	Technical report G: Detailed Site Investigation Technical report G2: Remediation Action Plan	The Detailed Site Investigation (DSI) (**Technical report G**) found elevated levels of some contaminants on the proposal site. A Remediation Action Plan (RAP) has been prepared and will be carried out to manage recognised soil contamination. RAP outlines additional investigations, monitoring of soil gas and water, and talks about unexpected finds during future civil and construction works.
Waste management (handling, storage, transport)	Chapter 3 EfW policy	The proposal will receive waste as a feedstock for thermal treatment in the EfW process. The EPL will regulate how waste is handled, stored and processed, to minimise harm to human health and the environment. The EfW process will generate residual waste streams – Incinerator Bottom Ash (IBA), Boiler Fly Ash (BFA) and Flue Gas Treatment Residue (FGTr). IBA will be transported to an offsite location for storage and processing under a separate development application and EPL as described in **Chapter 22 Related development**. BFA and FGTr will be treated at an existing offsite facility before being disposed at a licensed facility as discussed in **Table 14.2** above.
Pollution to water	Technical report F Soils and Water Assessment Report and Technical report H Hydrology and Flooding Assessment Report	The proposal will have reticulated sewer systems, and stormwater drainage will be directed to the local surface water system. The proposal does not pose an unacceptable risk to groundwater quality, subject to standard pollution prevention measures. The proposal has been assessed against Blacktown City Council water quality pollutant reduction targets. The proposal will meet these targets, through the incorporation of rainwater harvesting, gross pollutant traps, bioretention and revegetation of the overland flow path.
Noise	Technical report I Noise and Vibration Impact Assessment	Noise and vibration will be generated during the operation of the proposal. **Technical report I Noise and Vibration Impact Assessment** concludes that the proposal can be designed to comply with all noise criteria. Similarly, design-embedded measures will be incorporated to avoid vibration impacts.

Based on the assessment in **Table 14.3**, the proposal is not considered an offensive industry as there are safeguards and mitigation controls in place to meet the requirements of the EPL. The proposal will not have a significant adverse impact in the locality, or on the existing or likely future development on other land in the locality, and as such does not result in a significant level of offence.

14.5 SEPP 33 – matters for consideration

In determining an application to carry out development to which SEPP 33 applies, the consent authority must consider the criteria in Clause 13 of SEPP 33.

Table 14.4 presents an assessment of the criteria in Clause 13 of SEPP 33.

Table 14.4: Assessment of SEPP 33 Clause 13 criteria

Criteria	Assessment
(a) current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development	The following guidelines were used for the PHA: • Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines (Applying SEPP 33) (DoP, 2011) • Multi-level Risk Assessment, Assessment Guideline (DPI, 2011) • Hazardous Industry Planning Advisory Paper (HIPAP) No. 4, Risk Criteria for Land Use Safety Planning (DoP, 2011) • HIPAP No. 6, Hazard Analysis (DoP, 2011)
(b) whether any public authority should be consulted concerning any environmental and land use safety requirements with which the development should comply	The following authorities have been consulted in about environment and land use safety: • Blacktown Council • Fairfield Council • Western Sydney Parklands Trust • Fire and Rescue NSW • Environment Protection Authority • SafeWork NSW • CASA • Western Sydney Airport • Airservices Australia.
(c) in the case of development for the purpose of a potentially hazardous industry—a preliminary hazard analysis prepared by or on behalf of the applicant	A PHA has been prepared (**Technical report J**).
(d) any feasible alternatives to the carrying out of the development and the reasons for choosing the development the subject of the application (including any feasible alternatives for the location of the development and the reasons for choosing the location the subject of the application)	**Section 2.6** of **Chapter 2 Strategic context** considers the alternatives of the proposal.

Criteria	Assessment
(e) any likely future use of the land surrounding the development	The proposal site is adjacent to existing and disused waste management facilities to the north and east, transport infrastructure and industrial activities to the west and water infrastructure and industrial activities to the south. There is unlikely to be any development to the north of the proposal site on the disused landfill. Residential development is prohibited in WSP, so there is unlikely to be residential encroachment near the proposal site. The WSP Plan of Management indicates the future land uses for the area which are likely to be industrial in nature, such as recycling and renewable energy facilities, consistent with the EfW facility.

14.6 Mitigation

The hazards and risks associated with EfW facilities are well-known and this allows for them to be readily recognised and mitigated against. The mitigation for hazards and risks are typically managed by complying with the relevant standards of design for individual systems, goods, and processes. Mitigation measures relating to pollutants which may cause offence are covered in each of the relevant assessment chapters and technical papers. The following specific mitigation measures are recommended for this proposal.

Table 14.5: Hazard and risk mitigation measures

ID	Impact/Risk	Mitigation
Construction		
HR1	Construction risks	The CEMP will include details of how to manage construction related risks, including spills, incidents and transportation risks.
Operation		
HR2	Fire in tipping hall and waste bunker	Install fire detection and suppression systems in both the tipping hall and waste bunker. The final waste bunker fire safety design shall be developed through an appropriate fire engineering process.
HR3	Dust explosion	A facility-wide vacuum cleaning system will be installed to reduce the likelihood of dust build-up in the tipping hall.
HR4	Phosphine and hydrogen explosion	The ventilation of the IBA will be sufficient to prevent the building up of hydrogen into an explosive atmosphere. The IBA area will also have hydrogen gas sensors with alarm set points below the lower flammability limit.
HR5	Acid and base reaction	Acids and bases will be stored in line with AS 3780-2008, and in line with obligations under section 5 of Chapter 7 of the *Work Health and Safety Regulation 2011*.

ID	Impact/Risk	Mitigation
HR6		Ammonium hydroxide and sodium hydroxide will not be stored in the same bunded area or in compounds that share a common drainage system as per section 6.3 of AS/NZS 3833-2017.
HR7	Dust explosion (activated carbon)	The activated carbon storage area will be zoned in line with AS/NZS 60079.10.2-2016. A Hazard Assessment as outlined in section 3 of AS/NZS 4745-2012 will be carried out during the design phase.
HR8	Diesel spill and bund fire	The storage of diesel will be designed in line with EPA's Bunding and Spill Management guidelines and AS 1940-2017. It will be contained within a bunded area that can hold the capacity of the diesel storage silo.
HR9	Release of ammonium hydroxide	The ammonium hydroxide silos will have level sensors with real-time monitoring to recognise leaks quickly from the control room.
HR10		Notification and evacuation procedures will be developed and included in an emergency plan as part of the OEMP, if there is a significant release of ammonium hydroxide.
HR11	Emergency plans	The site managers will develop an emergency response plan which includes coordination with local response organisations, such as Fire and Rescue NSW and NSW Ambulance services. The emergency response plan would include, but not be limited to, the following: • Emergency procedures • Evacuation procedures • Roles and responsibilities and contact details of emergency contacts • Equipment necessary to rectify the emergency • Details of hazardous materials stored onsite • Medical treatment advice.
HR12	Aircraft collision	The stack will be lit in line with Chapters 5 and 6 of the Federal Aviation Administration's (FAA) AC 70/7460-1L: Obstruction Marking and Lighting.
HR13	Hazardous or offensive impacts	The proposal will be subject to an EPL and conditions of consent, that will further regulate the proposal to manage potentially hazardous or potentially offensive impacts.