

Genesis Xero Waste

Environmental Assessment | Modification of Project Approval

Prepared for Dial-A-Dump Industries (EC) Pty Limited | 31 August 2018



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Genesis Xero Waste

Final

Report J17118RP1 | Prepared for Dial-A-Dump Industries (EC) Pty Limited | 31 August 2018

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Executive Summary

ES1 Overview

Dial a Dump (EC) Pty Ltd (the Proponent) proposes to modify the project approval (MP 06_0139) of their Genesis Xero Waste Facility (the facility) at Eastern Creek in Sydney's west. It is proposed to reconfigure the arrangement of the facilities and roads on the subject site to improve the efficiency of operations and enhance the amenity of the facility. The proposed works include the demolition of selected buildings and the construction of new buildings and facilities, construction of a new access road and improvements to the internal road network, extension of the operational area, and environmental management works associated with these modifications.

These proposed modifications will enable the facility to better respond to the long term trends in waste streams for Sydney, accommodate market demand for waste management services and support NSW Government strategies for recycling. Specifically, the modifications will also optimise the efficiency of the site in terms of traffic movement and waste processing.

ES2 Predicted impacts, management and mitigation

The facility is located at 1 Kangaroo Avenue and comprises a Resource Recovery Facility (RRF) and a general solid waste (non-putrescible) landfill. The landfill is a former quarry site (Pioneer Quarry) and the RRF includes a Materials Processing Centre (MPC) and a Waste Transfer Station.

The landfill (former quarry) pit represents the central feature of the site area. The MPC, timber waste, green waste, sales yard, crushing and screening area and workshop area are situated in the west and north-west sectors of the site. The operational areas of the site are surrounded to the east, west and north by an environmental bund constructed of overburden from the former quarry which shields receptors from views of, and noise generated from, the facility.

The facility is approved to accept up to 2 million tonnes per annum (2M tpa) of construction, demolition, commercial and industrial and green waste. The majority of the waste is directed to the RRF for sorting, processing and resale. The RRF generates products suitable for application to land such as road base. The facility recycles an estimated 65-80% of all incoming waste. Material which is unsuitable or uneconomical for recovery or recycling is diverted from the RRF and disposed to landfill via a conveyor belt and chute system. This residual (non-recyclable) waste is estimated to be approximately 30% of waste processed through the RRF.

The facility currently landfills at a rate of approximately 629,000 tonnes per annum, however market demand is forecast to increase in the future, putting pressure on the ability of the facility to continue to receive direct-to-landfill waste and also receive and process co-mingled waste for recycling. The cap on landfill volumes at 700,000 tonnes per annum equally constrains the future ability of the facility to receive direct-to-landfill waste and co-mingled recyclable waste. This is because the processing and sorting of co-mingled waste creates a by-product (approximately 30% of co-mingled waste volume) which also requires disposal to landfill. The existing consent condition regarding the maximum volume of waste which can be landfilled each year is the subject of a separate application to modify consent 06_0139.

Operations at the facility are managed in accordance with a suite of existing environmental management plans with the principal documents being the Environmental Waste Management Plan (EWMP) and the Landfill Environmental Management Plan (LEMP) to manage the MPC and landfill, respectively.

ES3 Proposed modification and justification

The purpose of the proposed modification is to allow for the following:

- construction of two access roads to improve site access and traffic flow, one on the northern side of the proposed Precinct Road (entry only) and one on the western side of Kangaroo Avenue (exit only);
- relocation of three existing weighbridges and installation of three additional weighbridges at a location approximately 100m inside the proposed Precinct Road entrance;
- relocation of existing administration buildings and onsite visitor and staff car parking generally fronting Kangaroo Avenue adjacent to the exit road to Kangaroo Avenue;
- enclose the existing timber yard for use as an unloading area abutting the existing Materials Processing Centre;
- installation of a construction and demolition waste wash plant, and batch plant (or pug mill), all of which to be located adjacent to the materials processing centre;
- construction of an enclosed timber processing building; Approval to construct the enclosure was issued in Mod 5, this is to advise of the intention to now use part of the enclosure for timber processing as well as retaining the Pre-Sort Facility;
- re-establishment of the above ground fuel storage tank (capacity 90,000 litres) and associated covered refuelling facility. The facility was decommissioned from its previous location to enable the construction of the Precinct Road;
- modified operations to include reorganisation of existing building use and storage areas combined with the installation of high voltage electricity substations, the demolition of selected buildings, and the construction of new associated road network to support improved operations and vehicle movements;
- associated environmental management works to include modified stormwater management devices, a new water basin, combined with the relocation and modification of the approved western amenity berm; and
- extension of the operational area of the facility to an area to the west of the current operational areas to accommodate the relocation of the crushing plant and stockpiling of recycled material.

ES3.1 Access road

The site is currently accessed via a private access road off a temporary intersection at Kangaroo Avenue.

A new road (Precinct Road) will be constructed along the southern side of the site. Precinct Road will, when constructed, connect with the future extension of Archbold Road which runs along the western perimeter of the site.

The proposed relocation of the existing site access road and associated weighbridges is required to facilitate the delivery of part of the Precinct Road as required by conditions 45 and 46 of the project approval (MP 06_0139).

The separation of the access point from Precinct Road and an exit point to Kangaroo Avenue, the refinement of arrangements for traffic circulation, and particularly the more streamlined arrangements for truck movement through weighbridges, are all intended to alleviate congestion, improve vehicle safety, reduce wait times and mitigate the queuing of vehicles.

ES3.2 Internal roads and weighbridges

The relocation of the main weighbridge facility to a location at the south eastern corner of the site will create a more efficient means of accommodating truck movements. An increased number of weighbridges and additional feeder lanes will ensure faster weighing and reduced congestion and queuing.

The relocation of the weighbridges will provide an alternative access point into the landfill thereby reducing the requirement for loads not destined for the recycling facility to transverse this location and improve the overall traffic flow of the site.

There will be three weighbridges relocated to the new site from the current weighing area near the MPC and three new weighbridges added (making six parallel weighbridges in total). One weighbridge will be retained at the current MPC site. The weighbridge remaining in situ at the MPC will be used as a check-out weighbridge for recycled products sold for application off-site.

The internal roads will generally retain the current alignment but will be widened at selected points to provide safe movement of vehicles and to accommodate new facilities such as the weighbridges. There is also a need for some new extensions to the existing internal road network, notably to provide circulation around the perimeter of the new western operational area.

Adjacent to the proposed weighbridges, it is also proposed to install an above ground 90,000L fuel tank (diesel) and an associated shelter for refuelling.

ES3.3 Administration building

The administration building is currently located adjacent to the materials processing centre and lacks easy accessibility for visitors and business inquires. The construction of a new administrative and visitor facility facing Kangaroo Avenue will enable a street presence for the facility and also reduce vehicle movements that would otherwise need to mix with waste related truck movements on the internal road system.

This also aims to improve the street facade, which is currently characterised by dilapidated structures, and provide adequate off-street parking.

ES3.4 Enclosed unloading area, wash plants, and batch plant / pug mill

The construction of an enclosed unloading area adjacent to the MPC was authorised under Modification 1 and will be constructed as part of the suite of enhancements proposed under this Modification.

Two wash plants are proposed to be located immediately north of the MPC and unloading area. One plant is designed to recover materials from cement and washout materials. The other is a wash plant for construction and demolition waste.

A concrete batch plant (or alternatively a pug mill) is also proposed to be installed immediately to the north of the MPC and unloading area.

ES3.5 Reconfiguration of buildings plus new enclosed processing facilities

An enclosed building, approved under Modification 1, will be constructed to abut the MPC to the north-west for the purpose of unloading and pre-sorting co-mingled waste materials.

An enclosed building, approved under Modification 5, will be constructed immediately west of the existing weighbridge area to accommodate timber processing operations.

The staff amenities and lunchroom will be relocated to a site closer to the MPC.

An existing building will be demolished at the new weighbridge site, the existing weighbridge office will be demolished, and two small outbuildings abutting the MPC will also be demolished.

Three additional HV substations are proposed to be installed adjacent to the weighbridges, the timber processing building and the batch plant / pug mill.

ES3.6 Environmental management works and changes to bunds

The range of improvements included in this proposed Modification require a range of supporting environmental management works.

A major component is the provision of a new 38 ML water storage basin at the northern extent of the new operational area. The installation of the basin requires the filling of the existing basin and then the excavation and earthworks for the new triangular shaped basin.

The other major component is the retaining wall proposed along the northern, southern and western perimeter of the new western extension to the operational area. This also requires the filling of an existing basin and the reshaping of the landform to create the amenity berm.

There will also be some earthworks proposed adjacent to the new weighbridge area to create a stable batter at the proposed widening of the internal road to accommodate the new weighbridge facility.

ES3.7 Extension of the operational area to the west

The operational area as currently defined will need to be extended westward to accommodate the areas identified for crushing and stockpiling, as well as stockpiling. The western extension also incorporates the proposed new bund wall and the extension of the internal circulation road. It forms an area of approximately 10.6 hectares.

ES4 Predicted impacts, management and mitigation

Technical assessments were carried out to investigate the potential impacts of the proposed modification in accordance with the Secretary's environmental assessment requirements (SEARs) issued by the NSW Department of Planning and Environment (DPE). The Proponent carried out consultation with key stakeholders and the outcomes of these assessments are presented in the table below.

Table ES1 **Summary of predicted impacts of the modification**

Aspect
Noise and vibration • Potential noise impacts at the nearest residential and commercial/industrial receivers to the facility were assessed based on two operational scenarios, where 2M tpa of waste is processed in the MPC or 2M tpa of waste is landfilled. • Operational noise levels were assessed for the <i>NSW Industrial Noise Policy</i> periods of daytime, evening, night-time and morning shoulder during calm and prevailing weather conditions. The assessment found that operating noise from the site during both existing and proposed modified operations satisfies the relevant noise impact assessment criteria during all periods at all assessment locations. • Noise at the facility was found to be mostly generated by trucks, with landfilling operations an insignificant contributor to noise generation at the facility. • An assessment of cumulative industrial noise from the facility together with other industrial noise sources in the vicinity was also conducted. The facility is not predicted to increase industrial noise levels above the relevant amenity criteria. • The potential for sleep disturbance from the proposed modification during the night-time period was also assessed. The highest predicted external maximum noise level from the facility is below the noise levels likely to cause sleep disturbance affects. • The existing noise management mitigation measures implemented at the facility will be updated to incorporate the proposed modification.
Air quality and odour • Air quality impacts at the nearest residential and commercial/industrial receivers to the facility were assessed based on two phases of the proposed modification, a construction phase and an operations phase. Construction phase emissions are expected to be lower than the operation phase. • For both the construction and operation phases, the predicted cumulative annual average PM₁₀ concentrations were found to comply with the impact assessment criterion at all residential receptor locations and, with the addition of existing background levels, there were no additional exceedances of the 24-hour average PM₁₀ impact assessment criterion at residential receptor locations. • For the construction phase, with the addition of existing background, there were no additional exceedances of the 24-hour average PM_{2.5} impact assessment criterion at residential receptor locations • For the operation phase, the cumulative 24-hour average PM_{2.5} concentrations resulted in one additional exceedance of the impact assessment criterion at eight residential receptor locations. This was caused by a combination of elevated background with the additional dust emissions from the proposed modification. Additional statistical analyses showed that the probability or risk of any additional exceedances of the 24-hour PM_{2.5} impact assessment criterion would not significantly increase above what is already caused by background. • Cumulative annual average TSP concentrations for both the construction and operation phase were found to comply with the impact assessment criterion at all receptor locations, while predicted dust deposition levels complied with both the incremental and cumulative impact assessment criteria at all residential receptors. • For PM₁₀, additional statistical analyses indicated that the proposed modification would contribute to a small increased probability or risk (2-9%) of additional exceedances of the 24-hour PM₁₀ impact assessment criteria at nearby commercial premises. This is based on a maximum 2M tpa waste intake. To better monitor the effectiveness of existing controls and ongoing performance of the site, the Proponent will consider relocating the PM₁₀ monitoring site in Minchinbury to a boundary location adjacent to the northern and/or eastern boundary of the site so that mitigation can be tailored to actual air quality trends. • The assessment predicted that odour experienced at residential receivers will be below 2 OU and below 7 OU at commercial/industrial receivers, which are regarded by the EPA as suitable upper limits for these land uses.
Water management • The leachate is collected in a sump then pumped to sequential batch reactors for treatment and release into a Sydney Water sewer via an existing Trade Waste Agreement. • The existing leachate management system is capable of managing the maximum predicted leachate generation under the proposed modification of 505 m3 per day and 185,000 m3 per year.

Table ES1 Summary of predicted impacts of the modification

Aspect	
	- Leachate generation could exceed the predicted rates during prolonged or heavy rainfall. However, there will be sufficient spare capacity in the leachate collection system/sump and sequential batch reactors to temporarily store and treat more leachate if required. - Existing leachate and groundwater monitoring program is reported in the facility's annual report to the EPA. It is not proposed to amend this program as it is designed for leachate generation rates greater than those predicted for the proposed modification. - The revised Quarry Catchment is approximately 27.3ha whilst the original Quarry Catchment is 38.12Ha. This reduced catchment area plus the inclusion of the 38 ML dam within the Genesis Waste Facility ensures compliance with the Council's S94 Contributions Plans as no additional stormwater flows will be burdening the future precinct basin within the Quarry Catchment. - In general terms, it is in the landfill operator's best interest to minimise water use, since surplus water used in the vicinity of the landfill may increase leachate generation, either through direct infiltration through the landfill materials – when water is used for dust suppressant during daily landfilling operations, or through infiltration to groundwater – and thereby increasing groundwater inputs to the leachate. In addition, surplus water will create additional operational issues on roadways, by causing slippery and muddy conditions, which are unfavourable for truck movements and landfill operations efficiency. - The site currently uses (and will continue to use) a fleet of water cannons, water carts and water misters/sprinklers to minimise dust generation in the landfill pit, the segregated materials area (SMA) and the Materials Processing Centre (MPC). These water supply devices are operated in a strategic manner, i.e. they are not used when rainfall minimises the requirement for dust suppressant measures and are used on an increased basis during dry and windy conditions. Water for dust control is supplied from stormwater that has been harvested from the site area. This stormwater is currently pumped from the landfill pit stormwater basin into the northern and southern OSD basins. - Stormwater is also harvested from the roofs of structures, such as the MPC, which stores rainwater in the emergency dam underlying the MPC shed. - Soil analytical results indicate that the fill soils at the site up to a depth of 6 m bgl are not significantly contaminated, and are unlikely to pose an unacceptable risk to human or environmental health, based on the Tier 1 screening assessment undertaken. - A localised hotspot of benzene, in excess of the screening criteria (HSL-D, Sand, 0-<1 m bgl and HSL-D, Sand, 2-4 m bgl), was detected in BH10 at 4.0-5.0 m depth was identified, however this is considered to be a low risk. - The site location is outside of the high flood risk areas within the Ropes Creek Catchment.
Traffic and transport	
	- The construction of the site improvements will create a temporary increase in traffic volumes. - The rearrangement of buildings, internal roads, plant and processing improvements (including truck weighbridge enhancements and materials processing enhancement) do not, of themselves generate additional traffic. The improvements of on-site logistics and operations will however make the flow of traffic less congested and reduce the time required on site. - The separation of ingress and egress will alleviate the risk of displaced queuing during peak periods. - Congestion at the entry and exit point(s) for the facility is a potential impact but it is mitigated by the proposed separation of ingress and egress roads at Precinct Road and Kangaroo Avenue respectively. - The SIDRA analysis results for the new Precinct Road access intersection show that the intersection will have very low peak hour traffic delays (Level of Service 'A') indicating good traffic operations and a high level of spare traffic capacity during both the morning and afternoon peak hours. - The SIDRA intersection traffic modelling results for the new facility egress intersection on Kangaroo Avenue, also show this intersection will have very low peak hour traffic delays (Level of Service 'A') indicating good traffic operations and a high level of spare traffic capacity during both the morning and afternoon peak hours. - The proposed traffic circulation paths are all acceptable. The current internal levels of traffic safety within the facility will generally be improved by the new traffic circulation plans. The existing 10 km/hr and 20 km/hr speed limit zones within the site will continue to apply under the proposed modification.

Table ES1 **Summary of predicted impacts of the modification**

Aspect
Safety of the primary access route via Wonderland Drive, Honeycomb Drive and Kangaroo Avenue is very good as it has been constructed to a high design standard and the current speed limit is 50 km/hr. All the existing intersections along these routes have been well designed and have adequate sight distances for the prevailing speed limit.
Waste management
- The waste processing systems and the reconfiguration of the logistics of waste handling on site all assist in the delivery of the NSW Waste Avoidance and Resource Recovery Strategy 2014-2021. - The improvements to the efficient circulation of vehicles on site, the installation of a visitor centre, the introduction of a batching plant / pug mill and the expanded operational area for crushing and stockpiling all contribute to 'mainstreaming' recycled products, enabling better quality (and therefore market acceptability) of recycled materials; greater ease of access to recycling as a waste management stream; and raising awareness of the need for waste reduction, reuse and recycling. - The major contributing factor under this proposed Modification is the installation of a Pre-Sort Enclosure. - The facility can achieve a higher rate of recycling and reuse of dry waste with improved pre-sorting procedures than could otherwise be extracted. - Operational safety is improved by reducing the congestion of processing within the MPC.
Visual
- The area surrounding the site has generally low relief with no major hills or ridgelines, other than bunds adjacent to the landfill that were created from quarry overburden. - The visual significance of the proposed modification on surrounding view locations will primarily result from the construction of the proposed retaining wall. - The proposed wall will provide screening to reduce potential views of the operational components of the facility from the west and north of the site. - The retaining wall will be a stepped earthen bund with tiered benches planted with shrubs. It will be designed to reduce the degree of contrast with surrounding features in the landscape (namely remnant vegetation). - A combination of existing vegetation, distance and topography will continue to shield views of the facility from the residential areas of Minchinbury and Erskine Park. - The results of the viewshed analysis indicate that the proposed visual/noise wall will become the dominant visual feature of the facility within the surrounding landscape, with potential views likely to be experienced from the Western Motorway and from a future extension to Archbold Road. - There are negligible impacts expected to the east and south of the site, given the relative location of potentially intrusive structures which may be visible from sensitive receptor points to the east and south.
Boundary of Operational Area
- The adjustment of the Operational Area boundary will not, of itself, create or increase impacts. - The relocation of crushing and stockpiling operations within the new (western) extension area will move the source of noise and air quality impacts approximately 200 m to the west of the current Operational Area. This spatial change for noise and dust sources has been modelled and the impacts are assessed under the respective Acoustics and Air Quality sections.

Table ES1 **Summary of predicted impacts of the modification**

Aspect
Fire and incident management
- No new fundamental activities are proposed under the proposed modification. Intensification of existing activities may however increase the probability of a spill or leak occurring and that could cause subsequent contamination. - The facility has two pollution incident response management plans (PIRMP), one for each of the EPLs that apply to the landfill and resource recovery operations. These plans will be revised and if necessary amended in accordance to any changes to the EPLs that are required under the proposed modification. - The site currently maintains, and will continue to maintain, its general fire risk minimisation initiatives which include: - Regular cleaning of gutters and roofs and maintenance of leaf proofing; - Reticulated or bottled gas maintained in accordance with AS/NZD 1569-2002, storage and handling of LP Gas and NSW SafeWork Guidelines; - Weekly checks of the firefighting pumps servicing the fire hose reels provided to each building; - Regular maintenance of firefighting equipment; - Regular checks of paths to travel to ensure they are clear; - Regular drills on fire emergency and evacuation procedures; - Minimise the accumulation of debris that may present as a fire risk.
Hazards management
- No. increased use or storage of hazardous substances. - No increase the generation of offensive emissions beyond EPL criteria in any period. - No exposure to high bushfire risk.

Assessments were also undertaken on other environmental matters such as biodiversity, historic heritage, Aboriginal cultural heritage and ecology. It was considered that the proposed modification would not adversely affect these other environmental matters.

ES5 Conclusion

The Proponent proposes to modify the project approval to introduce greater efficiency in the operation of the site. This is achieved by the modifications which generally focus in superior traffic management on site and on adjoining roads via new entry and exit points and extensions to the internal circulation road; reconfiguration of operational zones, weighbridges and plant on site; an expansion of the operational area; and the construction of a new administration building (and other structures previously approved but not yet constructed).

Technical assessments have been prepared in accordance with relevant guidelines and assessment criteria and to address NSW Department of Environment and Planning specific assessment requirements.

In conclusion, the proposed modification will:

- improve the safety and efficiency of site operations;
- have modest environmental impacts which will be mitigated through the implementation of all reasonable and feasible measures;
- accord with the relevant legislation and state environmental planning policies; and
- accord with the objects of the *Environmental Planning and Assessment Act 1979* including compliance with the principles of ESD.

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1 Introduction

1.1 Background

The Proponent, Dial A Dump (EC) Pty Ltd operates a major recycling facility and general solid waste (non-putrescible) landfill facility known as the 'Genesis Xero Recycling and Landfill Facility' (the facility) at Honeycomb Drive, Eastern Creek (refer to Figure 1.1).

Dial A Dump (EC) Pty Ltd owns Lot 1 DP 1145808 and Lot 8 DP 1200048 (Eastern Creek in the Blacktown local government area), being the subject land of the facility and this assessment, as shown on Figure 1.2.

Dial A Dump (EC) Pty Ltd is also the licence holder of EPLs 20121 and 13426.

This existing facility includes the operation of a major Resource Recovery Facility (RRF) and a general solid (non-putrescible) landfill. The RRF includes a Materials Processing Centre (MPC) and a Waste Transfer Station (WTS). The site including the surface area of the quarry is 52.4 hectares (Ha).

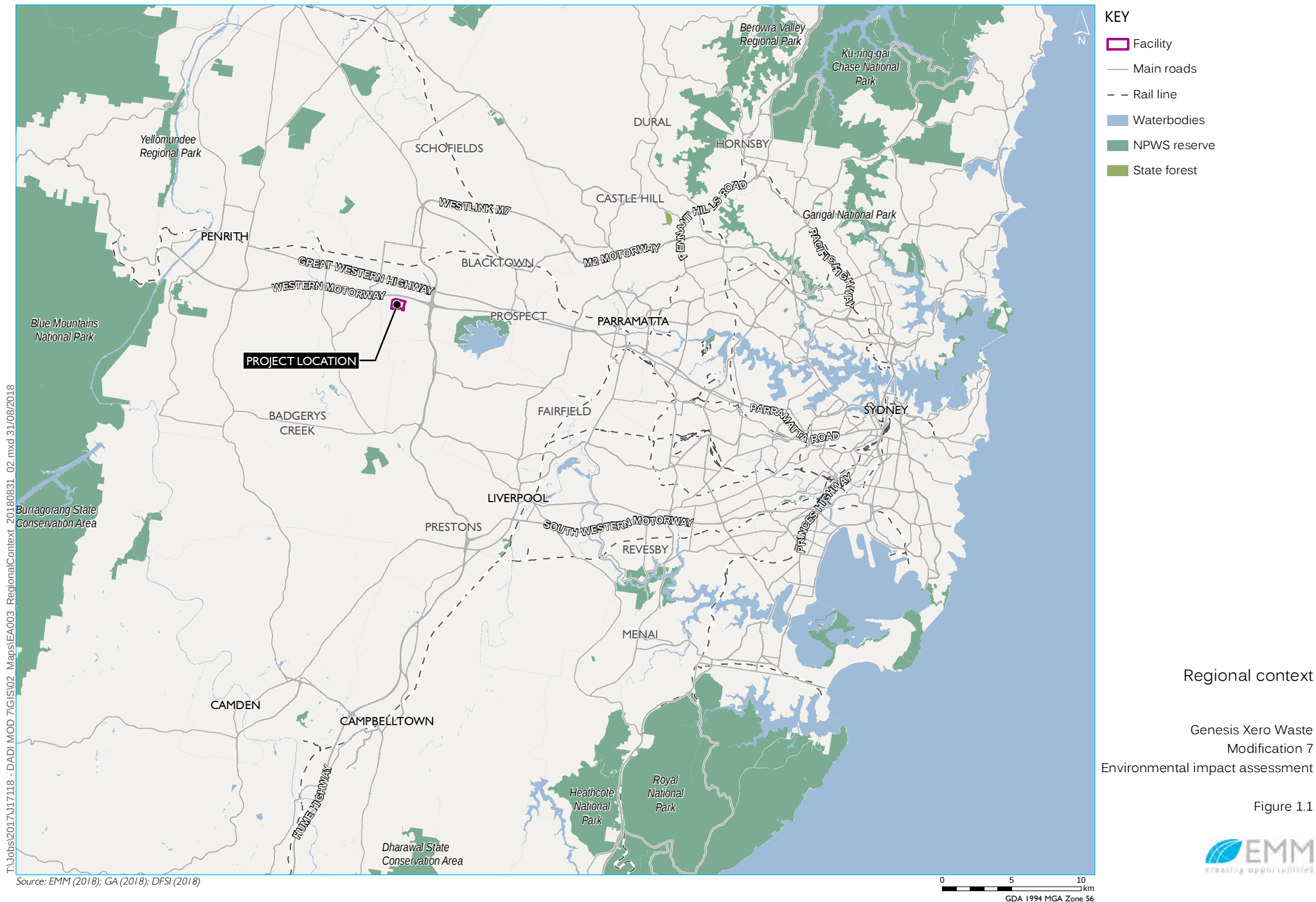
The original project approval for the site was granted by the Minister for Planning in 2009 (MP 06_0139) under Section 75J of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The operations commenced in 2012 and the project approval has been modified five times, most recently in March 2016. A summary of the planning approval history including an overview of each of the previous modifications is provided in Table 1.1.

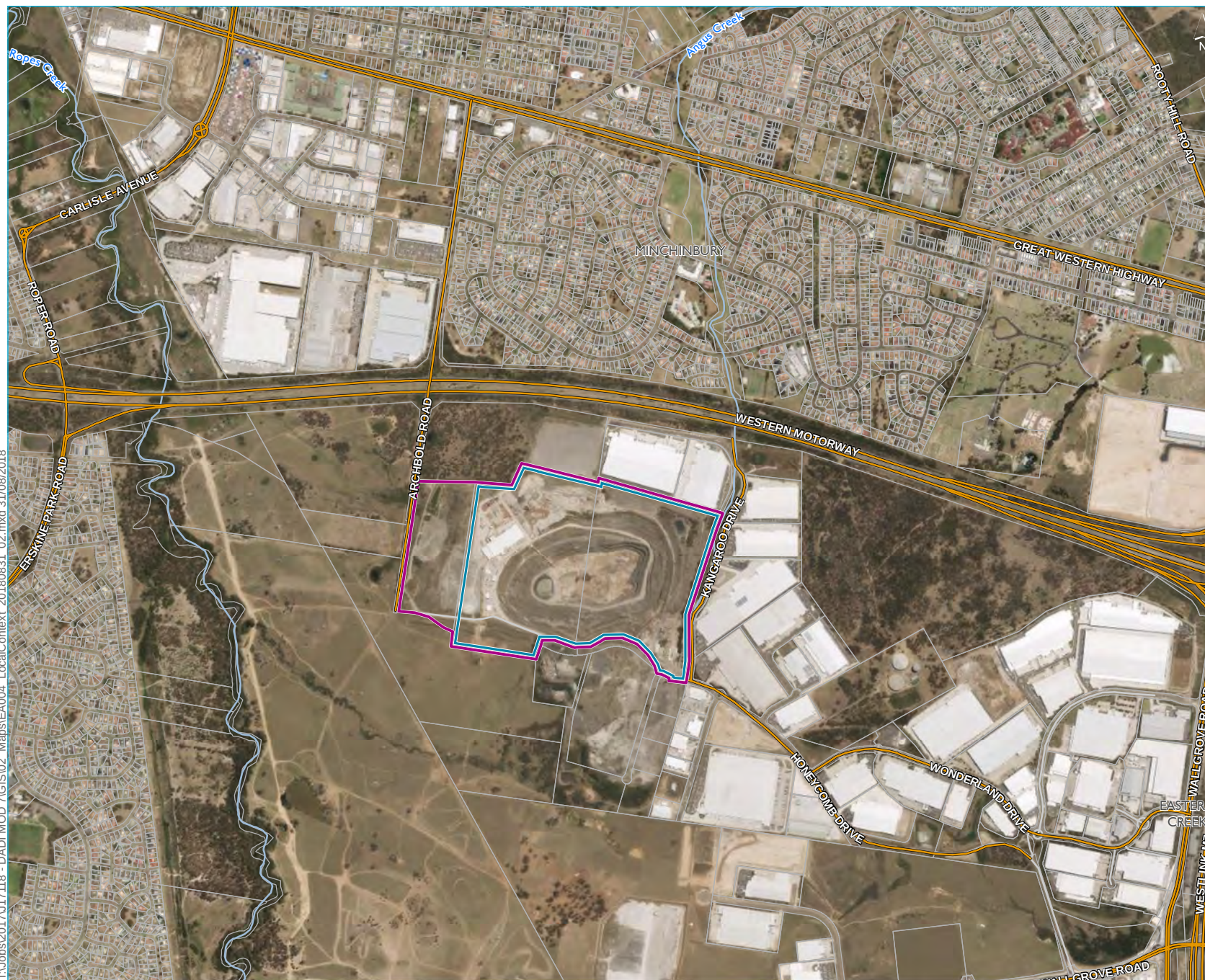
Table 1.1 Planning approval history

Approval	Date of approval	Summary
Original project approval	22 November 2009	A waste recovery facility including a Class 2 (non-putrescible) landfill
		Total throughput of 2 million tonnes per annum
		Landfilling of up to 700,000 tonnes per annum of non-putrescible waste including asbestos
		Stockpiling of up to 50 tonnes of tyres at any one time
		Stockpiling of up to 20,000 tonnes of green waste at any one time
Modification 1	30 September 2010	Electrically powered conveyor and chute
		Postponed commencement of construction
		Two-way traffic on Fourth Avenue
		Concrete bay walls in the greenwaste processing area
		Relocation of the wheelwash
Modification 2	9 November 2010	Correction of the land description in the project approval
Modification 3	5 December 2011	Revised final landform level of the fill pad at Area D
		Operational landform levels and site stormwater design
		Addition of internal office and external amenities at the weighbridge
		New administration and amenities buildings on site
		Relocation of vehicle turning bay
Modification 4	14 December 2013	Voluntary planning agreement
		Extend Materials Processing Centre operational hours to 6:00am to 10:00pm Monday to Friday and 6:00am to 4:00pm weekends and public holidays

Table 1.1 **Planning approval history**

Approval	Date of approval	Summary
Modification 5	17 March 2016	Construct a pre-sort shed adjacent to the existing Materials Processing Centre
		Prepare an interim stormwater management plan for the pre-sort enclosure
		Carry-out bulk earthworks in accordance with a spoil management plan
		Install a temporary noise barrier
		Construct 12 additional car parking spaces
Modification 6	Lodged with DPE, currently under assessment	Modified the construction and operating hours.
		Removed landfill volume limits for the site.





- KEY**
- Proposed extension to operation area
 - Facility
 - Main road
 - Local road
 - Watercourse
 - Cadastral boundary

Local context

Genesis Xero Waste
Modification 7
Environmental impact assessment

Figure 1.2

1.1.1 Environment Protection Licences

The Genesis Facility operates under two Environment Protection Licences (EPL) issued by the NSW Environment Protection Authority (EPA). These include:

- EPL No. 20121, which relates to the recycling and resource recovery arm of the operation; and
- EPL No. 13426, which relates to the management and regulation of the general solid waste (non-putrescible) landfill operation.

The relevant controls of each licence are set out below.

i EPL: 20121: Recycling and Resource Recovery

EPL 20121 applies to the resource recovery processes carried out on the site and allows for the storage of up to 667,000 tonnes of waste at any one time.

Of this the following fractions of waste may be stored:

- a maximum of 20,000 tonnes of garden waste;
- 50 tonnes of tyres; and
- individual wood waste stockpiles (both processed and unprocessed) must not exceed 2,000 tonnes each (notably there is no overall limit or a limit of the number of stockpiles).

ii EPL: 13426: Landfill and Waste Storage

Under the provisions of EPL 13426, a total of 700,000 tonnes of waste may be directed to landfill in a calendar year.

The facility is approved to accept up to 2 million (M) tonnes per annum (tpa) of construction, demolition, commercial and industrial waste and green waste clean-ups. The majority of the waste is directed to the RRF for sorting, processing and resale as products suitable for application to land such as road base. The facility recycles an estimated 65-80% of all incoming waste. Material which is unsuitable or uneconomical for recovery or recycling is disposed to landfill.

1.1.2 Consideration of Modification 6

Modification 6 (Mod 6) is currently subject to determination by DPE.

Mod 6 proposes to modify the project approval to alter the hours of operation, to increase the volume of waste permitted to be landfilled, and revise the noise impact assessment criteria. Detailed description and assessment of the changes proposed in Mod 6 are outlined in EMM (2018). The environmental assessment for this proposed Modification 7 (Mod 7) makes reference to the modifications proposed and assessed in Mod 6.

1.2 Purpose of the document

The purpose of this environmental assessment (EA) is to accompany an application to modify the project approval under Section 75W of the EP&A Act.

This document provides a description of the existing environment, an assessment of the potential impacts that may result from the proposed modification and measures that would be implemented to avoid and/or minimise potential impacts.

The EA provides information to allow the NSW Department of Planning and Environment (DPE), in consultation with other relevant NSW Government authorities, to assess the merits of the proposed modification and make a recommendation to the Minister for Planning (or delegate) as to whether or not to grant approval.

This EA was prepared by EMM Consulting Pty Limited (EMM), with input from a number of technical specialists.

1.3 Secretary's environmental assessment requirements

The Proponent applied for Secretary's environmental assessment requirements (SEARs) for the proposed modification on 23 March 2017. SEARs, including requirements from other government agencies, were received from DPE on 24 April 2017. Table 1.2 provides an overview of SEARs and where they are addressed in this EA. A full copy of the SEARs is provided in Appendix A.

Table 1.2 SEARs and where they are addressed within this EA

Assessment requirements	Reference in the EA
Strategic context - including: - demonstration that the proposal is consistent with all relevant legislation, strategies, environmental planning instruments and development control plans (DCPs); and - demonstration that the proposal is subject to section 75W of the EP&A Act.	Section 5
Other approvals – including the identification of any proposed variations to other licences and approvals	Section 5.3.2
Details of the existing operations on the site - including: - existing and approved operations/facilities, including any statutory approvals that apply to these; - a summary of the existing conditions of consent that would be relevant to the proposal; - a summary of the existing environmental management and monitoring regime; - detailed plans of all structures proposed to be constructed and modified.	Section 3
Description of the modification – including: - a detailed description of the proposed modification, including changes to the operation of the site and likely staging; - the justification and need for the modification; - details of any requested changes to the approved conditions of consent; and - an assessment of all potential impacts of the proposal on the existing environment and measures to avoid, minimise, mitigate and/or manage these potential impacts.	Section 4 Section 5
Waste management – including: - details of how waste will be managed during the demolition of structures and relocation of waste material onsite; - details of the types and amounts of materials to be stored in the Post Production Dispatch Area and justification for its needs; - a description of waste processing operations, including a description of the technology to be installed, resource outputs and the quality of control measures that would be implemented; - details of how waste would be stored and handled on-site, transported to and from the site and details of how the receipt of non-conforming waste would be dealt with; and - the measures that would be implemented to ensure the development is consistent with the aims, objectives and guidance in the NSW Waste Avoidance and Resource Recovery Strategy 2014-2021	Section 7.7 Section 5.3.7i
Traffic and access – including: - a traffic impact assessment for all phases of the modification which considers traffic types and volumes likely to be generated, impacts on road safety and impacts on the capacity of the road network; and - justification for the selected site access arrangements, internal road network and parking arrangements.	Section 7.5
Soil and Water – including: - an assessment of potential impacts to soil and water resources, topography, hydrology, drainage lines, watercourses and riparian lands on or nearby to the site; - details of stormwater/wastewater/leachate management systems including the capacity and integrity of on-site detention systems and measures to treat, reuse or dispose of water;	Section 7.4

Table 1.2 SEARs and where they are addressed within this EA

Assessment requirements	Reference in the EA
characterisation of the surface water quality at the discharge point and/or groundwater infiltration point against the relevant water quality criteria (including details of the contaminants of concern that may leach from the waste into the waters that may be discharged) and proposed mitigation measures to manage any impacts to surface water or groundwater;	
a revised site water balance, including identification of water requirements for the life of the project, measures that would be implemented to ensure an adequate and secure water supply is available for the proposal and a detailed description of the measures to minimise water use at the site; and	
details of proposed mitigation, management and monitoring measures.	
Noise and vibration – including a quantitative assessment of the construction, operation and transportation noise and vibration impacts on all affected receivers (including the residents of Minchinbury and Erskine Park), prepared in accordance with the relevant Environmental Protection Authority guidelines.	Section 7.2
Air quality and odour – including a quantitative assessment of the potential air quality, dust and odour impacts for all phases of the proposal in accordance with the relevant Environmental Protection Authority guidelines.	Section 7.3
Visual – including:	Section 7.6
a description of the potential visual impacts from proposed buildings and associated structures; and	
details of the measures proposed to minimise visual impacts, such as landscaping.	
Details of the proposed boundary adjustment – including consideration of any changes to existing obligations under Blacktown City Council’s s94 Contributions Plan No. 18, the Precinct Plan or any regional contributions under the existing approval from the Minister for Planning.	Section 4.8
Fire and incident management – including technical information on the environmental protection equipment to be installed on the premises such as air, water and noise controls, spill cleanup equipment and fire management (including location of fire hydrants and water flow rates at the hydrants) and containment measures.	Section 7.8
Hazards – including a preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the development. Should preliminary screening indicate that the project is ‘potentially hazardous’ a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011).	Section 5.3.7 Section 7.9
A table indicating where each element of the EARs is addressed in the EA.	This table
In preparing the EA, the Department strongly recommends that you directly consult with relevant government agencies.	Section 6.2

2 Site and local context

2.1 Location

The facility is on a site that comprises 52.4 Ha at the following lots (Figure 1.2):

- Lot 1 DP 1145808; and
- Lot 8 DP 1200048.

The site address is 1 Kangaroo Avenue, Eastern Creek.

2.2 History

The site was formerly owned by Ray Fitzpatrick Pty Limited and Hanson Construction Materials. It was cleared in the 1800s for agricultural use and subsequently blue metal was quarried in the area, after about 1829. Pioneer commenced major quarrying at the site in the 1930s, with Ray Fitzpatrick Quarriers occupying the site around 1950. Pioneer then operated the quarry until activities ceased in September 2006. The volume of the final quarry void was estimated to be 11 million m³.

ThaQuarry Pty Ltd and ACN 114 843 453 Pty Ltd secured the original approval for the construction and operation of a RRF and landfill at the site in November 2009.

2.3 Surrounding land use

The site is in an area being developed for commercial and industrial use under State Environmental Planning Policy (Western Sydney Employment Area) 2009 (the SEPP 2009). Adjacent landowners are:

- Australand, which owns and leases warehousing to the north-east;
- Hanson, which owns an asphalt batching plant to the south-east;
- NSW Government, which owns vacant land to the south-west; and
- Sargents, which owns vacant land to the west.

The site is surrounded by Kangaroo Avenue to the east and north-east, the M4 Western Motorway to the north, Archbold Road to the west and open grassland to the south.

Further afield there is residential development in Minchinbury beyond the M4 Western Motorway to the north and in Erskine Park beyond Archbold Road to the west, and predominantly undeveloped land containing high voltage powerlines to the west and south-west.

2.4 Sensitive receivers

The residential areas of Minchinbury and Erskine Park are approximately 430 m north and 1,200 m west of the nearest site boundaries, respectively. The nearest commercial premises are adjacent to the northern boundary of the site.

The assessment locations (M1a/b and M2) shown on Figure 2.1 represent these potential receivers of Minchinbury and Erskine Park, respectively.

2.5 Topography, water and biodiversity

The area has generally low relief with no major hills or ridgelines, other than bunds adjacent to the landfill that were created from quarry overburden. The RRF is on relatively flat land to the west and north-west of the landfill.

There are ephemeral drainage lines west of the site which drain towards Ropes Creek, which is approximately 580 m west of the site boundary.

The majority of the site is cleared. There are approximately 11 ha of Shale Plains Woodland to the north-west of the site, which is a sub-community of Cumberland Plain Woodland. Cumberland Plain Woodland is an endangered ecological community (EEC) under the NSW *Biodiversity Conservation Act 2016* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. No impacts are proposed to this vegetation community.

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- KEY**
- Proposed extension to operation area
 - Facility
 - Monitoring location
 - Main road
 - Local road
 - Watercourse / drainage line
 - Cadastral boundary
 - Waterbody
 - NPWS reserve
 - State forest
- Native vegetation of the Cumberland Plain (OEH, 2016)
- Alluvial Woodland
 - Shale Gravel Transition Forest
 - Shale Hills Woodland
 - Shale Plains Woodland

Assessment location and environmental features

Genesis Xero Waste
Modification 7
Environmental impact assessment

Figure 2.1



Source: EMM (2018); DFSI (2018)

0 250 500
m
GDA 1994 MGA Zone 56

3 Existing operations

3.1 Overview

The construction and operation of an RRF and General Solid Waste landfill at an existing quarry and surrounding land at the site were approved under the original project approval (MP 06-0139) in 2009. The RRF comprises the MPC and Waste Transfer Station. The following activities have been approved under Part 3A of the EP&A Act:

- Capacity to receive up to 2Mtpa of the following general solid waste (non-putrescible) types:
 - construction and demolition waste;
 - commercial and industrial waste;
 - waste streams complying with acceptable waste for general solid waste (non-putrescible) facilities; and
 - green waste.
- Use of fixed and mobile plant to process (sort, screen, sieve, crush, grind, shred, chip and compost) waste to produce products for application to land (road base, aggregate, landscaping soil, bedding sand, mulch, wood chip, compost and asphalt derived products).
- Testing and on-site storage of products for resale from the site to the construction and landscaping sectors.
- Landfilling of up to 0.7M tpa of waste, which caps the intake to the landfill of waste which is unsuitable or uneconomic for resource recovery (contaminated soil, asbestos waste and loads which cannot be physically sorted). Landfilling also includes residual non-recyclable material after the processing of co-mingled waste for recycling in the MPC.
- Quarantine and transfer of unsuitable wastes to off-site licensed waste facilities for disposal.
- Construction and operation of associated infrastructure, plant and equipment; including upgrading of internal roads and reshaping of earthen amenity berms.

3.2 Layout

The current layout of the facility is illustrated in Figure 3.1.

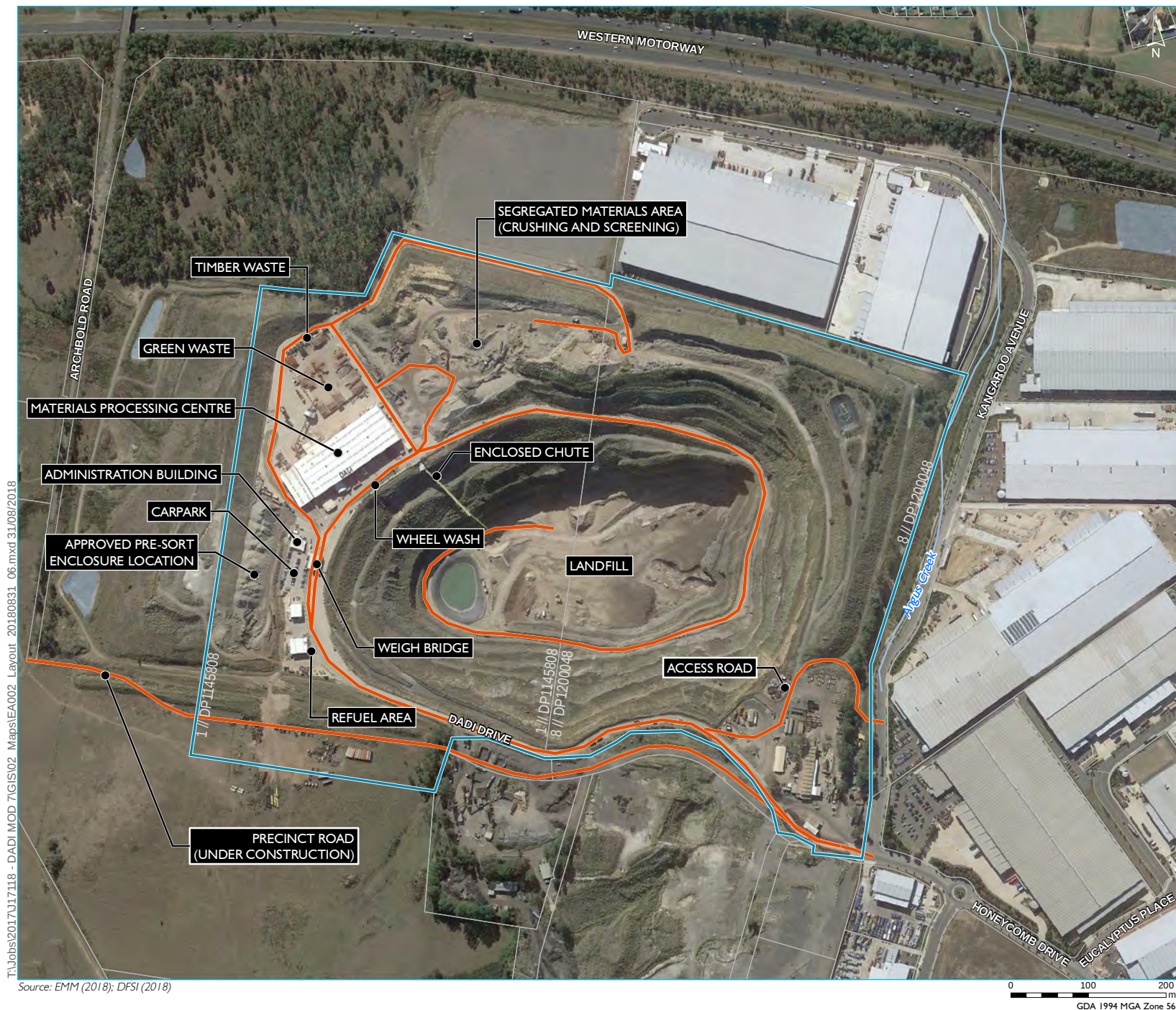
The site is currently accessed via a private access road off a temporary intersection at Kangaroo Avenue, approximately 150 m north of the intersection of Kangaroo Avenue and Wonderland Drive.

Upon entering the site, delivery vehicles queue along the internal road and proceed to weighbridges situated close to the main operational areas, comprising the Materials Processing Centre, the Segregated Materials Area and related plant and equipment.

After the weighbridge trucks are directed to the MPC; crushing and screening area; or the landfill. All vehicles travel along internal roads around the west and north of the MPC then divert to the south to enter the MPC; to the north to enter the crushing and screening area; or to the north-east to enter the landfill. All departing vehicles travel back to the weighbridge via a wheel wash to the east of the MPC.

The landfill (former quarry) pit comprises approximately 75% of the site area. The MPC, timber waste, green waste, sales yard, crushing and screening and workshop area are situated to the west and north-west of the landfill pit.

The operational areas of the site are surrounded to the east, west and north by an environmental bund constructed of overburden from the former quarry which shields receptors from views of, and noise generated from, the facility.



- KEY**
- Haul road
 - Facility
 - Watercourse / drainage line
 - Cadastral boundary
 - Waterbody

Existing site layout

Genesis Xero Waste
Modification 7
Environmental impact assessment

Figure 3.1

3.3 Process

Waste received on site is directed to one of two destinations for processing (recycling/reuse) or disposal (landfill). Initially, the load is received by truck at the weighbridge upon entering the site where it is weighed, inspected and assigned an internal destination. Waste suitable for recycling is directed to either the MPC (if comingled) or segregated materials area (SMA) for crushing and screening; and waste suitable for disposal is directed to the landfill.

The following processes occur at the internal waste destinations.

3.3.1 Material Processing Centre

The MPC opened 8 June 2012 and operates pursuant to EPL 20121.

Mixed or comingled building and demolition waste is transported by truck to the facility where it is unloaded within the MPC. The existing MPC is a large building of cast concrete slab, steel and Colorbond construction typical of the surrounding industrial buildings within the Precinct.

Waste which is received within the MPC is subject to processing by the fixed plant contained inside the building.

Accepted material is moved to the pre-sort area where bulky material such as metals, fibro sheeting and treated timbers are removed and stockpiled. Timber is directed to the timber yard, bricks and concrete are directed to the crushing and screening area and metals are on-sold to metal recyclers.

The remaining material is moved to the construction and demolition waste sorting plant feed stockpile, and then fed into a shredder which re-sizes it to 450 mm or less. The material passes through the plant, which sorts material using magnets, screens, blowers and picking stations. Sorted material which cannot be recycled is disposed to the landfill via a chute.

Recyclable sorted material comprises timber, crushing and screening feed and metals. Timber is shredded and timber that complies with the resource recovery exemption is sold as mulch and the timber that does not comply with the exemption and is not treated is sold as particle board feed or boiler fuel.

Bricks, concrete, ceramics and aggregates are used as stock in the SMA and metals are on-sold to metal recyclers. Materials such as plasterboard, plastics and cardboard are transferred to alternative recycling facilities.

3.3.2 Segregated Materials Area

The SMA is principally used for the receipt, processing dispatch and stockpiling of inert construction and demolition materials, such as sand dirt concrete, brick tiles and asphalt.

Materials received within the SMA come from both pre-sorted loads, transferred from the MPC and also from direct loads of material deposited within the area. Once delivered to the SMA materials are sorted into relevant categories (ie brick, concrete, sand, soil, stone and bitumen) for reprocessing into a variety of products for sale.

From these primary materials delivered direct to the SMA or sorted at the MPC, all different kinds of aggregates and road base can be produced. A list of typical products produced and subsequently stored on site is provided in Table 3.1 and shown in Photographs 3.1 and 3.2.



Photograph 3.1 **Stockpiles of finished products within the SMA**



Photograph 3.2 **Stockpiles of finished products within the SMA**

Table 3.1 **Materials produced on site and stored in the SMA**

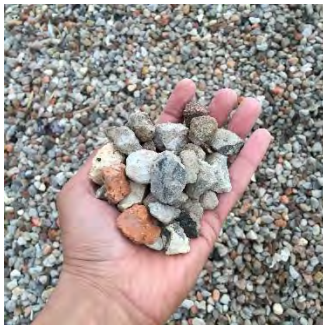
Product



Product Description

10mm Aggregate

A versatile, double screened recycled brick aggregate with multiple applications. Ideal for use around pipes, wet areas and decorative pathways.



20mm Aggregate

Double screened recycled aggregate sourced from concrete, asphalt and construction rubble. Perfect for drainage material, retaining wall backfill and decorative pathways.



40/70 Aggregate

Crushed recycled concrete between 40mm - 70mm. This larger-sized product is ideal for temporary site access roads (to minimise clay carryout by vehicles) and retaining wall backfill.



Bedding Sand

Suitable for pipe bedding, trench filling, slab levelling and sub-course for paving. A low-plasticity, economical and environmentally friendly alternative to virgin sands.

All products produced on site are routinely tested by independent third parties to ensure compliance with any relevant resource recovery exemptions and to ensure consistent quality products are produced.

All stockpiles heights are limited to within the height of the amenity berms as required by the project approval and are maintained in accordance with all current legislative and regulatory requirements.

The product is produced by a variety of machinery that is currently used as required within the area and generally consists of two mobile crushers plus auxiliary equipment (such as screens, stockpilers and re-claimers). Mobile equipment (such as loaders and excavators) used to relocate materials and products are also used within the area on an 'as required' basis.

3.3.3 Landfill

Waste directed to the landfill is categorised as:

- General solid waste, which is sub-categorised into construction and demolition waste containing small quantities of recyclables and soil containing recoverable brick, concrete and timber.
- Asbestos waste, which could be wrapped asbestos (sheeting), asbestos soil and construction and demolition waste containing asbestos.

Any waste that cannot be recycled or reprocessed through the MPC, or SMA, is also sent to landfill.

The landfill receives residual, non-recyclable waste from the MPC via a conveyor and chute.

Alternatively, loads of construction and demolition general solid waste may be accepted directly into the landfill via approved third parties.

The material is deposited at the base of the landfill and pushed into place, spread and compacted by a steel wheeled landfill compactor. Cover is placed by a bulldozer. Each 'lift' of waste is placed along a 50 m tipping face with a daily lift thickness not exceeding 2 m. Filling progresses in panels across the floor of the main tipping area.

The waste is covered progressively as the 2 m thickness is achieved. Therefore, only minimal areas of waste are exposed at any time, which reduces the potential for leachate generation during rain.

i Asbestos waste

If identified, asbestos waste is inspected as follows:

- wrapped asbestos is inspected for correct wrapping and sealing; and
- asbestos soil and other asbestos waste are inspected for sufficient moisture content to prevent the generation of dust during handling.

All asbestos waste is then disposed of in dedicated and restricted areas of the landfill.

ii Leachate management

Leachate is managed in accordance with EPL 13426, the *Leachate Collection, Conveyance and Management Plan* (DADI 2017a) and the *Soil, water and leachate management plan* (WMP) (DADI 2017b).

Infiltration of water through the cover is minimal as evapo-transpiration exceeds rainfall for 80% of the year in the area. Additionally, the steep slope batters of the covered waste results in high water runoff, which is directed to the water management system. Therefore, most leachate generation results from water entrained in the deposited waste or from heavy rainfall which inundates the waste prior to covering.

The active tipping area is covered daily with a minimum of 150 mm of virgin excavated natural material or an alternative daily cover, as required by Condition O5.4 of EPL 13426.

A HDPE leachate liner was installed at the base of the landfill, which was encapsulated by two geotextiles. Perforated polyethylene pipes were placed in an aggregate drainage layer above the liner, which is further covered with geotextile. The pipes collect any leachate and drain via gravity to a concrete lined sump at the lowest elevation of the landfill, from which it is pumped to leachate storage tanks.

The leachate is pumped to sequential batch reactors, which are processing tanks used for the treatment of waste water. There are four 110 kilolitre (kL) tanks at the facility which have a decanting capacity of 50 kL/7-9 hours. The system can treat 600 kL every 24 hours.

The treated leachate is discharged into a Sydney Water sewer on Lot 8 DP 1200048 as permitted by Trade Waste Agreement 35580, which allows the discharge of up to 650 kL a day of pre-treated waste water into Sydney Water infrastructure and is tested every eight days.

Leachate volumes and quality are monitored as follows and reported in the annual return to the EPA:

- the leachate level in the sump is monitored weekly;
- the quality of untreated leachate is monitored quarterly; and
- leachate generation rates are monitored to calibrate the leachate model.

Groundwater is sampled quarterly or yearly (depending on pollutant) and analysed in accordance with Condition M2.2 of the EPL 13426 to determine if landfill operations are impacting water quality. If analysis of the samples indicates that environmental trigger levels for groundwater are exceeded, an action plan or remediation plan is implemented to inform the EPA of the exceedance, re-sample to establish a trend, determine and remediate the source if there is a trend, and remediate the impacted area.

iii Landfill gas

The landfill does not accept putrescible waste and, therefore, there is reduced potential for the generation of landfill gas compared to facilities which do accept such waste. Landfill gas management will be considered before the final capping of the landfill at the end of its life, and may take the form of HDPE pipes and a blower to extract and diffuse the gas.

Landfill gas generation and movement is monitored quarterly via shallow boreholes in accordance with the site's *Landfill Gas Monitoring Program* (DADI 2017c) to determine if gas is moving laterally to adjacent lots. Gas is also monitored at the surface every month to identify if there are faults in the gas management system or capping layers.

iv Water management

Surface water at the facility is managed in accordance with the site's *Landfill Environmental Management Plan* (LEMP) and *Waste Management Plan* (WMP).

Water that falls on the landfill is managed as leachate, with such water falling on the site managed as described above in Section 3.3.3(ii).

Water that falls on the walls and road is directed to the sediment basin. A lined sediment basin is provided in a covered area of the landfill, with a new basin installed when a major high lift has occurred prior to the runoff from the landfill surface entering the sediment basin. The sediment basin can accommodate a 1 in 50 year average recurrence interval 24-hour storm. Sediment is allowed to settle and the resulting clean water collected by a water tanker for use in dust suppression and cleaning of machinery. There is also a transfer pump in the basin which can transfer water to other basins and tanks in the facility.

Runoff volumes will marginally decrease over time as the floor of the landfill raises towards to the top of the void, as the raising of the floor decreases the surface area of the void walls.

3.4 Hours of operation

The current hours of operation are summarised in Table 3.2.

Table 3.2 Current hours of operation

Activity	Days	Existing Times
Construction	Monday – Friday	7:00am to 6:00pm
	Saturday	8:00am to 4:00pm
	Sunday and Public Holidays	Nil
MPC Operations waste deliveries and chute use)	Monday – Friday	7:00am to 6:00pm
	Saturday, Sunday and Public Holidays	8:00am to 4:00pm
Crushing and screening	Monday – Friday	7:00am to 6:00pm
MPC [including maintenance]	Monday – Friday	6:00am to 10:00pm
	Saturday, Sunday and Public Holidays	6:00am to 4:00pm
Landfill Deliveries (by truck only)	Monday -to Sunday	7:00am to 6:00pm

Modification 6, which is currently being determined, proposes to change the operating hours as summarised in Table 3.3.

Table 3.3 Proposed hours

Activity	Days	Existing times	Proposed times
Construction	Monday – Friday	7:00 am to 6:00 pm	No change
	Saturday	8:00 am to 4:00 pm	No change
	Public holidays	Nil	No change
MPC Operations (waste delivers and chute use)	Monday – Friday	7:00 am to 6:00 pm	24 hours
	Saturday, Sunday and Public holidays	8:00 am to 4:00 pm	24 hours
Crushing and screening	Monday – Friday	7:00 am to 6:00 pm	6:00 am to 6:00 pm

Table 3.3 **Proposed hours**

Activity	Days	Existing times	Proposed times
Receipt of segregated materials at the SMA site (excluding crushing and screening)	Monday – Friday	7:00 am to 6:00 pm	24 hours
MPC (including maintenance)	Monday – Friday	6:00 am to 10:00pm	24 hours
	Saturday, Sunday and Public holidays	6:00 am to 4:00 pm	24 hours
Landfill deliveries (by truck only)	Monday – Sunday	7:00 am to 6:00 pm	5:00 am to 9:00 pm

3.5 Employment

The facility directly employs approximately 120 people, which includes up to 20 truck drivers transporting material to and from the site. The facility also contributes to indirect employment such as maintenance personnel and short term contractors. This could change marginally under the proposed modification in line with new shifts being added for evening and night time operations.

3.6 Environmental management and monitoring

Operations at the MPC are managed in accordance with the site Environmental Waste Management Plan, and as described above the landfill is managed in accordance with the LEMP.

The following issue-specific sub-plans relevant to the proposed modification are implemented at the facility under the above over-arching plans:

- Air quality, odour and greenhouse gas management plan;
- Conveyor and chute waste handling procedures;
- Leachate collection, conveyance and management plan;
- Soil, water and leachate management plan;
- Noise monitoring program; and
- Traffic and transport code of conduct.

4 Proposed modifications

4.1 Overview

The purpose of the proposed modification is to provide for the following:

- construction of two access roads to improve site access and traffic flow, one on the northern side of the proposed Precinct Road (entry only) and one on the western side of Kangaroo Avenue (exit only);
- the relocation of three existing weighbridges and installation of three additional weighbridges at a location approximately 50 m inside the proposed Precinct Road entrance;
- relocation of existing administration buildings and onsite visitor and staff car parking generally fronting Kangaroo Avenue adjacent to the exit road to Kangaroo Avenue;
- construction of an enclosed unloading area;
- installation of a construction and demolition waste wash plant, and batch plant / pug mill, all of which to be located adjacent to the materials processing centre;
- construction of an enclosed timber processing building;
- installation of a new above ground fuel storage tank (capacity 90,000 litres) and associated covered refuelling facility;
- modified operations to include reorganisation of existing building use and storage areas combined with the installation of high voltage electricity substations, the demolition of selected buildings, and the construction of new associated road network to support improved operations and vehicle movements;
- associated environmental management works to include modified stormwater management devices, a new water basin, combined with the relocation and modification of the approved western amenity berm; and
- extension of the operational area of the facility to an area to the west of the current operational areas to accommodate the relocation of the crushing plant and stockpiling of recycled material.

The proposed locations of new facilities and relocated operational areas are illustrated in Figure 4.1.

Detailed drawings for the layout and design of the proposed physical changes at the site are provided at Appendix B.

There is no requirement for staged approval and there will be a single period during which the proposed works will be implemented.

4.2 Site access and road realignment

4.2.1 Access

The facility is located at the end of Honeycomb Drive on Lot 1 DP 1145808 and Lot 8 DP 1200048 in Eastern Creek, which is in the Blacktown LGA, as shown in Figure 1.1. The facility is bound by Kangaroo Avenue to the east and north-east, the Western Motorway to the north, Archbold Road to the west and the future Precinct Road to the south.

Prior to 9 October 2017, traffic associated with the facility used a private road (DADI Drive) which intersected with Kangaroo Avenue and Honeycomb Drive as the western leg of a four way intersection. The fourth leg of this intersection was also a private industrial access driveway connecting to another site immediately to the south.

DADI Drive is now being upgraded to a public road (Precinct Road) and during this period, the western leg of the four way intersection has been closed and the facility is being accessed via a new driveway which has been constructed and is operating on the western side of Kangaroo Avenue, approximately 150 m north of the Honeycomb Drive intersection.

It is proposed to retain the Kangaroo Avenue access road for the facility but to convert that access to be for site egress only (no entry). Entry to the site is proposed to be via a new access road (one way; no exit) from the proposed Precinct Road approximately 150 m west of the intersection of Kangaroo Avenue and Honeycomb Drive.

The design requirements for the new site access intersection with Kangaroo Avenue have been determined by Traffix Pty Ltd, who have prepared a detailed traffic report which assesses the future access options for trucks entering the site. The full Traffix report including the swept path analysis for trucks utilising the route, is included as Appendix E of the TIA report.

The preferred Kangaroo Avenue egress arrangement can provide at least two lanes for the traffic exiting the site at all times of the day.

The swept path analysis in Appendix E demonstrates that the new intersection can safely accommodate turning trucks with the current 13.5 m road width of Kangaroo Avenue.

It is also proposed that the on-street car (or truck) parking on Kangaroo Avenue should be prohibited by 'No Stopping' signs, for 50 m either side of the new access intersection centre line, to maintain the current intersection visibility for traffic turning as well as allowing for the through traffic to easily pass any vehicles on Kangaroo Avenue which are turning either left or right at the intersection.

Appropriate road markings will also be instigated.

4.2.2 Internal roads

The primary purpose of the re-arrangement of the internal road system is to provide a safer and more efficient movement of traffic on site, to provide vehicular access to the proposed western extension of the site's operational area and to alleviate current queuing and congestion points.

Three key elements of the proposed modification - the new weighbridges, the construction of the (previously approved) wood processing building, and the extension of the operational area to the west - require an extension and reconfiguration of the internal circulation roads.

The main changes are a widening of the internal road at the proposed weighbridge area to enable multiple weighing of vehicles at any point in time, and the construction of a new perimeter road around the western extension of the operational area. There are also some minor road improvements (e.g. widening) to improve flow and safety near the proposed batching plant / pug mill (north of the MPC).

The internal facility traffic circulation road widths will all comply with the AS 2890 Part 2 recommended minimum road widths of 6.5 m for two way traffic movement by large trucks within industrial sites, with additional widening provided at corners to accommodate the increased vehicle swept path widths for large trucks when cornering.

4.2.3 Car parking

The main staff and visitor car parking area at the facility is located adjacent to the administration office. The car park is rectangular with three lines of car parking bays.

The approximate capacity of the car park is 60 parking spaces. The car park is sealed concrete and is adequate for the existing numbers of employees (50) and visitors normally present on a typical working day.

Visitor and administration car parking is proposed to be relocated to a new carpark located at the Kangaroo Road boundary of the site, and adjacent to the new administration building. There will be approximately 20 car parking spaces available at the new administration and visitor building.

The car parking area adjacent to the existing administration building will be retained for staff parking. The administrative staff relocated to the Kangaroo Avenue building will free up a number of car parking spaces at the existing car park. This will enable the existing parking area to absorb the parking needs of any increased number of operational staff as the business grows in the short term.

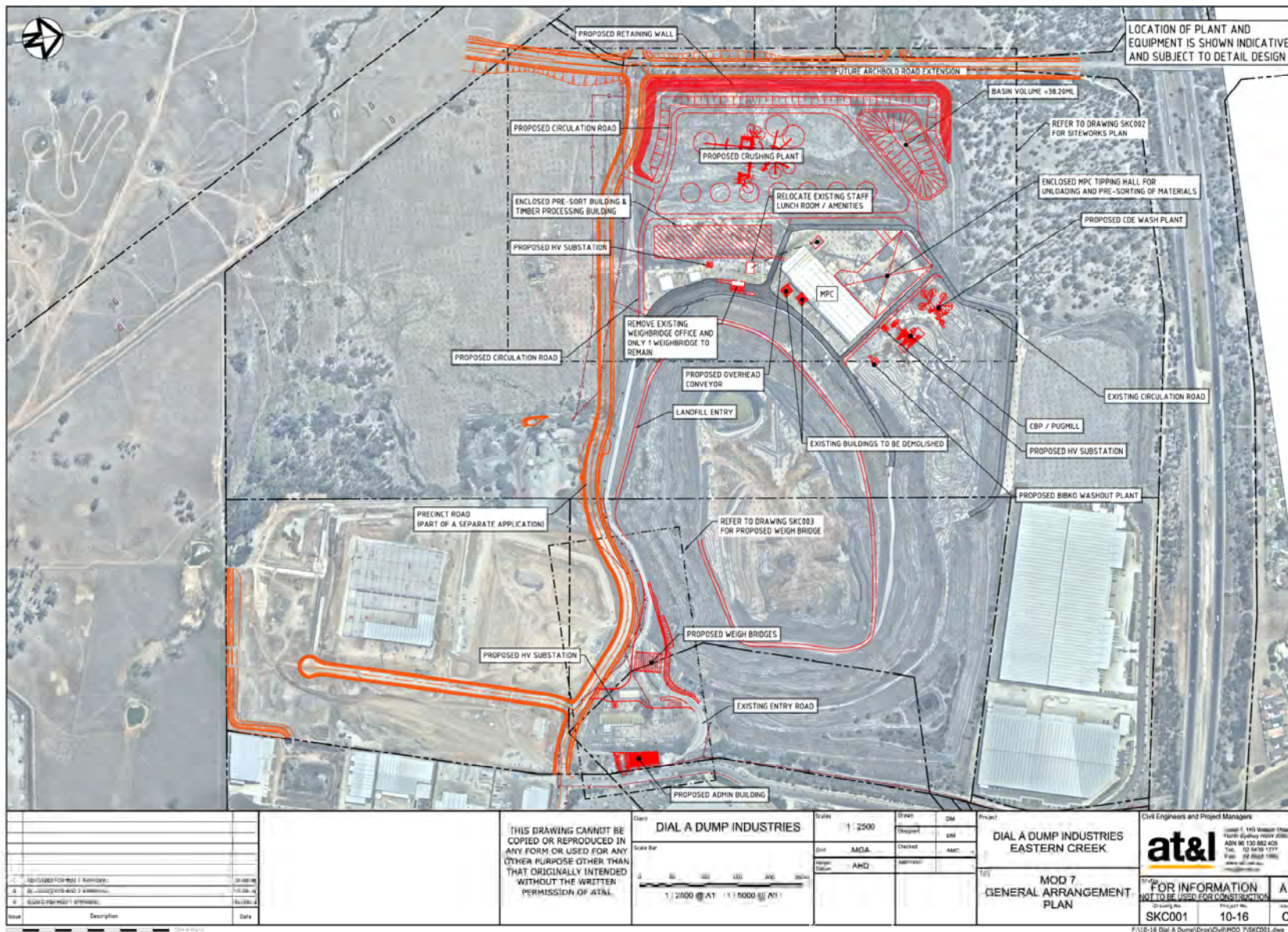
4.3 Weighbridges and refuelling facility

It is proposed to create a new weighbridge facility at a location approximately 50m inside the site from the proposed Precinct Road entry point.

This will create a more efficient means of accommodating truck movements. An increased number of weighbridges and additional feeder lanes will ensure faster weighing and reduced congestion and queuing.

There will be three weighbridges relocated to the new site from the current weighing area near the MPC and three new weighbridges added, making a total of six side-by-side weighbridges (and feeder lanes) at the proposed new location. This means that six vehicles can be weighed concurrently, which will significantly increase the processing times for truck entry, and therefore address potential queuing impacts. One weighbridge will be retained at the current MPC site. The weighbridge remaining in situ at the MPC will be used as a check-out weighbridge for recycled products sold for application off-site.

The installation of an above ground 90,000 L fuel tank (diesel) and an associated shelter for refuelling is also proposed adjacent to the proposed weighbridges.



Proposed site layout

Genesis Xero Waste
Modification 7
Environmental impact assessment

Figure 4.1

4.4 Administration building

The administration building is currently located adjacent to the materials processing centre (MPC) and lacks easy accessibility for visitors and business inquires. The construction of a new administrative and visitor facility facing Kangaroo Avenue will enable a street presence for the facility and also reduce vehicle movements that would otherwise need to mix with waste related truck movements on the internal road system.

This also aims to improve the street facade, which is currently characterised by dilapidated structures, and provide adequate off-street parking.

4.5 Enclosed unloading area, wash plants, and batch plant / pug mill

The construction of an enclosed unloading area adjacent to the MPC was authorised under Modification 1 and will be constructed as part of the suite of enhancements proposed under this modification.

Two wash plants are proposed to be located immediately north of the MPC and unloading area. One plant is designed to recover materials from cement and washout materials. The other is a wash plant for construction and demolition waste.

A concrete batch plant (or alternatively a pug mill) is also proposed to be installed immediately to the north of the MPC and unloading area. This will enable aggregates produced on site by recycling processes to be an input material for concrete production on site rather than transporting aggregate to concrete batching plants beyond the site. A pug mill and batch plant are both fixed mixing plants suitable for producing paste-fill for the mining industry or supplying mixer trucks with concrete.

4.6 Reconfiguration of buildings

An existing building will be demolished at the new weighbridge site, and two small outbuildings abutting the MPC will also be demolished.

An enclosed building, approved under Modification 5, will be constructed immediately west of the existing weighbridge area to house the timber processing operations.

Three additional HV substations are proposed to be installed adjacent to the weighbridges, the timber processing building and the batch plant / pug mill.

4.7 Environmental management works

The range of improvements included in this proposed modification require a range of supporting environmental management works.

A major component is the provision of a new 38 ML water storage basin at the northern extent of the new operational area. The installation of the basin requires the filling of the existing basin and then the excavation and earthworks for the new triangular shaped basin.

The other major component is the retaining wall proposed along the northern, southern and western perimeter of the new western extension to the operational area. This also requires the filling of an existing basin and the reshaping of the landform to create the amenity berm.

There will also be some earthworks proposed adjacent to the new weighbridge area to create a stable batter at the proposed widening of the internal road to accommodate the new weighbridge facility.

4.8 Operational area boundary adjustment

The operational area as currently defined (approximately 54.7 hectares) will need to be extended westward to accommodate the areas identified for crushing and stockpiling. The western extension also incorporates the proposed new bund wall and the extension of the internal circulation road. The proposed western extension comprises an area of approximately 10.6 hectares, being a generally rectangular area abutting the current western boundary of the operational area and extending to the alignment of the future Archbold Road extension.

The proposed modification incorporates some works (including modified stormwater management devices, and the relocated and modified western amenity berm) outside the existing approved operational area, being Lot 1 DP 1145808 and Lot 8 DP 1200648, and as mapped at Appendix 3 of Development Consent 06_0139 (as modified). The current map of the Operational Area is reproduced at Figure 4.2 below.

In order to retain the location of all associated operational structures within the operational area, it is therefore necessary to adjust the alignment of the western boundary of the Operational Area westward towards Archbold Road into part of Lot 2 DP1145808, as shown on Figure 4.3.

Condition 25(k) of the project approval requires that the stormwater management system for the operational area be constructed, owned and maintained by the developer, and that this requirement be created over the title on which the Operational Area is overlaid.

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- KEY**
- Current operational area
 - Proposed operational area
 - Lot 1, DP1145808
 - Lot 2, DP1145808
 - Lot 8, DP1200048
 - Main road
 - Local road
 - Watercourse
 - Cadastral boundary

Proposed extension to
operational area

Genesis Xero Waste
Modification 7
Environmental impact assessment

Figure 4.3



Source: EMM (2017); GA (2017)

0 0.5 1 km
GDA 1994 MGA Zone 56

4.9 The need for the project

4.9.1 New access road

The facility is located at the end of Honeycomb Drive on Lot 1 DP 1145808 and Lot 8 DP 1200048 in Eastern Creek, which is in the Blacktown LGA, as shown in Figure 1.1. The facility is bound by Kangaroo Avenue to the east and north-east, the Western Motorway to the north, Archbold Road to the west and the future Precinct Road to the south.

The primary access route to the site via Wonderland Drive, Honeycomb Drive and Kangaroo Avenue has been constructed to a high design standard for industrial area roads and the current general speed limit in the area is 50 km/hr which also improves traffic safety. All the existing intersections along these routes have been well designed and have adequate sight distances for visibility for the prevailing traffic speed which is 50 km/hr.

Prior to 9 October 2017, traffic associated with the facility used a private road (generally referred to as DADI Drive) which intersected with Kangaroo Avenue and Honeycomb Drive as the western leg of a four way intersection. The fourth leg of this intersection was also a private industrial access driveway connecting to another site immediately to the south.

DADI Drive is now being upgraded to a public road (Precinct Road) and during this period, the western leg of the four way intersection has been closed and the facility is being accessed via a new driveway which has been constructed and is operating on the western side of Kangaroo Avenue, approximately 150 m north of the Honeycomb Drive intersection.

The proposed relocation of the existing site access road and associated weighbridges is required to facilitate the delivery of part of the Precinct Road as required by conditions 45 and 46 of the project approval (MP 06_0139), which state the following:

45. Within five years from the date of this approval or when an adjoining land owner is building a precinct road to a common boundary (whichever is sooner), the Proponent shall design and construct, to the satisfaction of Council, those parts of the Precinct Plan Road network that ultimately fall within the operational area of the facility (See Appendix 3). These precinct roads shall be dedicated to council, at no charge, to form part of the public road network.
46. When a Precinct Plan road is constructed, the Proponent shall design and construct any new vehicular connections to the Precinct Plan Road, to the satisfaction of Council.

The preferred future site access arrangement is for two separate road connections which serve as entry and exit points. It is proposed that an entry from Precinct Road serves as a one way entry point (no exit) and that exit to Kangaroo Avenue serves as a one way exit point (no entry).

The connection of Precinct Road will be approximately 150 m west of the intersection of Kangaroo Avenue and Honeycomb Drive. The connection to Kangaroo Avenue is at a location approximately 150 m north of the current intersection with Honeycomb Drive.

The recommended driveway locations, with entry from the future Precinct Road and egress via Kangaroo Avenue, has been selected on the basis of minimising traffic queuing beyond (i.e. outside) the site boundary and also to improve the flow of traffic within the site.

The key traffic hold points, such as the entry/exit weighbridges, are located to accommodate maximum traffic queues within the facility and avoid external traffic queuing which might impede access to neighbouring businesses. Six site entry or exit weighbridges are proposed, located at an average travel distance of 50 m within the site boundary from the new Precinct Road. This gives a maximum site entry traffic queuing capacity of up to 250 m at the peak traffic entry times, when up to five out of the six weighbridges can be utilised to accommodate the peak incoming truck traffic movements.

The design requirements for the new site access intersection with Kangaroo Avenue have been determined by Traffix Pty Ltd, who have prepared a detailed traffic report which assesses the future access options for trucks entering the site. The full Traffix report, including the swept path analysis for trucks entering the site, is included as Appendix E of the TIA report (EMM 2018).

The use of Kangaroo Avenue as a temporary access arrangement has now been constructed and is operating as an interim site access - both ingress and egress - during the construction of the new Precinct Road. It will provide a better outcome for the future transport operations on the site and also for minimising any potential traffic impact to the public road network in terms of traffic flow and safety. The preferred future use of Kangaroo Avenue access road as an exit only road can provide at least two lanes for the departing site traffic at all times of the day.

According to the Blacktown City Council Road Hierarchy Standards for industrial roads, Kangaroo Avenue is a 'local industrial road' with daily vehicle movements less than 4,000. A road is categorised as an 'industrial collector road' when these daily movements are exceeded, and requires a road carriageway width of 15.5 m. Daily traffic movements along the 150 m of Kangaroo Avenue to the new access driveway are predicted to be 4,148, and subsequently the western side of that section of road should require widening by 2 m according to the road hierarchy standards.

Notwithstanding the above, the swept path analysis in the TIA (Appendix E) demonstrates that the new access intersection can safely accommodate turning trucks with the current 13.5 m road width. As the predicted daily traffic movements for Kangaroo Avenue will be only marginally above the 4,000 threshold, additional road widening is not proposed.

It is recommended, however, that the on-street car (or truck) parking on Kangaroo Avenue should be prohibited by 'No Stopping' signs, for 50 m either side of the new access intersection centre line, to maintain the current intersection visibility for traffic turning as well as allowing for the through traffic to easily pass any vehicles on Kangaroo Avenue which are turning either left or right at the intersection. Appropriate line markings will also be installed.

4.9.2 Internal roads

The primary purpose of the re-arrangement of the internal road system is to provide a more efficient movement of traffic on site, to provide for access at the proposed western extension of the operational area, and to alleviate current queuing and congestion points.

Three key elements of the proposed modification - the new weighbridges, the construction of the (previously approved) timber processing building, and the extension of the operational area to the west - require an extension and reconfiguration of the internal circulation roads.

These new roads do not require major re-routing of the existing internal roads. All existing roads will remain in their current alignment.

Widening of the existing road is required at the proposed weighbridge area to enable safe weighbridge access and egress for multiple vehicles at the same time. This proposed configuration gives a maximum site entry traffic queuing capacity of up to 250 m at the peak traffic entry times, when up to five out of the six weigh bridges can be utilised to accommodate the peak incoming truck traffic movements.

4.9.3 Car parking

The main staff and visitor car parking area at the facility is located adjacent to the administration office. The car park is rectangular with three lines of car parking bays.

The approximate capacity of the current car park is 60 parking spaces. The car park is sealed concrete and is adequate for the maximum numbers of employees (50) and visitors normally present on a typical working day.

Visitors and administrative staff are required, under the current car parking arrangements, to queue in the same traffic stream as waste-laden trucks and this is impeding the access of both trucks and visitor vehicles. A superior arrangement would be to position the visitor services and administration offices at a more accessible location near the perimeter of the site, hence the proposed location of the new administration and visitor building.

The transfer of parking demand from the existing car park site, which is essentially in a central operational area, to a new car park at the Kangaroo Avenue boundary, is also warranted as a means by which growth in the number of operational employees can be absorbed at the existing car park. In essence, operational staff will use the existing car park and administration staff and visitors will use the proposed new car park next to Kangaroo Avenue.

4.9.4 Weighbridges and refuelling facility

The expansion of the number of weighbridges and the relocation of the weighing process to the south eastern sector of the site is a crucial component of the reconfiguration of site logistics.

The parallel weighbridge arrangement will vastly improve the processing time and alleviate the queuing which is currently experienced at peak times on the site. It will also enable the access via Precinct Road to function without queuing impacts outside the site.

Refuelling facilities were previously located in the segregated materials area, but the provision of refuelling is more appropriately located close to the proposed exit route to Kangaroo Avenue.

4.9.5 Pre-sort building

The construction of a building to enclose the unloading and pre-sorting of co-mingled material was approved under Modification 1.

The building will enable co-mingled waste to be tipped from trucks and then subjected to a preliminary sorting process which will generate efficiencies within the adjoining MPC. This is achieved by removing, before MPC processing, all obvious material which will be unsuitable for the MPC plant (such as mattresses or large objects). Some of that unsuitable material will be redirected to an appropriate processing point or, if it constitutes materials which cannot be recycled, disposed to landfill.

The 'pre-sorting' currently occurs within the MPC and this can cause delays and congestion in the operation of the MPC recycling processes. The construction of the Pre-Sort Building therefore essentially represents an extension to the MPC to improve efficiencies in the recycling processes at the facility.

Note that the unloading and pre-sorting will be enclosed, as is now the case within the MPC, thereby avoiding any potential additional impact in terms of air quality or noise.

4.9.6 Timber processing building

The construction of a building to enclose the processing of timber material was approved under Modification 5.

The construction of the Pre-Sort Building will displace the processes which currently occur in that open area. The primary use of that area at present is to process and sort timber waste materials.

The proposed Timber Processing Building will house that displaced timber processing with the added advantage of enclosing the activities which are currently performed in an open area. This will enable improvements to air quality and noise impact management, and also provide a logistically superior movement for vehicles and process lines at the facility.

4.9.7 Extension of the operational area

The current growth in demand for waste recycling and disposal, and the anticipated demand in the mid-term, require increased through-put and processing capacity.

Expansion of operations, including the installation of new buildings such as the Pre-Sort Building and Timber Processing Building, and new plant such as batching and washing facilities, will crowd the areas currently used for crushing, sorting and stockpiling of segregated materials (generally to the north of the existing MPC).

There is also a need to provide a sufficient capacity for water storage on site.

These operations should logically be accommodated in the land owned by the Proponent to the west of the current operational area. An adjustment of the authorised operational area is therefore proposed into part Lot 2 DP1145808.

4.9.8 Environmental management works

The range of improvements proposed in this modification require a range of supporting environmental management works.

A major component is the provision of a new 38 ML water storage basin at the northern extent of the new operational area. The installation of the basin requires the filling of the existing basin and then the excavation and earthworks for the new triangular shaped basin.

The other major component is the retaining wall proposed along the northern, southern and western perimeter of the new western extension to the operational area. This also requires the filling of an existing basin and the reshaping of the landform to create the amenity berm. The justification for the proposed retaining wall and berm is to provide adequate mitigation of potential impacts such as light spill and noise.

There will also be some earthworks proposed adjacent to the new weighbridge area. This is needed to create a stable batter at the proposed widening of the internal road to accommodate the new weighbridge facility.

4.9.9 Administration building

The administration building is currently located adjacent to the materials processing centre (MPC) and lacks easy accessibility for visitors and business inquires. This means that passenger vehicles mix with the queuing of waste delivery trucks, and there is unnecessary congestion and delay as a result.

The construction of a new administrative and visitor facility facing Kangaroo Avenue will also enable a street presence for the facility and a more corporate streetscape for Kangaroo Avenue.

4.9.10 Additional plant

Two wash plants are proposed to be located immediately north of the MPC and unloading area - a Bibko Washout Plant and a wash plant for construction and demolition waste. It is also proposed to install a concrete batch plant (CBP) or alternatively a pug mill.

CBPs and pug mills are similar types of equipment which will enable 'value added' products to be produced on site.

The advantage of providing these facilities on site is that it will enable aggregates produced on site by recycling processes to be an input material for concrete (or similar) production on site rather than transporting aggregate to concrete batching plants beyond the site.

4.9.11 Reconfiguration of buildings

Demolition of selected buildings will be required to make way for the proposed new weighbridges and because some smaller buildings are not operationally redundant.

The exiting staff amenity building will be relocated to a site adjoining the MPC to improve the availability of amenities for staff who work in the main operational areas.

5 Strategic and statutory framework

This chapter outlines the statutory framework that applies to the proposed modification. It provides an overview of the applicable environmental planning approval process under NSW and Commonwealth legislation and details of other NSW legislation relevant to the proposed modification.

5.1 Planning approval history

The existing project approval (MP 06_0139), granted in 2009 by the NSW Minister for Planning, has been modified five times. A summary of the project approval and subsequent modifications was provided in Table 1.1.

This chapter outlines the strategic and statutory framework that applies to the modification. It provides an overview of the applicable environmental planning approval process under NSW and Commonwealth legislation and details of other NSW legislation relevant to the modification.

5.2 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) aims to protect matters deemed to be of national environmental significance (NES) that is:

- world heritage properties;
- places listed on the National Heritage Register;
- Ramsar wetlands of international significance;
- threatened flora and fauna species and ecological communities;
- migratory species;
- Commonwealth marine areas;
- nuclear actions (including uranium mining); and
- actions of development for coal seam gas or large coal mining on water resources.

If an action (or proposed modification) would, or is likely to, have a significant impact on any matters of NES, it is deemed to be a controlled action and requires approval from the Commonwealth Environment Minister or the Minister's delegate. To determine whether a proposed action would or is likely to be a controlled action, an action may be referred to the Commonwealth Department of the Environment and Energy (DoEE).

The proposed modification will not involve any ground disturbance and will not involve any nuclear, coal seam gas or coal mining actions. Accordingly, a referral to the Commonwealth DoEE is not required.

5.3 State legislation

5.3.1 NSW Environmental Planning and Assessment Act 1979

The project approval was granted under Part 3A of the EP&A Act. It was deemed a 'major project' by DPE under Section 75(b) of the EP&A Act. The consent authority for 'major projects' was then the Minister for Planning. At the time, an approved Part 3A major project could be modified under section 75W of the EP&A Act.

Part 3A was repealed by the *NSW Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011* (Part 3A Repeal Act). However, transitional provisions were introduced (Schedule 6A of the EP&A Act) enabling a 'transitional Part 3A project' to continue to be subject to Part 3A of the EP&A Act (as in force immediately before the repeal and as modified by the Part 3A Repeal Act). Transitional Part 3A projects include projects that were the subject of an existing approval under Part 3A. Therefore, the facility is a transitional Part 3A project and the proposed modification may be made under section 75W of the EP&A Act. Section 75W enables a proponent to request the Minister (or delegate) to modify a project approval granted under Part 3A.

Section 75W states:

(1) In this section:

Minister's approval means an approval to carry out a project under this Part, and includes an approval of a concept plan.

modification of approval means changing the terms of a Minister's approval, including:

- (a) revoking or varying a condition of the approval or imposing an additional condition of the approval, and
 - (b) changing the terms of any determination made by the Minister under Division 3 in connection with the approval.
- (2) The proponent may request the Minister to modify the Minister's approval for a project. The Minister's approval for a modification is not required if the project as modified will be consistent with the existing approval under this Part.
- (3) The request for the Minister's approval is to be lodged with the Director-General. The Director-General may notify the proponent of environmental assessment requirements with respect to the proposed modification that the proponent must comply with before the matter will be considered by the Minister.
- (4) The Minister may modify the approval (with or without conditions) or disapprove of the modification.

The proposed modification is considered to be consistent with the objects of the EP&A Act as demonstrated in Section 9.4 of this EA.

5.3.2 NSW Protection of the Environment Operations Act 1997

The POEO Act is the principal NSW environmental protection legislation and is administered by the EPA. The site has the following EPLs issued under the POEO Act:

- EPL 13426, which applies to waste disposal (application to land) and waste storage, and which states that the licensee must:
 - not landfill more than 700,000 tonnes of non-putrescible waste per year; and
 - operate between the hours of 7:00am and 6:00pm Monday to Friday, and 8:00am to 4:00pm Saturday, Sunday and public holidays.
- EPL 20121, which applies to composting, resource recovery and waste storage and which states that the licensee must operate between:
 - 7:00am to 6:00pm Monday to Friday, and 8:00am to 4:00pm Saturday, Sunday and public holidays for all activities at the site; and
 - 6:00am to 10:00pm Monday to Friday and 6:00am to 4:00pm Saturday, Sunday and public holidays at the MPC.

5.3.3 Waste Avoidance and Recovery Act 2001

The NSW *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) sets the strategic direction for waste management and resource recovery in NSW. Among the main objectives of the WARR Act are:

- (b) to ensure that resource management options are considered in accordance with the following hierarchical order:
 - (i) avoidance of unnecessary resource consumption,
 - (ii) resource recovery (including reuse, reprocessing, recycling and energy recovery), or
 - (iii) disposal.

The proposed modification would be consistent with the objectives of the WARR Act by increasing opportunities for resource recovery from building and demolition, and commercial and industrial wastes. It will accomplish this by accepting and processing more waste during the proposed extended operating hours and removal of the landfill limit, which will enable greater quantities of waste to be processed, including maximising the recycling potential of the facility.

The facility also provides a site for disposal of waste, which is the final waste management option in the waste hierarchy and which is preferably only used for material that cannot be recycled such as asbestos waste.

5.3.4 Contaminated Land Management Act 1997

The NSW *Contaminated Land Management Act 1997* (CLM Act) establishes a process for investigating and remediating land that the EPA considers contaminated.

The original EA investigated contamination at the site and found that no notices or orders to investigate or remediate contamination have been issued for the site under the NSW *Contaminated Land Act 1997*. Soil investigations of overburden and in-situ material at the site found that contaminant concentration levels were below the criteria recommended for the land use and no asbestos was detected. There was an elevated concentration of nickel in one sample, however, nickel levels are naturally high in the source material and did not indicate contamination had occurred.

Consistent with the original EA contamination investigation, no contaminated land is expected to be encountered during the proposed works.

5.3.5 Roads Act 1993

The NSW *Roads Act 1993* (Roads Act) governs activities in, on, under or over a public road. The Roads Act is administered by NSW Roads and Maritime Services (RMS), the local council or other roads authority depending on the road classification. The local council has authority over local roads and RMS has authority over major roads. Under Section 138 of the Roads Act approval is required before any works can be undertaken within a public road reserve.

The proposed modification includes the construction of a new entry road from the proposed Precinct Road (ingress only) and a formalised exit from the site (currently a temporary two-way ingress and egress) at Kangaroo Avenue.

A Section 138 approval for these works will be obtained by the proponent prior to construction.

5.3.6 Water Management Act 2000

The NSW *Water Management Act 2000* (WM Act) provides for the sustainable and integrated management of water sources of the State for the benefit of present and future generations. The WM Act governs the preparation of water sharing plans that set extraction limits and rules for water access, available water determinations, account management and trading to protect water sources.

Section 75U(1)(h) of the EP&A Act (now repealed) exempts projects approved under Part 3A from the need to obtain water use approvals, water management works approvals and controlled activity approvals under the WM Act. Therefore, these approvals are not required for the facility.

The proposed modification will have acceptable impacts on watercourses and will not be considered as a controlled activity under the WM Act.

5.3.7 Environmental planning instruments

i State Environmental Planning Policy (Western Sydney Employment Area) 2009

The SEPP 2009 provides land use zones for areas of Eastern Creek, Erskine Park and Horsley Park. According to Schedule 1 (additional permitted uses of the SEPP), the consent authority may consent to development for the purposes of a waste facility for general solid waste (non-putrescible) at the lots subject to this EA.

Consistent with the SEPP, project approval was granted for a waste facility at the site, and this EA accompanies an application to modify the approval to improve the ability of the facility to respond to waste disposal demands and fulfil NSW Government waste management objectives.

ii State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33) ensures that the consent authority has sufficient information to assess if a development is hazardous or offensive and to impose conditions to reduce the impact.

a. **Offensive development**

SEPP 33 regards an offensive development as one that could emit a polluting discharge without the implementation of management measures. The key consideration for the consent authority is whether there are adequate controls proposed to control emissions so that significant residual emissions are not discharged. In most cases, compliance with an EPL issued by the EPA demonstrates that a development is not offensive.

The original EA stated that the facility will not be offensive as the potential impacts identified in the technical assessments could be managed in accordance with an EPL.

As described in Section 5.2.2, two EPLs apply to the site, and, should the proposed modification be approved, the Proponent will apply to have these amended based on the outcomes of the technical assessments appended to this EA.

Therefore, should the amendments be accepted by the EPA, the proposed modification will not qualify the facility as offensive development.

b. **Hazardous development**

SEPP 33 regards a hazardous development as one which would pose a significant risk to human health, property or the environment in a locality without the implementation of management measures. The facility is approved to store diesel, which is classified as a C1 – class 3 hazardous good but is not classified in the Dangerous Goods Code.

The original EA determined that the storage of diesel at the facility would not qualify it as a hazardous development. No additional diesel is proposed to be stored onsite under the proposed modification and, therefore, the proposed modification will not qualify the facility as a hazardous development. The commencement of State Environment Planning Policy (Western Sydney Employment Area) 2009 (the SEPP) repealed SEPP 59. However, clause 19 of the SEPP allows for the Eastern Creek Precinct Plan to apply to land previously identified.

iii **Blacktown Local Environmental Plan 2015**

Blacktown Local Environmental Plan 2015 provides land use zones for the Blacktown local government area (LGA), which includes the lots subject to this EA. However, the land use zones for the site are contained in the SEPP, with waste facilities permissible at the subject lots.

iv **Eastern Creek Precinct Plan – Stage 3**

The Eastern Creek Precinct Plan has been prepared in accordance with the provisions of the now repealed State Environmental Planning Policy No 59 – Central Western Sydney Economic and Employment Area (SEPP 59) and aims to reinforce the provisions of SEPP 59, by providing guidelines for the detailed planning and development of the Eastern Creek Precinct.

Land identified within the Eastern Creek Precinct is zoned Employment under the provisions of SEPP 59 and covers an area of approximately 600 ha, and is bound by the M4 Western Motorway and the Lot 11 Precinct to the north, Wallgrove Road to the east, the Sydney Water Pipeline to the south, and the TransGrid transmission easements to the west.

The facility is on land identified as Release Area 3 in the Eastern Creek Precinct Plan. The proposed modification is consistent with the Eastern Creek Precinct Plan.

5.4 Other relevant policies, plans and guidelines

5.4.1 Blacktown City Council Contributions Plan No. 18

The Blacktown City Council Contributions Plan No. 18 outlines Blacktown City Council's policy regarding the application of Section 94 of the EP&A Act in relation to the provision of local infrastructure and baseline facilities within the Stage 3 Precinct of Eastern Creek where the facility is located.

In a letter dated 12 April 2017 to DPE, Judith Portelli, Manager Development Assessment, of Blacktown City Council outlined the applicability of the Blacktown City Council Contributions Plan No. 18 to the proposed modification. The letter states that the proposed realignment of the facility's western boundary to Archbold Road will increase the 'operational area' of the project and will have an impact on Council's adopted contributions plan. The applicable contribution will be paid in accordance with Blacktown City Council Contributions Plan No. 18 following approval of the proposed modification.

5.4.2 Eastern Creek Precinct Plan

The Eastern Creek Precinct Plan was prepared in accordance with the provisions of the now repealed State Environmental Planning Policy No 59 – Central Western Sydney Economic and Employment Area (SEPP 59) and aims to reinforce the provisions of SEPP 59, by providing guidelines for the detailed planning and development of the Eastern Creek Precinct.

Land identified within the Eastern Creek Precinct is zoned Employment under the provisions of SEPP 59 and covers an area of approximately 600 ha, and is bound by the M4 Western Motorway and the Lot 11 Precinct to the north, Wallgrove Road to the east, the Sydney Water Pipeline to the south, and the TransGrid transmission easements to the west.

The facility is on land identified as Release Area 3 in the Eastern Creek Precinct Plan. The proposed modification is consistent with the Eastern Creek Precinct Plan. Section 6.3 of the Plan provides for the future use of the former Pioneer Quarry as *a waste facility for non-putrescible material*.

5.4.3 NSW Waste Avoidance and Resource Recovery Strategy 2014-2021

The NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014–21 provides a framework for waste management in NSW with the primary goal “to enable all of the NSW community to improve environment and community well-being by reducing the environmental impact of waste and using resources more efficiently”.

The WARR Strategy 2014–21 sets targets for 2021-22 in the following key result areas:

1. avoid and reduce waste generation;
2. increase recycling;
3. divert more waste from landfill;
4. manage problem wastes better;
5. reduce litter; and
6. reduce illegal dumping.

The proposed modification would contribute to the key result areas and targets of the WARR Strategy 2014–21 to increase recycling, manage problem wastes better and reduce illegal dumping. The proposed modification will contribute to the WARR Strategy 2014–21 by increasing opportunities for resource recovery and recycling from building and demolition, and commercial and industrial wastes. It will accomplish this by establishing new plant and equipment and re-organising the layout of the existing facility. This will increase the efficiency of the facility and enable on-site resource recovery which will enable greater quantities of waste to be processed. The facility also provides a site for disposal of waste, which is important to improving management of problem wastes and material that cannot be recycled such as asbestos waste.

5.5 Summary of approvals

A summary of the approvals and licences relevant to the proposed modification is provided in Table 5.2.

Table 5.1 Summary of approvals and licences

Approval/licence	Relevant legislation	Issuing authority	Required
Section 75W modification approval	EP&A Act	DPE	Yes
Environment Protection Licence	POEO Act	EPA	Yes
Section 138 approval	Roads Act	Blacktown City Council	Yes
Water use approvals, water management works approvals and controlled activities approvals	WM Act	NSW Office of Water	No

6 Stakeholder engagement

6.1 Introduction

The Secretary's Environmental Assessment Requirements (SEARs), issued on 24 April 2017, included a recommendation that the Proponent consult directly with relevant government agencies in preparing the environmental assessment.

The SEARs attached a number of written responses prepared by NSW Government agencies and local authorities when DPE referred the proposal to those agencies seeking advice on key issues. Respondents include Blacktown City Council, NSW Roads and Maritime Services (RMS), NSW Environment Protection Authority (EPA), NSW Office of Environment and Heritage, Department of Primary Industries, and Water NSW.

6.2 Consultation with government

A summary of consultation is provided in Table 6.1 below.

Table 6.1 Consultation record and outcomes

Stakeholder	Method of engagement	Date	Purpose	Outcome/comment
Blacktown City Council	Meeting	31/07/17	Clarify requirements for MOD 6	Council confirmed requirements
	Meeting	13/09/17	Clarify issues raised in previous meeting	Awareness raising and resolution of uncertainties
	Meeting	06/02/18	Presenting site layout and additional details	Awareness raising and resolution of uncertainties
EPA	Meeting	14/08/18	Site visit to facility to provide detail regarding the explain Mod and allow EPA to inspect site	Awareness raising and resolution of uncertainties
	Meeting	27/08/18	To discuss prior EPA comments surrounding air quality	Amended modelling required prior to submission
DPE	Meeting	26/10/17	Clarify SEARs requirements for Mod	Agreed work requirements
	Teleconference	18/05/18	Provide information on traffic management	Awareness raising and resolution of uncertainties
	Meeting	21/06/18	Clarification on proposed modifications	Awareness raising and resolution of uncertainties

In addition there has been frequent telephone and email contact with DPE and EPA on procedural matters and clarification of technical issues.

7 Environmental assessment

7.1 Overview

The potential environmental impacts of the proposed modification were assessed at a level of detail commensurate with the associated levels of risk. Specialist reports have been prepared to assess key matters including noise and vibration, air quality and odour, leachate and traffic and transport. The EA and specialist reports have been prepared to address the SEARs issued for the proposed modification. This section summarises the technical specialist reports and provides an assessment of the potential environmental impacts associated with the proposed modification.

7.1.1 A note regarding the technical assessments

The technical assessments (attached at the Appendices) were prepared for the key potential areas of impact as prescribed in the SEARs.

In assessing the environmental impacts, the assessments considered the proposed modifications in the context of the consent condition which limits the maximum physical limit of waste processing for the facility, beings 2M tpa. The total waste received through the gate at the facility in FY 2018 was approximately 1.44M t.

The volumes of waste, regardless of whether direct-to-landfill, segregated recyclables or co-mingled recyclables, are driven by the market and not by theoretical limits. The facility is currently accommodating all market demand and the improvements in the roads, plant and buildings at the site will not suddenly release pent up demand. It is anticipated that demand will grow but the growth will be incremental and market driven over time.

The maximum of 2M tpa may indeed never be reached. The assessments, however, have taken a conservative approach by modelling impacts at that extreme maximum volume of waste. It should also be note that Modification 6, currently also being determined, seeks to set a landfilling limit of 1M tpa.

7.2 Noise and vibration

7.2.1 Introduction

The potential for noise and vibration to be generated by the proposed modification was assessed in detail. The noise and vibration assessment is provided at Appendix C and is summarised in this chapter.

Noise and vibration was assessed having regard to the SEARs and the following NSW guidelines and policies:

- *Industrial Noise Policy* (EPA 2000) ('INP');
- *Industrial Noise Policy Application Notes* (EPA 2013);
- *Road Noise Policy* (EPA 2011) ('RNP'); and
- *Environmental Noise Management – Assessing Vibration: a technical guideline* (DEC 2006) ('ENM').

7.2.2 Existing environment

i Sensitive receivers

The site is in an industrial and commercial precinct. The closest residential properties are approximately 430 m to the north in Minchinbury on the opposite (northern) side of the M4 Western Motorway. Other surrounding land uses are industrial and commercial, with the site directly bounded by industrial properties on the north, east and south. The assessment locations are shown on Figure 7.1, which represent potentially affected receivers.

ii Existing noise

Noise measurements were recently taken (2016) in the residential areas to the north (Minchinbury) and west (Erskine Park) for a proposed development adjacent to the facility (Figure 7.1). These measurements were used for this assessment as they are relatively recent and represent receivers potentially affected by noise from the proposed modification. The overall noise level representing each INP assessment period (day/evening/night) is presented in Table 7.1.

There are commercial/industrial facilities which contribute to existing noise levels in the area such as the retail depot and logistics distribution centres to the north-west of the site. Road traffic noise from major arterial roads (M4, M7, Great Western Highway and Wallgrove Road) surrounding the site also contribute significantly to the noise environment at residential areas, with noise from these sources dominant at most of the measurement locations.

The current application to modify MP 06_0139 includes a proposal to amend the current noise limits relevant to the facility.

As per the findings of the noise and vibration impact assessment (NVIA) prepared by EMM the current noise limits provided in Condition 38 of Schedule 3 of MP 06_0139 are set significantly below the project specific noise levels (PSNL) which have been established in accordance with INP methodology (refer Table 4.5 of the NVIA). This means that the current noise limits are more stringent than they need to be since they are significantly below those that are likely to cause intrusive noise impact at the nearest residences to the facility. This has been confirmed by results of bi-annual compliance noise monitoring which regularly determines that site noise emissions are not audible at the nearest residences.

The current Condition 38 of Schedule 3 of MP 06_0139 is reproduced as follows:

Noise Impact Assessment Criteria

38. The Proponent shall ensure that noise from the project does not exceed the noise limits in Table 4.

Table 4: Development Noise Limits (dBA)

Location	Day $L_{Aeq,15\text{ minute}}$, dB	Evening $L_{Aeq,15\text{ minute}}$, dB	Morning Shoulder $L_{Aeq,15\text{ minute}}$, dB
Any receiver	37	36	36

38a. Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the latest version of the NSW Industrial Noise Policy.

It is proposed that Condition 38 of Schedule 3 of MP 06_0139 be deleted and replaced with the following:

Noise Impact Assessment Criteria

38. The Proponent shall ensure that noise from the project does not exceed the noise limits in Table 4.

Table 4: Development Noise Limits, $L_{Aeq,15\text{ minute}}$ (dB)

Location	Day	Evening	Night	Morning Shoulder
Any private residence in Minchinbury	48	47	44	47
Any private residence in Erskine Park	42	40	37	37

1. Day is the period from 7 am to 6 pm on Monday to Saturday, and 8 am to 6 pm on Sundays and Public Holidays
2. Evening is the period from 6 pm to 10 pm
3. Morning shoulder is the period from 6 am to 7 am on Monday to Saturday, and 6 am to 8 am on Sunday and Public Holidays.
4. Night-time period is all other times.

38a. Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the latest version of the NSW Industrial Noise Policy.

We note that the proposed limits in the new Table 4 of Condition 38 are based on the predicted and expected achievable noise levels. For the night-time period these are stricter than the derived PSNLs for the site.

Table 7.1 Summary of existing and ambient background noise levels

Monitoring location (refer to Figure 7.1)	Period ¹	RBL ² , dB	Ambient $L_{Aeq, period}$ noise level ³ , dB
BG1 (24 Cobbler Crescent, Minchinbury)	Day	43	55
	Evening	48	54
	Night	41	51
BG2 (4 Blackbird Glen, Erskine Park)	Day	37	53
	Evening	44	57
	Night	35	46

- Notes
1. Day: 7 am – 6 pm Monday – Saturday; 8 am – 6 pm Sundays and public holidays; Evening: 6 pm – 10 pm; Night: all remaining periods.
 2. Rating background level (RBL) is the overall single figure background level representing each assessment period (day/evening/night) over the whole monitoring period.
 3. Represents the energy average noise level over the relevant period.

iii Meteorology

Noise propagation over distance can be significantly affected by the prevailing weather conditions. Of most interest are source to receiver winds, the presence of temperature inversions and drainage flow effects, as these conditions can enhance received noise levels. Weather conditions considered in the noise modelling are provided in Table 7.2, which were derived from data available for the Horsley Park automatic weather station (located approximately 6 km south-south-east of the facility).

Table 7.2 **Weather conditions considered in noise modelling**

Assessment period	Meteorological condition	Air temperature	Relative humidity	Wind speed ¹	Direction	Stability category (temperature gradient)
Day	Calm	20°C	70%	0 m/s	n/a	D class
Day	Winds	20°C	70%	1.9 m/s	292.5° to 315°	D class
Evening	Calm	10°C	90%	0 m/s	n/a	D class
Evening	Winds	10°C	90%	2.4 m/s	67.5° to 292.5°	D class
Night/morning shoulder	Calm	10°C	90%	0 m/s	n/a	D class
Night/morning shoulder	Winds	10°C	90%	2.5 m/s	157.5° to 315°	D class
Night/morning shoulder	Temp. inversion	10°C	90%	0 m/s	n/a	F class

Note 1. Based on the 10th percentile wind speed of all winds present for 30% of the time during the relevant period.

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KEY

- Assessment locations
- Monitoring location
- Proposed extension to operation area
- Facility
- Main road
- Local road
- Watercourse

Noise monitoring and
assessment locations

Genesis Xero Waste
Modification 7
Environmental impact assessment

Figure 7.1

7.2.3 Assessment criteria

i Industrial noise

Noise emissions from industrial sites in NSW are regulated by licences and/or approval conditions, which are derived from operational noise criteria applied at assessment locations. They are based on the INP or noise levels that can be achieved at a specific site following the application of all feasible and reasonable noise mitigation.

The INP guidelines for assessing industrial facilities have been used for this assessment. The objectives of these criteria are to protect the community from excessive 'intrusive' noise and to preserve 'amenity' for specific land uses. The fundamental difference between these criteria is intrusiveness criteria apply over 15 minutes in any period (day, evening or night) and the amenity criteria apply to the entire assessment period (day, evening or night). The project specific noise level (PSNL) is the most stringent of either the calculated intrusive or amenity criteria.

The intrusiveness criteria require that $L_{Aeq,15 \text{ minute}}$ noise levels from the subject site during the relevant operational periods (i.e. day, evening and night) do not exceed the RBL by more than 5 dB. The intrusiveness criteria for the proposed modification in Table 7.3 are based on the adopted RBLs.

Table 7.3 Intrusive noise criteria

Location	Period ¹	Measured RBL, dB(A)	Adopted RBL, dB(A)	Intrusive criteria dB, $L_{Aeq,15 \text{ minute}}$
Residential assessment locations (Minchinbury) (1-8)	Day	43	43	48
	Evening	48	43 ²	48
	Night	41	41	46
	Morning Shoulder ³	N/A	42	47
Residential assessment locations (Erskine Park) (9-11)	Day	37	37	42
	Evening	44	37 ²	42
	Night	35	35	40
	Morning Shoulder ³	N/A	36	41

Notes: 1. Day: 7 am - 6 pm Monday - Saturday; 8 am - 6 pm Sundays and public holidays; Evening: 6 pm - 10 pm; Night: all remaining periods.

2. The RBL measured for day has been adopted for the evening period in accordance with the INP Application Notes procedures.

3. The RBL adopted for the morning shoulder period has been taken as the midpoint of the RBLs determined for day and night-time periods in accordance with the INP Application Notes.

The assessment of amenity is based on noise criteria specific to the land use. The land uses and corresponding criteria for the assessment locations are in Table 7.4.

Table 7.4 **Amenity criteria**

Assessment location	Indicative area ¹	Time period ²	Recommended noise level dB, L _{Aeq,period}	
			Acceptable	Maximum
All residential areas	Urban (Minchinbury)	Day	60	65
		Evening	50	55
		Night	45	50
	Suburban (Erskine Park)	Day	55	60
		Evening	45	50
		Night	40	45
Commercial Premises	All	When in use	65	70
Industrial Premises	All	When in use	70	75

Notes: 1. According to INP urban amenity criteria.

2. Day: 7 am - 6 pm Monday - Saturday; 8 am - 6 pm Sundays and public holidays; Evening: 6 pm - 10 pm; Night: all remaining periods.

The PSNL for the daytime, evening and night periods are indicated in Table 7.5.

Table 7.5 **Project specific noise levels**

Assessment location	Period	Intrusive criteria, dB, L _{Aeq,15 minute}	Amenity criteria, dB, L _{Aeq,period}	PSNL, dB
Assessment locations 1-8 (Minchinbury)	Day	48	60	48 L _{Aeq,15 minute}
	Evening	48	50	48 L _{Aeq,15 minute}
	Night	46	43 ¹	46 L _{Aeq,15 minute} ⁴²
	Morning Shoulder	47	N/A	47 L _{Aeq,15 minute}
Assessment locations 9-11 (Erskine Park)	Day	42	55	42 L _{Aeq,15 minute}
	Evening	42	45	42 L _{Aeq,15 minute}
	Night	40	40	40 L _{Aeq,15 minute}
	Morning Shoulder	41	N/A	41 L _{Aeq,15 minute}
Commercial premises	When in use	-	65	65 L _{Aeq,period}
Industrial premises	When in use	-	70	70 L _{Aeq,period}
Assessment locations 22-23 (school classrooms)	When in use	-	35 (internal)	70 L _{Aeq,1 hour} (internal)
			45 (external)	70 L _{Aeq,1 hour} (external)

Notes: 1. The amenity criteria have been adjusted using INP modification factor methods to account for existing industrial noise and the measured existing industrial noise contribution.

2. It has been conservatively assumed that L_{Aeq,period} noise levels from site are 3 dB less than the L_{Aeq,15 minute} noise level. On this basis, the intrusive criteria of L_{Aeq,15 minute} 46 dB is equal to the adjusted amenity criteria of L_{Aeq,period} 43 dB. For the purposes of the noise assessment, the intrusive criteria of L_{Aeq,15 minute} 46 dB has been applied here forth.

Important to this assessment, the noise limits in the project approval and EPLs are below measured ambient noise levels at the nearest receivers. Table 7.1 shows that ambient noise levels at the nearest receivers are more than 10 dB higher than these noise limits. The project approval noise impact assessment criteria at any receiver are:

- Day – 37 dB(A) (L_{Aeq(15 minutes)});
- Evening – 36 dB(A) (L_{Aeq(15 minutes)}); and

- Morning shoulder – 36 dB(A) ($L_{Aeq(15 \text{ minutes})}$).

Further, the noise contribution from the facility is unable to be quantified during the bi-annual noise monitoring due to the elevated ambient noise levels.

ii Sleep disturbance

Operational criteria are not appropriate for use in assessing noise impacts on sleep as transient noise from sources such as truck movements is intermittent (rather than continuous) and needs to be assessed using the L_1 or L_{max} noise metrics. The INP application notes suggests that $L_{A1,1 \text{ minute}}$ level of 15 dB above the RBL is a suitable screening criteria for the night-time period, which is reflected in the adopted criteria in Table 7.6.

Table 7.6 Sleep disturbance screening criteria, residential assessment locations

Assessment location	Adopted RBL, dB	Sleep disturbance criteria dB, L_{Amax}
Assessment locations 1-8 (Minchinbury)	41	56
Assessment locations 9-11 (Erskine Park)	35	50

Notes: 1. The sleep disturbance assessment applies to residential assessment locations only.

iii Construction noise

The ICNG suggests the following time restriction for construction activities where the noise is audible at residential premises:

- Monday to Friday 7 am to 6 pm;
- Saturday 8 am to 1 pm; and
- no construction work is to take place on Sundays or public holidays.

These time restrictions are the primary management tool of the ICNG.

In summary, the ICNG noise management levels (NMLs) for activities during the recommended standard hours are 10 dB above the existing background levels. For activities outside of the standard hours the noise levels should be no more than 5 dB above the existing background levels. It is expected that construction will occur during standard hours only.

The residential construction NMLs and NMLs for other sensitive land uses for the proposed development are provided in Table 7.7.

Table 7.7 Construction noise management levels

Assessment location	Day-time RBL, dB	Noise management level, $L_{Aeq,15 \text{ minute}}$, dB
Residential (1-8)	43	53
Residential (9-11)	37	47
Industrial (12-21)	n/a	75
School Classrooms ¹	n/a	45 (internal) 55 (external)

Notes: 1. External noise criteria based on internal criteria as recommended in the INP + 10 dB.

iv Road traffic noise

Road traffic generated by the proposed modification travels directly between the site and the arterial road network (M4 and M7 motorways) via Kangaroo Avenue, Honeycomb Drive and Wonderland Drive. There are no residential or other noise sensitive assessment locations along Kangaroo Avenue, Honeycomb or Wonderland Drives. The proportion of site traffic on the M4 and M7 are inconsequential to average noise levels. Therefore, road traffic noise has not been considered further.

v Operational and construction vibration

To assess potential vibration impacts of the proposed modification consideration was given to the ENM (DEC 2006), Australian Standard (AS) 2187.2 – 2006 – Explosives – Storage and Use – Use of Explosives, and British Standards relevant to Australian conditions. The ENM presents preferred and maximum vibration values for use in assessing human responses to vibration and provides recommendations for measurement and evaluation techniques.

7.2.4 Impact assessment

Noise prediction software was used to predict noise impacts at the assessment locations, which calculates total noise levels at receptors from the concurrent operation of multiple noise sources using sound power levels for plant and equipment supplied by the Proponent.

i Operational noise

Three scenarios were modelled to compare the noise levels from approved and proposed operations for daytime, evening, night-time and morning shoulder periods under calm and prevailing meteorological conditions. These scenarios included:

- Scenario 1, modelling current approved operations including the existing site layout, operating hours and traffic volumes;
- Scenario 2, modelling the Modification 7 site layout with existing operating hours and traffic volumes; and
- Scenario 3, modelling the Modification 7 site layout with the operating hours and traffic volumes proposed in Modification 6.

It is noted that Modification 6 includes changes to the site's operational hours to allow greater flexibility in relation to the waste volume permitted to landfill.

Operational modelling scenarios represent a worst-case 15 minute period, with peak truck volumes assumed and all approved/proposed plant and equipment operating concurrently.

The predicted approved and proposed noise levels at each assessment location for each assessment period are in Table 7.8.

Table 7.8 Predicted L_{Aeq,15 minute} site noise emissions - approved and proposed operations

Assessment location	Period	Scenario 1, dB		Scenario 2, dB		Scenario 3, dB		PSNL, dB
		Calm	Adverse ¹	Calm	Adverse ¹	Calm	Adverse ¹	
1	Day	46	46	46	N/A	46	N/A	48 L _{Aeq,15 minute}
	Evening	<35	<35	<35	<35	43	46	48 L _{Aeq,15 minute} ¹
	Night	N/A	N/A	N/A	N/A	38 41	41 44	42 L _{Aeq,period} 46 L _{Aeq,15minute}
	Morning Shoulder	<35	<35	<35	<35	44	47	47 L _{Aeq,15 minute}
2	Day	46	46	46	N/A	46	N/A	48 L _{Aeq,15 minute}
	Evening	<35	<35	<35	<35	43	46	48 L _{Aeq,15 minute} ¹
	Night	N/A	N/A	N/A	N/A	38 41	41 44	42 L _{Aeq,period} 46 L _{Aeq,15minute}
	Morning Shoulder	<35	<35	<35	<35	44	47	47 L _{Aeq,15 minute}
3	Day	47	46	46	N/A	46	N/A	48 L _{Aeq,15 minute}
	Evening	<35	<35	<35	<35	43	46	48 L _{Aeq,15 minute} ¹
	Night	N/A	N/A	N/A	N/A	38 41	41 44	42 L _{Aeq,period} 46 L _{Aeq,15minute}
	Morning Shoulder	<35	<35	<35	<35	44	47	47 L _{Aeq,15 minute}
4	Day	44	46	44	45	44	45	48 L _{Aeq,15 minute}
	Evening	<35	<35	<35	<35	42	45	48 L _{Aeq,15 minute} ¹
	Night	N/A	N/A	N/A	N/A	37 40	40 43	42 L _{Aeq,period} 46 L _{Aeq,15minute}
	Morning Shoulder	<35	<35	<35	<35	43	46	47 L _{Aeq,15 minute}
5	Day	45	46	44	45	44	45	48 L _{Aeq,15 minute}
	Evening	<35	<35	<35	<35	43	45	48 L _{Aeq,15 minute} ¹
	Night	N/A	N/A	N/A	N/A	37 40	40 43	42 L _{Aeq,period} 46 L _{Aeq,15minute}
	Morning Shoulder	<35	<35	<35	<35	43	46	47 L _{Aeq,15 minute}
6	Day	43	45	43	45	43	45	48 L _{Aeq,15 minute}
	Evening	<35	<35	<35	<35	41	44	48 L _{Aeq,15 minute} ¹
	Night	N/A	N/A	N/A	N/A	36 39	38 41	42 L _{Aeq,period} 46 L _{Aeq,15minute}
	Morning Shoulder	<35	<35	<35	<35	42	45	47 L _{Aeq,15 minute}
7	Day	45	47	44	45	44	45	48 L _{Aeq,15 minute}
	Evening	<35	<35	<35	<35	43	45	48 L _{Aeq,15 minute} ¹
	Night	N/A	N/A	N/A	N/A	37 40	40 43	42 L _{Aeq,period} 46 L _{Aeq,15minute}
	Morning Shoulder	<35	<35	<35	<35	43	46	47 L _{Aeq,15 minute}
8	Day	44	47	44	46	44	46	48 L _{Aeq,15 minute}
	Evening	<35	<35	<35	<35	42	45	48 L _{Aeq,15 minute} ¹
	Night	N/A	N/A	N/A	N/A	37 40	40 43	42 L _{Aeq,period} 46 L _{Aeq,15minute}
	Morning Shoulder	<35	<35	<35	<35	43	46	47 L _{Aeq,15 minute}

Table 7.8 Predicted $L_{Aeq,15 \text{ minute}}$ site noise emissions - approved and proposed operations

Assessment location	Period	Scenario 1, dB		Scenario 2, dB		Scenario 3, dB		PSNL, dB
		Calm	Adverse ¹	Calm	Adverse ¹	Calm	Adverse ¹	
9	Day	39	39	39	N/A	39	N/A	42 $L_{Aeq,15 \text{ minute}}$
	Evening	<35	<35	<35	<35	39	42	42 $L_{Aeq,15 \text{ minute}}$
	Night	N/A	N/A	N/A	N/A	36	39	40 $L_{Aeq,15 \text{ minute}}$
	Morning Shoulder	<35	<35	<35	<35	38	41	41 $L_{Aeq,15 \text{ minute}}$
10	Day	38	38	40	N/A	40	N/A	42 $L_{Aeq,15 \text{ minute}}$
	Evening	<35	<35	<35	<35	39	42	42 $L_{Aeq,15 \text{ minute}}$
	Night	N/A	N/A	N/A	N/A	36	39	40 $L_{Aeq,15 \text{ minute}}$
	Morning Shoulder	<35	<35	<35	<35	39	41	41 $L_{Aeq,15 \text{ minute}}$
11	Day	38	38	40	N/A	40	N/A	42 $L_{Aeq,15 \text{ minute}}$
	Evening	<35	<35	<35	<35	39	42	42 $L_{Aeq,15 \text{ minute}}$
	Night	N/A	N/A	N/A	N/A	36	39	40 $L_{Aeq,15 \text{ minute}}$
	Morning Shoulder	<35	<35	<35	<35	38	41	41 $L_{Aeq,15 \text{ minute}}$
12	Day	52	52	46	N/A	46	N/A	70 $L_{Aeq,period}$
	Evening	<35	<35	<35	<35	45	47	70 $L_{Aeq,period}$
	Night	N/A	N/A	N/A	N/A	42	44	70 $L_{Aeq,period}$
	Morning Shoulder	<35	<35	<35	<35	44	47	70 $L_{Aeq,period}$
13	Day	41	43	39	41	39	41	70 $L_{Aeq,period}$
	Evening	<35	<35	<35	<35	39	41	70 $L_{Aeq,period}$
	Night	N/A	N/A	N/A	N/A	36	38	70 $L_{Aeq,period}$
	Morning Shoulder	<35	<35	<35	<35	37	40	70 $L_{Aeq,period}$
14	Day	39	42	44	46	44	46	70 $L_{Aeq,period}$
	Evening	<35	<35	<35	<35	42	45	70 $L_{Aeq,period}$
	Night	N/A	N/A	N/A	N/A	38	41	70 $L_{Aeq,period}$
	Morning Shoulder	<35	<35	<35	<35	42	45	70 $L_{Aeq,period}$
15	Day	39	41	49	50	49	50	70 $L_{Aeq,period}$
	Evening	<35	<35	<35	<35	47	50	70 $L_{Aeq,period}$
	Night	N/A	N/A	N/A	N/A	43	45	70 $L_{Aeq,period}$
	Morning Shoulder	<35	<35	<35	<35	47	50	70 $L_{Aeq,period}$
16	Day	45	47	65	65	65	65	70 $L_{Aeq,period}$
	Evening	<35	<35	<35	<35	62	63	70 $L_{Aeq,period}$
	Night	N/A	N/A	N/A	N/A	57	57	70 $L_{Aeq,period}$
	Morning Shoulder	<35	<35	<35	<35	62	63	70 $L_{Aeq,period}$
17	Day	46	48	58	60	58	60	70 $L_{Aeq,period}$
	Evening	<35	<35	<35	<35	55	57	70 $L_{Aeq,period}$
	Night	N/A	N/A	N/A	N/A	50	52	70 $L_{Aeq,period}$
	Morning Shoulder	<35	<35	<35	<35	55	57	70 $L_{Aeq,period}$
18	Day	48	50	55	57	55	57	70 $L_{Aeq,period}$
	Evening	<35	<35	<35	<35	52	54	70 $L_{Aeq,period}$
	Night	N/A	N/A	N/A	N/A	47	49	70 $L_{Aeq,period}$
	Morning Shoulder	<35	<35	<35	<35	52	54	70 $L_{Aeq,period}$

Table 7.8 Predicted $L_{Aeq,15 \text{ minute}}$ site noise emissions - approved and proposed operations

Assessment location	Period	Scenario 1, dB		Scenario 2, dB		Scenario 3, dB		PSNL, dB
		Calm	Adverse ¹	Calm	Adverse ¹	Calm	Adverse ¹	
19	Day	50	52	56	57	56	57	70 $L_{Aeq,period}$
	Evening	<35	<35	<35	<35	53	55	70 $L_{Aeq,period}$
	Night	N/A	N/A	N/A	N/A	48	50	70 $L_{Aeq,period}$
	Morning Shoulder	<35	<35	<35	<35	53	55	70 $L_{Aeq,period}$
20	Day	57	58	62	62	62	62	70 $L_{Aeq,period}$
	Evening	<35	<35	<35	<35	59	60	70 $L_{Aeq,period}$
	Night	N/A	N/A	N/A	N/A	54	54	70 $L_{Aeq,period}$
	Morning Shoulder	<35	<35	<35	<35	59	60	70 $L_{Aeq,period}$
21	Day	57	57	57	57	57	57	70 $L_{Aeq,period}$
	Evening	<35	<35	<35	<35	57	57	70 $L_{Aeq,period}$
	Night	N/A	N/A	N/A	N/A	56	56	70 $L_{Aeq,period}$
	Morning Shoulder	<35	<35	<35	<35	56	57	70 $L_{Aeq,period}$
22 ²	Day	43	44	43	43	43	43	45 $L_{Aeq,1 \text{ hour}}$
23 ²	Day	<35	<35	36	N/A	36	N/A	45 $L_{Aeq,1 \text{ hour}}$

Notes: 1. Adverse is the worst case result from prevailing winds or temperature inversion conditions at each assessment location. NB daytime adverse winds are favourable in direction for assessment locations in Minchinbury and Erskine Park, hence predicted calm weather results only are presented.
2. Assessment location is a school and therefore operates during the day-time only. Notwithstanding, noise levels for all other assessment periods would also satisfy criteria.

Operational noise levels were assessed for the daytime, evening, night-time and morning shoulder periods during calm and adverse weather conditions. The assessment found that criteria would be satisfied at all assessment locations and for all time periods.

The results showed that the main noise sources were trucking movements (for residences to the north and west) and equipment operating in the landfill pit (for residences to the west).

ii Sleep disturbance

The predicted L_{Amax} noise levels from the site at the nearest residential assessment locations during night time are presented in Table 7.8, which shows that noise levels will satisfy the sleep disturbance screening criteria at all residential assessment locations.

Table 7.8 Predicted L_{Amax} noise levels during night period

Assessment location ¹	Predicted L_{Amax} noise levels, dB	L_{Amax} screening criteria, dB
	Worst-case meteorological conditions (temperature inversions)	
1	54	56
2	55	56
3	55	56
4	52	56
5	53	56

Table 7.8 Predicted L_{Amax} noise levels during night period

Assessment location ¹	Predicted L _{Amax} noise levels, dB	L _{Amax} screening criteria, dB
	Worst-case meteorological conditions (temperature inversions)	
6	43	56
7	52	56
8	51	56
9	48	50
10	47	50
11	47	50

Notes: 1. The sleep disturbance assessment applies to residential assessment locations only.

iii Construction noise

The standard hours noise level predictions from construction activity and the relevant NML are presented in Table 7.9. Noise levels generated by the proposed construction are predicted to satisfy the ICNG NMLs for all assessment locations during standard construction hours.

Table 7.9 Predicted noise levels during construction

Location	Period	Predicted construction,	Standard hours NML,	Exceedance above NML's, dB
		L _{Aeq,15 minute} , dB	L _{Aeq,15 minute} , dB	
1	Day	47	53	Nil
2	Day	47	53	Nil
3	Day	46	53	Nil
4	Day	43	53	Nil
5	Day	44	53	Nil
6	Day	43	53	Nil
7	Day	44	53	Nil
8	Day	44	53	Nil
9	Day	42	47	Nil
10	Day	43	47	Nil
11	Day	42	47	Nil
12	When in use	47	75	Nil
13	When in use	42	75	Nil
14	When in use	51	75	Nil
15	When in use	50	75	Nil
16	When in use	62	75	Nil
17	When in use	59	75	Nil
18	When in use	64	75	Nil
19	When in use	61	75	Nil
20	When in use	54	75	Nil
21	When in use	58	75	Nil
22	When in use	43	55	Nil
23	When in use	38	55	Nil

iv Cumulative noise

The noise assessment inherently considered cumulative noise impacts as the impact of the facility with existing industrial noise sources has been assessed in the determination of the acceptable amenity levels at the assessment locations.

The combined impact of the proposed modification with the approved Hanson concrete and asphalt facility on a site to the south-east is predicted to have a negligible impact on the existing ambient amenity of the area as Hanson's facility is located further away from residences.

The proposed modification is predicted to have a negligible impact on the existing ambient acoustic amenity and is not predicted to increase industrial noise levels above the relevant amenity criteria.

v Construction vibration impacts

The closest building to the site is an industrial warehouse approximately 30 m from the eastern site boundary. It is therefore envisaged that cosmetic damage to nearby structures (rather than human response) would be the most likely impact from the proposed modification.

To prevent cosmetic damage to this property, the recommended safe working distances provided in Table 7.1 of Appendix C should be followed. Additional construction vibration management measure should also be implemented (refer to Section 8.2.2 of Appendix C).

vi Operational vibration impacts

The most significant source of vibration associated with the proposed modification will be heavy vehicle movements, which are considered an intermittent source of vibration as trucks come and go over the course of a day. Subsequently, the vibration criteria presented in Table 4.14 of Appendix C apply. All heavy vehicles associated with the proposed modification will use the RMS approved B double truck routes when arriving at and departing from the site.

As noted in Section 7.2 of Appendix C, the human comfort criteria are more stringent than the building damage criteria. Subsequently, it is expected that there is a low risk of cosmetic damage criteria being exceeded.

7.2.5 Conclusion

Operational noise levels were assessed for the daytime, evening, night-time and morning shoulder periods during calm and prevailing weather conditions. The assessment found that operating noise from the site during both existing and proposed operations satisfies relevant INP PSNLs for all periods at all assessment locations.

The results of the operational noise assessment showed that the main noise sources were trucking movements (for residences to the north and west) and equipment operating in the landfill pit (for residences to the west).

The potential for sleep disturbance from the proposed modification during the night-time period has been assessed. The highest predicted external maximum noise level from site is L_{Amax} 55 dB in Minchinbury and L_{Amax} 48 dB in Erskine Park which satisfies the EPA's sleep disturbance screening criteria. Subsequently, it is unlikely that night-time operations from the facility will cause sleep disturbance at any of the assessment locations.

Construction and operational vibration impacts are considered unlikely as a result of the proposed modification.

7.3 Air quality and odour

7.3.1 Introduction

Air quality and odour impacts potentially generated by the proposed modification were assessed by Ramboll Environ Australia Pty Ltd.

Details regarding the existing environment and emissions inventory (below) are based on the air quality impact assessment prepared by Ramboll Environ Australia Pty Ltd for Modification 6. A copy of the report is attached for reference at Appendix I.

The assessment was prepared in accordance with the SEARs and the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (the approved methods) (EPA 2016).

This chapter provides a summary of the air quality impact assessment which is in Appendix D. The assessment modelled potential impacts at nearby receivers by estimating the emissions associated with the proposed modification and using existing atmospheric conditions to determine how the pollutants will disperse and affect regional air quality.

7.3.2 Existing environment

i Assessment locations

The locations of sensitive receptors used to assess air quality impacts from the proposed modification are consistent with those for the noise assessment (see Figure 7.1). These receptors encompass the residential areas of Minchinbury to the north and Erskine Park to the west, and adjacent commercial and industrial premises.

ii Climate data

Meteorological mechanisms govern the generation, dispersion, transformation and eventual removal of pollutants from the atmosphere. Prevailing wind regime, ambient temperature, rainfall, relative humidity, mixing depth and atmospheric stability data from a number of local and regional weather stations were used to characterise the dispersion meteorology of the region. The Proponent operates an on-site weather station; however, it is used for operational dust control and the siting is unsuitable for use in dispersion modelling.

There is a dominant south-west component to the windroses (see Appendix D), with winds blowing from all directions for a smaller proportion of time. Average wind speeds range from 2 to 3 metres per second (m/s) while the percentage occurrence of calm winds (<0.5 m/s) ranges from low at Holsworthy (7%) to high St Marys (33%).

The minimum, maximum, mean and upper and lower quartile temperatures for each month of 2016 are shown on Figure 7.2.

Atmospheric stability is the degree of turbulence or mixing that occurs in the atmosphere and is a controlling factor in the rate of atmospheric dispersion of pollutants. At the facility, atmospheric instability increases during daylight hours while stable conditions prevail during the night-time. The potential for atmospheric dispersion of emissions is therefore greatest during day time and lowest during evening through to early morning.

Greater boundary layer depths are experienced during the day time, peaking in mid to late afternoon. Higher mixing depths increase the potential for atmospheric dispersion of pollutants. Therefore, the potential for atmospheric dispersion of emissions would be greatest during the day.

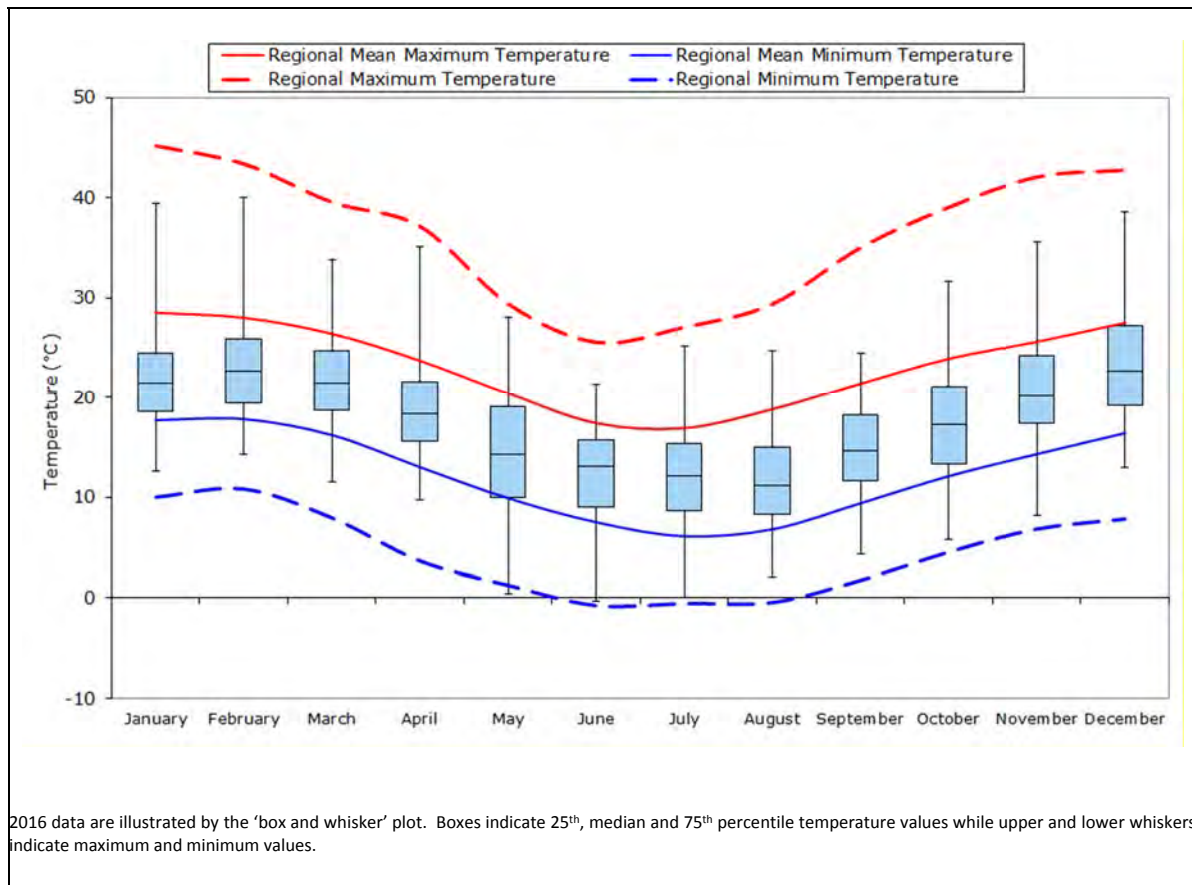


Figure 7.2 Long term and 2016 temperature comparison at Prospect Reservoir long-term monitoring station

iii Existing particulate matter

Emissions of particulate matter (PM), including total suspended particulate matter (TSP) and particulate matter with an equivalent aerodynamic diameter of less than 10 microns (PM₁₀) and 2.5 microns (PM_{2.5}) and dust deposition were assessed. In accordance with the approved methods (EPA 2016), local air quality impacts were assessed using a Level 2 assessment approach, which involves a refined dispersion modelling technique using site-representative input data.

Summary statistics for PM₁₀ and PM_{2.5} across the facility, St Marys and Prospect weather stations are in Table 7.11. Annual mean PM₁₀ concentrations across the region are 61% to 76% of the impact assessment criteria, while annual mean PM_{2.5} concentrations for the region are 98%-108% of the impact assessment criteria, that is, background concentrations are at or above the impact assessment criteria.

Table 7.10 Summary statistics for PM₁₀ and PM_{2.5}

Metric	Statistics	Site (µg/m ³)		
		The facility (Genesis)	St Marys	Prospect
PM ₁₀	Annual mean	15.3	16.1	18.9
	Daily maximum	125.0*	100.2	110.1
	95 th percentile	27.0	29.9	33.7
	90 th percentile	23.7	26.4	29.5
	Number of exceedances	2*	3	4
PM _{2.5}	Annual mean	-	7.8	8.7
	Daily maximum	-	93.2	84.9*
	95 th percentile	-	13.7	17.8
	90 th percentile	-	11.4	14.0
	Number of exceedances	-	5	5*

Notes: * Not based on a full year of observations so not a true daily maximum or number of exceedances.

Particulate emissions in the PM_{2.5} size range are usually generated through combustion processes or as secondary particles formed from chemical reactions rather than through mechanical processes that dominate emissions at the facility.

TSP concentrations are not measured in the vicinity of the site; however, historical measurements of TSP and PM₁₀ in Sydney indicate that PM₁₀/TSP ratios in urban areas typically range from 0.4 to 0.5.

The measured average dust deposition across the four dust deposition gauges at the facility between 2013 and 2016 is 1.7 g/m²/month, which is consistent with background measurements seen across much of NSW.

The baseline air quality parameters adopted for the cumulative impact assessment based on the above particulate concentrations are in Table 7.12.

Table 7.11 Adopted background for cumulative assessment

Pollutant	Averaging period	Adopted background value
PM ₁₀	24-hour average	Daily varying
	Annual average	18.9 µg/m ³
PM _{2.5}	24-hour average	Daily varying
	Annual average	8.6 µg/m ³
TSP	Annual average	47.2 µg/m ³
Dust deposition	Annual average	2 g/m ² /month

7.3.3 Impact assessment

i Method

Local air quality impacts were assessed using a Level 2 assessment approach (refined dispersion modelling technique using site-representative input data) in accordance with the approved methods (EPA 2016), comprising:

- key pollutant indicators were identified, in this case dust and odour;
- emissions were estimated for all dust generating activities associated with the facility;
- dispersion of pollutants was modelled using a regulatory dispersion model to predict ground level concentrations (GLCs) for key pollutants at nearby sensitive receptors; and
- cumulative impacts were assessed by taking into account the combined effect of the facility with existing baseline air quality and/or other local sources of emissions.

ii Air quality assessment criteria

In NSW, proposed developments must demonstrate compliance with the impact assessment criteria in the approved methods (EPA 2016). The criteria are designed to ensure maintenance of ambient air quality levels that provide protection of human health and well-being. The criteria considered as part of the air quality impact assessment are provided in Table 7.13.

Table 7.12 Air quality impact assessment criteria

Pollutant	Averaging period	Concentration ($\mu\text{g}/\text{m}^3$)
TSP	Annual	90 $\mu\text{g}/\text{m}^3$
PM ₁₀	24 hours	50 $\mu\text{g}/\text{m}^3$
	Annual	25 $\mu\text{g}/\text{m}^3$
PM _{2.5}	24 hours	25 $\mu\text{g}/\text{m}^3$
	Annual	8 $\mu\text{g}/\text{m}^3$
Deposited dust	Annual (incremental)	2 $\text{g}/\text{m}^2/\text{month}$
	Annual (total)	4 $\text{g}/\text{m}^2/\text{month}$

Source: The Approved Methods (EPA 2016), National Environment Protection (Ambient Air Quality) Measure (NEPC 2003).

Odour is measured in odour units (OU) and the odour nuisance level can be as low as 2 OU and as high as 10 OU (for less offensive odours). An odour goal of 2 OU is considered to be acceptable for the whole population (EPA 2016) and, therefore, appropriate for urban areas such as Minchinbury and Erskine Park. An odour assessment criterion of 7 OU is likely to represent the level below which 'offensive' odours should not occur.

iii Emission inventory

The emissions inventory is based on an air quality impact assessment prepared by Ramboll Environ Australia for Modification 6 (Appendix I).

a. Dust emissions

Emissions from activities associated with the proposed modification, such as wheel generated dust, waste handling/processing and wind erosion were estimated using the United States Environment Protection Agency's emissions factors for TSP, PM₁₀, PM_{2.5} and dust deposition rates. The emissions estimates were reduced by accounting for existing dust controls such as enclosure of the MPC, misting and water sprays and sealed roads.

The existing and proposed dust controls are accounted for in the emissions estimates are:

- enclosure of material handling and processing and storage within the MPC shed;
- misting sprays operated within the shed to dampen material as it is sorted and before being loaded to the hopper;
- the majority of travel routes onsite are sealed (exceptions are the haul route into the pit and within the segregated materials area);
- water sprays on the mobile crusher and shredder;
- fixed water sprays on product storage areas;
- water truck operating on unsealed haul road into the pit, within the landfill and on the paved roads as needed;
- speed limit of 40 km/hr for unsealed haul road into the pit;
- water cannon operating within the pit;
- established earth bund along the northern boundary of the pit; and
- a fixed water spray system operates on the access roadway.

Some of the dust controls listed above are incorporated into the emissions inventory for each relevant activity, based on control efficiencies reported in the literature. For example, all activities occurring within the shed are assigned a control efficiency of 40%. This is based on reported control efficiencies for material handling/transfer from enclosure or wind shielding, which range from 40% to 70% depending on roof/side wall wind shielding or full enclosure on all sides (Katestone, 2011). To provide a conservative (upper bound) estimate of emissions, we have adopted the lower of these reported control efficiencies. Also, to account for the mist sprays within the shed a control efficiency of 70% is assumed for waste sorting and loading the hopper (combination of 50% for watering and 40% for wind shielding).

Emissions are estimated based on a 50/50 split between the MPC and the landfill; that is, of the 2M tpa entering site, 1M tpa is processed through the MPC and 1M tpa enters the landfill. A summary of the annual TSP, PM₁₀ and PM_{2.5} emissions are presented in Table 6-1 of the Air Quality Impact Assessment Report (Ramboll, 2018) attached at Appendix I.

b. Odour emissions

The facility operates as a general solid waste (non-putrescible) landfill, and therefore odour emissions can be expected to be less significant when compared with a landfill which accepts putrescible waste (e.g. household waste, food waste, nappies, animal waste etc.). Recent odour audits for the current site found that no significant odour was detected beyond the site boundary (TOU, 2015; SEMA, 2017).

Notwithstanding, a proportion of the incoming waste is organic (wood waste, garden waste, paper and cardboard) and therefore has the potential to generate odour during decomposition. During normal operations the facility would aim to recover as much of this organic waste as possible, and therefore only a small volume of degradable waste would be disposed to landfill.

However, to address EPA's requirements, a worst-case scenario of 1Mtpa directed to landfilled needs to be considered. Furthermore, although composting is not currently undertaken onsite, the facility is approved and licenced for this activity and therefore composting is included for a worst-case odour assessment.

The following odour sources are included in the model:

- landfill (including active tip face, daily cover, intermediate cover and final cap);
- green waste storage; and
- composting (including fresh and aged compost windrows).

Site specific odour monitoring was completed onsite in 2013 for sources including the active tip face, the leachate sump/riser and the leachate treatment tanks. While these monitoring results are considered appropriate to derive emission rates for existing operations, no measurements were taken across the covered or capped areas of the landfill, although these areas of the landfill are expected to have low emissions potential. Furthermore, these measurements were taken while the MPC was operational and the organic waste volume may therefore not necessarily be representative of our worst-case scenario.

It is noted that subsequent odour assessments for the site in 2015 (TOU, 2015) and 2017 (SEMA, 2017) completed downwind odour surveys and did not measure odour sources directly. These reports, while useful in providing an indication of existing odour impact, cannot be used to derive odour emission rates for dispersion modelling.

To derive odour emission rates for a worst-case scenario, odour emission data for other putrescible waste landfills was reviewed, selecting sites where relatively recent odour monitoring was available. A summary of the data is provided in Table 6-3 of the Air Quality Impact Assessment Report at Appendix I.

The approach taken is to use the average specific odour emissions rate (SOER, expressed as OU.m³/m²/s) from the four putrescible waste landfills presented in Table 6-3 of the Air Quality Impact Assessment Report at Appendix C. As shown, this provides a higher SOER than measurements taken at the existing facility and is generally higher than the emission rates used in the original EIS. To provide an additional level of conservatism, the source areas, across which these SOERs are applied, are scaled from the existing site layout according to the production increase.

Emissions from activities associated with the proposed modification, such as wheel generated dust, waste handling/processing and wind erosion were estimated using the United States Environment Protection Agency's emissions factors for TSP, PM₁₀, PM_{2.5} and dust deposition rates.

The emissions estimates were reduced by accounting for existing dust controls such as enclosure of the MPC, misting and water sprays and sealed roads.

iv Dispersion modelling

The dispersion modelling is based on an air quality impact assessment prepared by Ramboll Environ Australia for this modification 6 (Appendix C).

a. Overview

GLCs were predicted for the pollutants associated with the construction and operation phase of the proposed modification. Concentrations were predicted for the incremental change associated with the proposed modification and cumulative impact, which added the existing background concentrations. These concentrations were compared to the criteria in Table 7.13 to determine if there will be exceedances. The results are summarised in the following sections.

Exceedances of criteria were due to existing high background pollutant concentrations, so the probability of the facility contributing to additional exceedances was assessed to determine if it will be responsible for exceedances.

v Construction phase

a. PM₁₀

The highest incremental annual average PM₁₀ concentration at a residential receptor was predicted to be 0.6 µg/m³ (R05, R07 and R08) and the cumulative annual average GLCs were predicted to comply with the impact assessment criteria at all residential receptors.

The highest incremental annual average PM₁₀ concentration at a commercial receptor was predicted to be 2 µg/m³ (compared to a criterion of 25 µg/m³). Cumulative annual average PM₁₀ concentrations are below the applicable impact assessment criterion at the commercial receptors on the site boundary.

The highest incremental 24-hour average PM₁₀ concentration at a residential receptor was predicted to be 9.0 µg/m³ (R05) (compared to a criterion of 50 µg/m³) and the cumulative 24-hour average GLCs were predicted to comply with the impact assessment criteria at all residential receptors.

There was a single additional exceedance of the 24-hour average PM₁₀ concentration at the commercial receptor adjacent to the site boundary (R12). This was attributed primarily to the elevated background PM₁₀ concentrations rather than emissions from the construction activities as part of the proposed modification.

b. PM_{2.5}

The highest incremental annual average PM_{2.5} concentration at a residential receptor was predicted to be 0.1 µg/m³ (R04, R05 and R07) (compared to a criterion of 8 µg/m³) and the cumulative annual average GLCs were predicted to exceed the impact assessment criteria at all locations.

The highest incremental 24-hour average PM_{2.5} concentration at a residential receptor was predicted to be 1.2 µg/m³ (R05) (compared to a criterion of 25 µg/m³). With the addition of existing background PM_{2.5} concentrations, the cumulative 24-hour average GLCs complied with the applicable impact assessment criterion at all residential receptor locations.

There were no additional exceedances of the 24-hour average PM_{2.5} impact assessment criterion at any of the commercial receptors on the site boundary.

c. TSP and dust deposition

The incremental increase in annual average TSP was predicted to be minor and the cumulative annual average GLCs were predicted to comply with the impact assessment criteria at all receptors.

The predicted dust deposition complied with both the incremental and cumulative impact assessment criteria at all residential and commercial receptor locations.

vi Operation phase

a. PM₁₀

The highest incremental annual average PM₁₀ concentration at a residential receptor was predicted to be 4.4 µg/m³ (R05) (compared to a criterion of 50 µg/m³) and the cumulative annual average GLCs were predicted to comply with the impact assessment criteria at all residential receptors.

The highest incremental annual average PM₁₀ concentration at a commercial receptor was predicted to be 14.3 µg/m³ (compared to a criterion of 25 µg/m³) and exceedances of the annual average impact assessment criteria were predicted at the commercial receptors on the site boundary (R12–R17). High background PM₁₀ concentrations are likely to have contributed to these exceedances, so the probability of the facility contributing to additional exceedances was assessed.

The statistical analysis demonstrated that the risk of additional exceedances of the 24-hour PM₁₀ criteria at impacted commercial receivers increases by 2–9% under the proposed modification. This demonstrates that the facility could contribute to exceedances at these locations on days when the ambient air quality is near or in exceedance of criteria.

b. PM_{2.5}

The highest incremental annual average PM_{2.5} concentration at a residential receptor was predicted to be 0.8 µg/m³ (compared to a criterion of 8 µg/m³) and the cumulative annual average GLCs were predicted to exceed the impact assessment criteria at all locations.

The highest incremental 24-hour average PM_{2.5} concentration at a residential receptor was predicted to be 4.4 µg/m³ (R05 and R07) (compared to a criterion of 25 µg/m³) and the cumulative 24-hour average GLCs were predicted to result in an additional exceedance of the impact assessment criteria at eight residential receptors.

Two to five additional exceedances of the 24-hour average impact assessment criteria were predicted at the commercial receptors adjacent to the site boundary. High background PM_{2.5} concentrations are likely to have contributed to these exceedances, so the probability of the facility contributing to additional exceedances was assessed.

The statistical analysis of the most impacted receivers demonstrated that the risk of additional exceedances of the 24-hour PM_{2.5} impact assessment criteria does not increase above what is already caused by background levels. This demonstrates that the facility will not contribute to exceedances at these locations on days when the ambient air quality is already in exceedance.

c. TSP and dust deposition

The incremental increase in annual average TSP will be relatively minor at residential receptors and the cumulative annual average GLCs were predicted to comply with the impact assessment criteria at all receptor locations.

The predicted dust deposition complies with both the incremental and cumulative impact assessment criteria at all residential and commercial receptors.

d. Odour

Odour emission rates were estimated as some of the incoming waste will be organic, such as wood waste and cardboard. The landfill does not accept putrescible wastes such as food and therefore odour emissions are expected to be less than those from a putrescible waste landfill. Recent audits did not detect any significant odour beyond the site boundary.

A worst case odour scenario was assessed where green waste was landfilled in combination with composting, which is an approved activity at the facility, at the existing green waste area adjacent to the MPC. All modelling predictions at residential receptors were below the residential odour goal of 2 OU and predictions for commercial receptors were all less than 7 OU, which is considered an appropriate odour goal for this type of receptor.

Table 7.13 Construction phase – incremental and cumulative particulate matter concentration results

Receptor ID	Receptor type	Incremental concentration due to proposed modification						Cumulative concentration due to proposed modification and background air quality					
		TSP	PM ₁₀	PM ₁₀	PM _{2.5}	PM _{2.5}	Deposition	TSP	PM ₁₀	PM ₁₀	PM _{2.5}	PM _{2.5}	Deposition
		Annual average	Maximum 24-hr	Annual average	Maximum 24-hr	Annual average	Annual average	Annual average	Maximum 24-hr ¹	Annual average	Maximum 24-hr ²	Annual average	Annual average
		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	g/m ² /month	µg/m ³	µg/m ^{3(b)}	µg/m ³	µg/m ^{3(b)}	µg/m ³	g/m ² /month
Criteria		90	50	25	25	8	2	90	50	25	25	8	4
R01	Residential	1.8	6.2	0.5	0.8	0.1	0.1	49.0	41.2	19.3	24.5	8.7	2.1
R02		2.1	5.9	0.5	0.7	0.1	0.1	49.3	41.2	19.4	24.5	8.7	2.1
R03		2.1	5.7	0.6	0.7	0.1	0.1	49.3	41.2	19.4	24.5	8.7	2.1
R04		1.9	8.5	0.5	1.1	0.1	0.1	49.1	41.2	19.4	24.5	8.7	2.1
R05		2.2	9.0	0.6	1.2	0.1	0.1	49.4	41.2	19.5	24.5	8.7	2.1
R06		1.3	4.9	0.4	0.6	0.1	0.1	48.5	41.2	19.3	24.5	8.7	2.1
R07		2.0	8.3	0.6	1.1	0.1	0.1	49.2	41.2	19.4	24.5	8.7	2.1
R08		1.9	7.3	0.6	1.0	0.1	0.1	49.2	41.2	19.4	24.5	8.7	2.1
R09		0.5	1.2	0.1	0.1	<0.1	<0.1	47.7	41.5	19.0	24.4	8.7	2.0
R10		0.5	1.5	0.1	0.2	<0.1	<0.1	47.7	41.9	19.0	24.4	8.7	2.0
R11		0.5	1.4	0.1	0.2	<0.1	<0.1	47.7	41.8	19.0	24.4	8.7	2.0
R12	Commercial/	7.8	23.9	2.0	3.1	0.2	0.5	55.0	50.8	20.9	24.7	8.9	2.5
R13		4.5	15.1	1.2	2.0	0.2	0.2	51.7	41.2	20.1	24.6	8.8	2.2
R14		2.2	11.5	0.6	1.5	0.1	0.1	49.4	41.2	19.5	24.5	8.7	2.1
R15		2.6	15.3	0.8	2.0	0.1	0.2	49.8	41.2	19.6	24.5	8.7	2.2
R16		2.9	19.0	0.8	2.5	0.1	0.2	50.1	41.2	19.7	24.4	8.8	2.2
R17		2.4	9.9	0.7	1.3	0.1	0.1	49.6	41.2	19.6	24.4	8.7	2.1

Notes: 1. The background dataset contains four existing exceedances of the impact assessment criteria and the cumulative 24-hour average PM₁₀ is therefore calculated using the 5th highest background day (excluding the background days already at or over 50 µg/m³).

2. The background dataset contains five existing exceedances of the impact assessment criteria and the cumulative 24-hour average PM_{2.5} is therefore calculated using the 6th highest background day (excluding the background days already at or over 25 µg/m³).

Table 7.14 Operation phase – incremental and cumulative particulate matter concentration results

Receptor ID	Receptor type	Incremental concentration due to proposed modification						Cumulative concentration due to proposed modification and background air quality					
		TSP	PM ₁₀	PM ₁₀	PM _{2.5}	PM _{2.5}	Deposition	TSP	PM ₁₀	PM ₁₀	PM _{2.5}	PM _{2.5}	Depositio n
		Annual average	Maximum 24-hr	Annual average	Maximum 24- hr	Annual average	Annual average	Annual average	Maximum 24-hr ¹	Annual average	Maximum 24-hr ²	Annual average	Annual average
		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	g/m ² /month	µg/m ³	µg/m ^{3(b)}	µg/m ³	µg/m ^{3(b)}	µg/m ³	g/m ² /mo nth
		Criteria	90	50	25	25	8	2	90	50	25	25	8
R01	Residential	4.9	14.7	2.6	2.7	0.5	0.2	52.1	46.4	21.4	25.0	9.1	2.2
R02		5.4	15.5	2.8	2.7	0.5	0.2	52.6	46.5	21.7	25.1	9.1	2.2
R03		6.4	19.2	3.3	3.1	0.6	0.2	53.7	45.0	22.2	25.3	9.2	2.2
R04		7.7	23.7	4.2	4.3	0.8	0.2	54.9	46.3	23.0	25.8	9.4	2.2
R05		8.5	24.2	4.4	4.4	0.8	0.2	55.7	46.6	23.3	25.9	9.5	2.2
R06		5.4	18.9	3.0	3.4	0.6	0.2	52.6	44.8	21.9	25.5	9.2	2.2
R07		8.0	24.2	4.2	4.4	0.8	0.2	55.2	46.8	23.1	25.9	9.4	2.2
R08		7.8	23.7	4.1	4.2	0.8	0.2	55.0	46.9	23.0	25.8	9.4	2.2
R09		1.0	3.3	0.6	0.6	0.1	<0.1	48.2	44.0	19.5	24.4	8.8	2.0
R10		1.1	4.1	0.7	0.8	0.1	<0.1	48.3	43.7	19.6	24.4	8.8	2.0
R11		1.0	4.5	0.7	0.8	0.1	<0.1	48.3	43.3	19.6	24.4	8.8	2.0
R12	Commercial/ Industrial	39.3	51.6	14.3	8.2	2.4	1.3	86.5	70.2	33.1	28.7	11.0	3.3
R13		30.1	45.1	11.4	6.9	1.9	1.2	77.3	69.9	30.2	28.1	10.6	3.2
R14		14.0	26.8	6.1	4.2	1.0	0.5	61.2	53.9	24.9	26.6	9.7	2.5
R15		20.7	40.9	8.1	6.1	1.4	0.9	67.9	58.0	26.9	27.3	10.0	2.9
R16		26.2	64.3	9.3	9.3	1.6	1.4	73.4	73.3	28.2	28.0	10.2	3.4
R17		16.0	42.2	6.1	7.3	1.1	0.5	63.2	71.7	24.9	27.2	9.7	2.5

- Notes:
1. The background dataset contains four existing exceedances of the impact assessment criteria and the cumulative 24-hour average PM₁₀ is therefore calculated using the 5th highest background day (excluding the background days already at or over 50 µg/m³).
 2. The background dataset contains five existing exceedances of the impact assessment criteria and the cumulative 24-hour average PM_{2.5} is therefore calculated using the 6th highest background day (excluding the background days already at or over 25 µg/m³).

7.3.4 Management and mitigation measures

The existing dust control measures include:

- enclosure of all waste unloading, processing and sorting within the MPC shed;
- misting water sprays within the shed to suppress dust;
- sealed travel routes on-site (with the exception of the pit) and use of water carts and/or fixed water sprays on all travel routes; and
- use of water sprays on crusher.

Based on the modelling results, the existing controls appear to be effective in preventing dust impacts in surrounding residential areas. This conclusion is supported by the existing monitoring data which demonstrate compliance with impact assessment criteria at the site boundary (dust deposition) and in the nearest residential area of Minchinbury (PM₁₀).

It is also noted that dust control measures, such as misting sprays, will be deployed in the new processing buildings such as the enclosed Pre-Sort Building and the enclosed Timber Processing Building.

The cumulative annual average PM_{2.5} concentrations exceed the impact assessment criterion at all locations, however this is because the annual average background concentrations of PM_{2.5} already exceed the impact assessment criteria. The cumulative 24-hour average PM_{2.5} concentrations result in additional exceedances of the impact assessment criterion at residential and commercial receptor locations. It is noted that the background PM_{2.5} concentration is already close to the impact assessment criterion (24.4 µg/m³). Furthermore, additional statistical analysis shows that the probability or risk of any additional exceedances of the 24-hour PM_{2.5} impact assessment criterion does not significantly increase, above what is already caused by background (i.e. up to one additional day as a worst case).

To better monitor the effectiveness of existing controls and ongoing performance of the site, the proponent will consider relocating the PM₁₀ monitoring site in Minchinbury to a boundary location at the northern and/or eastern site boundary. This reflects the key mitigation measure identified in the Holmes Air Sciences report being "To better monitor the effectiveness of existing controls and ongoing performance of the site, the proponent will consider relocating the PM₁₀ monitoring site in Minchinbury to a boundary location at the northern and/or eastern site boundary".

7.3.5 Conclusion

Air quality impacts at the nearest residential and commercial/industrial receivers to the facility were assessed based on two phases of the proposed modification, a construction phase and an operations phase. Construction phase emissions are expected to be lower than the operation phase; however, the majority of the emissions during construction will be concentrated around the area of the western amenity bund and, therefore, the footprint of impacts will differ from typical operations at the site.

Operation phase emissions were based on a likely operational scenario whereby approximately 60% of material enters the MPC and 40% of material is directed to landfill. The higher range value for landfilling was selected as a conservative worst case (as this produces more wheel generated dust for trucks entering the landfill void).

For both the construction and operation phases, the predicted cumulative annual average PM₁₀ concentrations were found to comply with the impact assessment criterion at all residential receptor locations and, with the addition of existing background levels, there were no additional exceedances of the 24-hour average PM₁₀ impact assessment criterion at residential receptor locations.

For both the construction and operation phases, the predicted cumulative annual average PM_{2.5} concentrations exceeded the impact assessment criterion at all locations; however, this was because the annual average background concentrations of PM_{2.5} were already above the relevant impact assessment criteria.

For the construction phase, with the addition of existing background, there were no additional exceedances of the 24-hour average PM_{2.5} impact assessment criterion at residential receptor locations.

For the operation scenario, the cumulative 24-hour average PM_{2.5} concentrations resulted in one additional exceedance of the impact assessment criterion at eight residential receptor locations. This was caused by a combination of elevated background with the additional dust emissions from the proposed modification. Additional statistical analyses showed that the probability or risk of any additional exceedances of the 24-hour PM_{2.5} impact assessment criterion would not significantly increase above what is already caused by background.

Cumulative annual average TSP concentrations for both the construction and operation phase were found to comply with the impact assessment criterion at all receptor locations, while predicted dust deposition levels complied with both the incremental and cumulative impact assessment criteria at all residential receptors.

For the operation phase, there were predicted exceedances at the commercial premises located adjacent to the northern and eastern boundaries of the site. These were caused by a combination of elevated background concentrations with the additional dust emissions from the proposed modification.

For PM₁₀, additional statistical analyses showed that the proposed modification would contribute to a small increased probability or risk (2-9%) of additional exceedances of the 24-hour PM₁₀ impact assessment criteria at nearby commercial premises. Therefore, to better monitor the effectiveness of existing controls and ongoing performance of the site, the Proponent will consider relocating the PM₁₀ monitoring site in Minchinbury to a boundary location adjacent to the northern and/or eastern boundary of the site.

The assessment predicted that odour experienced at residential receivers will be below 2 OU and below 7 OU at commercial/industrial receivers, which are regarded by the EPA as suitable upper limits for these land uses.

7.4 Soil and water

7.4.1 Introduction

This assessment has been prepared to assess potential impacts to soil and water resources, topography, hydrology, drainage lines, watercourses and riparian lands on or nearby to the site. There is also analysis of how water and leachate will be managed during the proposed modification, including mitigation and monitoring measures. Additionally, a description of potential impacts to water quality at the discharge point and/or groundwater infiltration point and a revised site water balance has been included.

7.4.2 Existing environment

i Catchment area

The facility falls within the Eastern Creek Precinct Plan No. 18 document.

The overall precinct is split into nine major catchments, however only four catchments are relevant for water management purposes.

The relevant catchments are:

- Quarry Catchment;
- Quarry North Catchment;
- Upper Angus Creek Catchment; and
- Ropes Creek Tributary Catchment.

These catchments are described below.

a. Quarry Catchment

This catchment is located in the north-western portion of the Precinct south of the M4 motorway and covers approximately 72 Ha. Currently this catchment drains to Ropes Creek via overland flow.

b. Quarry North Catchment

This catchment is located south of the M4 motorway and east of the quarry catchment and covers approximately 28 Ha. The majority of this catchment is within the open cut quarry however the existing stormwater runoff drains to the north of the M4 via a culvert beneath the motorway.

c. Upper Angus Creek Catchment

This catchment is located in the northern portion of the Precinct south of the M4 motorway and covers approximately 89 Ha. Stormwater runoff is split into two tributaries connecting at the northern boundary to a 3.5m diameter steel culvert running beneath the motorway.

The two tributaries form creeks and drain mostly vegetated land. There are two dams within this catchment on the eastern tributary.

d. Ropes Creek Tributary Catchment

This catchment is located in the western portion of the Precinct on the eastern side of Ropes Creek and covers approximately 127 Ha. The majority of this catchment drains the quarry which has been modified through quarry works. There are existing creek beds and a dam within the catchment.

ii Soil, geology and topography

During the site inspection - conducted by Consulting Earth Sciences (CES) - there were no signs of distressed vegetation (an indication of potential environmental impacts) and in the accessible areas observed, no surface staining indicative of surface spills that could have impacted underlying soil and groundwater. The site appeared to be graded an approximate 5 m above the surface level at the sediment dam. This difference in surface level suggests the site been graded with an unknown material to the current level.

Reference to the Penrith 1:100 000 Geological Series Sheet 9030 (1991) indicates that the site is underlain by Bringelly Shale of the Wianamatta Group of Middle Triassic Age. This formation typically comprises of shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, and rare coal and tuff.

The site was also observed during the site inspection to slope towards the north-western corner of the site towards the sediment dam.

iii Hydrogeology

It is expected that groundwater would flow to the west-northwest, towards Ropes Creek.

A search of the Department of Primary Industries Office of Water database (<http://allwaterdata.water.nsw.gov.au/water.stm>) accessed on 27 June 2017, indicates there are eleven registered groundwater wells located 1 km of the site boundary. Nine wells are used for monitoring, one well is used for irrigation, and one well used for waste disposal. The wells extend between 6 and 217.90 m below ground level. The recorded groundwater standing water level ranges from 31.6 to 40.3 m below ground level.

iv Existing management

a. Stormwater management

Rainfall runoff from roofs is captured in tanks and runoff from the ground is captured in a number of on-site detention (OSD) basins. The water captured in tanks and treated in the OSDs is reused on-site for toilets, dust suppression and in the wheel wash. The processing area is a net receiver of water inflow, which results in minimal discharges to receiving waters, with any residual water not used on-site discharged to council's stormwater system.

b. Leachate management

A leachate model was developed for the facility in 2008 based on the infilling system separates runoff from clean and covered areas within the landfill, and water falling on exposed waste. Model inputs were rainfall on waste, irrigation on waste and seepage from groundwater. Evaporation of water from the top 10 m of waste was subtracted from the total of the water inputs.

The model predicted that between 45 m³ and 872 m³ of leachate would be generated a day (average of 241 m³ per day and 87,965 m³ per year) and that pumping rates of between 250 m³ and 500 m³ per day would be required.

Recorded leachate extraction for the year from October 2015 to September 2016 was 61,485 m³, or 168 m³ per day, which reflects contemporary irrigation rates at the facility.

Leachate is collected at the base of the landfill and gravity-fed to a lined sump with a collection capacity of 890 m³ per day, where it is pumped to sequential batch reactors for treatment and release to a Sydney Water sewer under Trade Waste Agreement 35580.

The sequential batch reactors have capacity to treat up to 219,000 m³ of leachate per year, or approximately 600 m³ per day.

7.4.3 Impact assessment

i Water quality

A groundwater assessment by ERM (2008) found that there is an intermittent shallow perched groundwater system located around the quarry within the fill, clay and weathered shale. Permeability of these deposits ranges from 1.46E⁻³ m/day to 0.25 m/day. Based on the very isolated seepage observed from the clay and weathered shales exposed on the pit walls, this system is not in significant hydraulic contact with the quarry. This suggests that, provided leachate levels within the pit are kept below the base of the shallow aquifer system, leachate migration into this system is unlikely to occur. The water quality of this aquifer is considered to be poor and of limited human and environmental value.

ii Flooding

Based on the WorleyParsons *Erskine Park Link Road Flood Impact Assessment* (2010), land within the operational area of the site is unlikely to impact, or be impacted by, flooding events. The site location is outside of the high flood risk areas within the Ropes Creek Catchment.

iii Leachate generation

It is understood that the project approval currently limits landfill volumes to 700,000 tonnes per annum (tpa) and that Modification 6 for the facility proposes a landfilling limit of 1 million (M) tpa.

The actual rate of current landfilling is approximately 629,000 tpa.

In 2007, DECC requested that a spreadsheet based model be developed to assess the required discharge rates for leachate; the likely leachate water elevations in the landfill; the required leachate surface storage; and the anticipated discharge rate to sewer. A spreadsheet based model prepared by ERM (2008) was developed as per the recommendations.

The key findings were:

- the design of the infilling system will allow separation of surface water run-off from the sides of the landfill from the rain falling directly onto the landfill waste and infiltrating to become leachate. This will significantly reduce the volume of leachate generated. However, it should be noted that the separated rainwater that is pumped/discharged to the pit stormwater dam and the surface dams (including the dam underneath the Materials Processing Centre (MPC) is used for irrigation/dust suppression of the waste area. As a result, this water may generate leachate;

- ERM conservatively estimated the volumes of surface water and leachate generated within the landfill. Based on this, leachate generated is anticipated to range between 45 and 872 m³/day, with an average of 241 m³/day;
- ERM estimated that in order to maintain groundwater elevations at acceptable levels within the landfill, pumping rates from the landfill will be required to range between 250 m³/day and 500 m³/day;
- ERM stated that provided that pumping rates do not fall below 241 m³/day, the landfill will be able to be used as a storage facility during times of high rainfall. This pumping rate allowed a constant flow rate to be achieved from the leachate collection system and would negate the need for surface storage capacity for leachate pumped from the landfill; and
- at the completion of the landfill and subsequent capping, leachate generation is likely to fall below 90 m³/day. Due to the potentially poor ability of the regional groundwater system to absorb this volume of leachate there is potential for leachate elevations to eventually rise above the regional groundwater elevation and begin recharging the shallow perched groundwater system. Post landfill monitoring will help to quantify this process, however, there is potential for ongoing pumping to be required to prevent impact to receptors in potential hydraulic contact with the landfill.

iv Site water balance

a. Methodology

The water balance methodology takes inputs from measured precipitation, evapo-transpiration and expected volumes of irrigation and infiltration to calculate the net water balance at the site. The relationship between the four input parameters is based upon the site area, which is divided between waste areas and non-waste areas. Water applied to waste areas is assumed to become leachate, while water applied to non-waste areas is converted to leachate at a lower rate. The net water balance represents the volume of leachate being required to be removed from the pit per year.

b. Results

Consulting Earth Scientists (CES) undertook testing for the purpose of a water balance assessment. The findings of the CES report are summarised in Table 7.15.

Table 7.15 Water balance summary

Source		Leachate volume – without Mod 6 approval (m ³ / yr)	Leachate volume – with Mod 6 approval (m ³ / yr)
V1	Net rainfall on waste in landfill		+126,509
V2	Net irrigation on waste in landfill pit	+21,707	+26,753
V3	Seepage from groundwater		+730
	Total estimated water inputs	+147,946	+153,992
V4	Evaporation from landfill pit with current waste disposal at 10m AHD		-88,332
	Net water balance	+59,614	+65,660
V5	Leachate pumped out from landfill pit (2016)		-61,485

Notes: 1. Type any additional notes or Sources.
2. Or simply delete these lines of text if not required.

This balance indicates that the modelled irrigation scenario indicates a net positive volume of water (or maximum available water to derive leachate) within the landfill pit. It is noted that although the net water balance exceeds the leachate pumped from the landfill pit in 2016, the sequenced batch reactor (SBR) leachate treatment system has a capacity in the order of 219,000m³/year. As a result, the SBR system has sufficient capacity to manage the predicted net water balance. Mod 7 does not change the water balance at the site.

v Soil sampling

a. Methodology

Fieldwork was carried out on 1, 2 and 3 November 2017 by CES. An underground services search was carried out and each borehole location was cleared for underground services prior to commencement of fieldwork.

Borehole drilling and sample collection was carried out using sonic drilling techniques. Sonic drilling was selected due to the expected presence of uncontrolled fill at the site. Boreholes were advanced through fill to a maximum depth of 6.0m. Soil samples were collected every 1m and screened using a photo-ionization detector (PID), with the sample recording the highest reading submitted for analysis. One soil sample was collected from each borehole from the fill material between depths of 0.0m bgl to 6.0m bgl and tested for a range of analytes.

Fill was encountered to a maximum depth of 6.0 m bgl in all boreholes. Natural soil was not encountered during the investigation.

b. Results

Soil results are presented in Table 7.16.

Table 7.16 Soil laboratory analytical results

Parameter	Finding
Benzene, Toluene, Ethylbenzene and Total Xylenes, and Total Recoverable Hydrocarbons	Sample BH10 exceeded the adopted screening criteria (HSL-D Sand 0 - <1 m bgl) for benzene. It should be noted that the HSL-D Sand 2-4 m bgl (sample collected 4.0 – 5.0 m) is the same as HSL-D Sand 0 - <1 m bgl (6 mg/kg). A “backward” human health risk assessment (using the HSL calculator provided by CRC CARE, which is referenced in NEPM 2013) which would take into account the likely future building parameters, is likely to derive a higher site-specific SAC, that would confirm the low risk from this concentration of benzene. Sample BH10 exceeded the NEPM (2013) ESL Fraction 2 criteria concentration of 170 mg/kg and the TRH >C16-C34 criteria concentration of 1,700 mg/kg. However, it should be noted that the sample collected from BH10 was collected from 4.0 to 5.0 m bgl and as such the ESL screening criteria are not applicable (CES Report Reference: CES161004-ECS-AU, page 26).
Polycyclic Aromatic Hydrocarbon	PAH results in all soil samples were below the human health SAC. BH08, BH09, and BH10 benzo(a)pyrene concentrations of 1.5 mg/kg, 3.3 mg/kg, and 9.4 mg/kg, exceeding the NEPM (2013) ESL low reliability criteria concentration of 0.7 mg/kg were detected, however when the high reliability screening criteria (Technical Report 38, CRC CARE, 2017) was applied no exceedances were detected.
Heavy metals	Heavy metal concentrations in all soil samples were below the site assessment criteria (SAC).
Organo-chlorine pesticide (OCP)	OCP results in all soil samples were below laboratory practical quantification limits (PQL) and therefore the SAC.
Polychlorinated biphenyls (PCB)	PCB results in all soil samples were below laboratory PQL and therefore the SAC.

Table 7.16 **Soil laboratory analytical results**

Parameter	Finding
Asbestos	No asbestos was detected in the soil samples analysed. In addition, no potential asbestos containing materials were observed within the site soils.

Soil analytical results indicate that the fill soils at the site up to a depth of 6 m bgl are not significantly contaminated, and are unlikely to pose an unacceptable risk to human or environmental health, based on the Tier 1 screening assessment undertaken.

A localised hotspot of benzene, in excess of the screening criteria (HSL-D, Sand, 0-<1 m bgl and HSL-D, Sand, 2-4 m bgl), was detected in BH10 at 4.0-5.0 m depth was identified however this is considered to be a low risk for the following reasons:

- the screening criteria selected represents the most conservative soil type (sand), soil types observed during site investigation at BH10 varied from gravelly clayey sand to gravelly sandy silt, and therefore the screening criteria is not representative of site conditions. If the HSL-D, Silt 2-4 m bgl (6 mg/kg) is applied the benzene concentration detected does not represent a risk to site users. Gravelly sandy silt was encountered in BH10 from 3.0 to 4.3 m bgl; and
- PID screening did not detect evidence of volatile impact in any other location across the site, indicating that the benzene impact detected is localised and unlikely to represent gross contamination of the fill at the site. PID screening in BH10 at 4.0 m bgl and 5.0 m bgl detected 298.7 and 1957 ppm respectively. The next highest PID screen detection was located in BH01 at 1.0 m bgl, 19.9 ppm. This indicates that the benzene impact is likely to be limited in extent both vertically and laterally.

7.4.4 Management and mitigation

i Future Stormwater Management Plan

As part of the overall stormwater management strategy for the facility, a Future Stormwater Management Plan has been prepared. This plan was reviewed by Blacktown City Council (BCC) in March 2016 and matches the BCC adopted S94 Contributions Plan No. 18.

Within the site there are two existing OSD basins currently utilized for stormwater detention purposes. These are located in the area of the proposed western extension of the operational area. Future water detention is proposed to be directed to the proposed 38 ML OSD basin in the north western corner of the Quarry Catchment within the BCC adopted S94 Contributions Plan. The proposed modification arrangement decreases the size of the existing catchment (and catchment into the future Quarry Catchment basin) by approximately 10.82 Ha from 38.12 Ha to 27.3 Ha.

A siteworks and stormwater drainage plan (SKC306) for the modification has been prepared which indicates the overall site plan. This plan indicates a proposal to construct a 38 ML capacity dam within the north-west corner of the site. This dam is proposed to collect all stormwater generated from the Genesis facility (for all storm events up to the 100 year ARI) and will provide for the re-use of stored water at the facility. It is proposed that this new dam will replace the two existing OSD basins along the western boundary of the site. The total combined volume of these two existing basins is approximately 5,500m³ (as per Site Surface Water Management Plan prepared by Storm Consulting in November 2008). Storage capacity is therefore substantially increased through the installation of the proposed new 38 ML basin.

An overflow system in the form of a swale and culvert system below the future Archbold Road extension will be designed to manage stormwater flows into the proposed Quarry Catchment should the dam overtop. Control measures will be incorporated into the swale to ensure peak flows are managed and flow rates do not exceed pre-developed rates.

ii Offsite water quality controls

With the incorporation of raised outlet pits within the swales across the site and Gross Pollutant Traps, contaminated and sediment laden water is proposed to be treated at the source. Bunds will also be constructed at the catchment boundaries to ensure all overland flows within the site are directed to the basin.

Also given the only outlet from the basin will be via an emergency overflow system to the west, sediments within the water will generally settle to the base. Given the large volume within the basin and the regular re-use of the water internal to the site, the likelihood of sediment laden water being discharged off site is considered negligible. An online maintenance and monitoring plan will be developed and maintained throughout the life of the project to ensure build-up of sediment is managed.

iii Demolition and construction controls

Stormwater runoff generated from within the works area during construction will likely contain sediments and oils from construction machinery. A number of options will be put into place for the removal of these contaminants from stormwater, some of which include:

- wheel wash down/cattle grid at site access;
- sediment fence at downstream boundary;

- sediment basins;
- diversion banks;
- stabilisation of finished areas; and
- cut off drains.

Erosion and sedimentation controls will be installed and maintained in accordance with Department of Housing (1998) *Managing Urban Stormwater, Soils and Construction*, Fourth Edition.

The following control devices will be installed:

- silt fences will be installed along the base of excavated slopes and stockpiles to prevent runoff; and
- kerb inlet sediment traps will be installed at the completion of the drainage works. Whilst works are underway, geotextile filter fabric fences will be installed around open pits.

7.4.5 Conclusion

This section has demonstrated that a stormwater system consistent with good management practices can be provided for the modification.

The revised Quarry Catchment is approximately 27.3 Ha, whilst the original Quarry Catchment is 38.12Ha. This reduced catchment area plus the inclusion of the 38 ML dam within the facility ensures compliance with the Council's S94 Contributions Plans as no additional stormwater flows will be burdening the future precinct basin within the Quarry Catchment.

In general terms, it is in the landfill operator's best interest to minimise water use, since surplus water used in the vicinity of the landfill may increase leachate generation, either through direct infiltration through the landfill materials – when water is used for dust suppressant during daily landfilling operations, or through infiltration to groundwater – and thereby increasing groundwater inputs to the leachate. In addition, surplus water will create additional operational issues on roadways, by causing slippery and muddy conditions, which are unfavourable for truck movements and landfill operational efficiency.

The site currently uses (and will continue to use after the determination of Mod 6 and Mod 7) a fleet of water cannons, water carts, water sprinklers and misting devices to minimise dust generation in the landfill pit, the segregated materials area (SMA) and the Materials Processing Centre (MPC). These water supply devices are operated in a risk-reflective manner, i.e. they are not used when rainfall minimises the requirement for dust suppressant measures and are used on an increased basis during dry and windy conditions. Water for dust control is supplied from stormwater that has been harvested from the site area. This stormwater is currently pumped from the landfill pit stormwater basin into the northern and southern OSD basins.

Stormwater is also harvested from the roofs of structures, such as the MPC, which stores rainwater in the emergency dam underlying the MPC shed.

Moreover, the results of the Preliminary Investigation indicate that the fill investigated at the site is not grossly contaminated. A localised hotspot of benzene impact was detected, however this is not considered to pose a significant risk to future site construction workers or site occupiers (commercial/industrial land use setting).

7.5 Traffic and transport

7.5.1 Introduction

Traffic and transport impacts associated with the proposed modification were assessed in accordance with the SEARs and the *Guide to Traffic Generating Developments* (RTA 2002) and the requirements of the Australian Standards (AS 2890) for access and car parking for cars and heavy vehicles.

This chapter summarises the traffic impact assessment, which is provided at Appendix G. The assessment described the existing road network and usage around the facility and predicted vehicle movements associated with the proposed modification and assessed potential impacts on nearby intersections and roads. The assessment also considered the traffic impacts of the proposed additional site layout modifications and access changes as part of the proposed modification.

7.5.2 Existing environment

i Location and access

The facility is at the end of Honeycomb Drive and adjacent to Kangaroo Avenue, which is a local industrial road according to Blacktown City Council's *Road Hierarchy Standards*. Honeycomb Drive is 15.5 m wide and Kangaroo Avenue is 13.5 m wide, and both roads have kerbside parking. Honeycomb Drive connects to Wonderland Drive approximately 600 m east of the facility. Wonderland Drive is an industrial collector/sub-arterial road and is the main thoroughfare through the precinct. It connects to the major road network at Walgrove Road.

The existing roads in the locality (which include Wallgrove Road, Wonderland Drive, Honeycomb Drive and Kangaroo Avenue) all carry high proportions of heavy vehicle traffic currently which are a minimum of 14% of the total daily traffic using these routes.

The facility is currently accessed via an entry and exit point on Kangaroo Avenue approximately 150 m north of the intersection of Kangaroo Avenue and Honeycomb Drive. This access arrangement commenced on 9 October 2017 to enable the planned and approved construction of Precinct Road which will, when constructed, connect Honeycomb Road to Archbold Road west of the facility.

As noted, the proposed modification includes the construction of a new access road on the northern side of Precinct Road and the retention of the existing access from Kangaroo Avenue.

ii Hourly traffic volumes

Peak hour traffic volumes on local roads were surveyed at the Walgrove Road/Wonderland Drive and Honeycomb Drive/Kangaroo Avenue intersections on 27 July 2017. The road peak hours and traffic counts are summarised in Table 7.18.

Table 7.17 Peak hourly traffic volumes using Eastern Creek locality roads in July 2017

Road and location	Time period	North or East Bound	South or West Bound	Combined two-way	Proportion of Heavy Vehicles
Wallgrove Road north of Wonderland Dr	Morning peak hour (7.30–8.30)	1,034	1,640	2,674	13%
	Afternoon peak hour (4.00–5.00)	1,359	1,038	2,397	8%

Table 7.17 Peak hourly traffic volumes using Eastern Creek locality roads in July 2017

Road and location	Time period	North or East Bound	South or West Bound	Combined two-way	Proportion of Heavy Vehicles
Wallgrove Road south of Wonderland Dr	Morning peak hour (7.30–8.30)	1,178	1,181	2,359	14%
	Afternoon peak hour (4.00–5.00)	940	1,352	2,292	9%
Wonderland Drive west of Wallgrove Road	Morning peak hour (7.30–8.30)	314	890	1,204	18%
	Afternoon peak hour (4.00–5.00)	910	201	1,111	11%
Honeycomb Drive east of Kangaroo Ave	Morning peak hour (7.15–8.15)	106	208	314	27%
	Afternoon peak hour (4.00–5.00)	236	49	285	17%
Kangaroo Ave north of Honeycomb Dr	Morning peak hour (7.15–8.15)	158	70	228	18%
	Afternoon peak hour (4.00–5.00)	29	154	183	14%
Site Access Traffic west of Honeycomb Dr	Morning peak hour (7.15–8.15)	44	53	97	56%
	Afternoon peak hour (4.00–5.00)	84	24	108	26%

Total daily traffic at the existing site access, Honeycomb Drive and Kangaroo Avenue was also surveyed and vehicle movements were:

- existing site access – 1,400 including 837 (60%) heavy vehicles;
- Honeycomb Drive – 3,550 including 1,196 (34%) heavy vehicles; and
- Kangaroo Avenue – 2,236 including 412 (18%) heavy vehicles.

iii Traffic generated by the facility

The facility operates on approximately 270 days each year, and even though the facility is licensed to operate on weekends and public holidays, it generally only receives material and dispatches product on weekdays and Saturdays.

Weighbridge vehicle records for the month of April and the traffic surveys were used to estimate a typical day of truck movements across a year of operation. This showed that an average of 396 trucks visit the facility a day and the peak period was between 9.00 am and 3.00 pm on weekdays, which does not coincide with peak hours on other roads in the area. Approximately 40% of hourly truck movements during the peak period are associated with the Fulton Hogan site.

Peak inbound car traffic is approximately 50 cars per hour between 5.00 am and 7.00 am, which is before the morning peak hour on local roads, and peak outbound car traffic is 70 cars between 4.00 pm and 5.00 pm, which coincides with the local road afternoon peak period.

iv Intersections and turning traffic

The existing morning and afternoon peak period performance of the Honeycomb Drive and Kangaroo Avenue intersection was assessed using the SIDRA intersection analysis program. The intersection has very low peak hour traffic delays (Level of Service 'A') and a high level of spare capacity during the peak periods.



KEY

- Facility
- RMS classified roads
 - Auslink
 - Regional
 - State
 - Watercourse

Regional road network

Genesis Xero Waste
Modification 7
Environmental impact assessment

Figure 7.3



7.5.3 Impact assessment

i Overview

As part of the proposed modification, no change to the facility's approved maximum material receipt rate is proposed. The intent of the proposed modification is to change the internal operating layout of the facility to improve the site logistics and to provide efficiencies in the processing of materials.

Until such time as the Archbold Road extension is completed, materials received at, and transported from, the facility will continue to travel along Kangaroo Avenue, Honeycomb Drive and Wonderland Drive.

As noted previously, an intersection was constructed on Kangaroo Avenue to facilitate continued access to the facility and the Fulton Hogan site.

ii Future traffic generation

The rearrangement of buildings, internal roads, plant and processing improvements (including truck weighbridge enhancements and materials processing enhancement) do not, of themselves generate additional traffic. The improvements of on-site logistics and operations will however make the flow of traffic less congested and reduce the time required on site.

Future traffic generation is driven by forces external to the facility, such as the commencement of major private sector projects and government infrastructure projects in Western Sydney. This growth is accounted for in the traffic impact assessment.

The only exception to this will be an increase in traffic during construction works.

iii Changes to site access and car parking

The proposed modification will result in changes to the current internal site layout and traffic management arrangements, including the relocation of the site entry and exit, and the location of the weighbridges.

Traffix Pty Ltd has assessed the future access options for trucks entering the site. The report is an attachment to the Traffic Impact Assessment Report at Appendix G.

Interpreting the Traffix report with respect to the proposed separation of ingress and egress arrangement, the following conclusions can be drawn.

- if access to the facility is required directly from Precinct Road, inbound heavy vehicles will be required to make a right turn into the site directly from Precinct Road. Outbound heavy vehicles will exit to Kangaroo Avenue via a separate access road. The separation of ingress and egress will alleviate the risk of displaced queuing during peak periods (as noted in the Traffic report) which might otherwise occur if trucks were attempting to enter and exit via the same access point; and
- the continued use of the existing site access point as a one-way exit road will provide a better outcome for the future transport operations on the site and also minimise the impact on the public road network in terms of traffic flow and safety.

The provision of an increased capacity in the weighbridge infrastructure is best achieved at the south eastern corner of the site. Six weighbridges, arranged in parallel, create a significant improvement in processing times and the parallel configuration has limited options for location within the site.

The south eastern corner is the obvious choice and this means that the relative short distance between Precinct Road and the weighbridges precludes any consideration of using that access point for both ingress and egress. A superior outcome, in terms of reduced queuing and vehicle safety, is achieved by the separation of ingress and egress.

Site distances from the site access intersection on Kangaroo Avenue satisfy Austroads minimum intersection visibility standards in both directions.

iv Assessment of road network impacts

In accordance with Blacktown City Council's *Road Hierarchy Standards for Industrial Roads*, a 150 m section of Kangaroo Avenue north from Honeycomb Drive to the site access location requires widening by 2 m to enable that road to be used for facility-related truck traffic. However, swept path analyses, which were performed as part of the Mod 6 EA (EMM 2017), demonstrated that the site access intersection on Kangaroo Avenue could safely accommodate turning trucks without further road widening. Subsequently, additional road widening is not proposed as part of the proposed modification.

Consistent with the conclusions drawn from the EA prepared for Mod 6 (EMM 2017), it is recommended that on-street car (or truck) parking on Kangaroo Avenue should be prohibited by 'No Stopping' signs, for 50 m either side of the site access intersection centre line. This will maintain the current intersection visibility for traffic turning, as well as allowing for through traffic to easily pass any vehicles on Kangaroo Avenue which are turning left or right at the site access intersection. Road markings will also be installed as appropriate.

v Assessment of intersection impacts

The SIDRA intersection analysis also assumes additional future through traffic movements of +350 vehicle movements per hour in each direction using the Precinct Road, with approximately 10 percent heavy vehicles. This is equivalent to approximately 7,000 daily vehicle movements in total using the Precinct Road in future years after the route is connected to the southern extension of Archbold Road.

At the future Honeycomb Drive and Kangaroo Avenue intersection, which will also include an additional connection with the Precinct Road to the west, the future intersection will operate with a morning or afternoon peak hour level of Service C or D for the exit traffic movements from Kangaroo Avenue. However, these changes in comparison to the assessed peak hour Level of Service 'A'(LoS 'A') for the existing intersection operations prior to October 2017, are primarily a result of the assumed additional through traffic movements using the Precinct Road, once it is connected to Archbold Road, and the resulting changes in the intersection level of service are not in principle a result of the proposed Modification traffic changes.

The SIDRA analysis results for the new Precinct Road access intersection show that the intersection will have very low peak hour traffic delays (LoS 'A') indicating good traffic operations and a high level of spare traffic capacity (low DOS) during both the morning and afternoon peak hours.

The SIDRA intersection traffic modelling results for the new Facility access intersection on Kangaroo Avenue, also show this intersection will have very low peak hour traffic delays (LoS 'A') indicating good traffic operations and a high level of spare traffic capacity (low DOS) during both the morning and afternoon peak hours.

Tables 7.19, 7.20 and 7.21 (below) indicate the level of service (LoS), degree of saturation (OS), average delay and traffic queuing at key intersections.

Table 7.18 Results of the future Honeycomb Drive/Kangaroo Avenue SIDRA analysis

Intersection Peak Hour	Future situation – Average Day Facility Traffic			
	LoS	DOS	AVD* (seconds)	Maximum traffic queue length (m)
Intersection am peak hour (7.15–8.15 am)	D	0.362	42.9	16
Intersection pm peak hour (4.00–5.00 pm)	C	0.244	29.9	8

Notes: * The average vehicle delay for give way intersections is for the highest delayed traffic movement at the intersection.

Table 7.19 Results of the new Precinct Road access intersection SIDRA analysis

Intersection Peak Hour	Existing situation – Average Day Facility Traffic			
	LoS	DOS	AVD* (seconds)	Maximum traffic queue length (m)
Intersection am peak hour (7.15–8.15 am)	A	0.141	9.1	6
Intersection pm peak hour (4.00–5.00 pm)	A	0.120	9.5	3

Notes: * The average vehicle delay for give way intersections is for the highest delayed traffic movement at the intersection.

Table 7.20 Results of the new Precinct Road access intersection SIDRA analysis

Intersection Peak Hour	Existing situation – Average Day Facility Traffic			
	LoS	DOS	AVD* (seconds)	Maximum traffic queue length (m)
Intersection am peak hour (7.15–8.15 am)	A	0.141	9.1	6
Intersection pm peak hour (4.00–5.00 pm)	A	0.120	9.5	3

Notes: * The average vehicle delay for give way intersections is for the highest delayed traffic movement at the intersection.

vi Car parking, safety, public transport and access

Under the proposed modification, there will be no change to employee numbers. Subsequently, there will be no additional requirements for on-site car parking.

Safety of the primary access route via Wonderland Drive, Honeycomb Drive and Kangaroo Avenue is very good as it has been constructed to a high design standard and the current speed limit is 50 km/hr. All the existing intersections along these routes have been well designed and have adequate sight distances for the prevailing speed limit.

As noted above, site distances from the site egress intersection on Kangaroo Avenue satisfy Austroads minimum intersection visibility standards in both directions.

The proposed traffic circulation paths are all acceptable. The current internal levels of traffic safety within the facility will generally be improved by the new traffic circulation plans. The existing 10 km/hr and 20 km/hr speed limit zones within the site will continue to apply under the proposed modification.

The internal traffic circulation road widths will all generally comply with the AS 2890 Part 2 recommended minimum road widths of 6.5 m for two-way traffic movement by large trucks within industrial sites, with additional widening provided at corners to accommodate the increased vehicle swept path widths for large trucks when cornering.

7.5.4 Conclusion

A detailed traffic report has been prepared, which assesses the future access options for trucks entering the site from either Kangaroo Avenue or Precinct Road.

As noted previously, it is understood that the Blacktown City Council's preferred position is to limit the use of public roads for commercial activity, where access to private roads is readily available; however, the proposed operation of the facility, namely the requirement to weigh all inbound and outbound traffic, restricts its flexibility to use Precinct Road exclusively for access and egress in an efficient manner. This is largely due to the high truck volumes and the specific movements required in both directions.

If access to and from the facility is required directly from Precinct Road, inbound heavy vehicles would need to make a right turn into the site directly from Precinct Road and outbound heavy vehicles would require a slip road to exit back onto Precinct Road. This site access arrangement could contribute to inbound traffic queues into the site, which, during peak periods, would impede the operation of the intersection between Kangaroo Avenue and Honeycomb Drive.

The continued use of the site access intersection on Kangaroo Avenue - as a future 'exit only' road - will provide a better outcome for future transport operations at the facility and will also minimise the impact of the facility on the public road network in terms of both traffic flow and safety.

No road widening on Kangaroo Avenue is required; however, consistent with the recommendations provided within the EA for Mod 6 (EMM 2018), it is recommended that on-street parking should be prohibited by 'No Stopping' signs 50 m either side of the site intersection on Kangaroo Avenue. This will maintain good visibility for traffic turning at the intersection as well as allowing for through traffic to easily pass other vehicles on Kangaroo Avenue which may be turning left or right at the intersection.

7.6 Visual amenity

7.6.1 Introduction

The SEARs require an assessment of the potential visual impacts of the proposed modification. The SEARs state that this EA must include:

a description of the potential visual impacts from the proposed buildings and associated structures; and details of the measures proposed to minimise visual impacts, such as landscaping.

This section of the EA addresses the potential visual impacts of the proposed modification and summarises the proposed mitigation measures to minimise visual impacts.

In the absence of federal, state government or local government planning policies, guidelines or standards applicable to assessing the potential visual impacts of a waste management facility, the assessment of potential visual impacts has been undertaken in consideration of wider industry standards, in particular the United Kingdom (UK) guidelines: *Guidelines for Landscape and Visual Impact Assessment* (GLVIA) Third Edition (2013) prepared by the Landscape Institute and Institute of Environmental Management and Assessment.

7.6.2 Existing environment

The site is in an existing industrial and commercial precinct within the Blacktown LGA. The site is part of an area being developed for commercial and industrial use under the WSEA SEPP.

Land use zoning immediately adjoining the site under the provisions of the Blacktown LEP is deferred to the State Environmental Planning Policy (Western Sydney Employment Area). Further afield there are lands zoned RE1 Public Recreation, SP2 Infrastructure (Classified Road), R1 General Residential and R2 Low Density Residential.

Adjacent landowners include:

- Australand, which owns and leases warehousing to the north-east;
- Hanson, which owns an asphalt batching plant to the south-east;
- NSW Government, which owns vacant land to the south-west; and
- Sargents, which owns vacant land to the west.

The site is bounded by Kangaroo Avenue to the east and north-east, the M4 Western Motorway to the north, Archbold Road to the west, and open grassland to the south.

It is understood that Blacktown City Council intends to extend Archbold Road further south to connect with Lenore Drive and that the alignment of the new Archbold Road extension will run parallel with and adjacent to the base of the proposed western retaining wall. In addition, a new road is proposed to be constructed along the southern site boundary, which would connect Archbold Road with Honeycomb Drive and Kangaroo Avenue to the east.

Further afield, there is predominantly undeveloped land containing high voltage powerlines west of Archbold Road and to the south and south-west of the site. Beyond this to the west is residential development in Erskine Park, and similarly in Minchinbury beyond the M4 Western Motorway to the north.

At its closest point, the site is approximately 450 m south and 1,200 m east of the closest residential areas of Minchinbury and Erskine Park, respectively. With the addition of further operational land to the west of the current Operational Area, the operations become approximately 1,000 m east of the nearest residential dwellings in Erskine Park.

The area surrounding the site has generally low relief with no major hills or ridgelines, other than bunds adjacent to the landfill that were created from quarry overburden.

7.6.3 Method

The objectives of the visual assessment were to assess the existing visual character of the facility including to determine the extent and nature of the potential visual significance over and above operations approved under the development consent, as modified, and to identify measures to mitigate potential impacts as required. The visual amenity assessment therefore included the following:

- a desktop study to assess the visual character of the site, with particular focus on the proposed visual/noise wall adjacent to portions of the western boundary of the site, and to identify view locations within the surrounding landscape;
- a viewshed analysis from identified viewpoints; and
- assessment and determination of visual amenity impacts.

The visual significance of the proposed modification on surrounding view locations will primarily result from the construction of the proposed retaining wall (which serves as an amenity barrier for visual and acoustic impacts). The impacts include the introduction of a prominent landform close to the proposed Archbold Road extension and the visibility of the new landform between, and surrounding, any view locations and the site.

As part of the visual assessment, the potential degree of visibility and resultant visual significance has been determined by a combination of factors, including:

- the distance between the view location and the site, including the proposed retaining wall;
- the duration of view from the assessment locations towards the site and the proposed wall;
- the nature of the predicted impact of the proposed modification over and above that approved on the existing visual amenity; and
- the visual sensitivity of locations from which views towards the site and the proposed visual/noise wall exist.

Evaluation of the magnitude of change from each of the selected viewpoints has been based on the following criteria:

- a) whether the impact is temporal or permanent – impacts that are for a limited duration are considered less significant than those which occur for an extended period or are permanent;

- b) scale of change – the loss or addition of features in the view and changes in the proportion of the view affected by the proposed modification;
- c) degree of contrast – level of integration of new features with existing or remaining landscape elements, having regard to form, scale, height, colour, and texture;
- d) distance of the viewer from the altered elements in the landscape – close proximity to an altered landscape will increase the significance for private residences. In the case of motorists, mid ground changes can be greater than foreground elements as they can result in longer viewing times;
- e) viewing direction – whether the change is to the primary view from the receptor;
- f) extent of view affected – impacts that are visible over a greater portion of a view are more significant than those where only a part of the view is impacted. Intervening topography and vegetation will also affect the magnitude of change; and
- g) length of viewing time – views from a residence are constant whereas some views from roadways as experienced by motorists are generally brief dependent upon speed and viewing direction.

Potential visual impacts east and south of the site have not been investigated. As part of the proposed modification the construction of a new administration and visitor reception building complements the existing streetscape and removes a number of unsightly structures which are dilapidated or in poor condition. Other than the administration building, only minor works are proposed in those areas of the site visible from the east and south. Further, existing infrastructure, topography and scattered vegetation in the landscape east and south of the site, as well as distance to the proposed retaining wall, will likely screen views of this infrastructure from sensitive receptors east and south of the site, including motorists travelling along Lenore Drive and Old Wallgrove Road to the south and Honeycomb Drive, Wallgrove Road and Westlink M7 to the east.

7.6.4 Impact assessment

i Viewpoint selection

To determine potential visual impacts, a desktop analysis was undertaken to determine relevant viewpoints from which the site is currently visible and from where the proposed visual/noise wall may be visible. Viewpoints were selected based on:

- proximity to the site and, in particular, the proposed visual/noise wall;
- the location of sensitive receptors (ie dwellings);
- the positioning of road corridors and potential impacts on passing motorists;
- local topography; and
- existing vegetation screening.

The locations of the six viewpoints are illustrated in Photographs 7.1 to 7.5 (below). The rationale for the selection of the viewpoints analysed are summarised in Table 7.21.

Table 7.21 **Assessed viewpoints and sensitive receptors**

Assessment location	Viewpoint type	Rationale for selection
Viewpoint 1	Dwellings Motorists	Views are representative of sensitive receptors (ie dwellings) west of the site within the residential area of Erskine Park (see Photograph 7.1). This viewpoint was selected on the basis that dwellings close to this location will be among the closest sensitive receptors from the residential area of Erskine Park to the proposed visual/noise wall. Views are also representative of those experienced by motorists travelling along the local road network west of the site.
Viewpoint 2	Dwellings Motorists	Views are representative of sensitive receptors (ie dwellings) west of the site within the residential area of Erskine Park (see Photograph 7.2). This viewpoint was selected on the basis that dwellings close to this location will be among the closest sensitive receptors from the residential area of Erskine Park to the proposed visual/noise wall. Views are also representative of those experienced by motorists travelling along Erskine Park Road and the local road network west of the site.
Viewpoint 3	Motorists	Views are representative of those experienced by motorists travelling east along the Western Motorway (see Photograph 7.3). This viewpoint was selected on the basis that motorists travelling east along the Western Motorway at this location may experience limited views of the proposed wall.
Viewpoint 4	Motorists	Views are representative of motorists travelling along Archbold Road west of the site. This viewpoint was selected on the basis that motorists travelling along Archbold Road at this location may experience views of the proposed wall.
Viewpoint 5	Dwellings Motorists	Views are representative of sensitive receptors (ie dwellings) north of the site within the residential area of Minchinbury (see Photograph 7.4). This viewpoint was selected on the basis that dwellings close to this location will be among the closest sensitive receptors from the residential area of Minchinbury to the proposed wall. Views are also representative of those experienced by motorists travelling along the local road network north of the site.
Viewpoint 6	Motorists	Views are representative of those experienced by motorists travelling west along the Western Motorway (see Photograph 7.5). This viewpoint was selected on the basis that motorists travelling west along the Western Motorway at this location may experience limited views of the proposed wall.

Photograph 7.1 to Photograph 7.5 illustrate the views of the site from each of the viewpoints described in Table 7.21. No photographs were available from Viewpoint 4.



Photograph 7.1 **Viewpoint 1 – Swampen Street – Looking north-east**



Photograph 7.2 **Viewpoint 2 – Warbler Street – Looking west**



Photograph 7.3 **Viewpoint 3 – Western Motorway – Looking south-east**



Photograph 7.4 **Viewpoint 5 – Tod Place – Looking south**



Photograph 7.5 Viewpoint 6 – Western Motorway – Looking south-west

To determine potential visibility of the proposed visual/noise wall, a viewshed analysis was also completed. The viewshed analysis simulates the effects of existing vegetation (based on aerial imagery) and topography on screening views. The results of the viewshed analysis indicate that the proposed retaining wall / bund may be visible from viewpoints 3 and 6 (Western Motorway). These views are filtered by roadside vegetation.

ii Potential impacts

The proposed modification involves the construction of a retaining wall / amenity bund, which, once constructed, will provide further screening to reduce potential views of the facility and further reduce potential noise impacts on nearby sensitive receptors. The proposed wall will screen views of the facility from viewpoints to the west and north of the site. The retaining wall will be a stepped earthen bund with tiered benches planted with shrubs. It will be designed to reduce the degree of contrast with surrounding features in the landscape (namely remnant vegetation).

a. Construction impacts

During construction, views of the site from viewpoints 3 and 4 will change with the construction of the proposed visual/noise wall, which will add new features to the visual landscape at these locations. Any changes to the visual landscape during construction are not considered significant due to the low visual sensitivity of passing motorists and the temporary nature of construction activities.

b. Operation impacts

The results of the viewshed analysis indicate that views of the proposed visual/noise wall will not be visible from sensitive receptors (ie dwellings) in the closest residential areas of Minchinbury and Erskine Park, which will (when the wall is constructed) be approximately 430 m north and 1,000 m west of the site, respectively. A combination of existing vegetation, distance and topography will continue to shield views of the facility from the residential areas of Minchinbury and Erskine Park.

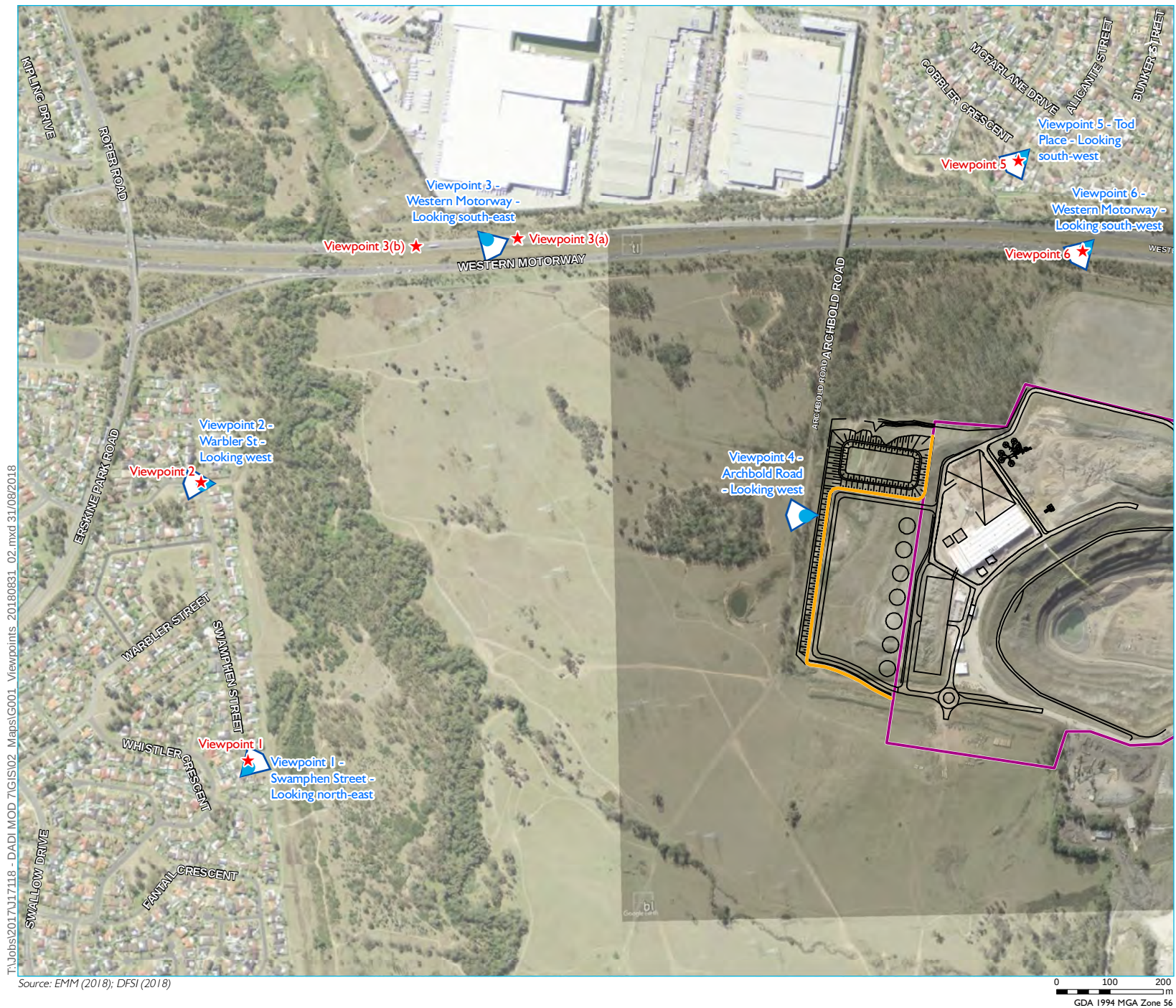
The results of the viewshed analysis indicate that the proposed visual/noise wall will become the dominant visual feature of the facility within the surrounding landscape, with potential views likely to be experienced from two of the viewpoints selected as part of the visual assessment.

As noted, viewpoints 3 and 6 were selected on the basis that motorists travelling east and west along the Western Motorway at these locations may experience limited views of the proposed wall. Views of the proposed wall may be possible from Viewpoint 3, however, it is assumed that the focus of motorists will be in line with their direction of travel east along the Western Motorway. Vehicle passengers may experience filtered views if their viewing direction is southward whilst travelling in the vehicle. Further, the proposed wall will be designed and planted to reduce the degree of contrast with surrounding features in the landscape.

Viewpoint 4 was selected on the basis that motorists travelling along Archbold Road west of the site may experience views of the proposed visual/noise wall. Daily traffic estimates indicate that only a limited number of vehicles travel along Archbold Road close to this location.

It is noted that Blacktown City Council plans to extend Archbold Road further south to connect with Lenore Drive and construct a new road to connect Archbold Road with Honeycomb Drive and Kangaroo Avenue to the east. This will result in an increase to the number of vehicles travelling along Archbold Road close to the western perimeter of the site.

Travelling in close proximity to the proposed retaining wall will mean that the wall will be visible to those motorists. It is assumed, however, that the focus of motorists travelling along the extension of Archbold Road and the proposed new road will be in line with their direction of travel. Furthermore, the proposed retaining wall will be designed and vegetated to reduce the degree of contrast with surrounding features in the landscape. In addition, trees planted adjacent to the proposed wall will provide a permanent and natural screen along the perimeter of the proposed wall at these locations. Nevertheless, it can reasonably be expected that the retaining wall will be visible as a dominant landscape feature for future traffic on the upgraded Archbold Road. The proposed tiered planting of the western face of the wall, and roadside trees, will however soften the intrusion.



- KEY**
- Facility
 - Mod 7 site works
 - Mod 7 Noise barrier
 - ★ Photograph locations
 - ▶ Viewpoint location

Viewpoint and photograph

Genesis Xero Waste
Modification 7
Environmental impact assessment

Figure 7.4

7.6.5 Management and mitigation

The purpose of the proposed wall is to provide further screening to reduce potential views of the operational components of the facility and further reduce potential noise impacts on nearby sensitive receptors. Once constructed, the proposed wall will become the prominent visible feature of the precinct. A range of management and mitigation measures will contribute to an acceptable outcome in terms of visual impact.

i Colour of materials

The materials used to construct the proposed wall will be dependent on detailed design and commercial considerations at the time of construction. It will, however, be designed to reduce the degree of contrast with surrounding features in the landscape (including remnant vegetation).

ii Vegetation screening

Screening in the form of foreground and mid-ground tree and shrub planting is a very effective way of reducing exposure of a sensitive receptor to various aspects of a project's infrastructure. Remnant vegetation adjacent to Rope's Creek to the west and along the southern side of the Western Motorway currently reduces exposure from sensitive receptors to the north and east of the facility.

Once construction of the proposed wall has been completed, vegetation will be planted on and adjacent to the wall. Once established, these trees will provide a permanent and natural screen along the perimeter of the wall. The plant species will be selected to include those common to the ecological community into which they will be planted.

iii Night lighting

Australia Standard 4282 (AS4282) Control of Obtrusive Effects of Outdoor Lighting sets out guidelines for the control of the obtrusive effects of outdoor lighting and gives recommended limits for relevant lighting levels to contain these effects within tolerable levels. All night lighting at the facility will comply with AS4282.

Localised night lighting may be required around the perimeter of the site. If required, lighting will be motion-activated and will be linked with security cameras, which will be positioned in strategic locations around the perimeter of the site. The use of motion-activated lighting will minimise impacts on surrounding areas.

In addition, during the construction of the proposed wall, temporary lighting may be required. If required, lighting sources will be directed away from sensitive receptors and below the horizontal to minimise potential light spill. Lighting of light coloured surfaces, which have greater reflectivity, will also be avoided.

7.6.6 Conclusion

The proposed modification involves the construction of a retaining wall, for the purpose of visual and acoustic amenity, along portions of the western boundary of the (expanded) operational area of the site. Once constructed, the proposed wall will become the prominent visible feature of the facility; however, it will be designed to reduce the degree of contrast with surrounding features in the landscape, including remnant vegetation.

Subsequently, the proposed modification will have a negligible incremental visual impact on people living in, and travelling through, the area around the facility over and above currently approved operations, with existing views from the viewpoint locations considered as part of the visual assessment remaining substantially the same. The exception remains the future traffic on an upgraded Archbold Road which will travel in close proximity with, and parallel to, the proposed wall and will therefore experience a modest impact. The potential impact is however mitigated by the significant planting of shrubs and trees on the wall itself and between the wall and the road. Notwithstanding the physical prominence of a high embankment/retaining wall, travelling close to a steep but vegetated embankment is unlikely to represent a significant visual imposition on the viewscape of drivers or passengers in transiting via the proposed new Archbold Road extension.

There is no immediate impact given the negligible level of current use of the unformed Archbold Road track adjacent to the facility. There will be opportunity to establish tree and shrub plantings before traffic makes use of the yet-to-be-built Archbold Road extension.

The most critical issues are mitigated due to existing vegetation, distance and topography, which shield the majority of views of the facility from sensitive receptors in the closest residential areas of Minchinbury and Erskine Park.

Filtered views of the proposed wall will be possible from motorists travelling east along the Western Motorway. It is anticipated that the focus of these motorists will be in line with their direction of travel along the Western Motorway. Further, the proposed wall will be designed to reduce the degree of contrast with surrounding features in the landscape.

The proposed modification will not have significant adverse visual impacts on the locality. Due to existing mature vegetation in the landscape, distance and the local topography, the facility will remain relatively shielded from view. The construction of the proposed wall will result in some changes to the landscape. Such changes will be noticeable to viewers from certain viewpoints surrounding the facility, particularly from the Western Motorway and the future extension to Archbold Road.

7.7 Waste management

7.7.1 Introduction

There are a number of aspects to waste management which are considered in this assessment. Principally, the aspects are:

- management of waste generated by the proposed works;
- changes to the processing of waste and the construction of key waste processing buildings; and
- management of normal waste processing activities at the facility while construction works are undertaken.

These aspects of waste management are examined below.

7.7.2 Management of waste generated by the proposed works

The works proposed under this modification will require the demolition of selected buildings, the construction of new buildings and earthworks, including excavation. The management of that waste will be as described below.

All waste generated from the demolition of existing structures will be recycled, processed through the existing MPC or SMA, or sent directly to landfill.

During the demolition process, stockpiles will be created for materials (using existing machinery such as excavators and material handlers) which are recyclable, suitable for processing through the MPC or SMA, or are non-recyclable and therefore can be sent directly to landfill.

The stockpiled demolition waste will then be placed into skip bins, weighed and, sent for further processing or recycling at the MPC or SMA, or direct to landfill.

The demolition waste will then be processed as per the normal MPC or SMA operations.

7.7.3 Post Production Dispatch Area

Not all waste received as co-mingled recyclable material is able to be processed fully on site. Material which is technically recyclable but not able to be processed sufficiently on site can often be processed by other waste operators at other facilities off-site. This form of exported recyclable material is stored separately to materials which have been fully recycled on site and is transported to off-site processing facilities once sufficient volumes are accumulated for consignment. Currently the Post Production Dispatch Area (PPDA) is housed within the MPC.

The SEARs make reference to the Post Production Dispatch Area (PPDA) because there was initially a proposal to move the PPDA to the building which is now proposed as the Timber Processing Building (TPB). That proposal is now redundant.

The initial intent was to create efficiencies within the MPC by relocating the PPDA, but the desired operational efficiencies are now achieved in other ways, such as the installation of a Pre-Sort Building for early sorting of co-mingled material prior to transferring that material to the MPC.

As a result, the PPDA will remain within the MPC and the TPB will be dedicated to timber processing.

7.7.4 Waste processing operations

The material will be delivered to site by truck and inspected at the waste unloading and pre-sort area. From here, the waste is initially processed by a 'pre-pick' where any mattresses and oversized metals or timber are removed.

The co-mingled recyclable material is then conveyed to the MPC where the waste is fed into one of the two belt feeders.

The main function of the belt feeder is to control the feed of material through the plant. Material will then be conveyed and passed over a drum separator. A magnet drum is used to remove any large ferrous metals from the waste.

The material will then move toward the Anti Wrapping Screens and then conveyed onto the Feed Conveyors and into Primary Sizers or alternatively bypassed and discharged onto the floor inside the shed.

The C&I waste processing and recovery facility has a capacity of 455,000 tonnes per annum.

i Quality of control measures

The Unloading and Pre-Sort Enclosure is an additional building for the pre-sorting (particularly with respect to the C&I waste stream) of material to enhance the recovery of recyclables from the waste stream. The building will be fully enclosed.

This will increase the effectiveness of the plant in the MPC and will allow better controls on waste being received as it will afford more time to be spent sorting the waste this will also generally increase safety at the facility.

7.7.5 The rationale for the installation of a Pre-Sort Enclosure

In the absence of an Unloading and Pre-Sort Enclosure, mixed loads need to be directed to tip at the MPC work floor.

It is now proposed to enhance and increase the productivity and efficiency of the MPC by initially receiving appropriately classified waste into the Pre-Sort Enclosure. Once pre-sorted in the Enclosure the waste materials will be transported to either the landfill (if non-recyclable) or to the MPC for further recovery or directly off site for reuse.

Ferrous and non-ferrous metals recovered through the sorting process as well as plastics and paper/cardboard are sorted, placed into bays and bins and stored until sold or transported from site for recycling by others.

Timber waste wood waste is recovered from the mixed materials during the separation sorting process and currently that material is chipped for blending and/ or testing and resale as woodchip or for use as fuel by others.

7.7.6 Contribution to the Waste Avoidance and Resource Recovery Strategy

The waste processing systems and the reconfiguration of the logistics of waste handling on site all assist in the delivery of the NSW *Waste Avoidance and Resource Recovery Strategy 2014-2021*.

The improvements to the efficient circulation of vehicles on site, the installation of a visitor centre, the introduction of a batching plant or pug mill, and the expanded operational area for crushing and stockpiling all contribute to 'mainstreaming' recycled products, enabling better quality (and therefore market acceptability) of recycled materials; greater ease of access to recycling as a waste management stream; and raising awareness of the need for waste reduction, reuse and recycling.

The major contributing factor under this proposed Modification is the installation of an Unloading and Pre-Sort Enclosure.

i The Pre-Sort Building and associated processes

The facility can achieve a higher rate of recycling and reuse of dry waste with improved pre-sorting procedures than could otherwise be extracted from C&D waste.

The introduction of pre-sort systems and procedures will allow the facility to increase beneficial reuse of recyclables associated with C&I waste.

One significant advantage is that the addition of a Pre-Sort Building will alleviate much of the existing pressure associated with the MPC operations.

The construction of a Pre-Sort Building is a natural progression for the facility. It enables improved functionality and efficiency of the existing operation, increasing the productivity and effectiveness of the MPC and improving the amounts of recycled and reused material through improved extraction from exiting waste streams; further reducing landfill on site.

7.7.7 Operations during construction period

The works will have minimal impact on the day to day operations for the business as the works will predominantly occur in what are currently non-operational areas. The new weighbridges will be installed and opened before the old ones are decommissioned.

There will be capacity for the waste management demands of the market to continue to be met during the construction work outlines in this modification.

The existing MPC will not be shut for any extended period, but may be impacted by ancillary works such as the construction of the Pre-Sort Building which will connect to the MPC.

There is capacity within the site to stockpile materials for short period of time, for example if the MPC is temporarily unavailable.

In the event that demand cannot be accommodated at the facility for a period, there is an option to divert waste to nearby operators until the facility can once again accept the waste stream required. The current acquisition of the Dial A Dump business by Bingo Industries would suggest that diversion of waste to facilities owned by Bingo will be a viable option.

All waste that is direct landfill waste can continue to be received. Works will not preclude landfill of suitable waste such as asbestos.

7.8 Fire and incident management

7.8.1 Assessment

No new fundamental activities are proposed under the proposed modification. There could, however, be an intensification of existing activities depending on market demands which may could increase the probability of a spill or leak occurring and that could cause subsequent contamination.

The Genesis facility maintains two pollution incident response management plans (PIRMP), one for each of the EPLs that apply to the landfill and resource recovery operations. These plans will be revised and if necessary amended in accordance to any changes to the EPLs that are required under the proposed modification.

In the event of a fire, Genesis implements the emergency and evacuation response plan for the site as well as the above mention PIRMP. The site currently maintains, and will continue to maintain, its general fire risk minimisation initiatives which include:

- regular cleaning of gutters and roofs and maintenance of leaf proofing;
- reticulated or bottled gas maintained in accordance with AS/NZD 1569-2002, storage and handling of LP Gas and NSW SafeWork Guidelines;
- weekly checks of the firefighting pumps servicing the fire hose reels provided to each building;
- regular maintenance of firefighting equipment;
- regular checks of paths to travel to ensure they are clear;
- regular drills on fire emergency and evacuation procedures; and
- minimise the accumulation of debris that may present as a fire risk.

Fire Hydrants and firefighting equipment is shown as set out in the Fire Evacuation Diagrams (refer to Appendix H).

7.9 Hazards management

7.9.1 Assessment

The proposed Modification will not involve

- an increased use of hazardous substances;
- an increase the generation of offensive emissions beyond EPL criteria; or
- place structures within a high bushfire hazard area or increase risks associated with quarry face.

Therefore, the Modification will not increase the risk of hazards on site.

The application of State Environmental Planning Policy No. 33 – Hazardous and Offensive Development is addressed in Section 5.3.7 (ii).

7.10 Ecology

7.10.1 Introduction

The SEARs do not specifically require an assessment of the potential ecological impacts of the proposed modifications. Nevertheless, it was considered good practice to assess the potential impacts of the proposed modification in relation to ecological impacts given the proposed removal of some mature vegetation associated with the construction of a new administration building on the Kangaroo Avenue boundary of the site.

7.10.2 Existing environment

The vast majority of the site is in a highly modified state, given the history of the site as a quarry and in more recent years as a waste management facility.

There is a stand of mature trees at the section of the site adjoining Kangaroo Avenue. This represents the only significant area of potential biodiversity value within the Operational Area of the site. There is very little other mature vegetation, other than occasional isolated 'paddock trees', and in the areas inspected there was a significant degree of degradation in terms of understorey and soil condition.

7.10.3 Method

As noted, the Secretary's Environmental Assessment Requirements issued for the project do not require a biodiversity assessment. Accordingly, this biodiversity assessment has been completed as a due diligence exercise to identify if any threatened species, populations and ecological communities listed under the *NSW Biodiversity Conservation Act 2016* (BC Act) and/or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were present or likely to occur at the site; and could be potentially impacted by the works proposed in this modification.

An EMM ecologist (Adriana Corona Mothe) undertook an assessment of the site on 7 December 2017. The assessment comprised the identification of native and exotic flora species and searches for fauna habitat features including tree hollows, nests, burrows and foraging resources. Targeted searches were planned for threatened species recorded in the locality including *Pimelea spicata* and the Cumberland Plain Land Snail (*Meridolum corneovirens*).

7.10.4 Impact assessment

The following was observed during the site assessment:

- the site is located within an industrial area and consists of modified land including access road, tracks, commercial buildings and office buildings. Most of the subject site is cleared with exposed soils and/or gravel;
- biodiversity values at the site comprise individual trees. Fourteen of these trees had a diameter at breast height greater than 50 cm. The trees occurred on exposed soils and/or gravel, and did not contain an understorey or any canopy regeneration, and therefore do not represent any native plant community type;
- the following tree and shrub species were observed:

- remnant and planted native trees, comprising four Grey Box (*Eucalyptus moluccana*), 19 Forest Red Gum (*Eucalyptus tereticornis*), 16 Spotted Gum (*Corymbia maculata*) and 24 Narrow-leaved Ironbark (*Eucalyptus crebra*);
 - planted native trees and shrubs comprising five Brush Box (*Lophostemon confertus*), one Lemon-scented Gum (*Eucalyptus citridora*) and one Willow Bottlebrush (*Callistemon salignus*);
 - exotic species present included African Olive (*Olea europea subsp. cuspidata*), White Mulberry (*Morus alba*), Large-leaved Privet (*Ligustrum lucidum*), and African Boxthorn (*Lycium ferocissimum*).
- two of the exotic species are High Threat Exotics, namely Large-leaved Privet (*Ligustrum lucidum*), and African Boxthorn (*Lycium ferocissimum*). Naturally occurring fauna habitat is absent from the site, except for the potential foraging habitat provided by native trees and exotic shrubs when in flower and/or fruit. No tree hollows, nests or burrows were observed. In addition, no birds or other fauna were observed opportunistically on the site;
 - no suitable habitat was identified for threatened flora species, *Pimelea spicata*, as a native understorey was absent, and the ground consisted of exposed soils and/or gravel; and
 - no suitable habitat was identified for the Cumberland Plain Land Snail as no debris was present under or near individual trees, and the ground consisted of exposed soils and/or gravel.

Given the location of the site, the most likely vegetation community that would have occurred prior to removal of the native shrub layer and understorey was Cumberland Plain Woodland in the Sydney Bioregion, listed as a critically endangered ecological community under the BC Act, and a similar community, Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, listed as a critically endangered ecological community under the EPBC Act. Species indicative of the former presence of these listed ecological communities comprise Forest Red Gum, Narrow-leaved Ironbark and Grey Box.

The final determination for Cumberland Plain Woodland in the Sydney Basin Bioregion states that the structure of the community varies on past and current disturbances, particularly clearing, fire and grazing. It includes patches of the community in modified condition such as sites with a sparse or regenerating tree canopy with a structurally simplified native understorey, and native grasslands derived from the clearing of woodland and forest if they contain representative non-woody understorey species. Vegetation within the site has been substantially modified, leaving remnant trees with no native understorey. Therefore, vegetation at the site does not represent Cumberland Plain Woodland in the Sydney Basin Bioregion.

The Commonwealth listing advice for Cumberland Plain Shale Woodland and Shale-Gravel Transition Forest also includes some degraded remnants, and sets condition thresholds for patches included in the listed ecological community. Vegetation at the site does not satisfy any of these condition thresholds as although some trees larger than 50 cm diameter at breast height are present, patch size is less than the minimum threshold of 0.5 ha (ie the largest patch is 0.09 ha), the site does not contain any perennial native understorey and does not contain trees with hollows.

The location of trees in the area proposed for the Administration Building are illustrated in Figure 7.5 below.



Source: EMM (2018); DFSI (2018)

KEY

Facility

Tree species (common name)

African Boxthorn

African Olive

Brush Box

Forest Red Gum

Grey Box

Large-leaved Privet

Lemon-scented Gum

Narrow-leaved Ironbark

Spotted Gum

White Mulberry

Willow Bottlebrush

Tree locations

Genesis Xero Waste
Modification 7
Environmental impact assessment

Figure 7..5



T:\Jobs\2017\17118 - DADI MOD 7\GIS\02_Maps\E001_TreeLocations_20180831_02.mxd 31/08/2018

7.10.5 Conclusion

It is concluded that the site does not contain any listed ecological community or habitat for threatened species. The location of the site within an industrial area, in addition to the absence of shrub layer, ground layer, tree hollows or logs/debris has reduced the site's biodiversity values to planted trees and weeds that have potential to provide occasional foraging resources for fauna when in flower or fruit.

7.11 Other environmental aspects

This section considers environmental aspects which are pertinent but are not at significant risk of impact from the proposed modifications. The aspects are listed in Table 7.23 and descriptions provided from the original EA and previous modifications. Assessment is provided in relation to the proposed modification.

Table 7.22 **Other environmental factors**

Environmental factor	Original EA and previous modification descriptions	Impacts of proposed modification
Biodiversity	The original EA stated that the majority of the site was clear of native vegetation other than 8.3 ha of a community representative of CPW in the north-west corner and 2.8 . CPW is an EEC. The vegetation contained habitat for many bird species, arboreal mammals and the threatened Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>). Discarded shells of the threatened Cumberland Plain Land Snail (<i>Meridolum corneovirens</i>) were discovered in the CPW and there was suitable habitat for ten threatened species, though none of these were observed onsite. No threatened flora was observed onsite, though there was suitable habitat for five threatened species. The EA reported that the proposed clearing of 2.8 ha of CPW would not have significant impacts. Assessments of significance for the threatened flora and fauna species that could occur onsite determined they would not be significantly impacted by the project. None of the subsequent project modifications involved impacts to biodiversity.	The proposed modification will only involve ground disturbance at areas previously disturbed for the facility and quarry which preceded it. This will include disturbance in the western section of the site for the new crushing plant, relocated amenity bund and 38 ML OSD basin, which is where the north and south OSDs and amenity bund are currently located. Therefore, the proposed modification is unlikely to adversely impact biodiversity.
Aboriginal heritage	The original EA stated that two isolated finds and one open scatter comprising three artefacts were previously recorded at the site. The open scatter was recorded in a highly disturbed area with low archaeological potential. The isolated finds were on the boundary between a highly disturbed area with low archaeological potential and a mostly undisturbed area with high archaeological potential. The public significance of these sites was judged to be low given their poor surface manifestations. The EA determined that, as the project was designed to mostly avoid impacts to Aboriginal items and some items in the footprint could be would be relocated under supervision of Aboriginal groups, the project would not significantly impact Aboriginal heritage. None of the subsequent project modifications involved impacts to Aboriginal heritage.	The proposed modification will only involve ground disturbance at areas previously disturbed for the facility and quarry which preceded it. This will include disturbance in the western section of the site for the new crushing plant, relocated amenity bund and 38 ML OSD basin, which is where the north and south OSDs and amenity bund are currently located. Therefore, the proposed modification is unlikely to adversely impact Aboriginal heritage.
Historic heritage	The original EA stated that are no items on the National Heritage List, Commonwealth Heritage List or the Register of the National Estate near the site. The Blacktown LEP (1988) (still current at the time of the original EA) and the NSW Heritage Office State Heritage Inventory showed five heritage items in Minchinbury and Eastern Creek, with the nearest item 400 m to the north-east of the site. no heritage items were identified at or adjacent to the site. None of the subsequent modifications involved extensions of the site area and therefore did not have potential to impact heritage items.	The proposed modification is unlikely to adversely impact historic heritage.

Table 7.22 **Other environmental factors**

Environmental factor	Original EA and previous modification descriptions	Impacts of proposed modification
Socio-economic	The original EA stated that the community consultation undertaken identified a general acceptance that the area was developing and changing and there were both positive and negative impacts associated with this. There was concern from the community that the project would not be adequately controlled and would come at the expense of community. Community concerns identified in the original EA (such as dust, noise, traffic, odour and hours of operation) were to be addressed through ongoing provision of clear transparent information about the project to the community and managed through mitigation measures (to be included in the project design and management plans). None of the subsequent modifications were expected to impact the socio—economic aspect of the project.	The proposed modification may have a minor positive socio-economic impact as people will be employed during the construction phase, and through ongoing operational efficiencies which will reduce queuing on local roads.
Contamination	The original EA stated that no notices or orders to investigate or remediate contamination have been issued for the site under the NSW <i>Contaminated Land Act 1997</i>. It reported that agricultural chemicals, heavy metals, hydrocarbons and asbestos could be present from spills, leaks and dumping associated with previous uses. Soil investigations of overburden and in-situ material at the site were below levels recommended for the land-use and no asbestos was detected. There was an elevated concentration of nickel in one sample, however, nickel levels are naturally high in the source material and did not indicate contamination had occurred. The original EA recommended that the overburden be further tested if it is to be removed from site as fill at off-site construction projects. None of the subsequent modifications considered contamination impacts.	There is risk of a spill or leak occurring and subsequent contamination of the new operational areas. Genesis maintains two pollution incident response management plans (PIRMP); one for each of the EPLs that apply to the landfill and resource recovery operations. These plans will be revised if amendments to the EPLs are required under the proposed modification. The overburden is proposed to be relocated further west along the site boundary to form a new amenity bund. As this material is not proposed to be removed from site, it does not require further testing for contamination. Notwithstanding, if material different to that described in Douglas Partners (2006) is encountered, or material is odourous, stained or shows anthropogenic intrusions, it will be tested for contamination.

8 Proposed project approval modifications

8.1 Introduction

This chapter describes the proposed modifications to conditions within the project approval. Technical assessments have been undertaken regarding the proposed modification with the outcomes demonstrating that the environmental consequences can be sufficiently managed.

The conditions proposed for amendment are:

- Schedule 2, Condition 2;
- Schedule 2, Condition 8;
- Schedule 3, Condition 25(j);
- Schedule 3, Condition 43;
- Schedule 3, Condition 54; and
- Appendices.

The proposed amendments to the relevant conditions of the project approval are described below. The proposed modifications are shown in green and redundant text is shown as ~~struck through~~.

Note that modifications proposed by Modification 6 are not included as these are concurrently under consideration.

8.2 Schedule 2, Condition 2

8.2.1 Terms of Approval

2. The Proponent shall carry out the project in accordance with the:

- a) EA;
- b) Statement of Commitments;
- c) Site plan and building elevation drawings at Appendix 1;
- d) Modification application 06_0139 Mod 1 with supporting document titled Light Horse Business Centre, Environmental Assessment Report: Project Modification prepared by Light Horse Business Centre, dated August 2010 and Additional Information, dated 6.9.2010 and 13.9.2010;
- e) Modification application 06_0139 Mod 2 dated 9.11.10;
- f) Modification application 06_0139 Mod 3 dated 10 May 2011 with supporting document titled Light Horse Business Centre, Environmental Assessment Report: Modification 3, September 2011 prepared by Light Horse Business Centre (which contains 'LandPartners' operational landform plan, 'Martens' report for stormwater management, and building elevations);
- g) Modification Application 06_0139 Mod 4 with supporting document titled the document titled S75W Modification 4, dated October 2013 and prepared by Urbis Pty Ltd;

- h) Modification Application 06_0139 Mod 5 and supporting documents titled Section 75W Report, Modification 5, dated 18 March 2015, prepared by Urbis Pty Ltd; Response to Submissions, dated 19 May 2015, prepared by Urbis Pty Ltd; and Spoil Management Plan, dated September 2015, prepared by Genesis Xero Waste;
- i) Modification Application 06_0139 Mod 7 and supporting documents titled Genesis Xero Waste Facility Modification 7, dated [TBC], prepared by EMM Consulting Pty Limited; Response to Submissions, dated [TBC], prepared by EMM Consulting Pty Limited; and
- j) Conditions of this approval.

8.3 Schedule 2, Condition 8

8.3.1 Structural adequacy

Prior to commencement of operations the Proponent shall obtain and provide copies of all necessary building certificates from Council to the Director-General, for the following works:

- a) the weighbridges, refuelling facility and associated infrastructure;
- b) the amenities-pre-sort building adjacent to the MPC building; and
- c) the new administration/office building adjacent to the and car parking area;
- d) the structure enclosing the unloading and pre-sorting area adjacent to the MPC; and
- e) the timber processing building.

8.4 Schedule 3, Condition 25(j)

8.4.1 Soil, Water and Leachate Management Plan

25.

j) Note: Should minor adjustments to the Total Operational Area be approved in future (typically less than 10% of the overall Operational Area), then the permissible predevelopment discharges must be recalculated in accordance with the parameters listed in Table 1 and an amended site stormwater management system design prepared, submitted to, approved by the Director-General and implemented in conjunction with the adjustment.

8.5 Schedule 3, Condition 43

8.5.1 Traffic, Transport and Access

43.

Access to the Project shall be via Old Wallgrove Road or Wonderland Drive, via Kangaroo Avenue and/or the public Precinct Plan Road network, wherever a public road is available.

8.6 Schedule 3, Condition 54

8.6.1 Amenity Berms

54. Prior to the commencement of operations, the Proponent shall:

- a) construct and maintain, for the duration of the operations, amenity berms, impervious barriers and visual screens around the perimeter of the operational area (as detailed in the EA , the site plan at Appendix 1 and Schedule 3, Condition 53 above);
- b) retain the existing amenity berm to the north east of the quarry void at the perimeter;
- c) vegetate the berms in accordance with the Landscape and Vegetation Management Plan at Schedule 3, condition 59;
- d) maintain the height of the amenity berms at no less than 10 metres except where tapering is required to form a batter at the end of the berms; and
- e) conduct all earth works required to reshape the amenity berms on site, without impacting on adjoining landowners.

8.7 Appendices

8.7.1 Appendix 1 Site Plan and Building Elevations

Replace the current site plan and drawings with the site plan and drawings as approved.

8.7.2 Appendix 2 Operational Area

Replace the current operational area plan with the operational area plan as approved.

9 Conclusion

9.1 Introduction

The SEARs for the proposed modification state that the need and justification for the proposed modification must be described within the EA.

As such, the proposed modification requires justification on economic, social and environmental grounds, taking into consideration whether it is consistent with the objects of the EP&A Act. Each aspect is addressed below.

9.2 Need and justification for the proposed modification

The proposed modification to the project approval would allow the facility to better respond to demands of the waste market and assist in the delivery of the NSW Government's waste goals in accordance with the *NSW Waste Avoidance and Resource Recovery Strategy 2014-21* (EPA 2014).

The modifications also respond to the changes in the local road network and to the need to improve the efficiency of vehicle movement within the site.

The on-site logistics and facilities for processing waste materials, particularly waste streams such as segregated recyclable waste and co-mingled recyclable waste, are currently not optimised. The combination of new plant (such as the batching and washout plant) require some reconfiguration of existing layout and also improvements in the co-location of complementary functions. Hence areas for stockpiling crushed aggregates are most logically located close to the plant at which crushing and/or sorting is conducted. Concrete batching (or pug mill) and washout facilities should also logically be in close proximity.

The efficient allocation of 'zones' and functions within the site requires two key physical changes - the provision of traffic movement solutions and the extension of the current operational area.

Finally, the construction of a retaining wall around the proposed western extension of the operational area provides an effective barrier to noise and light penetration into residential areas to the north and west of the facility.

9.3 Suitability of the site

The facility is an existing waste resource recovery facility operating under a variety of approvals including: the project approval (MP 06_0139) as modified; and an EMP, including a detailed LEMP; and EPLs 13426 and 20121. Due to the history of operations at the facility, the regional and local social, physical and economic environments are well understood and the site has well established environmental management systems.

The proposed modification aims to improve the efficiency in the operation of the site through the reorganisation of access roads, the repositioning of certain structures, additional operational assets such as fuel storage facilities, and the extension of the operational area to the west. The reorganisation of the facilities and roads on site also seek to reduce the impacts of the operations of the site where possible. This includes, for example, minimising the risk of vehicle queuing on local roads by establishing an entry/exit point where potential queuing can be maximised within the internal road network.

Combined with traffic management improvements internally, the site arrangement and new facilities achieve an optimal solution to address increasing market demand for access to waste management facilities in Western Sydney.

9.4 Objects of the Environmental Planning and Assessment Act 1979

Section 5 of the EP&A Act sets out its objects. It states:

The objects of this Act are:

- (a) to encourage:
 - (i) the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment,
 - (ii) the promotion and co-ordination of the orderly and economic use and development of land,
 - (iii) the protection, provision and co-ordination of communication and utility services,
 - (iv) the provision of land for public purposes,
 - (v) the provision and co-ordination of community services and facilities, and
 - (vi) the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats, and
 - (vii) ecologically sustainable development, and
 - (viii) the provision and maintenance of affordable housing, and
- (b) to promote the sharing of the responsibility for environmental planning between the different levels of government in the State, and
- (c) to provide increased opportunity for public involvement and participation in environmental planning and assessment.

The overall conclusion is that the proposed modification is consistent with the objects of the EP&A Act either wholly or in the majority. The proposed modification's consistency with the individual objects of the EP&A Act is considered below.

9.4.1 Proper management, development and conservation of resources

The object is to encourage 'the proper management, development and conservation' of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment'.

The facility is an existing operation that enables resource recovery and disposal of non-putrescible waste. The facility's operations continue to optimise the use of and rehabilitation of a former quarry site, supporting recycling initiatives and diverting waste away from landfill. The proposed modification will allow the facility to respond more effectively to long term trends in waste generation, short term waste disposal demands and support government waste management policies.

Technical assessments indicate no significant impacts are anticipated as a result of the proposed modification. There are a number of existing environmental management measures in place at the facility which will continue to mitigate, manage and monitor operations. These management measures will be revised and updated to account for impacts of the proposed modification.

It is considered that the proposed modification will facilitate proper management, development and conservation of resources.

9.4.2 Orderly development

The object is to encourage 'the promotion and co-ordination of the orderly and economic use and development of land'.

The proposed modification encourages the proper management and development of a natural resource. It will optimise the logistics of transport to, from and within the site, and will introduce efficiencies in the existing waste management systems. The better flow of materials within the site is achieved by proposed facilities such as a new expanded weighbridge system with greater capacity to alleviate queuing, the introduction of a pre-sort enclosure and the co-location of crushing and stockpiling in an adequate area. The improvements in flow and logistics also achieve better workplace safety by ensuring less congestion and improved clearance between different operational functions.

Accordingly, it is considered that the proposed modification constitutes orderly and economic development of land.

9.4.3 Communication and utility services

The object is to encourage 'the protection, provision and co-ordination of communication and utility services'.

The proposed modification will have no direct impact on communication and utility services, although it is noted that any increase in the provision of communication and utility services in Western Sydney is likely to require infrastructure projects which produce waste. A more efficient and well organised waste management facility will benefit those projects.

9.4.4 Land for public purposes

The object is to encourage 'the provision of land for public purposes'.

The proposed modification will have no direct or indirect impacts on the provision of land for public purposes.

9.4.5 Community services and facilities

The object is to encourage 'the provision and co-ordination of community services and facilities'.

The proposed modification will allow for the continuation of the safe and efficient operation of the facility to receive trucks transporting waste.

The construction of a visitor centre will enable awareness raising and education about the waste challenges confronting the community and the way that waste can be avoided, reduced or recycled.

9.4.6 Protection of the environment

The object is to encourage 'the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities and their habitats.

The works associated with the modification will generally occur on land which is already highly degraded and with little biodiversity value. There is not expected to be any impact on threatened species, populations or ecological communities and their habitats.

There are a number of existing environmental management measures in place at the facility to continue to mitigate, manage and monitor operations. These management measures will be revised and updated to account for impacts of the proposed modification. Accordingly, it is considered the proposed modification is consistent with this object of the EP&A Act.

9.4.7 Ecologically sustainable development

The object is to encourage 'ecologically sustainable development' (ESD). The principles of ESD, for the purposes of the EP&A Act, are provided in clause 7(4) of Schedule 2 of the EP&A Regulation. It states:

The principles of ecologically sustainable development are as follows:

- (a) the precautionary principle, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:
 - (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
 - (ii) an assessment of the risk-weighted consequences of various options,
- (b) inter-generational equity, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,
- (c) conservation of biological diversity and ecological integrity, namely that conservation of biological diversity and ecological integrity should be fundamental consideration,
- (d) improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:
 - (i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance and abatement,

- (ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,
- (iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

The principles of ESD and the compatibility of the proposed modification with each principle is considered below.

In addition, the Commonwealth Government's *National Strategy for Ecologically Sustainable Development* defines ESD as 'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased'.

The proposed modification does not result in additional disturbance and will not impact on ecological resources.

i Precautionary principle

This means that if there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. This EA, prepared by experts in their respective fields, has identified and assessed the potential environmental impacts and appropriate mitigation, and management and monitoring measures have been developed in response. Taking these measures into account, it is considered that there would be no threat of serious or irreversible damage to the environment as a result of the proposed modification.

ii Inter-generational equity

Inter-generational equity is a part of social equity, as is intra-generational equity.

Inter-generational equity is the concept that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations, while intra-generational equity is applied within the same generation.

The proposed modification would contribute to social equity by providing continued employment at the facility. It would facilitate the continued cost-effective and efficient use of land to recycle or safely dispose of construction and demolition materials as well as allow the facility to better contribute to the NSW Government's waste goals to increase recycling rates in accordance with the *NSW Waste Avoidance and Resource Recovery Strategy 2014-2021* (EPA 2014), thus developing physical and human capital investment. This transformation from natural to human capital would contribute to both inter-generational and intra-generational equity.

Operations at the facility include a range of well-established controls and environmental management and mitigation measures to minimise potential impacts on the environment, and the costs of these measures would be met by the proponent.

iii Conservation of biological diversity and maintenance of ecological integrity

The proposed modification will not impact on biological diversity and the maintenance of ecological integrity, given the highly modified character of the environment within which the proposed works will occur.

iv Improved valuation and pricing of environmental resources

One of the common broad underlying goals of concepts of ESD is economic efficiency, including improved valuation and pricing of environmental resources.

The potential environmental impacts of the proposed modification have been thoroughly addressed in this EA. The value of the proposed modification in terms of introducing operational efficiencies assists in the proper valuation and pricing of environmental resources.

Operational inefficiencies can act as a drag on prices and the value of environmental resources (including resources processed at the facility such as soils, metals and aggregate) by increasing the unit cost of the recycled materials. Improvements such as easier truck movements and the production of better quality recycled products can incentivise greater use and application of recycled or other products diverted from landfill.

Having considered all aspects of ESD, the conclusion is that the proposed modification is consistent with the object and its specific components.

9.4.8 Affordable housing

The object is to encourage 'the provision and maintenance of affordable housing'.

This object is not directly relevant to the proposed modification. The proposed modification will, however, increase the efficiency of waste management the construction sector, and thereby reduce or avoid costs associated with waste management. The cost of waste disposal is a contributing factor to housing affordability.

9.4.9 Sharing of responsibility

The object is 'to promote the sharing of the responsibility for environmental planning between the different levels of government in the State'.

State government agencies that have an interest in the proposed modification, and the local Council (BCC) have been engaged prior to, and during the preparation of this EA.

9.4.10 Increased public involvement

The object is 'to provide increased opportunity for public involvement and participation in environmental planning and assessment'.

The preparation of this EA has been undertaken in conjunction with consultation undertaken by the proponent through consultation with BCC. The proponent will continue to consult with BCC during and after the modification process.

In addition, all stakeholders, both government and community, will have the opportunity to comment on the proposed modification, including this EA, when it is placed on public exhibition by DPE.

9.5 Conclusion

The Proponent proposes to modify the project approval to introduce a suite of operational improvements which respond to the waste management market and the broader land use development context of the precinct.

Key areas such as traffic ingress and egress, internal circulation of vehicles and faster weighing of trucks all contribute a safer and more efficient traffic flow on site and in surrounding streets.

The expansion of the Operational Area and the establishment of the Timber Processing Building and the Enclosed Unloading Area provide the necessary space within which safe and efficient handling, sorting, processing and recycling can occur on site.

The construction of a new Administration and Visitor building at Kangaroo Avenue provides a significantly better arrangement than the existing one which requires visitors and administration staff to mix with waste trucks in order to reach an office. It also provides an opportunity to repurpose the current administration building as a facility for operational staff, and to free up operational car parking for future increases in employment numbers.

New plant will also be introduced to maximise the ability of the proponent to provide not only raw materials but materials which have value add, such as concrete, and to maximise the use of recycled materials available on site.

Technical assessments have been prepared in accordance with relevant guidelines and assessment criteria and to address the Secretary's environmental assessment requirements.

In conclusion, the proposed modification accords with the relevant legislation, environmental planning instruments and broader NSW Government strategies and policies and warrants favourable consideration.

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