Moss Vale Plastics Recycling and Reprocessing Facility EIS

Volume 1

Plasrefine Recycling Pty Ltd

January 2022

→ **The Power of Commitment**

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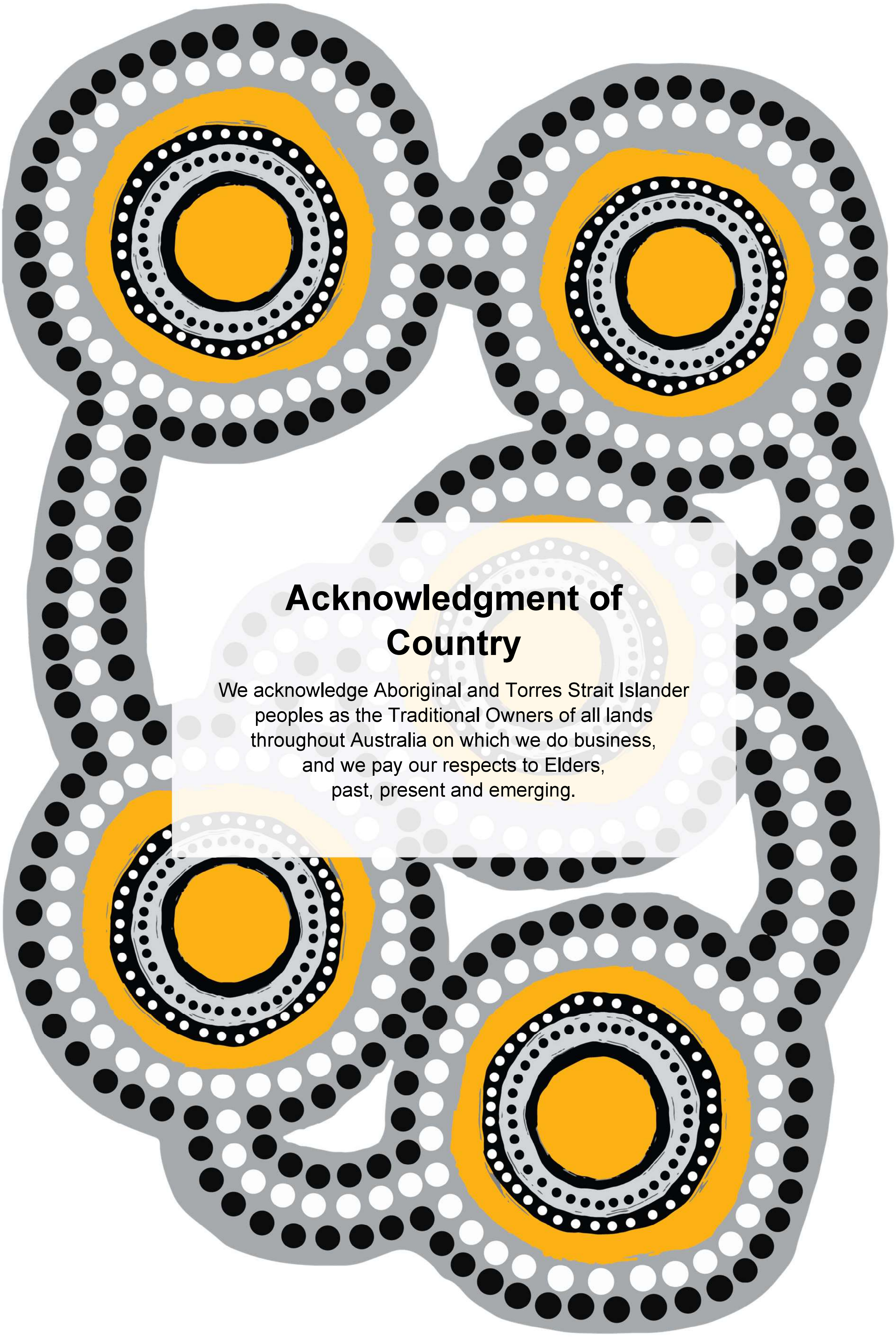

Acknowledgment of Country

We acknowledge Aboriginal and Torres Strait Islander peoples as the Traditional Owners of all lands throughout Australia on which we do business, and we pay our respects to Elders, past, present and emerging.

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The Power of Commitment

Certification

Submission of environmental impact statement
Prepared under Part 4 of the *Environmental Planning and Assessment Act 1979*.

Environmental impact statement prepared by:

Name:	David Gamble
Qualifications:	Master of Engineering Science (Waste Management) Bachelor of Economics Bachelor of Engineering (Mechanical)
Address:	Level 15, 133 Castlereagh Street Sydney NSW 2000
Application number:	SSD-9409987

Proposed development: Moss Vale Plastics Recycling and Reprocessing Facility

Address of the land on which the infrastructure to which the statement relates: Lot 11 DP 1084421, partial Lot 10 DP 1084421, partial Lot 1 DP26490

Description of the infrastructure to which the statement relates: The EIS relates to the construction and operation of a plastics recycling and reprocessing facility and ancillary infrastructure including

– Two main buildings for waste receival, recycling and reprocessing and finished product storage
– Wastewater treatment plant
– Ancillary infrastructure including an office building, workshop, staff and visitor parking, truck parking, internal roadways, weighbridges, water management, landscaping and visual screening, fencing, signage and utility connection.

Environmental impact statement:

An environmental impact statement is attached addressing all matters in accordance with Part 4 of the *Environmental Planning and Assessment Act 1979* (NSW).

Declaration:	I certify that I have prepared the contents of this environmental impact statement in response to the Secretary's environmental assessment requirements dated 15 October 2020 and the relevant provisions of Schedule 2 of the Environmental Planning and Assessment Regulation 2000. To the best of my knowledge the information contained in the environmental impact statement is not false or misleading.
Signature:	
Name:	David Gamble
Date:	27/01/2022

Summary

Overview

This environmental impact statement (EIS) considers the potential impacts of the proposal to construct and operate a plastics recycling and reprocessing facility in Moss Vale ('the proposal'). It has been prepared to support Plasrefine Recycling's application for approval of the proposal in accordance with the requirements of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The proposal is State significant development, as it is development for the purpose of a resource recovery or recycling facility that would handle more than 100,000 tonnes per year of waste, as well as development for the purpose of the manufacture or reprocessing of polymers, plastics, rubber or tyres with a capital investment value of more than $30 million.

The proposal is subject to approval by the New South Wales (NSW) Minister for Planning.

The EIS focuses on the key assessment requirements specified by the Secretary's Environmental Assessment Requirements (SEARs). It is supported by specialist technical assessment reports.

Proposal objectives

The key objectives of the proposal are to:

- construct and operate a plastics recycling and reprocessing facility that will recover and sort plastics into different types, and convert them into valuable products, reducing the amount of plastics in landfill
- increase the capacity and resilience of the recycling network in Australia
- provide necessary waste management infrastructure to meet Sydney's future waste management requirements
- contribute to NSW achieving its resource recovery targets under the *NSW Waste and Sustainable Materials Strategy 2041* and *NSW Plastics Action Plan* through the recovery and recycling of plastics
- manage potential impacts associated with the construction and operation of the proposal in an environmentally and socially responsible manner

The proposal

Location

The proposal would be located on the northern parcel of land in Lot 11 DP 1084421, known as 74-76 Beaconsfield Road, Moss Vale.

The proposed new access road would extend from the plastics recycling and reprocessing facility site to Lackey Road via the currently unformed Braddon Road (paper road), traversing Lot 1 DP 26490 and Lot 10 DP 1084421

All proposal lots are within the Moss Vale Enterprise Corridor, a significant area of land (greater than 1,000 hectares) between Moss Vale and New Berrima, set aside for industrial and employment generating development under the Wingecarribee Shire Local Environmental Plan 2010 (Wingecarribee LEP).

Surrounding land uses are a mix of vacant land, industrial, warehouse, manufacturing, waste management and rural residential.

Key features

The proposal is defined as the construction and operation of a plastics recycling and reprocessing facility with capacity to receive up to 120,000 tonnes per year of mixed plastics, comprising:

- Two main buildings for waste receival, recycling and reprocessing and finished product storage
- Wastewater treatment plant
- Ancillary infrastructure including an office building, workshop, staff and visitor parking, truck parking, internal roadways, weighbridges, water management, landscaping and visual screening, fencing and utility connection.

The proposal also includes construction of a new access road comprising part of Braddon Road (paper road, currently unformed) and a new connection to Lackey Road (the proposed Braddon Road east extension).

Construction

An indicative construction strategy has been developed, based on the current design, to be used as a basis for the environmental assessment. Detailed construction planning, including programming, work methodologies and work sequencing, would be undertaken subject to approval, and once construction contractor(s) have been engaged.

It is estimated that the proposal would take about 15 months to construct and commission. Construction would consist of three key stages. The first stage (about one month) would involve early works and site establishment. The second and main stage (about 11 months) would include:

- site clearance
- bulk earthworks
- civil works including water management infrastructure, internal roads, hardstand, parking areas, foundations, and slabs
- building construction
- installation of equipment and fit out
- services installation
- road access construction
- restoration works and landscaping

The final stage (about three months) would include testing and commissioning.

Operation

The proposal would sort mixed plastics into different types and convert the various plastics to flakes and pellets (in the first stage) and produce more advanced products (in the second stage). The combined outputs of both stages of the proposal would help fill the gap in local processing capacity for mixed plastics.

Need for the proposal

Plastic plays an important role in our society. It is cheap, light and durable and is an essential component to so many of the items we rely on today – from life-saving medical supplies to consumer goods like clothing and electronics. While plastic is versatile, it’s also increasingly threatening our natural environment through littering and nearly every piece of plastic produced also emits greenhouse gases at every stage of its lifecycle, contributing to carbon emissions and climate change.

Approximately 760,000 tonnes of plastic entered the waste management system in NSW in 2018-19. Of that, only 19% was recycled into new plastic products or recovered as refuse derived fuel. Over 424,000 tonnes of potentially recyclable plastics was disposed in NSW landfills in 2018-19.

The NSW Government’s *NSW Circular Economy Policy Statement: Too Good to Waste* was released in February 2019. This policy provided a basis for NSW’s updated waste strategy – the *NSW Waste and Sustainable Materials Strategy 2041* (the NSW Waste Strategy). The NSW Waste Strategy recognises that NSW is committed to making the transition to a circular economy over the next 20 years. It also sets targets to:

- increase the average recovery rate from all waste streams to 80 per cent by 2030
- triple the plastics recycling rate by 2030.

Further to this, in March 2020, the former Council of Australian Governments (COAG) announced a ban on the export of waste plastic, paper, glass and tyres. From July 2022 exporters cannot export single resin/polymer plastics that have not been re-processed. The COAG response strategy detailed the volumes of material affected by the export ban based on 2018-19 export data. It showed that a total of 81,000 tonnes of plastic, including 69,000 tonnes of mixed plastics, was exported from NSW and would be affected by the export bans.

By mid-2024 when the full waste export ban comes into effect, Australia must recycle around 645,000 additional tonnes of waste plastic, paper, glass and tyres each year.The NSW Government's *NSW Waste and Sustainable Materials Strategy: A guide to future infrastructure needs* (the Infrastructure Needs Report) identifies that by 2030 an additional 192,000 tonnes of plastics recycling / processing capacity is required in order to address the export ban and meet the *NSW Plastics Action Plan* target of tripling the plastics recycling rate. It also identifies that by 2040 a further 112,000 tonnes per year of additional new capacity for mixed plastics recycling is required (assuming all infrastructure needs to meet the 2030 capacity gap as are brought online).

The proposal would have the capacity to recycle and reprocess up to 120,000 tonnes of plastic waste per year including mixed plastics, mixed soft plastics and used PVC pipes. This would provide just part of the required capacity needed in NSW. The proposal would use innovative separation, sorting and cleaning technologies to keep waste plastics out of landfill.

The proposal would also provide local plastic manufacturing capacity consistent with capacity requirements identified in the Infrastructure Needs Report. It would create a new industry and jobs in Moss Vale through innovation and provide investment to produce circular goods in the form of reprocessed advanced plastics products.

The proposal is consistent with key national and NSW waste management plans and policies, and other relevant plans and strategies. In summary:

– The proposal is consistent with the *National Waste Policy: Less Waste, More Resources* and *National Waste Policy Action Plan* as it would transform plastic waste into high value materials, create jobs and contribute towards meeting Australia's resource recovery targets, which includes achieving an 80% average recovery rate from all waste streams by 2030.
– The proposal is consistent with the *National Plastics Plan 2021* as it would increase Australia's recycling capacity and contribute towards the packaging and plastics targets.
– The proposal is consistent with the NSW Waste Strategy and Infrastructure Needs Report, as it would contribute necessary infrastructure to improve NSW's capacity to increase resource recovery and lift both the plastics recycling rate and the overall average recovery rate. It would also increase plastics manufacturing capacity.
– The proposal is consistent with the *NSW Circular Economy Policy Statement: Too Good to Waste* as it would reduce demand for new landfills, provide innovative technologies that increases resource efficiency and create jobs in the resource recovery sector.

The key overall benefits of the proposal are:

– **Diversion of waste from landfill:** the proposal would divert significant quantities of plastics waste from landfill, which in turn would reduce demand for new landfills
– **Improved sustainability:** every tonne of mixed plastics that can be recycled is estimated to lead to a net avoidance of 320 tonnes of CO_2 equivalent greenhouse gas emissions, 1.2 kilograms of non-methane volatile organic compounds (ie. smog) and 26 kilolitres of water
– **Increased resource efficiency:** the proposal would not only recycle mixed plastics, but it would also reprocess the plastics into advanced products, which is consistent with a move towards a circular economy
– **Job creation:** the proposal is expected to create new up to 30 jobs at the peak of construction and up to 140 new long-term jobs in the resource recovery sector once at full scale operation
– **Stimulate the local economy:** the proposal would increase economic activity in the Southern Highlands region with potential increases in trade at local businesses and increased demand for construction related goods and services

- **Drive innovation:** the proposal includes advanced automated sorting and processing technologies but also includes a products manufacturing lab to conduct recycling research and product development to further drive innovation in plastics recycling
- **Provide education:** the proposal would include facilities to enable educational activities for school groups and other interested parties to be carried out (and learn about plastic waste, plastic recycling and turning wastes into valuable resources).

Summary of the key findings of the EIS

Waste management

Wastes would be generated during construction and operation, which would require appropriate storage, segregation, handling and reuse, recycling or disposal. During construction this would include spoil from earthworks, construction materials and general waste from construction site offices and amenities. During operation this would include recycling and reprocessing residues, filter cake effluent from the wastewater treatment plant and general waste from maintenance, offices and amenities.

With the proposed controls, handling and management measures, wastes generated from the proposal are not expected to have any significant impact on the environment or human health.

Soils and water

Contamination

A preliminary site investigation was undertaken to assess the likelihood for contamination to exist on the plastics recycling and reprocessing site and surrounding area from past or present activities. The assessment identified no complete source-pathway-receptor linkages at the plastics recycling and reprocessing facility site. The potential risk from contamination is therefore considered acceptably low.

Erosion and sedimentation

During construction there is potential for erosion and generation of sediment due to a relatively large area of disturbance and hence impacts on downstream water quality if management measures and not implemented, monitored and maintained.

A detailed Soil and Water Management Plan would be developed prior construction, dealing specifically with erosion and sediment control. It would be prepared in accordance with *Managing Urban Stormwater: Soils and Construction – Volume 1,* more commonly known as the ‘Blue Book’. With appropriate implementation of detailed Soil and Water Management Plan, the proposal is anticipated to be acceptable in relation to construction phase erosion and sediment control.

Operational water quality

No plastics receival, stockpiling, recycling and reprocessing activities or finished product storage would occur outside buildings. Therefore, the nature of water quality risks posed by the proposal would be limited to those associated with the provision and utilisation of urban impervious surface areas. A stormwater treatment train was developed, and MUSIC modelling was undertaken to assess the pollutant loads pre and post development with implementation of the proposed stormwater quality treatment train. The MUSIC model demonstrated conceptually that the proposal would achieve a neutral or beneficial effect on water quality.

Creek realignment and riparian vegetation restoration

The proposed operational water management strategy for the proposal includes realignment of the existing eastern watercourse and changes to surface water flows as a result of the proposal infrastructure. However, the proposed strategy would fully comply with the riparian requirements specified in the *Guidelines for Riparian Corridors on Waterfront Land*.

Riparian vegetation would be managed in accordance with a riparian vegetation management plan to be developed for the proposal. The plan would provide details on the proposed vegetation management measures, maintenance and monitoring. A concept riparian vegetation management plan has been developed and is provided in Technical Report 10 – Soils and Water.

Flooding

Flood modelling indicates that the existing 1 in 100 year average exceedance probability (AEP) peak flood would encroach into the plastics recycling and reprocessing site as well as the adjacent lots to the west. However, modelling also predicts that:

- the 1 in 100 AEP plus 500 millimetres freeboard would not encroach on the proposed building areas, and
- in the 1 in 100 AEP event, the proposal would not significantly impact the flood conditions of the surrounding areas outside of the plastics recycling and reprocessing facility site boundary.

Water and wastewater infrastructure

Overall, water modelling indicates that the water demands of the proposal would not adversely impact on the performance of Council's water network. Sensitivity analysis for the year 2026 indicates that the system will be overloaded, with and without the demands from the proposal. However, by 2026, Council plans to complete several major water projects to increase the water supply to Moss Vale area.

Wastewater modelling indicates that the current wastewater network can accommodate the additional wastewater discharges from the proposal. That is, the expected flows from the proposal would not adversely impact Council's wastewater network.

The current capacity of the Moss Vale wastewater treatment plant (WWTP) is 9,000 equivalent population (EP). Council has advised that it is nearing capacity in 2021 and there are plans to upgrade the plant to 18,000 EP capacity in 2025/26.

The expected wastewater flows from the proposal are equivalent to flows from 20 houses. Therefore, the additional load from the proposal would have an insignificant impact on the Moss Vale WWTP.

If required, wastewater flows from the proposal could be temporarily stored on-site and discharged overnight when there are much lower domestic flows in the Council wastewater system.

Traffic and transport

The proposal includes construction of a new public road to provide access to the plastics recycling and reprocessing facility site. The new access road would extend from the east of the plastics recycling and reprocessing facility site along the existing "paper road" west of Beaconsfield Road (currently unformed) and then along the southern boundary of the Australian BioResources site (proposed Braddon Road east extension) to Lackey Road.

Construction traffic would access the plastics recycling and reprocessing facility site via Berrima Road, Lytton Road and Beaconsfield Road while the new access (Braddon Road and Braddon Road east extension) is under construction. Construction traffic would use new access road once it has been constructed. Construction vehicles would then access the plastics recycling and reprocessing facility site using the same haulage route proposed for operational access.

Operational vehicles would access the plastics recycling and reprocessing facility along the Hume Highway (Old Hume Highway), Medway Road, Taylors Avenue, Douglas Road and then Collins Road and Lackey Road before turning into the new access road (Braddon Road via the proposed Braddon Road east extension).

The proposal would result in increases in heavy vehicle and light vehicle traffic movements on the local road network during both construction and operation. The traffic assessment determined that the existing road network has sufficient mid-block capacity, and would be able to cater for traffic flow associated with construction and operation of the proposal, with negligible impact to road operation.

Traffic modelling of the intersection of Lackey Road and the proposed new access road indicates that the intersection would have an acceptable Level of Service with spare capacity in both the weekday morning, evening weekday and weekend peak periods during both construction and operation.

Noise and vibration

The *Interim Construction Noise Guideline* identifies that, due to the nature of construction, it is inevitable that impacts arise where construction occurs near sensitive receivers. During construction there would be noise impacts on some receivers during certain times and during certain construction activities.

Construction noise levels are predicted to be below the construction noise management level for the majority (151 out of 164) of the sensitive receivers in the study area. During worst-case construction conditions (when construction works are at the closest distance between the source and receiver), there are predicted exceedances of the noise management level at the closest receivers to the proposal site (exceedances of up to 19 dBA).

Construction traffic would access the plastics recycling and reprocessing facility site via Berrima Road, Lytton Road and Beaconsfield Road while the new access road (Braddon Road and Braddon Road east extension) is under construction. Residences within 19 metres of Beaconsfield Road are likely to be impacted by construction traffic noise during this time. Once the new access road has been constructed, it would provide access to the plastics recycling and reprocessing site for construction traffic. It is anticipated that noise levels during construction would not result in impacts from the use of the new access road during construction.

Where noise is above the construction noise management levels, all feasible and reasonable work practices to minimise noise would be implemented, and all potentially affected receivers would be informed.

No adverse human comfort, adverse cosmetic or structural damage vibration impacts are anticipated as a result of construction of the proposal.

During operation, noise levels are predicted to comply with the noise criteria at all sensitive receiver locations. In addition, no sleep disturbance impacts are predicted.

Compliance with the *Road Noise Policy* is also predicted from operational traffic generated by the proposal at the nearest sensitive receivers to the new access road and to the nearest residences located along Douglas Road, Collins Road and Lackey Road.

Air quality and odour

Construction of the proposal would have the potential for low levels of dust generation during earthworks, access road and main facility construction activities and well as track-out across all stages of construction. The risk identified for all construction activities is 'Low Risk' for all sensitivity types. Mitigation measures are proposed to further minimise the risks of dust impacts during construction.

During operation there would be potential for low levels of particulates and volatile organic compound emissions from granulation and injection and extrusion moulding units. Products such as doors and chairs produced in Building 2 would require milling to size or profiling. These activities have the potential to lead to the emission of particulate matter.

The proposed emission control system includes localised capture of emissions from individual processing units, with emissions ventilated to a total of four emission control systems. Three emission control systems would be for the primary purpose of volatile organic compounds treatment, and would include a pneumatic cyclone spray tower, an electrostatic degreasing device, and activated carbon adsorption prior to treated air being discharged. The fourth system would be for the treatment of particulate matter from the deep processing operations and would include fabric filters.

Dispersion modelling of the emissions from the activities within Buildings 1 and 2 was undertaken in accordance with the EPA's Approved Methods. The modelling predicted that ground level concentrations of both volatile organic compounds and particulates would be significantly below the assessment criteria at all sensitive receivers.

The air quality assessment also qualitatively assessed emission generation potential and source to receptor pathway associated with operation of the wastewater treatment plant. The wastewater treatment plant would be fully enclosed, with air flow achieved through natural ventilation of the building. It would not generate significant odour. Further, the distance from potential sources of emission to the nearest sensitive receptors is significant, and meteorological conditions that make dispersion of ventilation air from the facility in the direction of the nearest sensitive receptors unlikely. Therefore, based on the characterisation of the proposed activities and the source to receptor pathway the risk of air quality impacts due to the operation of the wastewater treatment plant is considered low.

Hazards and fire risk

Preliminary risk screening and hazards

The preliminary risk screening in accordance with *Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines* confirmed that the proposal would not be potentially hazardous industry.

While the preliminary risk screening process confirmed that the proposal is not considered to be a potentially hazardous industry, a hazard identification exercise was undertaken to demonstrate that potential hazards have been identified and control measures would be place. Risks from operational hazards would include vehicle interaction, natural hazards, fire, entanglement, falls from heights, flying/falling objects, manual handling, slips, trips, falls, collisions, and contact with chemicals. Proposed safeguards and controls measures have been identified to each identified hazard.

The plastics recycling and reprocessing facility site is not located on bush fire prone land and therefore the risks associated with bush fire are considered to be low.

Fire safety

The plastics recycling and reprocessing facility would include two buildings and a range of ancillary infrastructure. Building 1 (the northern building) would contain combustible waste stockpiles and was therefore assessed against the *Fire safety guideline - Fire safety in waste facilities* (FRNSW 2020) (the FRNSW Guidelines). The assessment identified preliminary fire safety requirements to demonstrate that the proposal can operate in accordance with the FRNSW Guidelines including:

– fire hydrant system
– fire hose reels
– perimeter access
– combustible waste stockpile requirements
– fire water containment
– operational requirements

The other buildings, including Building 2 (the southern building), are not proposed to contain any combustible waste stockpiles. Therefore, while some of the site-wide FRNSW Guidelines would apply in general (such as access requirement using perimeter roads), Building 2 and the ancillary buildings were not the focus of the assessment. Building 2 (the southern building) and the ancillary buildings, would be still subject to *Building Code of Australia* requirements, which would be undertaken as part of the detailed design.

Aboriginal cultural heritage

The proposal would result in harm to three isolated finds (MVRec IF1, BR-IF1, and BR-IF2) assessed as having high cultural values but low scientific values and three sites (Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3) assessed as no longer having cultural heritage value.

An Aboriginal cultural heritage management plan would be developed in consultation with registered Aboriginal parties prior to construction commencing to minimise potential impacts to Aboriginal cultural heritage values.

Urban design and visual

While the study area is predominately a rural landscape at present, with gently undulating grassland pastures and long-range views north to the Southern Highlands, the area surrounding the proposal also forms part of the Moss Vale Enterprise Corridor (MVEC) which is a large area of industrial-zoned land, between Moss Vale and New Berrima, set aside for employment generating development under the *Wingecarribee Shire Local Environmental Plan 2010*.

The viewshed for the proposal is largely confined to land within two kilometres of the proposal site and a total of four landscape character zones and eight viewpoint locations were assessed. While the proposal design aims to minimise the impact on the surrounding landscape and sensitive receivers, the scale and nature of buildings would result in a discernible change to the visual characteristics, features, and values of the proposal site and immediate area. Mitigation measures have been developed to reduce the impacts, including proposed screening planting.

The surrounding landscape is in a state of transition, with rural land earmarked and under development for future industrial uses within the MVEC. It is anticipated that although there would be impacts, they can be partially mitigated through the mitigation measures proposed and the proposal would likely be in keeping with the planned future character of the 'General Industrial - IN1' zone.

Biodiversity

The proposal would result in impacts to two plant community types (PCT) comprising removal of 0.32 ha of native vegetation:

- 0.22 hectares of PCT 1256 Tableland swamp meadow on impeded drainage sites of the western Sydney Basin Bioregion and South Eastern Highlands Bioregion (HN602)
- 0.1 hectares of PCT 944 Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion (HN544).

A possible call from the Southern Myotis (*Myotis macropus*) was recorded on the proposal site. The Southern Myotis is listed as a vulnerable species under the *Biodiversity Conservation Act 2016* (BC Act) and is a candidate species credit species under the *Biodiversity Assessment Method* (BAM). A conservative approach was taken and the species was assumed present on-site. As such, the proposal would remove 0.32 hectares of potential foraging habitat for the Southern Myotis (*Myotis macropus)*.

A possible call from the Large Bent-winged bat (*Miniopterus orianae oceanensis*) was also recorded onsite. Large Bent-winged Bat is listed as a vulnerable species under the BC Act and is a dual credit species meaning species credits are only calculated if suitable breeding habitat is located on the proposal site or within two kilometres of the proposal site. As no breeding habitat was located on the proposal site, or within two kilometres of the proposal site, offsets for removal of foraging habitat for the Large Bent-winged Bat are calculated via the ecosystem credits for the native vegetation on the proposal site and no species credits are required.

No other threatened biota listed under the BC Act or *Environment Protection and Biodiversity Conservation Act 1999* (Cth) would be impacted by the proposal. The proposal would not impact any threatened biota listed under the *Fisheries Management Act 1994* (FM Act).

A biodiversity assessment and credit calculations have been performed in accordance with the BAM and using credit calculator version 1.3.0.00. The following credits are required to be retired to offset the impacts of the proposal:

- 5 ecosystem credits to offset impacts to 0.22 ha of PCT 1256 Tableland swamp meadow on impeded drainage sites of the western Sydney Basin Bioregion and South Eastern Highlands Bioregion
- 2 ecosystem credits to offset impacts to 0.1 ha of PCT 944 Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion
- 7 Southern Myotis species credits to offset the removal of habitat within a 0.32 hectare species polygon.

Other threatened species identified as potentially being impacted by the proposal are ecosystem credit species which would be offset through the retirement of the ecosystem credits listed above.

Impacts to 9.05 hectares of land in the proposal site would not require offsetting as this area is not native vegetation as defined in the BAM and comprises exotic vegetation.

The preferred approach to offset the residual impacts of the proposal is to secure and retire appropriate credits from stewardship sites that fit within the trading rules of the NSW Biodiversity Offsets Scheme, in accordance with the 'like for like' report generated by the BAM calculator. If such credits are unavailable, credits would be sourced in accordance with the 'variation report' generated by the BAM calculator.

A payment to the Biodiversity Conservation Trust would be considered if a suitable number and type of biodiversity credits cannot be secured.

Impacts on biodiversity values would be largely restricted to the construction phase of the proposal. Some beneficial impacts would occur as a result of the riparian vegetation management plan and the revegetation associated with the realignment of the eastern watercourse.

Other issues

Greenhouse gas

Scope 1 and 2 emissions from construction of the proposal are estimated as 2,583 tCO_2-e, which is approximately 0.0019% of NSW's annual emissions and 0.0005% of Australia's annual emissions. Construction emissions is considered negligible compared to annual emissions in NSW and Australia.

Annual Scope 1 and 2 emissions during operations are estimated as 91,033 tCO_2-e, which is approximately 0.07% of NSW's annual emissions and 0.02% of Australia's annual emissions. Operational emissions are also considered negligible compared to annual emissions in NSW and Australia.

Operational emissions are higher than the facility reporting threshold of 25,000 tCO_2-e per annum, under the National Greenhouse and Energy Reporting (NGER) scheme. Therefore, the plastics recycling and reprocessing facility would be required to monitor fuel and electricity use and report energy use and emissions annually under the NGER scheme.

Socio-economic

During construction there is potential for actual or perceived amenity impacts associated with increased vehicle movements on the local road network, noise, vibration, dust and views to the proposal site. Any potential actual or perceived construction-related amenity impacts would be temporary in nature (about 12 to 15 months).

During operation there is also potential for actual or perceived amenity impacts associated with increased vehicle movements on the local road network, noise, air emissions and changes to landscape character and views to the proposal site.

Ways to reduce and minimise unavoidable potential amenity and socio-economic impacts have been considered during design development to date and as a result of the environmental investigations.

The proposal also has a number of significant benefits which must also be considered when determining if the proposal is in the public and community's interest overall.

Non-Aboriginal heritage

No heritage-listed items or site are located on or within 200 metres of the proposal site. No direct impacts on items or sites of local, state or national heritage significance are anticipated.

Environmental mitigation and management

Potential impacts resulting from the proposal are considered manageable through the implementation of the proposed mitigation and management measures.

The detailed design for the proposal would be developed with the objective of minimising potential impacts on the local and regional environment and the local community. The design and construction methodology would continue to be developed, taking into account the input of stakeholders.

To manage the potential impacts identified by the EIS, and in some cases remove them completely, the assessment chapters outline a range of mitigation measures that would be implemented during construction and operation. The environmental performance of the proposal would be managed as described in chapter 20, including implementation of the mitigation measures, construction and operation environmental management plans.

These plans would also ensure compliance with relevant legislation and any conditions of approval.

Conclusion

Key environmental considerations have been summarised above. Development consent should be granted for the proposal because it:

- is permissible with consent and consistent with the objectives of the IN1 General Industrial zone
- is located in the Southern Highlands Innovation Precinct, a strategically designated employment generating area where various industrial uses and high technology industries can be accommodated
- is consistent with the strategic planning directions of State and local planning policies
- will contribute to the State's waste recovery performance in meeting waste reduction targets and is consistent with the orderly and economic use and development of land
- would generate social and economic benefits including the provision of 140 operational jobs for the local area and a direct capital investment value of $88 million
- the impacts of the development can be mitigated and managed to ensure an acceptable level of environmental performance
- involves the staged construction of the public access road prior to construction of the recycling and reprocessing facility onsite and performance verification prior to commencement of operational stages as additional safeguards in mitigating environmental impacts and
- is in accordance with the Objects of the *Environmental Planning and Assessment Act 1979* and is consistent with the Ecologically Sustainable Development Principles, because it would achieve an appropriate balance between the relevant environmental, economic and social considerations.

Whilst the proposal has the potential to result in minor increases in traffic, noise, air quality and amenity impacts, it is a suitable development for the site, sited within the broader MVEC and Southern Highlands Innovation Park, and would deliver local and regional economic benefits. As such, it is in the public interest.

Glossary and abbreviations

Term	Definition
ABS	Acrylonitrile butadiene styrene
A weighting	The human ear responds more to frequencies between 500 Hz and 8 kHz and is less sensitive to very low-pitch or high-pitch noises. The frequency weightings used in sound level measurements are often related to the response of the human ear to ensure that the meter better responds to what you actually hear.
AEP	Average exceedance probability
ACHAR	Aboriginal Cultural Heritage Assessment Report
ACHMP	Aboriginal cultural heritage management plan
AHIMS	Aboriginal Heritage Information Management Systems
Access road corridor	The proposed access road that extends from the plastics recycling and reprocessing facility to Lackey Road via the currently unformed Braddon Road, traversing Lot 1 DP 26490 and Lot 10 DP 1084421
Ambient noise	The all-encompassing noise associated within a given environment. It is the composite of sounds from many sources, both near and far. This is described using the Leq descriptor.
Approved Methods	*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA 2016)
AWS	Automatic weather station
BA	Building application
Background noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is described using the L90 descriptor.
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BOM	Bureau of Meteorology
CCTV	Closed circuit television
CEEC	Critically endangered ecological community
CEMP	Construction environmental management plan
CO_2-e	Carbon dioxide equivalent
COAG	Council of Australian Governments
CSM	Conceptual site model
CTMP	Construction traffic management plan
DA	Development application
dB	Decibels
dBA	A-weighted sound levels
dBZ	Z-weighted sound levels
DAWE	Department of Agriculture, Water and Environment (Cth)
DCP	Development control plan
DEWHA	Department of the Environment, Water, Heritage and the Arts (Cth)
DECCW	Department of Environment, Climate Change and Water (NSW)
DP	Deposited plan
DPIE	Department of Planning, Industry and Environment (NSW)

Term	Definition
EEC	Endangered ecological community
EIS	Environmental impact statement
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
EPI	Environmental planning instrument
EPL	Environment protection licence
FAQ	Frequently Asked Questions
Feasible and reasonable measures	Feasibility relates to engineering considerations and what is practical to build. Reasonableness relates to the application of judgement in arriving at a decision, taking into account the following factors. For example: – noise mitigation benefits (amount of noise reduction provided, number of people protected) – cost of mitigation (cost of mitigation versus benefit provided) – community views (aesthetic impacts and community wishes) – noise levels for affected land uses (existing and future levels, and changes in noise levels).
FM Act	*Fisheries Management Act 1994* (NSW)
FRNSW	Fire and Rescue New South Wales
FRNSW Guideline	*Fire safety guideline - Fire safety in waste facilities (FRNSW 2020)*
FTE	Full time equivalent
GDE	Groundwater dependent ecosystem
GIPA	Government Information (Public Access)
Ground-borne vibration	Vibration transmitted from a source to a receptor via the ground
HDPE	High-density polyethylene
Hertz	The measure of frequency of sound wave oscillations per second. 1 oscillation per second equals 1 hertz.
IAP2	International Association for Public Participation
IBRA	Interim Biogeographic Regionalisation for Australia
Infrastructure SEPP	State Environmental Planning Policy (Infrastructure) 2007
Key Fish Habitat	Aquatic habitats that are important to the sustainability of the recreational and commercial fishing industries, the maintenance of fish populations generally, and the survival and recovery of threatened aquatic species
km/h	Kilometres per hour
LDPE	Low-density polyethylene
LED	Light emitting diode
LEP	Local Environment Plan
LGA	Local government area
LoS	Level of service
m AHD	Metres relative to Australian height Datum
m bgl	Metres below ground level
MNES	Matters of National Environmental Significance
MVEC	Moss Vale Enterprise Corridor A significant area of land between Moss Vale and New Berrima set aside for employment generating development under the *Wingecarribee Shire Local Environmental Plan 2010*
NML	Noise management level

Term	Definition
	Defined in the EPA's *Interim Construction Noise Guideline*. To be measured and assessed at the property boundary that is most exposed to construction noise, and at a height of 1.5 metres above ground level. If the residential property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most affected point within 30 metres of the residence.
Most-affected location	Location(s) that experience (or will likely experience) the greatest noise impact from the construction works under consideration. In determining these locations, existing background noise levels, noise source location(s), distance and any shielding between the construction works (or proposed works) and the residences and other sensitive land uses need to be considered.
NCA	Noise catchment area Noise catchment areas are used to classify areas of different noise environments
NGER	National Greenhouse and Energy Reporting
NorBE	Neutral or beneficial effect
NPI	*National Pollutant Inventory*
NSW	New South Wales
NSW EPA	New South Wales Environment Protection Authority
NSW Waste Strategy	*NSW Waste and Sustainable Materials Strategy 2041*
OEMP	Operation environmental management plan
PAC	Polyaluminium chloride
PAD	Potential archaeological deposits. Indicates that a particular location has potential to contain subsurface archaeological deposits, although no Aboriginal objects are visible (OzArk 2021).
PAM	Polyacrylamide
PCT	Plant community type
Plastics recycling and reprocessing facility site	The northern parcel of land in Lot 11 DP 1084421, with a current street address of 74-76 Beaconsfield Road, Moss Vale
PET	Polyethylene terephthalate
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
PP	Polypropylene
Project-specific noise trigger level	Target noise levels for a particular noise generating facility. They are based on the most stringent of the intrusive criteria or amenity criteria. Which of the two criteria is the most stringent is determined by measuring the level and nature of existing noise in the area surrounding the actual or propose noise generating facility.
Proponent	Plasrefine Recycling Pty Ltd
Proposal	The construction and operation of a plastics recycling and reprocessing facility with capacity to receive up to 120,000 tonnes per year of mixed plastics, comprising: – Two main buildings for waste receival, recycling and reprocessing and finished product storage – Wastewater treatment plant – Ancillary infrastructure including an office building, workshop, staff and visitor parking, truck parking, internal roadways, weighbridges, water management, landscaping and visual screening, fencing and utility connection. The proposal also includes construction of part of Braddon Road (currently unformed) and a new road access connection to Lackey Road (the Braddon Road east extension).
Proposal site	The area that would be occupied by the proposal's permanent operational infrastructure, and/or directly disturbed during construction
PM_{10}	Particulate matter (less than 10 micrometers in diameter)
$PM_{2.5}$,	Particulate matter (less than 2.5 micrometers in diameter)

Term	Definition
PMST	Protected Matters Search Tool
PVC	Polyvinyl chloride
RBL	Rating background level Defined by the *Noise Policy for Industry* as the overall, single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period (as opposed to over each 24-hour period used for the assessment background level). This is the level used for assessment purposes.
RDF	Refuse derived fuel Also called process-engineered fuel (PEF). RDF is a solid fuel produced after processing of waste to increase the calorific value, homogenise the material, remove recyclable materials, remove inert materials, and remove hazardous contaminants.
Rw	Weighted sound reduction index A rating used to measure the level of sound insulating abilities of walls, floors, windows and doors etc
SEPP	State and Environmental Planning Policy
SEPP 33	State and Environmental Planning Policy No 33 – Hazardous and Offensive Development
SEPP 44	State Environment Planning Policy No 44 – Koala Habitat Protection
SEPP 55	State Environmental Planning Policy 55 – Remediation of Land
SEPP 64	State Environmental Planning Policy 64 – Advertising and signage
SSC	State suburb code
SSD	State significant development
SSI	State significant infrastructure
SEARs	Secretary's (of the Department of Planning, Industry and Environment) environmental assessment requirements
Southern Highlands Innovation Park	An area comprising the MVEC and adjacent industrial zoned land, approximately 1,020 hectares in size and designated for sustainable and innovative businesses, providing a unique opportunity for large scale industrial development conveniently close to Sydney, and good distribution to most of the country.
State and Regional Development SEPP	State Environmental Planning Policy (State and Regional Development) 2011
State suburb	State Suburbs (SSC) are an Australian Bureau of Statistics approximation of localities gazetted by the Geographical Place Name authority in each State and Territory. Gazetted Localities are the officially recognised boundaries of suburbs (in cities and larger towns) and localities (outside cities and larger towns). Gazetted Localities cover most of Australia.
Study area	The study area is defined as the wider area, including and surrounding the proposal site and the access road corridor, with the potential to be directly or indirectly affected by the proposal (for example, by noise and vibration, air quality, visual and/or traffic impacts). The actual size and extent of the study area varies according to the nature and requirements of each assessment and the relative potential for impacts.
SWL	Sound power level
TN	Total nitrogen
TP	Total phosphorus
TSS	Total suspended solids
UPVC	Unplasticised polyvinyl chloride
veh/d	Vehicles per day
veh/h	Vehicles per hour
VOC	Volatile organic compounds

Term	Definition
VPA	Voluntary planning agreement
VRZ	Vegetated riparian zone
WLEP	Wingecarribee Local Environment Plan 2010
WM Act	*Water Management Act 2000* (NSW)
Z-Weighting (or Linear-weighted)	Zero-weighting or Linear-weighting indicates no weighting filter has been applied and refers to a flat frequency response for sound level meters.

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1. Introduction

1.1 Background

For many years, recyclable plastics have been recovered from kerbside collections and it has been profitable to export mixed plastics to China and other countries. With the advent of the China National Sword policy (a policy in China which banned the importation of certain types of waste and set strict contamination limits on recyclable materials), as well as issues with contaminated loads of recyclables being sent to China and other countries, opportunities to send mixed plastics overseas for processing have diminished. In March 2020, the former Council of Australian Governments (COAG) decided to ban exports of recyclable waste from Australia from July 2021.

Despite these difficulties, export markets still exist for clean, separated, pelletised or flaked plastics and resins. However, there is very little local capacity in New South Wales (NSW) and within Australia to sort mixed recovered plastics into different types and convert them into valuable products.

To help address this issue, Plasrefine Recycling Pty Ltd (Plasrefine Recycling) ('the proponent') proposes to construct and operate a plastics recycling and reprocessing facility in Moss Vale ('the proposal').

1.2 The proposal

1.2.1 Proposal location

The proposal would be located at 74-76 Beaconsfield Road, Moss Vale.

The proposed plastics recycling and reprocessing facility and ancillary infrastructure would be located on the northern parcel of land in Lot 11 DP 1084421. This parcel of land has a total site area of about 7.7 hectares.

The proposal would be accessed via Braddon Road (paper road, currently unformed) and a new connection to Lackey Road via Lot 1 DP 26490 and Lot 10 DP 1084421 (the proposed Braddon Road east extension).

All proposal lots are within the Moss Vale Enterprise Corridor, a significant area of land (> 1,000 hectares) between Moss Vale and New Berrima, set aside for industrial and employment generating development under the Wingecarribee Shire Local Environmental Plan 2010 (Wingecarribee LEP).

Surrounding land uses are a mix of industrial, warehouse, manufacturing, waste management, vacant land and rural residential.

The location of the proposal is shown on Figure 2.1.

1.2.2 Key features

The proposal is defined as the construction and operation of a plastics recycling and reprocessing facility with capacity to receive up to 120,000 tonnes per year of mixed plastics, comprising:

- Two main buildings for waste receival, recycling and reprocessing and finished product storage
- Wastewater treatment plant
- Ancillary infrastructure including an office building, workshop, staff and visitor parking, truck parking, internal roadways, weighbridges, water management, landscaping and visual screening, fencing, signage and utility connection.

The proposal also includes construction of a new access road comprising part of Braddon Road (currently unformed) and a new connection to Lackey Road (the proposed Braddon Road east extension).

The proposal would sort the plastics into different types and convert the various plastics to flakes and pellets (in the first stage) and produce more advanced products (in the second stage). The combined outputs of both stages of the proposal would help fill the gap in local processing capacity for mixed plastics.

1.2.3 Construction

An indicative construction strategy has been developed, based on the current design, to be used as a basis for the environmental assessment. Detailed construction planning, including programming, work methodologies and work sequencing, would be undertaken subject to approval, and once construction contractor(s) have been engaged.

It is estimated that the proposal would take about 15 months to construct and commission. Construction would consist of three key stages. The first stage (about one month) would involve early works and site establishment. The second and main stage (about 11 months) would include:

- site clearance
- bulk earthworks
- civil works including water management infrastructure, internal roads, hardstand, parking areas, foundations, and slabs
- building construction
- installation of equipment and fit out
- services installation
- road access construction
- restoration works and landscaping

The final stage (about three months) would include testing and commissioning.

1.2.4 Approval requirements

The proposal is State significant development in accordance with the requirements of Part 4 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act), as it is development for the purpose of a resource recovery or recycling facility that would handle more than 100,000 tonnes per year of waste, as well as development for the purpose of the manufacture or reprocessing of polymers, plastics, rubber or tyres with a capital investment value of more than $30 million.

The proposal is subject to approval by the NSW Minister for Planning.

Further information on the approval requirements is provided in chapter 4.

1.3 Proposal objectives

The key objectives of the proposal are to:

- construct and operate a plastics recycling and reprocessing facility that will recover and sort plastics into different types, and convert them into valuable products, reducing the amount of plastics in landfill
- increase the capacity and resilience of the recycling network in Australia
- provide necessary waste management infrastructure to meet Sydney's future waste management requirements
- contribute to NSW achieving its resource recovery targets under the *NSW Waste and Sustainable Materials Strategy 2041* (Department of Planning, Industry and Environment (DPIE) 2021a) and *NSW Plastics Action Plan* (DPIE 2021b) through the recovery and recycling of plastics
- manage potential impacts associated with the construction and operation of the proposal in an environmentally and socially responsible manner

1.4 Related development and other approvals required

Related development are additional projects required to support the operation of the proposal which would be assessed and determined through separate approval processes. This may be because the scope of related development is not sufficiently developed to allow a detailed assessment of environmental impacts to be undertaken at this stage and/or it is assessed under a different planning pathway. A summary of the related developments is provided in Table 1.

Consultation took place with Council (as water and sewerage provider), Endeavor Energy (as electricity provider) and NBN Pty Ltd (as telecommunications provider) during preparation of the EIS (see chapter 6). All utility related connection works would be assessed and determined separately under Part 5 of the EP&A Act. A gas connection is not anticipated to be required, however would also be assessed and determined separately under Part 5 of the EP&A Act if it was required in future.

Table 1 Summary of related development and relationship to the proposal

Related development	Relationship to the proposal
Water and sewer connection	The proposal would require new connections to water supply and sewer infrastructure. Preliminary studies undertaken for the EIS confirm that connection to existing water supply and sewer infrastructure adjacent to the site is feasible. The exact connection points would be confirmed as the design progresses.
Telecommunications connections	The proposal would require a new connection to the telecommunications network.
Power connection	The proposal would require a new power connection to supply electricity to the plastics recycling and reprocessing facility. The Australian Bioresources facility on the adjacent site to the east has a power connection. It may or may not be possible for Plasrefine Recycling to use the same substation as Australian Bioresources. Endeavor Energy has a zone substation at Douglas Road to the northwest of the plastics recycling and reprocessing facility site. A connection to this zone substation is envisaged, but no application has been lodged with Essential Energy because insufficient information is available at this stage about the plant loadings. An overhead powerline would likely be required, to connect the facility to the Endeavor Energy substation. A possible route for this would be along the paper road that runs along the western side of the plastics recycling and reprocessing facility site, to Douglas Road. A section of underground line may be required to cross the railway line, after which an overhead line along Douglas Road to the substation is envisaged. A substation would need to be located on the plastics recycling and reprocessing facility site near the site boundary (at a location to be determined).
Australian Bioresources private driveway	A new access road is proposed as part of the proposal to provide road connection to the plastics recycling and reprocessing facility from Lackey Road. As result, a new private driveway would need to be constructed to provide continued access to the Australian Bioresources facility from the Braddon Road east extension portion of the new access road.

1.5 The proponent

Plasrefine Recycling Pty Ltd is the operating company for the proposal and registered in Australia for the purpose of building and operating the Moss Vale Plastics Recycling and Reprocessing Facility. The proponent's details are shown in Table 2.

Table 2 Proponent details

Aspect	Detail
Name	Plasrefine Recycling Pty Ltd
Address	Suite 607, Level 6,109 Pitt Street. Sydney, NSW 2000
ABN	82 642 246 704

1.6 Purpose and structure of this environmental impact statement

This EIS supports the application for approval of the proposal as State significant development under Part 4 of the EP&A Act. It addresses the environmental assessment requirements of the Secretary of the Department of Planning, Industry and Environment (the SEARs) dated 15 October 2020 (refer to Appendix A) and the EIS form and content requirements of schedule 2 of the Environmental Planning and Assessment Regulation 2000 (the EP&A Regulation) (refer to Appendix B).

The main EIS is structured as follows:

- An introduction to the EIS (chapter 1)
- A description of the site including location, land ownership, land use and the environmental setting (chapter 2)
- An overview of the strategic context and need for the proposal (chapter 3)
- Information on the statutory planning approvals (chapter 4)
- The alternatives and options considered during development of the proposal (chapter 4)
- A summary of the community and stakeholder engagement that occurred during the concept design and assessment process and how comments have been addressed (chapter 6)
- A description of the proposal including plans of proposed building works, construction activities, likely staging of construction works and the plastics recycling processes (chapter 7)
- An overview of the assessment approach, method and identification and prioritisation of environmental issues (chapter 8)
- The results of the assessment of key environmental issues (chapters 9 to 18)
- An overview of relevant planning agreement/development contributions (chapter 19)
- Proposed environmental management and monitoring and a compilation of proposed mitigation measures (chapter 20)
- The conclusion and justification for the proposal including an evaluation of the proposal with regard to social, economic and environmental considerations and the results of the environmental impact assessment (chapter 21)
- References

Other volumes of the EIS provide supporting technical reports, which provide detailed assessments of the potential impacts of the proposal as they relate to the key environmental issues defined by the SEARs.

2. Site and surrounds

This chapter describes the site location, the proposal site and surrounds.

2.1 Location

2.1.1 Regional setting

The proposal would be located approximately 2.8 kilometres north west of the Moss Vale town centre within the Wingecarribee local government area (LGA). It would be about 70 kilometres of Wollongong, 140 kilometres of Sydney and 165 kilometres of Canberra, and also along the main route to Melbourne (see Figure 2.1). Suburbs neighbouring Moss Vale include Burradoo, Glenquarry, Avoca, Werai, Sutton Forest, New Berrima, and Bowral.

The proposal would be located within the Moss Vale Enterprise Corridor (MVEC) catchment. The MVEC is a significant area of land between Moss Vale and New Berrima set aside for employment generating development under the Wingecarribee Shire Local Environmental Plan 2010 (Wingecarribee LEP) (see Figure 2.2).

Moss Vale is one of four main towns in the Wingecarribee LGA and has a mixed urban land use pattern ranging from detached housing to general industrial activities (Wingecarribee Shire Council n.d.). The town is located at a junction of important road and railway routes, and is accessed via the Hume Highway and Moss Vale Road (Wingecarribee Shire Council n.d.).

2.1.2 Plastics recycling and reprocessing facility

The proposed plastics recycling and reprocessing facility would be located on the northern parcel of land in Lot 11 DP 1084421, with a current street address of 74-76 Beaconsfield Road, Moss Vale (see Figure 2.3). This parcel of land is referred to as ‘the plastics recycling and reprocessing facility site’ for the purpose of the EIS. It has a total site area of about 7.7 hectares and is roughly square in shape. It contains four small farm dams and an artificial drainage channel which was built between 1969 and 1979 to drain the north-western corner of the site. The only structure on-site is an old, decrepit cattle loader. It is also partially fenced and is generally clear of significant vegetation.

The proposal would occupy a portion of the plastics recycling and reprocessing facility site, being an area of about six hectares (including buildings, roads and areas for water management).

The southern parcel of land in Lot 11 DP 1084421 is zoned E4 Environmental Living and is separated from the northern parcel of land by the future road corridor for Braddon Road. The southern parcel of land does not form part of this development application.

2.1.3 Access road

The proposed new access road would extend from the plastics recycling and reprocessing facility to Lackey Road via the currently unformed Braddon Road (paper road), traversing Lot 1 DP 26490 and Lot 10 DP 1084421 (the ‘Proposed Braddon Road east extension’) (see Figure 2.3). The portion of these lots which would be occupied by the new access road are currently privately owned.

The access road would be located within a corridor with a width of about 20 metres (referred to as the ‘access road corridor’ for the purpose of the EIS). This provides for a two-way access road with four metre wide lanes and 1.5 metre verges within the corridor.

The western end of the access road corridor would commence near the western entrance of the plastics recycling and reprocessing facility site and would connect to Lackey Road in the east.

The access road corridor would be about 915 metres in length, with an area of about 1.8 hectares. It would be located mainly on disturbed land, with a small area of existing vegetation. The corridor would be subject to disturbance during construction of the access road.

2.1.4 The proposal site

The area that would be occupied by the proposal's permanent operational infrastructure, and/or directly disturbed during construction, is referred to as 'the proposal site' for the purposes of the EIS. The proposal site is shown on Figure 2.3 and comprises:

- The plastics recycling and reprocessing facility site (7.7 hectares)
- The new access road corridor (1.8 hectares)

It is noted that the areas that would be disturbed for construction of buildings, roads and water management would comprise about six hectares of the total 7.7 hectare plastics recycling and reprocessing facility site. Disturbance of the remaining 1.7 hectares would be limited to plantings as part of riparian vegetation management and landscaping.

2.1.5 The study area

The study area is defined as the wider area, including and surrounding the proposal site, with the potential to be directly or indirectly affected by the proposal (for example, by noise and vibration, air quality, visual and/or traffic impacts).

The actual size and extent of the study area varies according to the nature and requirements of each assessment and the relative potential for impacts. For example, the study area for the non-Aboriginal cultural heritage assessment is generally restricted to the area with the potential for heritage impacts, extending for a distance of about 200 metres surrounding the proposal site. In comparison, the study area for the noise and vibration assessment extends for a distance of about 1.6 kilometres surrounding the proposal site.

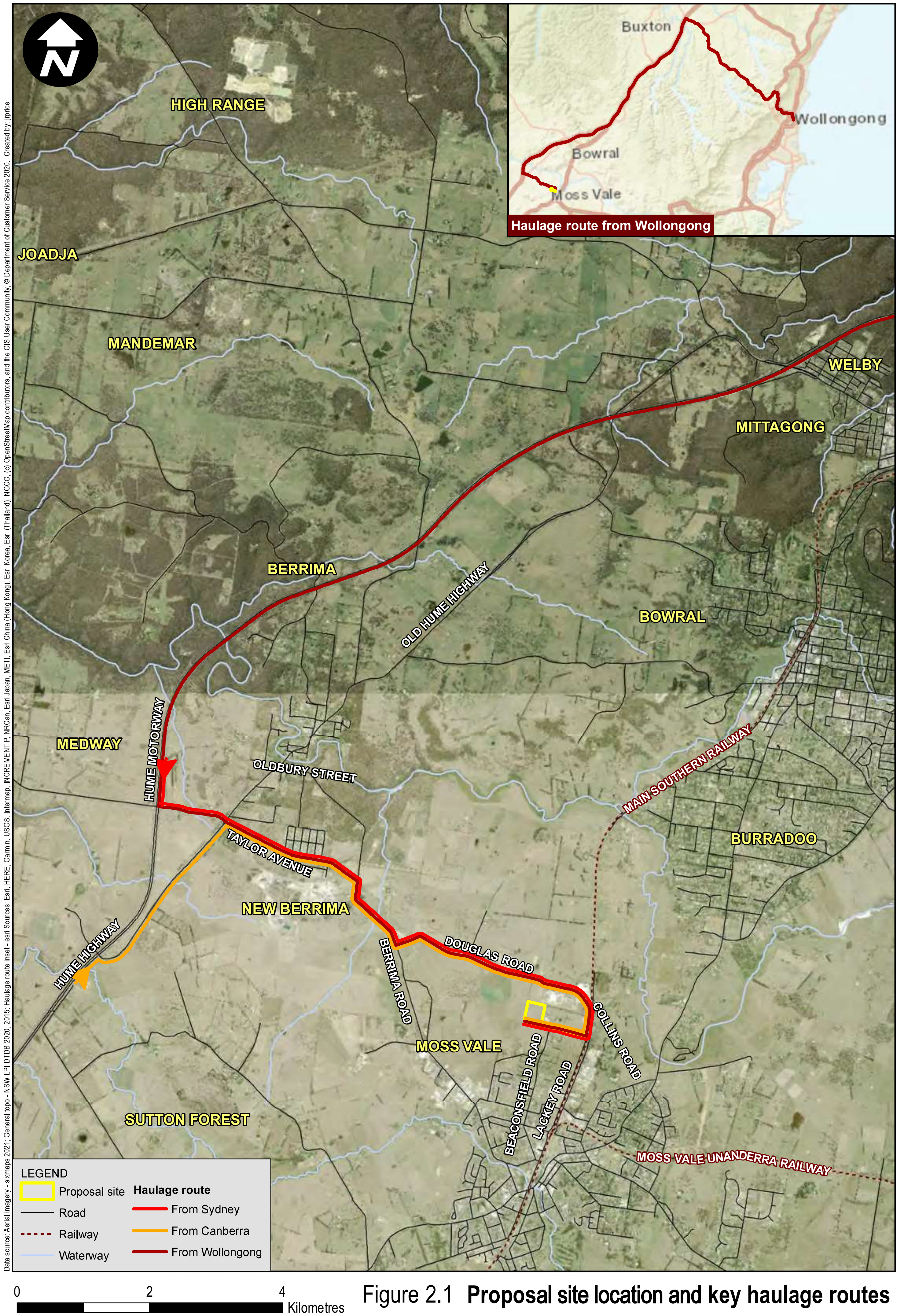
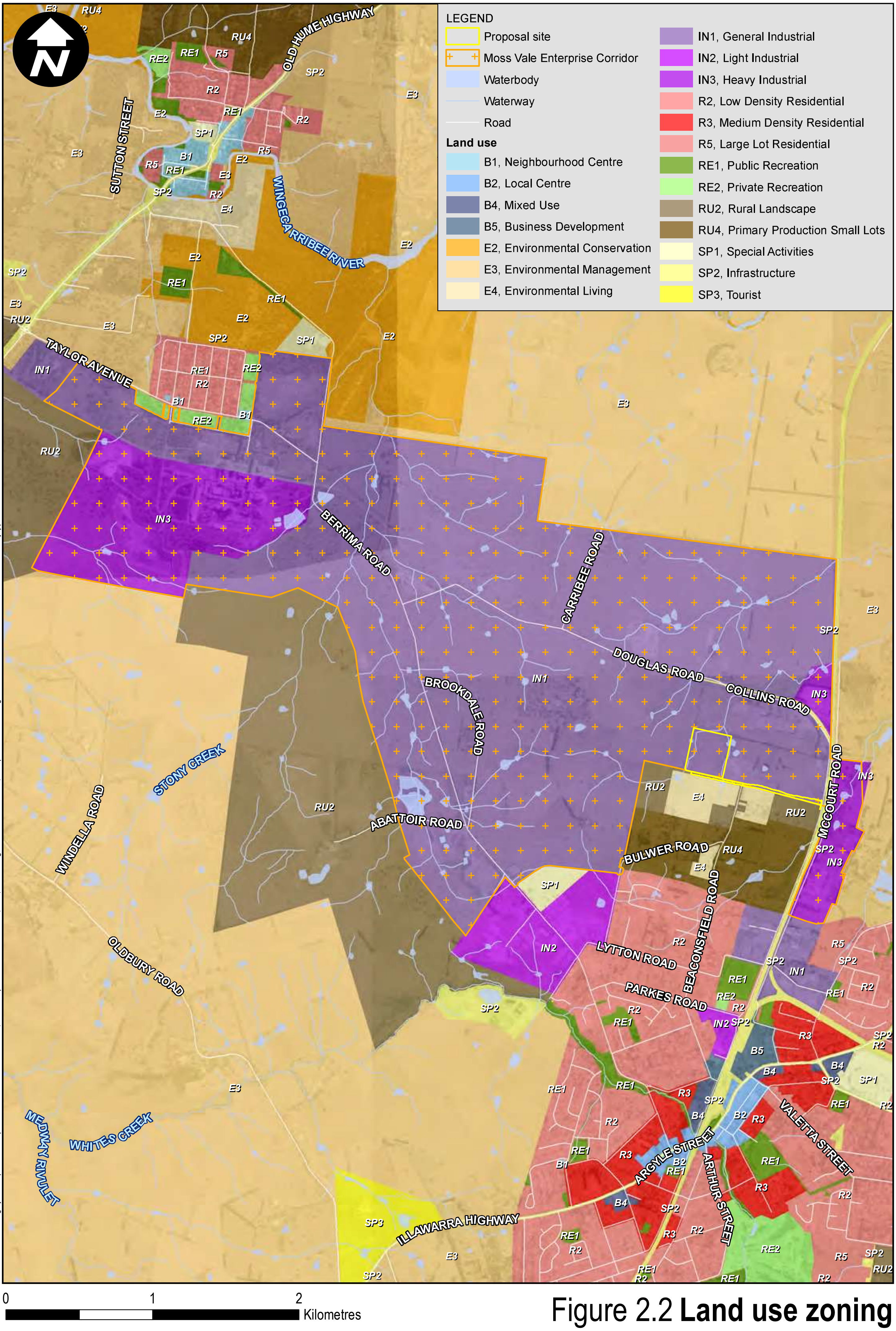
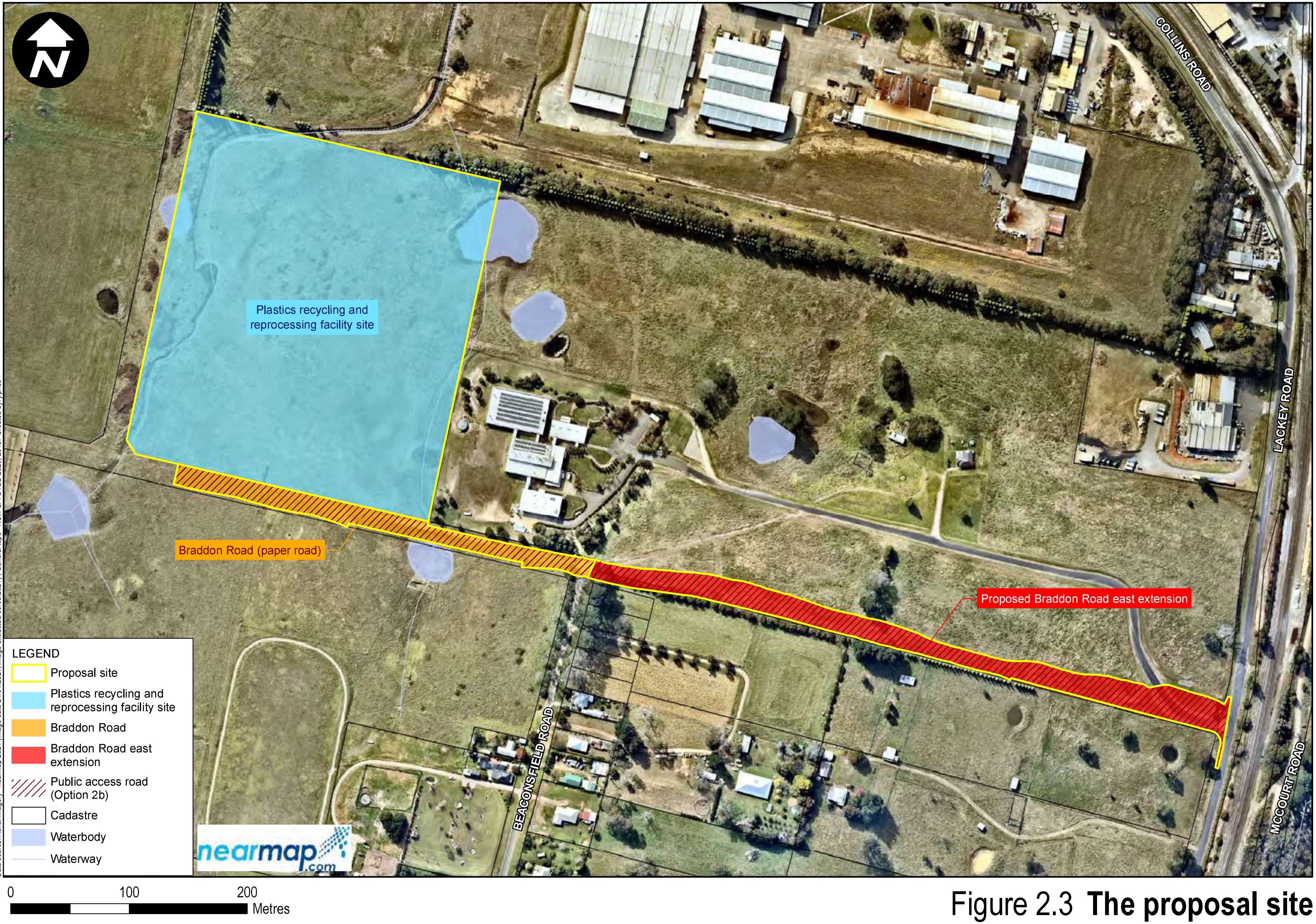


Figure 2.1 **Proposal site location and key haulage routes**



Data source: Aerial imagery - Sixmaps 2021 © Department of Customer Service 2020; General topo - NSW LPI DTDB 2020, 2015; Land zoning - NSW DPE 2020/2018; Enterprise corridor - Wingecarribee Shire Council & NSW DPE 2018. Created by: jrprice

Figure 2.2 **Land use zoning**



Data source: Aerial imagery - nearmap 2021 (image date 24/04/2021, image extracted 30/06/2021) ; General topo - NSW LPI DTDB 2020, 2015. Created by: jrprice

Figure 2.3 **The proposal site**

2.2 Key features of the existing environment

A summary of the general characteristics of the study area is provided below. Further detail about the existing environment in relation to each environmental issue/aspect is provided in chapters 9 to 18.

2.2.1 Social and cultural environment

Social

The Wingecarribee LGA covers an area of about 268,888 square kilometres (Profile id. n.d.). At the time of the 2016 Australian Bureaus of Statistics census, it had a population of 47,882 people. The LGA is largely rural, with urban areas in numerous towns and villages. It comprises of four main towns: Bowral, Moss Vale, Mittagong and Bundanoon, and many smaller villages.

Moss Vale is located about 3.8 kilometres south of the Hume Highway. In 2016, the suburb of Moss Vale had a population of 8,579 people, comprising 18.3 percent of the overall LGA population (Australian Bureaus of Statistics 2016). It has a mixed urban land use pattern ranging from detached housing to general industrial activities (Wingecarribee Shire Council n.d.). The town is located at a junction of important road and railway routes and is accessed via the Hume Highway and Moss Vale Road (Wingecarribee Shire Council n.d.).

Land use

The study area consists of a mix of land uses and zonings. It is primarily dominated by a number of existing industrial developments, as well as a mix of residential, recreational, rural, business and mixed land uses and zonings. Environmental land uses (land zoned E3 Environmental Management) are located within the broader locality in all directions.

The plastics recycling and reprocessing facility site and surrounding land to the immediate north and west is zoned IN1 General Industrial and primarily vacant. The land set aside for the access road corridor is zoned IN1 General Industrial and RU2 Rural Landscape. The land immediately south of the proposal site (consisting of the southern parcel of land in Lot 11 DP 1084421) is zoned E4 Environmental Living (see Figure 2.2).

The plastics recycling and reprocessing facility site has been recorded as undeveloped and unused land since at least 1933.

The plastics recycling and reprocessing facility site is adjoined by:

– Dux Hot Water (consisting of multiple industrial buildings/warehouses and about 5.8 hectares of vacant land directly north of the plastics recycling and reprocessing facility site)
– Australian BioResources (consisting of four large buildings, internal roads and car parking, a residence and currently vacant land which the access road would be located on)
– the future road corridor for Braddon Road, and vacant land owned by Plasrefine Recycling (southern parcel of land in Lot 11 DP 1084421) currently used for cattle grazing
– private property and land used by Moss Vale Hay Sales (consisting of a number of small sheds).

The approximate distances to the existing industrial developments located to the north and east of the proposal site are provided in Table 2.1.

Table 2.1 Nearby industrial developments

Business/development	Approximate distance from the proposal site
Australian BioResources – breeding and holding research mice	Directly adjacent to the east of the proposal site
Dux Hot Water – hot water system manufacturers	Directly adjacent to the north-east of the proposal site
Fast Skips Recycling – waste management service	450 m north-east
Omya Australia – mineral processing plant	660 m north-east
A&I Coatings – polyurethane and fluoropolymers manufacturing	640 m east

Business/development	Approximate distance from the proposal site
Moss Vale Recycled Timber Building Centre – recycled building materials	650 m east
Cromford Pipe Holdings – plastic pipe manufacturers	560 m north-west
Joy Mining – mining machinery manufacturers	870 m south-east
Dunsteel – steel fabrication business	980 m south-east

Sensitive receivers in the vicinity of the proposal site are shown in Figure 12.2. Sensitive receivers are typically regarded as residential properties, schools, childcare centres, aged-care facilities, commercial and industrial premises, hospitals and neighbouring businesses.

There are seven rural residential properties located within 250 metres of the proposal site, and a further 146 within 1.2 kilometres. Southern Highlands Early Childhood Learning Centre is located 935 metres south of the proposal site on Beaconsfield Road.

The residence nearest to the plastics recycling and reprocessing facility is located at 72 Beaconsfield Road, about 180 metres south east of the plastics recycling and reprocessing facility at the closest point. The closest residence to the access road corridor is located about 92 metres from the closest point, at 79 Beaconsfield Road.

The Braddon Road east extension would be located on land primarily owned by the Garvan Institute of Medical Research (parent company of Australian BioResources).

Cecil Hoskins Nature Reserve is located within the broader locality of the proposal site, about 2.7 kilometres to the east.

Heritage

The Southern Highlands has a rich history which began with the traditional owners of the land, the Gundungurra and D'harawal people, and later European settlers who first explored the area in 1798.

Aboriginal

A search of the Aboriginal Heritage Information Management System (AHIMS) database identified 49 Aboriginal archaeological sites within a 10 by 10 kilometre search area, centred on the study area. Two of these registered sites are located within the study area but during a survey undertaken by Biosis in June 2021, they were unable to be located. It was suggested that the artefacts may have been water washed or had become obscured by ground vegetation.

During an archaeological survey undertaken by OzArk in August 2021, one isolated find was recorded. This site consisted of an isolated quartz steep edged scraper that was located on the surface of an area of disturbance associated with the removal of a timber fence post on the spur crest.

In addition, three potential archaeological deposits (PAD) were recorded, two of which were later the focus of the test excavation program.

As a result of the archaeological survey and test excavation program, six sites were recorded in the study area. In addition, two isolated finds have been previously recorded in the study area. The archaeological survey and test excavation program also indicated that there were no subsurface archaeological deposits of conservation value within the areas to be impacted by the proposal.

Overall, there is a low artefact density within subsurface deposits recorded by the test excavation investigations. The artefact density represents a standard 'background' expression of artefacts that are common in many NSW environments.

Non-Aboriginal

Council (Wingecarribee Shire Council n.d.) identifies that European settlement commenced in the Southern Highlands around 1820. The first settlement, Bong Bong settlement, located on the Moss Vale Road between Moss Vale and Burradoo adjoining the Wingecarribee River, is marked by an obelisk and sits within the greenbelt between Moss Vale and Burradoo as part of the Burradoo Landscape Conservation Area. The 1860s saw rapid development in the region through the advent of the Main Southern Railway Line.

There are four sites listed on the State Heritage Register and 66 locally listed sites/items within the suburb of Moss Vale. However, there are no sites/items located on or within 200 metres of the proposal site.

The closest site of local heritage significance is located about 970 metres to the east of the plastics recycling and reprocessing facility site and about 280 metres east of the access road corridor (where it meets Lackey Road). This site is Austermere, (former SCEGGS School) house and ground – listing No. I398, located at Suttor Road, Moss Vale.

The closest site of state heritage significance is the Christ Church, Churchyard and Cemetery (listing No. 01383) which located about two kilometres to the southeast of the plastics recycling and reprocessing facility site.

Transport and access

The road network in the study area consists mainly of local roads and one regional road. There are three main (classified) roads within the vicinity of the proposal site: the Hume Highway (M31), Illawarra Highway (A48) and Argyle Street (15) which changes to Moss Vale Road at the Cecil Hoskins Access Road intersection.

The proposal site would be accessed via Lackey Road which adjoins the access road at its eastern end. Lackey Road is a collector road which connects Collins Road and the Illawarra Highway in a north-south direction. It has an undivided carriageway, with one travel lane in each direction. It has no dedicated active or public transport facilities.

Vehicles travelling towards the proposal site are likely to travel via: Hume Highway (M31), Oldbury Street, Berrima Road, Douglas Road, Collins Road, Lackey Road and the access road (see Figure 2.1).

At present, direct access to the plastics recycling and reprocessing facility site is via the unformed Braddon Road (paper road), which is located at the northern end of Beaconsfield Road.

2.2.2 Biophysical environment

Biodiversity

Flora

The proposal site has been cleared of all native vegetation and is dominated by exotic pasture. There are several planted windbreaks nearby or adjacent to the site which support the only midstorey or overstorey vegetation close to the proposal site. These windbreaks support a mixture of mature exotic species, as well as sub-mature, generally native species, however, do contain species that are not locally indigenous.

A total of 73 flora species from 22 families were recorded within the study area, comprising 35 native and 38 exotic species. The *Poaceae* (grasses, seven native species and 17 exotic species) and *Asteraceae* (one native species and eight exotic species) were the most diverse families recorded. Field surveys confirmed the presence of two native Plant Community Types (PCTs) within the proposal site. No threatened flora species or threatened ecological communities were identified within the proposal site during field surveys.

Fauna

Two threatened fauna species were possibly recorded within the proposal site during field surveys:

- Southern Myotis (*Myotis macropus*)
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*)

A call from the Southern Myotis species group was recorded in the proposal site via anabat echolocation call recording. The Southern Myotis is listed as a vulnerable species under the *Biodiversity Conservation Act 2016* (BC Act). A call from the Large Bent-winged Bat was also recorded in the proposal site via anabat echolocation call recording. The Large Bent-winged Bat is listed as a vulnerable species under the BC Act.

The proposal site is not mapped as Biophysical Strategic Agricultural Land (BSAL) and agricultural use of the proposal site is not permitted in the IN1 General Industrial zone.

Water and soils

The proposal site is located within the Sydney drinking water catchment. This catchment covers 16,000 square kilometres and services more than four million people in Sydney, Wollongong, Goulburn, Lithgow, the Blue Mountains, Bowral and Nowra (DPIE 2020a).

The plastics recycling and reprocessing facility site is undulating and falls from its southern-central portion to the north and north-east (see Figure 2.4). Four ponds are located in the low points of the plastics recycling and reprocessing facility site, and two watercourses run along the western and eastern boundaries.

In accordance with the Strahler stream ordering system, the western watercourse is a second order stream which eventually passes into a concrete channel where it joins the eastern watercourse. The eastern watercourse, as per the Strahler stream ordering system, is a first order stream. The watercourse passes the eastern boundary of the plastics recycling and reprocessing facility site, through a large dam shared with the neighbouring site, and enters a concrete channel. The combined watercourse traverses the concrete channel, pass an industrial site and flow in a north- easterly direction, under Collins Road, until it reaches the Wingecarribee River. Wingecarribee River eventually outflows to Wingecarribee Reservoir.

The plastics recycling and reprocessing facility site is relatively elevated from regional waterways and as such not in a floodplain location. However, due to its proximity to local drainage lines there is potential for short duration overland flow inundation.

Site inspections undertaken by GHD in March 2021 identified several soil profiles exposed by the western watercourse. The soil is generally comprised of about 50 millimetres of topsoil underlain by residual light-brown sandy clay (stiff, medium-plasticity and dry). No odours, no staining and no anthropogenic material was found in the soil profiles.

The *Atlas of Australian Acid Sulfate Soils* indicates that the plastics recycling and reprocessing facility site is within a zone classified as B - low probability of occurrence (i.e., 6-70 per cent chance of occurrence). It is also noted that the elevation of the proposal (approximately 670 metres AHD) would have precluded the generation of acid sulfate soils. Acid sulfate soils are therefore unlikely to be on-site based on available information.

Air quality

Air quality within the study area is characteristic of a regional location. The main influences on air quality across the proposal site is likely to be largely influenced by natural sources such as bush fires and/or dust storms. It is expected that ambient concentrations of gaseous and toxic air pollutants (eg. volatile organic compounds) are low in regional locations such as Moss Vale. However, this has the potential to change at locations close to any existing or proposed sources of ambient air pollution. Identified operations likely to emit significant amounts of air pollutants within five kilometres of the proposal site are:

- Dux Manufacturing
- Australian BioResources
- Moss Vale Meter Station
- Moss Vale Sewage Treatment Plant

2.3 Historic development applications for the site

Council records were accessed via a *Government Information (Public Access)* (GIPA) request. Council records (GIPA0576/21) were received on 2 March 2021.

Three building and development applications (BA and DA) have been lodged for Lot 11 DP 1084421 (complete allotment (including the plastics recycling and reprocessing facility site)) between 1989 and 2012. The BA and DAs are summarised in Table 2.2

Table 2.2 Summary of GIPA information relevant to the investigation

Year	Purpose of DA or BA	Outcomes	Comments
1989	Building application (BA 89/0612) for the construction of a factory.	Approved by the council under conditions of approval.	The BA was submitted for Lot 13 in DA 590307. GHD has searched this lot on the NSW ePlanning database and could not identify it. Hence, it was assumed that the BA was submitted for the site.
2008	Development application (DA 08/0525) for the construction of rural dwellings.	Approved by the council under general development conditions.	It does not appear to have been undertaken.
2012	Development application (LUA12/0420) for a two-lot subdivision.	Approved subject to conditions.	No works was undertaken in accordance with this development application. It subsequently lapsed and was resubmitted in 2019 (see below).
2019	Development application (19/1525) for a two-lot subdivision.	Refused	Refusal was based on the absence of a connection to the sewer and stormwater systems. The council noted the site is flood prone, traversed by watercourses, and degraded. The DA also contemplated the use of Braddon Road as the point of vehicular access and was refused on that grounds that it would generate, by reason of future vehicle movements, a significant adverse impact on the residential amenity and safety of Moss Vale residents living to the south of the site. The DA documentation contained no traffic estimates, and that the reason for unacceptability of the (undefined) traffic impacts was unclear.

Data source: Aerial imagery - nearmap 2021 (image date 24/04/2021, image extracted 30/06/2021) ; General topo - NSW LPI DTDB 2020, 2015. Created by: jrprice

Figure 2.4 **Topography**

3. Strategic context and need

The chapter describes the strategic planning context for the proposal, including the key issues and demands that have influenced the need for, and development of, the proposal. Also relevant are the key features of the site and surrounds (see chapter 2) and the alternatives and options that were considered during development of the proposal (see chapter 4).

3.1 Strategic background

The strategic planning context for the proposal is provided by a range of plans and strategies, particularly those that set the direction for the future management of waste in NSW.

The key directions provided in these plans and strategies, and how they influence the strategic context for the proposal, are described below. Further information on the plans and strategies, including a description of their purpose, key relevant directions, and how the proposal is consistent with each, is provided in Appendix E.

Waste hierarchy

The main options for managing waste are usually presented in order of preference known as the waste hierarchy. The waste hierarchy originated from the 1975 European Union Framework Directive on Waste and has become a key waste management concept internationally.

The waste hierarchy (see Figure 3.1) establishes a preferential order of waste management priorities for the efficient use of resources. The waste hierarchy is, in order of priority:

1. **Avoidance**, including action to reduce the amount of waste generated by households, industry and all levels of government.
2. **Resource recovery**, including re-use, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources.
3. **Disposal**, including management of all disposal options in the most environmentally responsible manner.

The waste hierarchy underpins the objectives of the *Waste Avoidance and Resource Recovery Act 2001* (NSW).

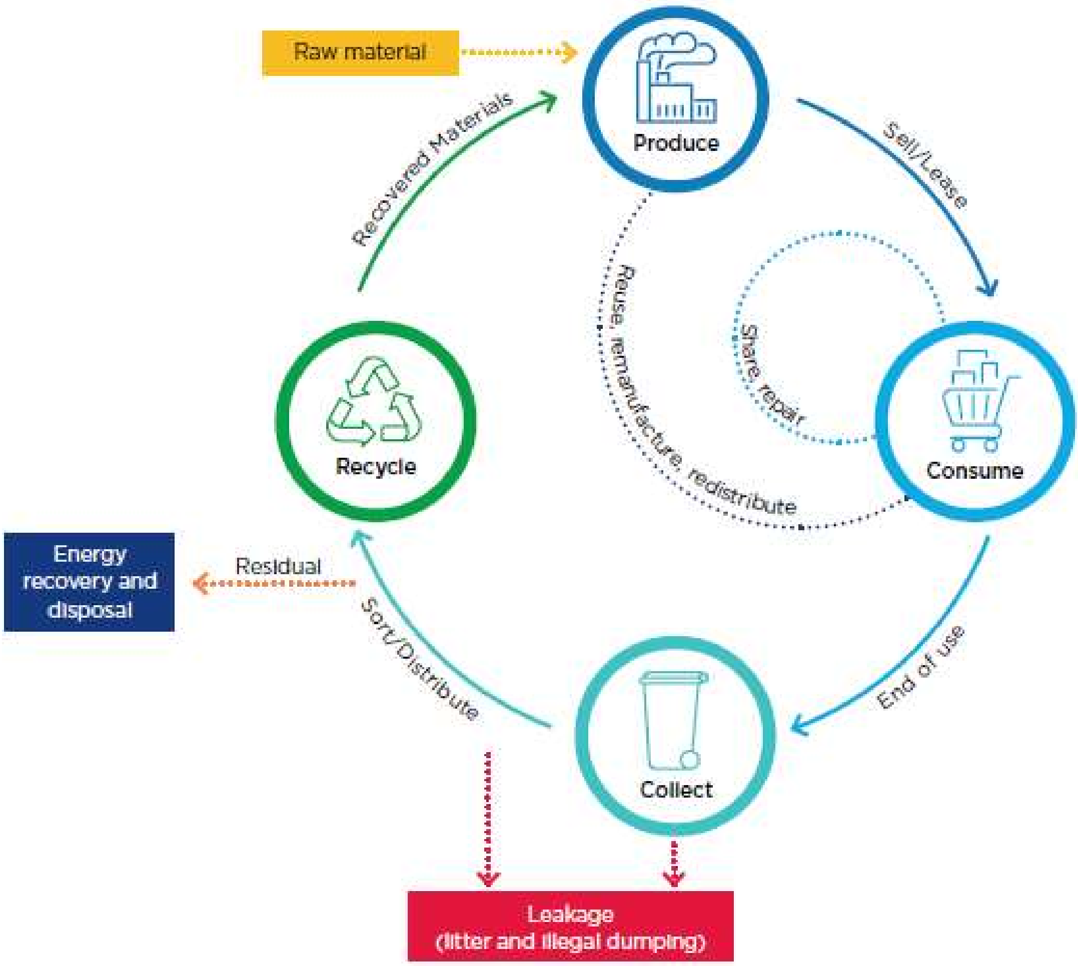
Consistent with the waste hierarchy, where avoiding and reducing waste is not possible, the next most preferred option is to re-use the materials without further processing, followed by recycling.

Source: *NSW Waste Avoidance and Resource Recovery Strategy 2014-21* (NSW EPA 2014)

Figure 3.1 The waste hierarchy

Transitioning to a circular economy framework to the management of waste

There is a global movement towards applying circular economy principles to the economy as a whole (Australian Government et al 2018). A circular economy is an economic system aimed at minimising waste and promoting the continual re-use of resources. The circular economy aims to keep products, equipment and infrastructure in use for longer, thus improving the productivity of these resources. In a circular economy, waste materials and energy should become input for other processes (see Figure 3.2). This approach contrasts with the traditional linear economy, which has a 'take, make, dispose' model of production (DPIE 2021a).



Source: *NSW Waste and Sustainable Materials Strategy 2041* (DPIE 2021a)

Figure 3.2 The circular economy

A circular economy retains the value of materials in the economy for as long as possible, reducing the unsustainable depletion of natural resources and impacts on the environment.

The circular economy is based on three key principles:

1. Design out waste and pollution
2. Keep products and materials in use
3. Regenerate natural systems.

The *National Waste Policy: Less Waste, More Resources* (Australian Government et al 2018) recognises that better management of waste, including application of the waste hierarchy, is a key part of the transition to a circular economy.

The NSW Government's *NSW Circular Economy Policy Statement: Too Good to Waste* (NSW EPA 2019) was released in February 2019, building on NSW's strong track record in waste avoidance and resource recovery. The NSW Circular Policy Statement provided a basis for NSW's updated new waste strategy – the *NSW Waste and Sustainable Materials Strategy 2041* (DPIE 2021a) (the NSW Waste Strategy). The NSW Waste Strategy recognises that NSW is committed to making the transition to a circular economy over the next 20 years. Applying the circular economy principles to waste management in Australia requires changes to product design, production, use and re-use, recycling and disposal.

The NSW Waste Strategy has set a target of an 80 per cent average recovery rate from all waste streams by 2030. It has also set a target to triple the plastics recycling rate by 2030.

The NSW Waste Strategy recognises that moving to a circular economy will stimulate growth in the resource recovery sector as well as creating new industries and jobs through innovation and investment in circular goods and services.

The *National Waste Policy Action Plan* (Australian Government et al 2019) presents targets and actions to implement the *National Waste Policy*. These targets and actions complement and supports the implementation of national packaging targets developed and agreed by Australian businesses and industry through the Australian Packaging Covenant Organisation, and the policies committed in NSW Waste Strategy. The *National Waste Policy Action Plan* actions include a ban on exports of waste plastic by the second half of 2020, phasing out problematic and unnecessary plastic use by 2025 and an 80% resource recovery rate from all waste streams following the waste hierarchy by 2030.

3.2 Need for the proposal

Plastic plays an important role in our society. It is cheap, light and durable and is an essential component to so many of the items we rely on today – from life-saving medical supplies to consumer goods like clothing and electronics. While plastic is versatile, it's also increasingly threatening our natural environment through littering and nearly every piece of plastic produced also emits greenhouse gases at every stage of its lifecycle, contributing to carbon emissions and climate change.

The NSW Waste Strategy highlights that currently, about 99% of plastics are made from fossil feedstocks, plastic production involves significant energy consumption and if current production rates continue, carbon emissions of plastics are forecast to comprise 15% of global emissions by 2050.

With renewed focus on pollution reduction and resource conservation comes acknowledgement of the need to reduce the amount of waste ending up in landfills where the embodied energy and utility value of many resources are lost. The increasing focus on the waste hierarchy and circular economy underpins efforts to divert waste otherwise destined for landfill and drives effort towards increased recycling and more efficient waste management.

An RMIT report for Sustainability Victoria (Carre et al 2015) identified that recycling one tonne of mixed plastic can lead to a net avoidance of 320 tonnes of CO_2 equivalent greenhouse gas emissions, 1.2 kilograms of non-methane volatile organic compounds (ie. smog) and 26 kilolitres of water.

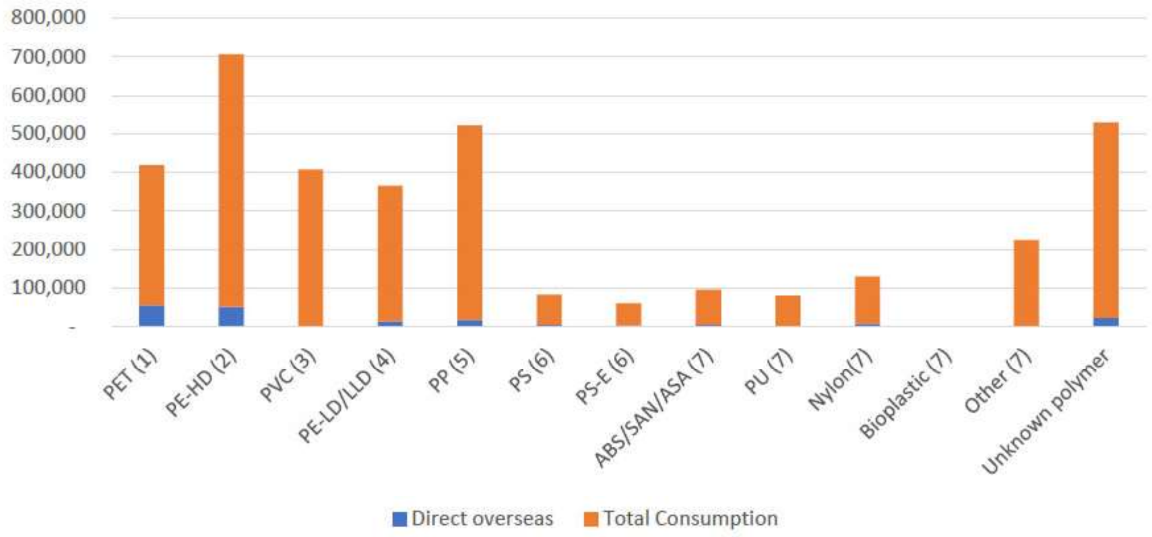
The *2020 National Waste Report* (Blue Environment 2020) provides an overview of Australia's current performance for waste and recycling. It estimated that the Australian plastics consumption in 2018-19 was 3.36 million tonnes, with approximately 2.1 million tonnes (85% of discarded plastics) sent to landfill. The *2020 National Waste Report* also provides data and commentary on the generation, recycling and end destination for the key waste streams in NSW. It shows that there are significant quantities of plastic waste generated in NSW.

The DPIE (2021c) *NSW Waste and Sustainable Materials Strategy: A guide to future infrastructure needs* (the Infrastructure Needs Report), identifies that 760,000 tonnes of plastic entered the waste management system in NSW in 2018-19. Of that, only 19% was recycled into new plastic products or recovered as refuse derived fuel. Therefore over 424,000 tonnes of potentially recyclable plastics was disposed in NSW landfills in 2018-19.

The NSW Waste Strategy also notes that at current rates of generation and recycling, putrescible landfills servicing Greater Sydney are likely to reach capacity within the next 15 years.

There is therefore a strong need to develop additional plastic recycling and reprocessing infrastructure in order to provide the capacity and technology to divert plastic waste from landfill, increase plastics recycling and keep existing plastics in use in the economy.

While there was significant amounts of plastics landfilled, the *2018–19 Australian Plastics Recycling Survey* (Envisage Works 2020) identified that in 2018-19 Australia also exported a total of 190,700 tonnes waste plastics. Figure 3.3 shows the breakdown of the different plastic polymers exported.



Source: *Plastic Feedstock Study* (MRA 2021)

Figure 3.3 Plastic waste generation and export in Australia in 2018-19 (tonnes)

However, in March 2020, the former COAG announced a ban on the export of waste plastic, paper, glass and tyres. The purpose of the ban was to prevent the export of unprocessed waste which will likely have a negative environmental or health impact in the importing countries; to encourage Australian companies to take greater responsibility for the waste consumed in Australia; and to develop Australia's capacity to recycle material and produce high value products from recycled content.

The ban requires exporters to obtain a licence to export waste plastics to a specified quality. The ban on the export of plastic waste is being implemented in two phases:

– Phase 1 (from July 2021):
  - exporters cannot export plastics that have not been sorted into a single resin/polymer type and/or require further sorting, cleaning and processing before re-use in manufacturing.
  - during this phase, exporters will be able to export single resin/polymer plastics that have not been re-processed, such as cleaned and baled polyethylene terephthalate (PET) bottles, and single resin/polymer plastics that have been processed with other materials into a product ready for final consumption, such as processed engineered fuel.
– Phase 2 (from July 2022):
  - exporters cannot export single resin/polymer plastics that have not been re-processed.
  - During this phase, exporters will be able to export single resin/polymer plastics that have been processed for further use, such as flakes and pellets.

The COAG response strategy detailed the volumes of material affected by the export ban based on 2018-19 export data. It showed that a total of 81,000 tonnes of plastic, including 69,000 tonnes of mixed plastics, was exported from NSW and would be affected by the export bans (MRA Consulting Group 2021).

The Infrastructure Needs Report identifies two pipeline plastics recycling facilities, which are expected to provide at least another 41,000 tonnes per year of capacity once operational. However, the report noted that there would still be a gap of about 47,000 tonnes per year (in 2030) in processing capacity for material affected by the export ban.

That is, even if the two other pipeline plastics recycling facilities come online as planned, there is still a need for other facilities to fill the gap in processing capacity for plastics affected by the export bans. There is also a need for even more processing capacity in order to help recover the more than 400,000 tonnes of potentially recyclable plastic wastes currently disposed in NSW landfills each year and meet the NSW Plastics Action Plan target of tripling the plastics recycling rate.

The Infrastructure Needs Report acknowledges that a mix of facilities is needed to handle increasing volumes of plastics across NSW, including commercially viable secondary processing (flaking and pelletising). There is a large potential domestic market for plastic products, however as plastics are currently largely imported, local plastic manufacturing would need to increase to support this.

The Infrastructure Needs Report identifies that to address the export ban and meet the NSW Plastics Action Plan target of tripling the plastics recycling rate, the additional infrastructure listed in Table 3.1 is required in 2030 (assuming the existing pipeline facilities are brought online). This shows that by 2030 an additional 192,000 tonnes of plastics recycling / processing capacity is required.

Table 3.1 2030 plastics recycling capacity needs

Plastics recycling infrastructure needs	Total capacity need (tonnes per year)
Minimum new infrastructure to address export ban requirements	
2 x small secondary processing plants (8,000 t/yr per site), potentially aligned to MRF expansions, including regional focus	16,000
2 x medium secondary processing plants (16,000 t/yr per site) (likely beneficiation given lower capex, but could include chemical processing).	32,000
Sub-total	*48,000*
Minimum new infrastructure to meet the NSW Plastics Action Plan target of tripling the plastics recycling rate	
4 x small (8,000 t/yr per site) secondary processing facilities (including mixed and PP, some via MRF expansions/regional)	32,000
2 x medium (16,000 t/yr per site) secondary processing facilities	16,000
3 x large (32,000 t/yr per site) secondary processing facilities (primarily PET and HDPE)	96,000
Sub-total	*144,000*
TOTAL	**192,000**

Source: NSW Waste and Sustainable Materials Strategy: A guide to future infrastructure needs (DPIE 2021)

The Infrastructure Needs Report also identifies that by 2040 a further 112,000 tonnes per year of additional new capacity for mixed recycling is required (assuming all infrastructure needs to meet the 2030 capacity gap as listed in Table 3.1 are brought online). The report also acknowledges that it is not highly critical where a plastic processing facility is located. It is more important that each facility achieves critical throughput, due to the relatively high capital requirements.

The proposal would have the capacity to recycle and reprocess up to 120,000 tonnes of plastic waste per year including mixed plastics, mixed soft plastics and used PVC pipes. This would provide just part of the required capacity needed in NSW. The proposal would use innovative separation, sorting and cleaning technologies to keep waste plastics out of landfill.

The proposal would also provide local plastic manufacturing capacity consistent with the capacity requirements identified in the Infrastructure Needs Report. It would create a new industry and jobs through innovation and provide investment to produce circular goods in the form of reprocessed advanced plastics products.

As described in Appendix E, the proposal is consistent with key national and NSW waste management plans and policies, and other relevant plans and strategies. In summary:

- The proposal is consistent with the *National Waste Policy: Less Waste, More Resources* and *National Waste Policy Action Plan* as it would transform plastic waste into high value materials, create jobs and contribute towards meeting Australia's resource recovery target.
- The proposal is consistent with the *National Plastics Plan 2021* (DAWE 2021) as it would increase Australia's recycling capacity and contribute towards the packaging and plastics targets.

- Consistent with the NSW Waste Strategy and Infrastructure Needs Report, the proposal would contribute necessary infrastructure to improve NSW's capacity to increase resource recovery and lift both the plastics recycling rate and the overall average recovery rate. It would also increase plastics manufacturing capacity.
- The proposal is consistent with the *NSW Circular Economy Policy Statement: Too Good to Waste* as it would reduce demand for new landfills, provide innovative technologies that increases resource efficiency and create jobs in the resource recovery sector.

The plastics recycling and reprocessing facility would be located on industrial zoned land, within the MVEC and Southern Highlands Innovation Park, which is land specifically set aside by Council for large-scale industrial development and sustainable and innovative businesses.

The plastics recycling and reprocessing facility site is zoned IN1 General Industrial. The objectives of the IN1 General Industrial zone are:

- To provide a wide range of industrial and warehouse land uses.
- To encourage employment opportunities.
- To minimise any adverse effect of industry on other land uses.
- To support and protect industrial land for industrial uses.
- To allow a range of non-industrial land uses, including selected commercial activities, that provide direct services to the industrial activities and their workforce or that, due to their type, nature or scale, are appropriately located in the zone without impacting on the viability of business and commercial centres in Wingecarribee.
- To ensure that new development and land uses incorporate measures that take account of their spatial context and mitigate any potential impacts on neighbourhood amenity and character, or the efficient operation of the local or regional road system.

The proposal is consistent with the objectives of the IN1 zone as it would be an industrial development that provides employment opportunities. The anticipated transition to an 'Enterprise Corridor' industrial zone with predominantly large industrial buildings and associated facilities would require measures to mitigate changes to the character of the area. However, mitigation is proposed through the use of sensitive and considered architecture and landscape design that considers façade articulation, built-form setbacks, architectural screening, and high-quality landscape treatments for visual amenity and screening, as discussed in chapter 16.

4. Alternatives and options

A number of alternative scenarios to achieve the proposal's objectives were considered. These included:

– A 'do nothing' scenario
– Construction of a new facility at an alternate site
– Alternative site configurations and layouts
– Alternative road access options
– Size of the facility

A 'do nothing "scenario would mean that up to 120,000 tpa of mixed plastics that would otherwise be recycled at the proposed facility, would instead potentially go to landfill. This is because no other facility of this scale is currently proposed in NSW or elsewhere in Australia.

Alternative sites were considered, and are discussed in section 4.1 below. Configurations and layouts, and alternative road access are also discussed below. The physical size of the facility as well as its throughput are also discussed.

4.1 Site selection

Sorting and reprocessing of mixed plastics ideally requires large open buildings because of the linear nature of the equipment and material flows. Since articulated vehicles such as semi-trailers are expected to deliver raw material and collect finished products, large turning radii are required for roads servicing the facility.

This means that the site needs to be wide and that such vehicles ideally need to travel around the outside of large wide buildings and potentially in a one direction around the main building, rather than having to do a U turn within the site. There is also a need for a weighbridge prior to the material delivery area and a second weighbridge to weigh products leaving the site. This means that the site needs to be quite deep as well as wide.

Plasrefine Recycling initially considered locating the facility in Western Sydney. One of the parcels of land that was considered was part of the Aerotropolis zone. However, the existing zoning of the site did not permit the use, and the future objectives of the Aerotropolis zone did not appear to be consistent with the activity proposed. Another site was also considered, but a future motorway appeared to significantly reduce the land area available. On these grounds, both sites were rejected.

Plasrefine Recycling decided that the facility did not need to be located in Sydney, but that utilising vacant industrial land in Moss Vale would be preferable to continuing to search for a site within Greater Sydney, because of the good transport links via the M5.

The *Economic Opportunities and Infrastructure Review* prepared for Illawarra First – Illawarra Business Chamber by Cardno (3 May 2020) notes:

> 'The major area of industrial zoned land in the Wingecarribee LGA is located to the immediate northwest of Moss Vale town centre. Described in strategic Council documents as the Moss Vale Enterprise Corridor (MVEC), the area comprises around 1,100 ha of industrial zoned land, most of it IN1 General Industry zoned land…. There is a competitive surplus of land to take advantage of given the location of the enterprise corridor and its strategic position in terms of regional infrastructure. This includes its proximity to the Hume Highway (which provides merge movements in both north and south directions) and being serviced by a natural gas main pipeline, an existing siding of the Main Southern Railway and a direct rail connection to Port Kembla.'

The current site was advertised for sale, with suitable zoning, road access and access to services. Plasrefine Recycling inspected the site, and determined that it was zoned industrial (IN1), of suitable size and a reasonable distance from residential areas, before purchasing the site. Searches of services through Dial Before You Dig showed power, water and sewerage services in the vicinity of the site.

The MVEC and adjacent industrial zoned land together are referred by Council as the Southern Highlands Innovation Park. The *Southern Highlands Destination Strategy 2020-2030* (Destination Southern Highlands and

Wingecarribee Shire Council no date) identifies that the Southern Highlands Innovation Park provides a unique opportunity for large scale industrial development conveniently close to Sydney, and good distribution to most of the country.

The plastics recycling and reprocessing facility site would be located within the MVEC and the Southern Highlands Innovation Park.

4.2 Layout options

A number of different site configuration options were considered. These included facing buildings north south, rather than east west, having raw material delivered on the east side (rather than the west), and having the wastewater treatment plant located on the east side.

To minimise the potential for noise impacts on the adjoining Australian Bioresources (ABR) operations (which are noise sensitive), the raw material delivery was shifted to the western side, so the buildings would shield ABR from potential truck and unloading related noise and the building layout was reconfigured to permit unloading operations to occur within the building rather than on the roadway outside.

The office and workshop areas were moved from the western side of Building 2 to the eastern side, as these would have quieter activities than those potentially associated with manufacturing of products from recycled plastics. The overall size of the buildings on site was reduced as much as possible to ensure adequate setbacks/buffers from the developable footprint to the defined waterways but still enable them to fit the necessary equipment. This minimised the developable footprint and ensured that the bulk and scale of the proposal was not out of character with the surrounding locality and intended future use.

4.3 Road access options

Three key road access options were considered and assessed during development of the proposal. These included:

- Option 1: Beaconsfield Road to Braddon Road (utilising the existing access and “paper road”).
- Option 2: New east-west road along the southern boundary of the ABR site connecting the “paper road” (Braddon Road) with Lackey Road
- Option 3: New north-south road originating along the western boundary of the site and connecting with Douglas Road in the north.

The three road access options were discussed with Council at a meeting on 18 June 2021, at which analysis of each of the three options from a traffic, environmental, safety and strategic perspective was presented. Following this meeting, Council agreed that Option 2, the east-west connection with Lackey Road (Braddon Road east extension), was the most preferred access option, and requested that Plasrefine Recycling acquire the land and build the road at its own cost, then transfer it to Council for future use as a public road, under a yet to be determined financial arrangement.

A Voluntary Planning Agreement (VPA) would be prepared to identify the land required for public purposes (ie the road), the works to be undertaken as ‘works in kind’ and which costs to the Plasrefine Recycling would offset potential developer contributions.

4.3.1 Option 1: Beaconsfield Road to Braddon Road (existing access)

Option 1 includes access to and from the south of the site via Berrima Road, Lytton Road, Beaconsfield Road and a new constructed road to the west (currently a “paper road” – Braddon Road). This option utilises the existing access to 74-76 Beaconsfield Road. Upgrades to Beaconsfield Road would be required for access to the plastics recycling and reprocessing facility site, as shown in Figure 4.1.

A site visit and preliminary traffic and road traffic noise studies confirmed that this road access option would be suitable for use subject to an initial reduction in plant capacity (up to 60,000 tonnes per year depending upon truck capacities), including three heavy vehicles per hour and 30 light vehicles per staff shift (including crossover).

4.3.2 Option 2: New east-west connection with Lackey Road

Option 2 includes access from the south of the site heading east to Lackey Road. This would comprise a new constructed road along the existing "paper road" west of Beaconsfield Road and an extension of this public road along the southern boundary of the Australian BioResources site (Braddon Road east extension), as shown in Figure 4.2 (Option 2a) and Figure 4.3 (Option 2b). Both sub-options align with the future east-west road corridor proposed by Council as part of the MVEC. They are only preliminary designs and detailed design, following project approval and consultation with Council would be required to determine the final alignment.

As the land on which the paper road is shown is currently privately owned, the acquisition (or lease agreement) of a portion of the following parcel of land would be required for the construction of this road using the Option 2a alignment shown on Figure 4.2:

– Lot 10 DP 1084421 (9-11 Lackey Road, Moss Vale) – the Australian BioResources site

The road can be constructed and operated safely with this option, but if a decision is made during detail design to provide a straighter alignment (closer to that shown in Figure 4.3), the following parcel of land would also be affected:

– Lot 1 DP 26490 (77 Beaconsfield Road, Moss Vale)

The purchase of land required for the roadway would need to be arranged by either Plasrefine Recycling or via compulsory acquisition by Council. Council has indicated that Plasrefine Recycling needs to negotiate with the existing owner (or owners) to purchase the land. Option 2b has been assessed in the EIS, as it would impact on more land owners and have a higher potential environmental impact than Option 2a.

Option 2b has been assessed having slightly greater biodiversity impacts than Option 2a, because it would require the removal of a small number of planted trees along the alignment near Beaconsfield Road. Option 2a avoids impacting these trees, but has a slight road curve alignment at the mid-section. It should be noted that neither option provides a straight road alignment because of misalignment between the Braddon Road (paper road) corridor, and existing property boundaries east of Beaconsfield Road.

Option 2b would result in direct impacts on 0.1 hectares of planted native and exotic vegetation that has been assigned to PCT 944 Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion. This is discussed in chapter 17.

Traffic modelling was undertaken to assess the level of performance of the intersection of Lackey Road and the proposed new access road. The results of the analysis are shown in chapter 11. The analysed intersection would have an acceptable Level of Service with spare capacity in both the weekday morning, evening weekday and weekend peak periods during construction and operation.

A noise assessment of road Option 2 (which applies to both sub-options 2a and 2b) is provided in chapter 12. The predicted noise levels from operational traffic on Braddon Road and the Braddon Road east extension, which show that the predicted noise levels at the nearest sensitive receivers to the access road would be below the noise criteria. As construction traffic generation volumes are expected to be lower than the operational traffic volumes, it is anticipated that noise levels during construction would also not result in impacts from the use of Braddon Road and the east west extension during construction.

4.3.3 Option 3: North-south connection with Douglas Road

Option 3 includes access to / from the north of the plastics recycling and reprocessing facility site via Berrima Road, Douglas Road, Collins Road and a new constructed north-south road. This would require constructing a road in the existing road easement and expanding the existing level crossing area, to accommodate vehicles turning left out of the new road onto Douglas Road as shown in Figure 4.4.

During consultation with Council, this option was found to be the least preferred due to the need for heavy vehicles to carry out a hook turn across a level rail crossing associated with the Berrima Branch Line. Reference was made to *Level crossing safety - Transport for NSW and National Railway Level Crossing Safety Strategy 2010-2020* specifically, that level crossing collisions between trains and vehicles are a major road safety risk.

This is of concern given the projected growth in Australian freight over the next few decades: between 2010- 2030, truck traffic is predicted to increase by 50 per cent and rail freight is expected to increase by 90 per cent. In addition, the Berrima Rail Project proposed by Hume Coal (SSD 7171) would, if approved, significantly increase the use of the Berrima Branch Line. This would increase the risk of accidents between heavy vehicles and trains at this level crossing.

In addition, road access Option 3 would result in impacts to nine *Eucalyptus macarthurii* which is an endangered species under the *Biodiversity Conservation Act 2016* (NSW) (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). The occurrence of this species is also associated with the endangered ecological community Southern Highlands Shale Woodlands of the Sydney Basin Bioregion listed under the BC Act.

4.3.4 Road access option summary

A summary of potential positive and negative attributes with each of the above access options are summarised in Table 4.1.

Table 4.1 Summary of road access options

Access options	Positive attribute	Negative attribute
Option 1 - Beaconsfield Road to Braddon Road (utilising the existing access and "paper road")	✓ Utilises existing access road and existing designated "paper roads" ✓ Only option that minimises existing road access ✓ Does not require any acquisition of land ✓ Negligible impact on native vegetation	× Plant throughput reduced below 120,000 tpa capacity to comply with traffic noise criteria on Beaconsfield Road × Road upgrades to Beaconsfield Road would be required × Increased heavy vehicle traffic movements along Beaconsfield Road which Council has indicated it does not support
Option 2: New east-west connection with Lackey Road (along the southern boundary of the proposal site) – Braddon Road east extension	✓ Minimal impact on native vegetation ✓ Maintain access to existing landowners ✓ New road corridor aligns with the MVEC future road network	× New road construction × Land acquisition or agreement required with landowners for the lease of the adjoining site (Australian BioResources). × Moderate terrain
Option 3 – New north-south connection with Douglas Road (along the western boundary of the proposal site)	✓ Generally level terrain	× Impacts to vegetation including *Eucalyptus macarthurii* which are endangered species × Need for heavy vehicles to carry out a hook turn across a level rail crossing × Major road safety risk (collision between trains and vehicles) × New road construction including crossing a watercourse

4.3.5 Access option conclusion and next steps

The three road access options were discussed with Council staff at meetings on 18 June 2021 and 30 August 2021. At the 18 June meeting, Council advised that it would not support the use of Beaconsfield Road for heavy vehicles associated with the operation of the proposal although this was the only current access. It is noted that Beaconsfield Road is not restricted to residential use.

A subsequent meeting was held with Council staff on 30 August 2021, at which Council advised that Plasrefine Recycling needed to negotiate directly with existing landowners to acquire the necessary land for the proposed extension of the unformed Braddon Road eastwards from Beaconsfield Road to Lackey Road. Council indicated that it would agree to the proposed new road being designated as a public road, and that the road had to meet Council's design and construction requirements.

Since the east-west road (Option 2) is shown in the current Section 94 plan for the Moss Vale Enterprise Corridor (MVEC), Plasrefine Recycling proposes that the costs associated with purchasing land and building the road be considered as works in kind and offset against potential Section 94 contributions associated with the proposal. A VPA would be put in place between all parties to transfer the constructed road to Council for future use as a public road.

Figure 4.1 **Option 1: Beaconsfield Road - road upgrade**

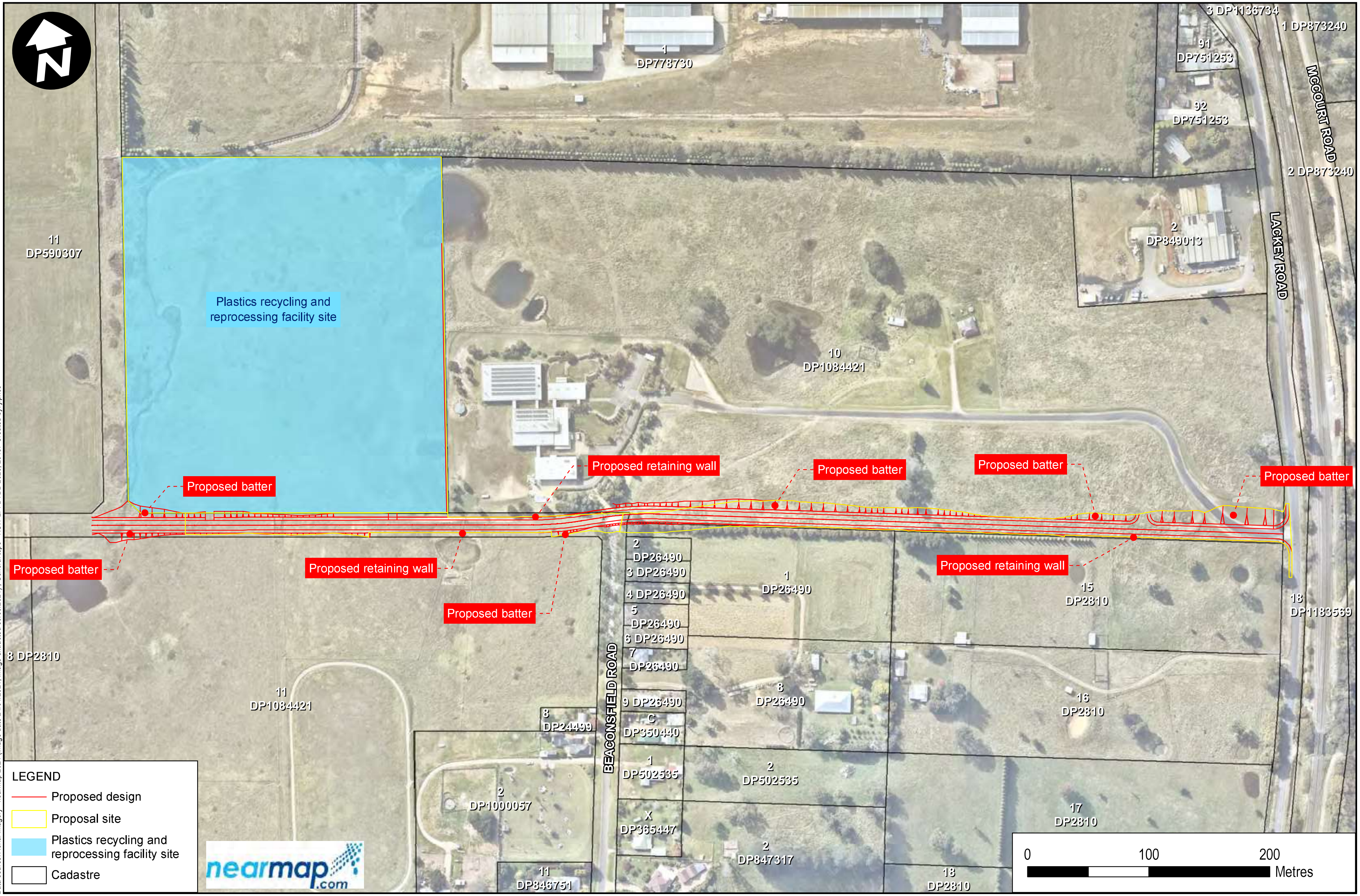


Figure 4.2 **Option 2a: New access road – connecting Lackey Road with the plastics recycling and reprocessing facility site**

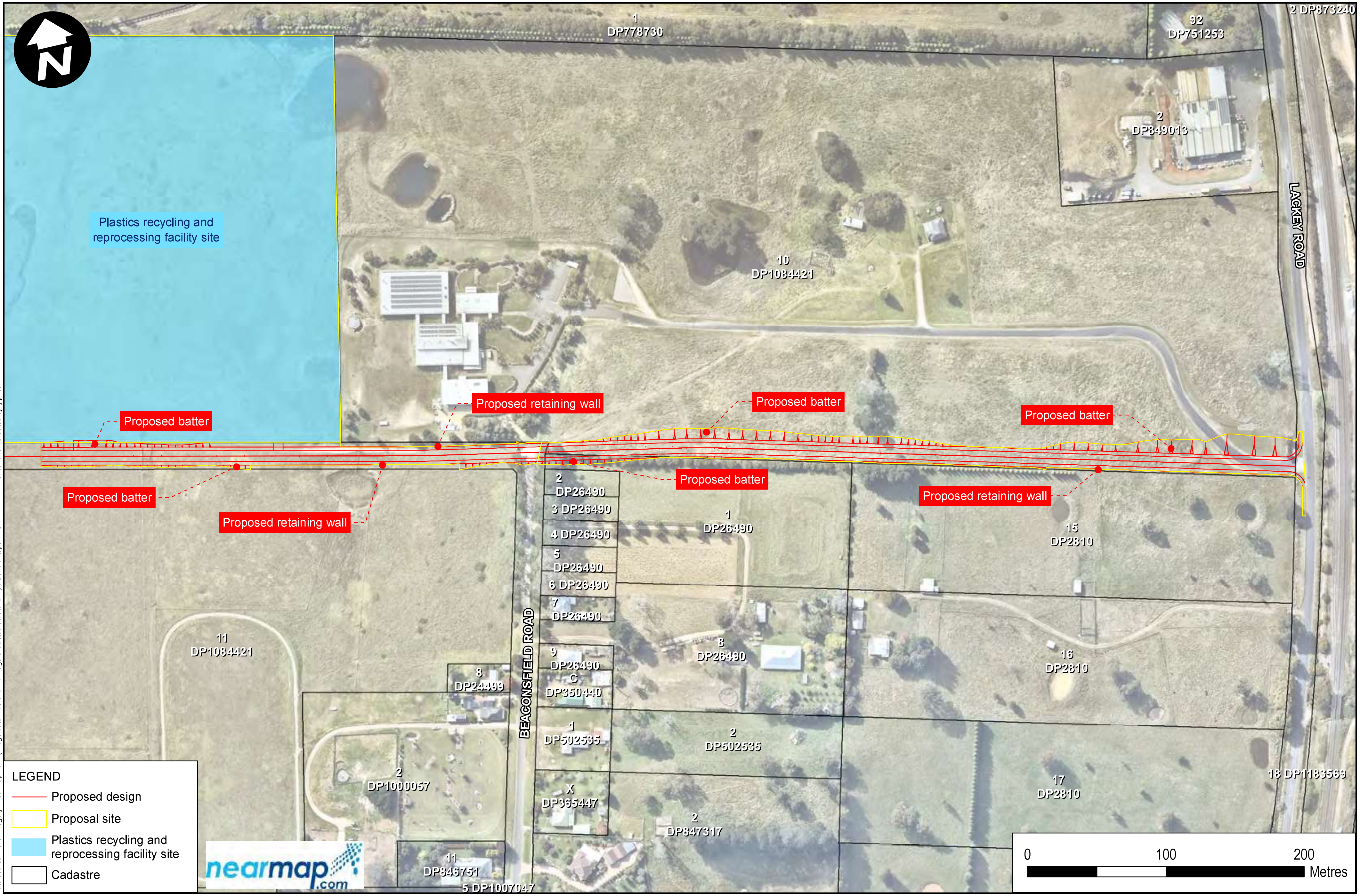


Figure 4.3 **Option 2b: New access road – connecting Lackey Road with the plastics recycling and reprocessing facility site (alternative alignment)**

Data source: Aerial imagery - nearmap 2021 (image date 24/04/2021, image extracted 30/06/2021) ; General topo - NSW LPI DTDB 2020, 2015. Created by: jrprice

5. Statutory context

This chapter provides a summary of the planning approval requirements for the proposal under relevant legislation. The approval pathway and permissibility of the proposal are summarised, relevant planning instruments and legislation are considered, and the pre-conditions to granting approval and mandatory approval considerations are outlined.

5.1 Power to grant approval and permissibility

5.1.1 Approval pathway

The proposal requires development consent in accordance with the requirements of Part 4 of the EP&A Act as a result of the operation of Wingecarribee Local Environmental Plan 2010 (the Wingecarribee LEP) and State Environmental Planning Policy (Infrastructure) 2007 (the Infrastructure SEPP) (see section 5.1.2).

Section 4.36(2) of the EP&A Act provides that a State environmental planning policy may declare any development, or any class or description of development, to be State significant development. The proposal is declared State significant development in accordance with Schedule 1, clauses 20 and 23 of State Environmental Planning Policy (State and Regional Development) 2011 (the State and Regional Development SEPP) (see below).

In accordance with section 4.5(a) of the EP&A Act, the consent authority for State significant development is the Minister for Planning or the Independent Planning Commission (pursuant to section 8A of the State and Regional Development SEPP).

State Environmental Planning Policy (State and Regional Development) 2011

The State and Regional Development SEPP (clause 8(1)) provides that development is State significant development if it is permissible with development consent by the operation of an environmental planning instrument and it meets the definitions provided in Schedule 1 or 2 of the SEPP.

The proposal meets the definitions of 'waste and resource management facilities' in Schedule 1 clause 23, as it is development for the purpose of a resource recovery and recycling facility that would handle more than 100,000 tonnes per year of waste. The proposal also meets a separate definition in Schedule 1 under clause 10, as development for the purpose of the manufacture or reprocessing of polymers, plastics that has a capital investment value of more than $30 million.

As the proposal is permissible with consent under Part 4 of the EP&A Act (see section 5.1.2), and it meets the definitions in Schedule 1 of the State and Regional Development SEPP, it is declared State significant development.

New access road

The proposed new access road meets the definition of regionally significant development under Schedule 7 of the State and regional Development SEPP as it is development for a road infrastructure facility with a capital investment value over $5 million. However, as the proposal is declared State Significant development, the remainder of the development, including the proposed access road, is also declared State significant development (clause 8(2)).

5.1.2 Permissibility

Application of the LEP

The proposal site is located within the Wingecarribee Shire LGA and the relevant local environmental plan is the Wingecarribee LEP.

The proposal involves constructing and operating a facility to sort and recycle waste plastics and meets the definition of a waste and resource management facility under the LEP. The proposed access road is considered to meet the definition of road under the LEP

The land use zones that cover the land on which the proposal site is located are shown on Figure 2.3 and summarised below.

Plastics recycling and reprocessing facility

The site for the proposed plastics recycling and reprocessing facility is zoned IN1 General industrial under the Wingecarribee LEP. In accordance with the LEP zone provisions, a waste or resource management facility is permissible with consent in the IN1 zone.

New access road

The proposed access road would traverse land zoned RU2 Rural Landscape, E4 Environmental Living and IN1 General industrial. In accordance with the LEP provisions, roads are permitted with consent in the RU2, E4 and IN1 zones.

Application of State Environmental Planning Policy (Infrastructure) 2007

In addition to the proposal being permissible with consent under the Wingecarribee LEP, the proposed plastics recycling and reprocessing facility is also permissible with consent under the provisions of clause 121 of the Infrastructure SEPP.

5.2 Other approvals required

Other approvals that are required to carry out the proposal are summarised in Table 5.1. The table summarises the requirements under legislation relevant to the project approval process, and how these apply to the proposal as declared State significant development. It also identifies the approvals that would have been required if the proposal was not State significant development.

Table 5.1 Other approvals required / potentially required

Act	Potentially relevant approval requirement	Relevance to proposal
Consistent approvals[1]		
Protection of the Environment Operations Act 1997 (POEO Act)	An environment protection licence under Chapter 3 for scheduled activities or development work (as defined by clauses 43 and 47-49).	The proposal would require an environment protection licence as plastics processing and recovery of general wastes are defined as scheduled activities in Schedule 1 of the POEO Act.
Roads Act 1993	A consent under section 138(1) dig up or disturb the surface of a public road.	Construction of the proposed access road would involve minor disturbance to Lackey Road where the proposed access road would intersect. There would also be some minor disturbance to the end of Beaconsfield Road during construction where the proposed access road would intersect. Lackey Road is managed by Council (refer to section 7). Consent under the Roads Act 1993 would be required from Council to undertake these works.
Approvals that do not apply[3]		
National Parks and Wildlife Act 1974	An Aboriginal heritage impact permit under section 90.	An Aboriginal heritage impact permit is not required as a result of the application of section 4.41 of the EP&A Act. However, the potential impacts on Aboriginal heritage have been assessed. Further information is provided in chapter 15.

Act	Potentially relevant approval requirement	Relevance to proposal
Water Management Act 2000	A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91.	The proposal would not involve any activities such that these approvals would have been required if the proposal was not State significant development. However, the potential impacts on water resources (including surface and groundwater) have been assessed. Further information is provided in chapter 10.
Approvals under Commonwealth legislation		
Environment Protection and Biodiversity Conservation Act 1999	Approval required for controlled actions.	A BDAR was undertaken for the proposal and is summarised in chapter 17. The BDAR confirmed that the proposal would not have a significant impact on matters of national environmental significance and is not a controlled action.

Notes:

1. Approvals under NSW legislation that must be applied consistently to State significant development in accordance with section 4.42 of the EP&A Act
2. Approvals under NSW legislation that are not expressly integrated into the State significant development assessment process under the EP&A Act

5.3 Pre-conditions to grant approval

There are a number of statutory pre-conditions that must be met by the proponent before the approval authority can exercise its power to grant approval to the proposal. These pre-conditions are outlined in Table 5.2, together with a reference to where relevant information is provided in the EIS.

5.4 Mandatory considerations

Mandatory considerations are the matters that the consent authority is required to consider in deciding whether to grant approval. These considerations are outlined in Table 5.2, together with a reference to where relevant information is provided in the EIS.

Table 5.2 Summary of pre-conditions and mandatory considerations

Statutory instrument	Reference	Relevant considerations / requirement	Relevance	Where addressed in the EIS
Pre-conditions under relevant instruments / SEPPs				
State Environment Planning Policy (Infrastructure) 2007	Cause 104	(3) Before determining a development application for development to which this clause applies, the consent authority must— (a) give written notice of the application to TfNSW within 7 days after the application is made, and (b) take into consideration— (i) any submission that RMS provides in response to that notice within 21 days after the notice was given (unless, before the 21 days have passed, TfNSW advises that it will not be making a submission), and (ii) the accessibility of the site concerned, including— (A) the efficiency of movement of people and freight to and from the site and the extent of multi-purpose trips, and (B) the potential to minimise the need for travel by car and to maximise movement of freight in containers or bulk freight by rail, and (iii) any potential traffic safety, road congestion or parking implications of the development. (4) The consent authority must give TfNSW a copy of the determination of the application within 7 days after the determination is made	This clause applies to the proposal as it is identified as 'traffic generating development' under Schedule 3 of the Infrastructure SEPP being a development for the purposes of waste or resource management facilities of any size. The proposal will be referred to TfNSW as part of the assessment process. Traffic and access impacts of the proposal has been considered in Technical Report 6 – Traffic and Transport, and is summarised in this EIS.	Chapter 11
State Environment Planning Policy (Sydney Drinking Water Catchment) 2011	Clause 10	(1) A consent authority must not grant consent to the carrying out of development under Part 4 of the Act on land in the Sydney drinking water catchment unless it is satisfied that the carrying out of the proposed development would have a neutral or beneficial effect on water quality. (2) For the purposes of determining whether the carrying out of the proposed development on land in the Sydney drinking water catchment would have a neutral or beneficial effect on water quality, the consent authority must, if the proposed development is one to which the NorBE Tool applies, undertake an assessment using that Tool.	The proposal is located on land within the Sydney drinking water catchment. As advised by WaterNSW the development is not a type of development that use of the NorBE tool is applicable to under Clause 10(2) of the SEPP. An assessment considering the neutral or beneficial effect on water quality has been undertaken for the	Chapter 10

Statutory instrument	Reference	Relevant considerations / requirement	Relevance	Where addressed in the EIS
			proposal using the MUSIC assessment tool and the results are summarised in this EIS.	
State Environmental Planning Policy No 55 – Remediation of Land	Clause 7	(1) A consent authority must not consent to the carrying out of any development on land unless— (a) it has considered whether the land is contaminated, and (b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and (c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.	A contamination assessment (Preliminary Site Investigation) has been undertaken for the proposal.	Chapter 10
State Environmental Planning Policy 64 – Advertising and signage (SEPP 64)	Clause 8	A consent authority must not grant development consent to an application to display signage unless the consent authority is satisfied— (a) that the signage is consistent with the objectives of this Policy as set out in clause 3 (1) (a), and (b) that the signage the subject of the application satisfies the assessment criteria specified in Schedule 1.	Proposed signage associated with the proposal will be visible to the surrounding road network. The requirements of SEPP 64 have been considered as part of the urban design and visual impact assessment.	Chapter 16
Considerations under the EP&A Act and Regulation				
EP&A Act	Section 4.15(1) Matters for consideration	In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application (a) the provisions of - (i) any environmental planning instrument	Relevant planning instruments are described in this chapter	
		(ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved)	There are no proposed instruments that are relevant to the proposal.	
		(iii) any development control plan	In accordance with clause 11 of the State and Regional Development SEPP development control plans do not apply to State significant development.	

Statutory instrument	Reference	Relevant considerations / requirement	Relevance	Where addressed in the EIS
		(iiia) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4	The proposal is likely to be subject to the Wingecarribee Developer Contribution Plan 2021. Due to the need to provide a new access road, a Voluntary Planning Agreement (VPA) is under consideration. This would manage the costs of acquisition and construction of the public road by Plasrefine Recycling on behalf of Council, and enable them to be offset against developer contributions that would otherwise be due. Refer chapter 19.	
		(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph)	The EIS has been prepared in accordance with the form and content requirements defined by Schedule 2, Part 3 of the EP&A Regulation.	Appendix B
		(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality	The EIS has assessed the potential impacts of the proposal in accordance with the SEARs.	Chapter 9 to 18
		(c) the suitability of the site for the development		Section 21.1.4
		(e) the public interest (including the objects of the EP&A Act and the principles of ecologically sustainable development)		Section 21.1 Appendix B
Considerations under environmental planning instruments				
State and Environmental Planning Policy (Sydney Drinking Water Catchment) 2011	Clause 9	(1) Any development or activity proposed to be carried out on land to which this Policy applies should incorporate Water NSW's current recommended practices and standards. (2) If any development or activity does not incorporate Water NSW's current recommended practices and standards, the development or activity should demonstrate to the satisfaction of the consent authority or determining authority how the practices and performance standards proposed to be adopted will achieve outcomes not less than those achieved by Water NSW's current recommended practices and standards.	The proposal is located on land within the Sydney drinking water catchment. The proposal would be designed and constructed in accordance with Water NSW's recommended practices and standards.	Chapter 10
State Environmental Planning Policy No.	Clause 13	In determining an application to carry out development to which this Part applies, the consent authority must consider (in addition to any other matters specified in	A preliminary risk screening has been prepared which	Chapter 14

Statutory instrument	Reference	Relevant considerations / requirement	Relevance	Where addressed in the EIS
33 Hazardous and Offensive Development (SEPP 33)		the Act or in an environmental planning instrument applying to the development)— (a) current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development, and (b) whether any public authority should be consulted concerning any environmental and land use safety requirements with which the development should comply, and (c) in the case of development for the purpose of a potentially hazardous industry—a preliminary hazard analysis prepared by or on behalf of the applicant, and (d) any feasible alternatives to the carrying out of the development and the reasons for choosing the development the subject of the application (including any feasible alternatives for the location of the development and the reasons for choosing the location the subject of the application), and (e) any likely future use of the land surrounding the development.	concluded that the proposal is not a potentially hazardous industry for the purposes of the SEPP.	
State Environment Planning Policy (Koala Habitat Protection) 2021	Clause 11	(2) Before a council may grant consent to a development application for consent to carry out development on the land, the council must assess whether the development is likely to have any impact on koalas or koala habitat. (3) If the council is satisfied that the development is likely to have low or no impact on koalas or koala habitat, the council may grant consent to the development application. (4) If the council is satisfied that the development is likely to have a higher level of impact on koalas or koala habitat, the council must, in deciding whether to grant consent to the development application, take into account a koala assessment report for the development. (5) However, despite subclauses (3) and (4), the council may grant development consent if the applicant provides to the council— (a) information, prepared by a suitably qualified and experienced person, the council is satisfied demonstrates that the land subject of the development application— (i) does not include any trees belonging to the koala use tree species listed in Schedule 2 for the relevant koala management area, or (ii) is not core koala habitat, or (b) information the council is satisfied demonstrates that the land subject of the development application— (i) does not include any trees with a diameter at breast height over bark of more than 10 centimetres, or (ii) includes only horticultural or agricultural plantations.	This SEPP applies to part of the proposal on land zoned IN1 General Industrial. It does not apply to the part of the proposal on land zoned RU2. The presence of koala habitat and the potential impact of the proposal on koalas has been considered via a habitat assessment including surveys for koala food trees. The assessment concluded that the proposal site does not contain core koala food trees or important habitat for koalas	Chapter 17
Wingecarribee LEP	Clause 2.3	Consistency with zone objectives	The proposal and proposed access road	Chapter 3

Statutory instrument	Reference	Relevant considerations / requirement	Relevance	Where addressed in the EIS
	Objectives for IN1, RU2 and E4 Zones		are permissible within the subject zones and are consistent with the zone objectives.	
Relevant considerations under other legislation				
Biodiversity Conservation Act 2016	Part 7, Section 7.14(2)	The Minister must take into consideration the likely impact of the proposed development on biodiversity values as assessed in the biodiversity development assessment report.	A BDAR has been prepared for the proposal.	Chapter 17
Development Control Plans (DCP)s				
Moss Vale Enterprise Corridor Development Control Plan 2008 (MVEC DCP)	Part 3	Development controls	Pursuant to the provisions of Clause 11 of the SRD SEPP, development control plans do not apply to SSD. Notwithstanding the above, the proposal has been designed to have regard to the DCP wherever possible Development controls provided in the MVEC DCP are considered as part of the LVIA Report.	Chapter 16

6. Engagement

This chapter summarises the community and stakeholder engagement undertaken prior to and during preparation of the EIS, and the consultation proposed to be undertaken during design and delivery of the proposal. The key issues relevant to the EIS are summarised. Further information is provided in the engagement outcomes report, included in Appendix G.

6.1 Engagement approach

6.1.1 Overall approach and objectives

Communication and engagement approach

GHD developed a Community Engagement Strategy (Appendix G) at the commencement of the proposal, which:

- identified key stakeholders (as part of the SEARs)
- identified directly impacted stakeholders
- captured a communication risk assessment
- recommended an engagement program.

The Core Values and Code of Ethics of the International Association for Public Participation (IAP2) (Figure 6.1) guided the engagement approach for this proposal. The IAP2 Spectrum (Figure 6.1) underpins our engagement activities, and their audiences, as reflected in section 6.1.2. The level of participation during the preparation of the EIS for the proposal was primarily at the 'inform' and 'consult' levels of engagement.

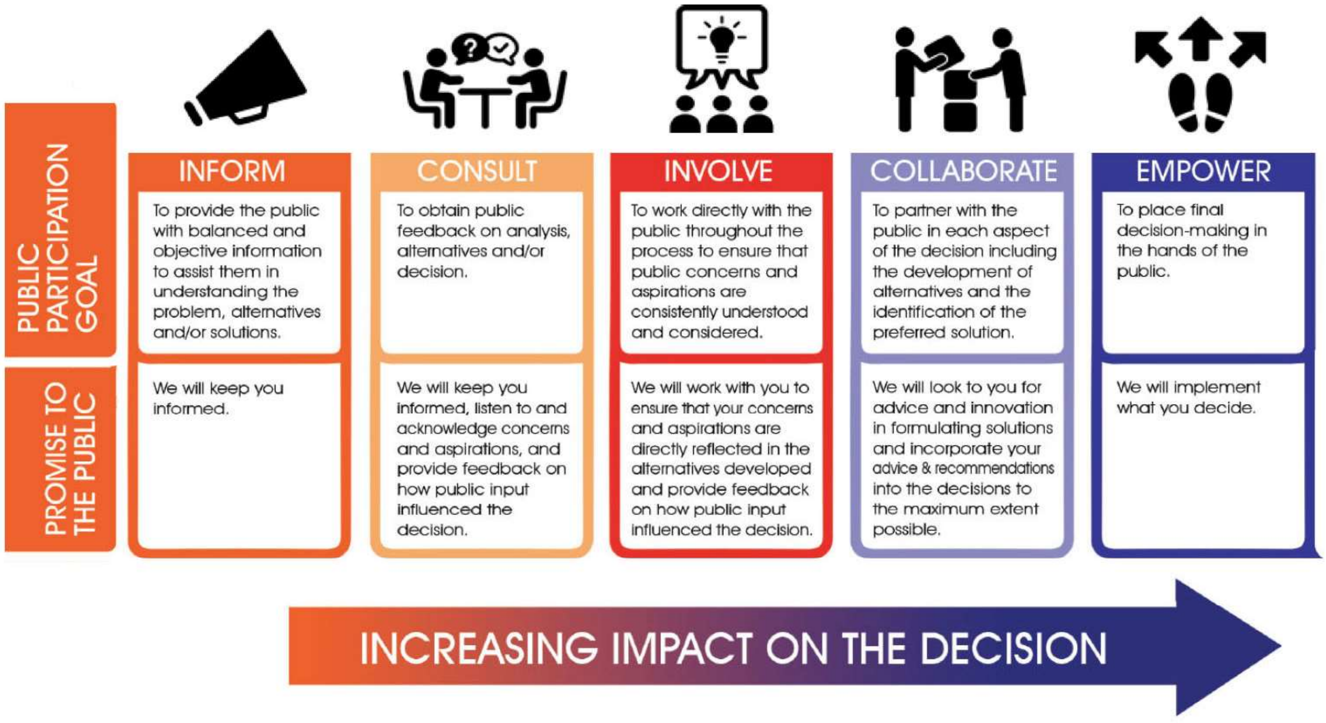


Figure 6.1 International Association for Public Participation Spectrum (IAP2 International Federation 2018)

The level of participation for the engagement undertaken during the EIS was based on the level of community and stakeholder impact of the proposal, and the desire of Plasrefine Recycling to ensure adequate feedback was received.

By consulting with the community and stakeholders at these levels, the project team demonstrated that they would work with the community and stakeholders to ensure that concerns and aspirations are reflected in the concept design and environmental assessment. Where feasible, feedback will be provided on how their input influenced the decision-making process.

Principles of engagement

At the commencement of the proposal, Plasrefine Recycling and GHD proposed a clear and comprehensive approach to engaging with the community and stakeholders. This approach is based around the principles of regular, two-way communication and active listening:

- Being responsive to all stakeholders
- Providing information about the proposal and its impacts
- Explaining how community feedback is used
- Providing ongoing opportunities for feedback.

Communication and engagement objectives

To successfully deliver appropriate community and stakeholder engagement in accordance with the SEARs and DPIE's *Undertaking Engagement Guidelines for State Significant Projects* (July 2021), GHD worked within the following engagement objectives:

- Build and maintain relationships with the community and stakeholders
- Ensure that a broad range of the local community and stakeholders are informed about the proposal and were given the opportunity to provide feedback
- Provide the community and stakeholders with an opportunity to ask questions and to identify areas of concern with respect to the proposal
- Provide direct feedback to the project team during all stages of the proposal and develop solutions that address community expectations, where possible
- Identify and manage issues, effectively and proactively
- Manage stakeholder feedback and complaints in a timely, respectful way
- Satisfy the engagement requirements stipulated in the SEARs
- Monitor and evaluate stakeholder feedback to measure success
- Build community and stakeholder confidence in Plasrefine Recycling and the decisions it makes through transparency and ongoing commitment to working in partnership with the community.

6.1.2 Stakeholder identification

Understanding the local community and identifying stakeholders is critical to the success of the proposal and community engagement activities. A stakeholder is defined as any individual, group of individuals, organisation or political entity with an interest in the outcomes of a decision. They may be, or perceive that they may be, affected directly or indirectly by the outcome of a decision related to the proposal.

The key stakeholder groupings for the proposal and the environmental assessment, and the justification for their selection can be seen in Table 6.1.

Table 6.1 Stakeholder identification and justification

Stakeholder grouping	Justification for selection
Elected government members (NSW and local government) and representative of relevant government agencies and organisations, including statutory authorities and Wingecarribee Shire Council (Council)	**Level of influence:** High **Level of interest:** High The decisions made by this stakeholder grouping directly impact the proposal, and/or the proposal would directly impact them.
Interest groups, including peak bodies, community, environment, and other specialist groups	**Level of influence:** Moderate **Level of interest:** High This stakeholder grouping may experience regional impacts and benefits during construction and operation of the proposal.

Stakeholder grouping	Justification for selection
Landowners and landholders with properties within close proximity to the proposal site	**Level of influence:** Moderate **Level of interest:** High Construction and operation of the proposal would directly impact this stakeholder grouping.
Local/regional businesses	**Level of influence:** Moderate **Level of interest:** Moderate This stakeholder grouping may experience regional impacts and benefits during construction and operation of the proposal.
The general public/local community	**Level of influence:** Moderate **Level of interest:** High This stakeholder grouping may experience regional impacts and benefits during construction and operation of the proposal.

6.2 Engagement during the environmental assessment process

Engagement with community and stakeholders was carried out during the environmental assessment process. The purpose of consultation was to raise awareness about the proposal, understand community and stakeholder issues, and obtain important feedback to help shape the proposal's design and environmental assessment.

A summary of the activities and tools employed during the environmental assessment process is provided in Table 6.2. Further information is provided in Appendix G.

Table 6.2 Engagement tools

Engagement and communication tools	Purpose/summary	Timing
Toll free project hotline (1800 810 680)	– Enables responses for queries about the proposal – This line is open 24 hours a day, seven days a week. – Community and stakeholder engagement advisors take calls and direct queries to the appropriate subject matter expert for a response.	Established September 2020, ongoing
Project email (community.input@ghd.com)	– A dedicated project inbox for the community and stakeholders to contact the project team by email and for correspondence.	Established September 2020, ongoing
Stakeholder database	– A record all correspondence relating to the proposal, including feedback, concerns, and comments.	Established September 2020, ongoing
Printed information: letters – project newsletter letter box drops	– Raise awareness and understanding of the proposal. – Provided to the community and stakeholders to increase understanding of the proposal. – Newsletter hand delivered to over 4,600 residences within proximity to the proposal site, and emailed to stakeholders on the mailing list (see Appendix G)	Commenced in December 2020, ongoing
Door knocks	– Door knocks to residents along Beaconsfield Road and Bulwer	March 2021

Engagement and communication tools	Purpose/summary	Timing
	Road to hand deliver a copy of the newsletter. – 'Sorry we missed you' cards and a copy of the newsletter were left if local residents were not home during the time of the door knock.	
Stakeholder meetings and briefings	– An event to address specific questions and issues – Build relationships and trust. Provide an opportunity for community and stakeholder input to inform the design process and development of the EIS.	Commenced in November 2020, as required
Introductory email to local member of state parliament	– Provided to Wendy Tuckerman MP to introduce the proposal and offer a briefing.	December 2020
Plasrefine Recycling website (www.plasrefine.com.au)	– Raise awareness and understanding of the proposal. – Provide information to the community and stakeholders, allowing them to ask questions, share their views, issues and concerns, and request additional information. – Includes minutes from community engagement sessions and Frequently Asked Questions (FAQs) – Updates as required to reflect the stages of the proposal.	Established March 2021, ongoing
Emails	– Promote engagement channels and opportunities to learn more about the proposal. – Promote when community feedback and inputs are required. – Provide information to the community and stakeholders	Established March 2021, ongoing
Local media: – advertisement in local newspaper	– Raise awareness and understanding. – Provide information and promote channels through which the community and stakeholders can communicate their views, issues and concerns. – Highlight proposal milestones. – Publicise community information sessions	November 2021
Responses to local media enquiries	– Provide responses to queries emailed to the project team by local media outlets	As required
Online and in-person community engagement sessions	– To provide information on the proposal to the community and stakeholders – Seek local input to inform the design process and the environmental assessment.	July, August and November 2021
Frequently Asked Questions (FAQs)	– To provide responses to commonly asked questions from the	May 2021

Engagement and communication tools	Purpose/summary	Timing
	community and stakeholders and make them available to the public	FAQ update 1: June 2021

6.2.1 Engagement activites

As part of the development of the EIS, GHD undertook engagement activities with a number of community members and stakeholders. The purpose of this engagement was to raise awareness about the proposal, understand community and stakeholder issues, and obtain important feedback to help shape the environmental assessment.

An overview of the community and stakeholder engagement activities can be seen in Appendix G.

6.3 Summary of issues raised and responses to feedback received

6.3.1 Where issues relevant to the EIS have been addressed

A summary a key issues raised during consultation during the environmental assessment process, including the potential impacts to be considered and the information to be provided by the EIS, is provided in Appendix C. More detailed information on the issues raised by stakeholders is provided in Appendix G.

6.3.2 How the proposal has responded to the inputs received

During development of the environment assessment process, the design of the facility and its access point was iterative and dependent on rigorous engineering and ongoing community and stakeholder engagement. Where possible, Plasrefine Recycling has sought to incorporate community and stakeholder feedback directly into the design process. This process has enabled the following changes to the proposal:

- Further consideration of the types of trucks servicing the site has identified average loads of 20 tonnes in trucks (rather than 10 tonnes which was assumed initially) are more likely to be used. Therefore Technical Report 3 - Traffic and Transport was updated to assess up to 50 trucks accessing the site per day (Monday – Friday). This would result in 100 truck movements per day (Monday – Friday 7 am – 6 pm). **This equates to 3 trucks per hour (6 movements).**
- Undertaking detailed traffic and safety assessments, civil and environmental engineering, and consultation with the local community and Council to **identify an alternate road access option** for the plastics recycling and reprocessing site.
- Enclosing all plastic waste receival, recycling, reprocessing and storage within buildings with automatic opening and closing doors **to minimise the potential for noise impacts** and **to prevent waste materials from entering the environment**.
- Shifting the entire developed area of the site eastwards **to provide greater distances** from the waterway on the western side of the site and **to meet riparian zone objectives** in accordance with *Controlled Activities on Waterfront Land: Guidelines for riparian corridors on waterfront land* (NSW Office of Water 2012).
- Minimising the overall size of the building onsite as much as possible **to minimise the amount of developed land**, and **also to maximise the distance between the facility and the nearest sensitive receivers**.
- Careful selection of plant, equipment and building materials **to reduce noise emissions and vibration** and enable the proposal to meet strict operational noise criteria defined by the *Noise Policy for Industry* (NSW EPA 2017).
- Incorporating air pollution control devices on all crushing, granulation and injection or extrusion moulding production lines **to treat air emissions at source** and therefore minimise air emissions.
- Designing the concept site layout **to enable all waste delivery trucks to queue entirely within the site** (avoid any queuing on Braddon Road).
- Provision of an on-site wastewater treatment plant **to recycle water used in the plastic cleaning processes** in order to maximise water re-use and reduce demand on potable water.

- Enclosing the wastewater treatment plant and placement on the site **to minimise potential for noise or odour**.
- Installing rainwater tanks **to capture roof water and further reduce potable water demand**.
- Preparing a water quality treatment train including gross pollutant traps for primary treatment of runoff from impervious ground surfaces, lined storage basins for rainwater tank overflow and gross pollutant trap outflow and a bioretention filter basin and swale immediately downstream of storage basins **to ensure all water discharged off-site would have a neutral or beneficial effect on water quality**.
- Designing the internal building layout **to ensure internal plastic waste stockpile dimensions and volumes would comply** with the *Fire safety guideline - Fire safety in waste facilities* (FRNSW 2020).

Amendments which were unable to be implemented

During preparation of the EIS, GHD and Plasrefine Recycling have sought to address all community and stakeholder concerns, and implement changes to the design and development of the proposal based on this feedback.

During preparation of the EIS and in consultation with Council, it has been identified that if construction of the new access road is delayed due to land acquisition issues, the proponent would need to use Beaconsfield Road for construction access until the new road is available. During this period, limitations on the number of heavy vehicle movements allowable on Beaconsfield Road would be implemented to ensure compliance with the noise criteria stipulated in the *Construction Noise and Vibration Guideline* (Transport for NSW 2016).

6.4 Future engagement

6.4.1 Engagement during exhibition of the EIS

The EIS will be placed on public exhibition by the NSW DPIE for a minimum of 28 days. During this period, local residents, stakeholders and members of the wider community will be able review the EIS and are invited to make submissions. Engagement activities to be undertaken during the public exhibition period can include:

- Advertisements in the local media providing information regarding the proposal and display of the EIS (Council newsletters, local news outlets, etc.)
- Series of in-person and online community engagement sessions during the first week of public exhibition to assist project stakeholders with making an informed submission
- Briefings to stakeholders and community members, as required
- Fortnightly project newsletters

The EIS will also be made available for viewing on the DPIE Major Projects and Plasrefine Recycling websites. The public will be able to review the EIS and send submissions to DPIE for consideration. While all submissions received will be made available for viewing on the DPIE Major Project website, if requested, the privacy of submitters will be protected by redacting names from submissions.

6.4.2 Submissions report

Written submissions received by DPIE during the EIS exhibition period will be forwarded to Plasrefine Recycling and GHD for consideration and review.

After reviewing the submissions, GHD will prepare a Response to Submissions report, which will document all submissions received and responses to the submissions in accordance with the Environmental Planning and Assessment Regulation 2000.

Once the Response to Submissions report has been published on the DPIE Major Project website, Plasrefine Recycling's website will also be updated. Community members and stakeholders will be informed via email that the Response to Submissions report is available. In the event that design changes to the proposal are required, to reduce or minimise impacts, an Amendment Report will be prepared, and further engagement on the Amendment Report may be required by DPIE.

Further guidance on this process is available on the DPIE Major Projects website.

6.4.3 Engagement during design and delivery of the proposal

Plasrefine Recycling is committed to ongoing communication and engagement activities. Should the project receive approval, the communication and engagement activities to be undertaken during this period would be confirmed during post approval and would ensure that:

- landholders, community and stakeholders have a high level of awareness of all processes and advanced notification of activities associated with the project
- accurate and accessible information is made available
- a timely response is given to issues and concerns raised by the community
- feedback from the community is encouraged
- opportunities for further input are provided.

A project 1800 number and email address will continue to be available during construction. Targeted engagement methods, such as letters, notifications, signage and face-to-face communications, would continue to occur. The Plasrefine Recycling website will also include updates on the progress of the project.

The following engagement tools and activities will continue to be used during the construction phase:

- Development of a post-approval communication management plan detailing a complaint handling process
- Project email address
- 1800 phone number
- Updates to the Plasrefine Recycling website
- Targeted engagement and notifications, such as letters, notifications, and face-to-face communications
- Construction signage.

Upon determination, DPIE will also decide whether a Community Consultative Committee should be established for the project, considering factors such as:

- the scale and nature of the project and its potential impacts
- the level of public interest in the project
- the proponent's community engagement strategy

If DPIE determines a Community Consultative Committee is warranted for the project, Plasrefine Recycling will be required to establish this committee following approval through the conditions of the project.

6.5 Complaints management

A complaints management system will be developed and implemented prior to the commencement of construction. It would be maintained throughout the construction period and for a minimum of six months following completion of the construction program. The complaints management system would include the following:

- A response line for complaints and enquiries
- A postal and email address to which complaints and enquiries may be sent
- Publication of contact details on the Plasrefine Recycling website
- Management of complaints in accordance with Plasrefine Recycling's complaints management procedure.

7. Proposal description

7.1 Overview

The proposal would involve the construction and operation of a plastics recycling and reprocessing facility with capacity to receive up to 120,000 tonnes per year of mixed plastic waste.

The proposal would sort the mixed plastics into different types and convert the various plastics to flakes and pellets (in the first stage) and produce more advanced plastic products (in the second stage). The combined outputs of both stages of the proposal would help fill the gap in local processing capacity for mixed plastics.

7.1.1 Physical infrastructure/design features

The main physical elements of the proposal development would include:

- Buildings and plant that comprise the plastics recycling and reprocessing facility including:
  - two main buildings for mixed plastics and waste receival, recycling and reprocessing and finished product storage
  - a wastewater treatment plant
- Ancillary infrastructure including:
  - offices
  - truck parking
  - staff and visitor parking
  - internal roadways and weighbridges
  - water management infrastructure
  - fire management infrastructure
  - landscaping and fencing
- A new access road via Braddon Road (currently unformed) and extending to Lackey Road (the Braddon Road east extension):

Further information on these features is provided in sections 7.2 and 7.3.

Impact mitigation features incorporated into the physical layout and design of the proposal

The key impact mitigation features that are incorporated in the design of the proposal include:

- enclosure of all plastic waste receival, recycling, reprocessing and storage within buildings with automatic fast opening and closing doors to minimise the potential for noise impacts and prevent waste materials from entering the environment
- design of the concept site layout to enable the main doors where waste delivery trucks would enter and exit to be placed on the western side of the building, facing away from the nearest sensitive receivers
- careful selection of plant, equipment and building materials to reduce noise emissions and vibration and enable the proposal to meet strict operational noise criteria defined by the *Noise Policy for Industry* (NSW EPA 2017)
- localised capture of emissions from individual processing units with emissions ventilated to a total of four emission control systems for treatment prior to discharge
- design of the concept site layout and access road to minimise (and avoid where possible) potential impacts to riparian vegetation and native vegetation
- design of the concept site layout to enable all waste delivery trucks to queue entirely within the site (avoid any queuing on Braddon Road)

- provision of an on-site wastewater treatment plant to recycle water used in the plastic cleaning processes in order to maximise water re-use and reduce demand on potable water
- enclosure of the wastewater treatment plant and placement on the site to minimise potential for noise or odour
- installation of rainwater tanks to capture roof water and further reduce potable water demand
- a water quality treatment train including gross pollutant traps for primary treatment of runoff from impervious ground surfaces, lined storage basins for rainwater tank overflow and gross pollutant trap outflow and a bioretention filter basin and swale immediately downstream of storage basins to ensure all water discharged off-site would have a neutral or beneficial effect on water quality
- design of the internal building layout to ensure internal plastic waste stockpile dimensions and volumes would comply with the *Fire safety guideline - Fire safety in waste facilities* (FRNSW 2020)

7.1.2 Operational characteristics

Table 7.1 Proposal key elements

Proposal element	Summary
Physical elements	
Plastics recycling and reprocessing facility	A facility to recycle and reprocess mixed plastic waste that would otherwise be landfilled. The facility would have a footprint of about six hectares (including buildings, roads and areas for water management), occupying part of lot 11, DP 1084421 (at 74-76 Beaconsfield Road, Moss Vale). The total area of the northern part of the allotment is 7.7 hectares.
Access road	About 915 metres of new public road from Lackey Road to the facility entrance
Plastics recycling and reprocessing facility life	Notionally 25+ years
Operational elements	
Processing capacity	Up to 120,000 tonnes per year
Input waste streams	100,000 tonnes of mixed plastics and up to 20,000 tonnes of polyvinyl chloride (PVC) and plastic films Up to 4,800 cubic metres of feedstock material stored at any one time within Building 1.
Input water	About 46.3 kilolitres per day sourced from a combination of rainwater harvesting and potable water supply connection to the mains
Outputs for offsite recycling or re-use	Up to 107,000 tonnes per year of various plastic products, recovered metals or refuse derived fuel
Sewage	About 5.8 kilolitres per day of sewage for disposal to sewer via a new sewer connection
Hours of operation	
Recycling and reprocessing	Continuous (seven days per week, 24 hours per day) Up to eight weeks planned shutdown/maintenance per year
Waste delivery hours	7am to 6pm weekdays
Administration, visitor and education centre hours	9am to 5pm weekdays
Process wastes	
Process wastes	About 10,000 tonnes per year of residual waste for disposal to landfill About 9,000 tonnes per year of dewatered sludge (filter cake residue) from the wastewater treatment plant for disposal to landfill for further processing into refuse derived fuel, or otherwise disposal to landfill About 1,800 tonnes per year of filter residue and waste filters from the extrusion and granulation process for disposal to landfill
Process wastewater	About 10 kilolitres per year for disposal to sewer via a new sewer connection

7.1.3 Design standards and requirements

The design has been, and would continue to be, prepared in accordance with relevant standards and design requirements for the plastics recycling and reprocessing facility and access road, including:

- *Guide to Traffic Generating Developments* (Roads and Traffic Authority 2002 as updated)
- AS/NZS 2890.1 *Parking facilities – Part 1: Off-street car parking* (Standards Australia 2004)
- *Managing Urban Stormwater: Soils and Construction – Volume 1* (Landcom 2004)
- *Controlled Activities on Waterfront Land: Guidelines for riparian corridors on waterfront land* (NSW Office of Water 2012)
- AS2441-2005 *Fire Hose Reels Installation* (Standards Australia 2005)
- Water Sharing Plan for the Greater Metropolitan Region Unregulated Water Sources 2011
- AS1851-2012 *Routine Service of Fire Protection Systems and Equipment* (Standards Australia 2012)
- AS2118.1-2017 *Automatic Fire Systems* (Standards Australia 2017)
- *NSW Noise Policy for Industry* (NSW EPA 2017)
- AS/NZS 2890.2 *Parking facilities – Part 2: Off-street commercial vehicle facilities* (Standards Australia 2018a)
- AS1670.1-2018 *Fire detection, warning, control and intercom systems - System design, installation and commissioning* (Standards Australia 2018b)
- *Using MUSIC in the Sydney Drinking Water Catchment* (WaterNSW 2018)
- AS/NZS 4282 *Control of obtrusive effects of outdoor lighting* (Standards Australia 2019)
- *Building Codes of Australia 2019 Amdt1 ed.* (2018 ed.) (Australan Building Codes Board 2020)
- *Fire safety guideline - Fire safety in waste facilities* (FRNSW 2020)
- *Guide to Road Design, Part 4A: Unsignalised and Signalised Intersections* (Austroads 2021)

7.2 Plastics recycling and reprocessing facility features

The proposed layout, buildings, infrastructure and ancillary components of the plastics recycling and reprocessing facility are described in the following sections.

7.2.1 Overview and layout

Figure 7.1 provides a concept site layout showing the physical locations of the key elements of the plastics recycling and reprocessing facility. The layout would be refined further during detailed design but not in any manner that would increase any potential impacts associated with water, air, noise and vibration beyond those described and assessed by this EIS.

A visual representation of the plastics recycling and reprocessing facility (without any vegetation screening) is shown in Figure 7.2. Final building material and finishes would be confirmed during detailed design. The materials are expected to be typical of industrial buildings – concrete footings and foundations, steel framework and metal cladding, and metal sheeting roofs. Acoustic insulation would be installed where required to ensure operational noise criteria are met.

Colours and finishes would be chosen carefully to blend with the existing surrounding landscape and other existing industrial facilities in the general locality. Architectural plans are provided in Appendix I.

Details on the recycling and reprocessing operations are provided in section 7.5.

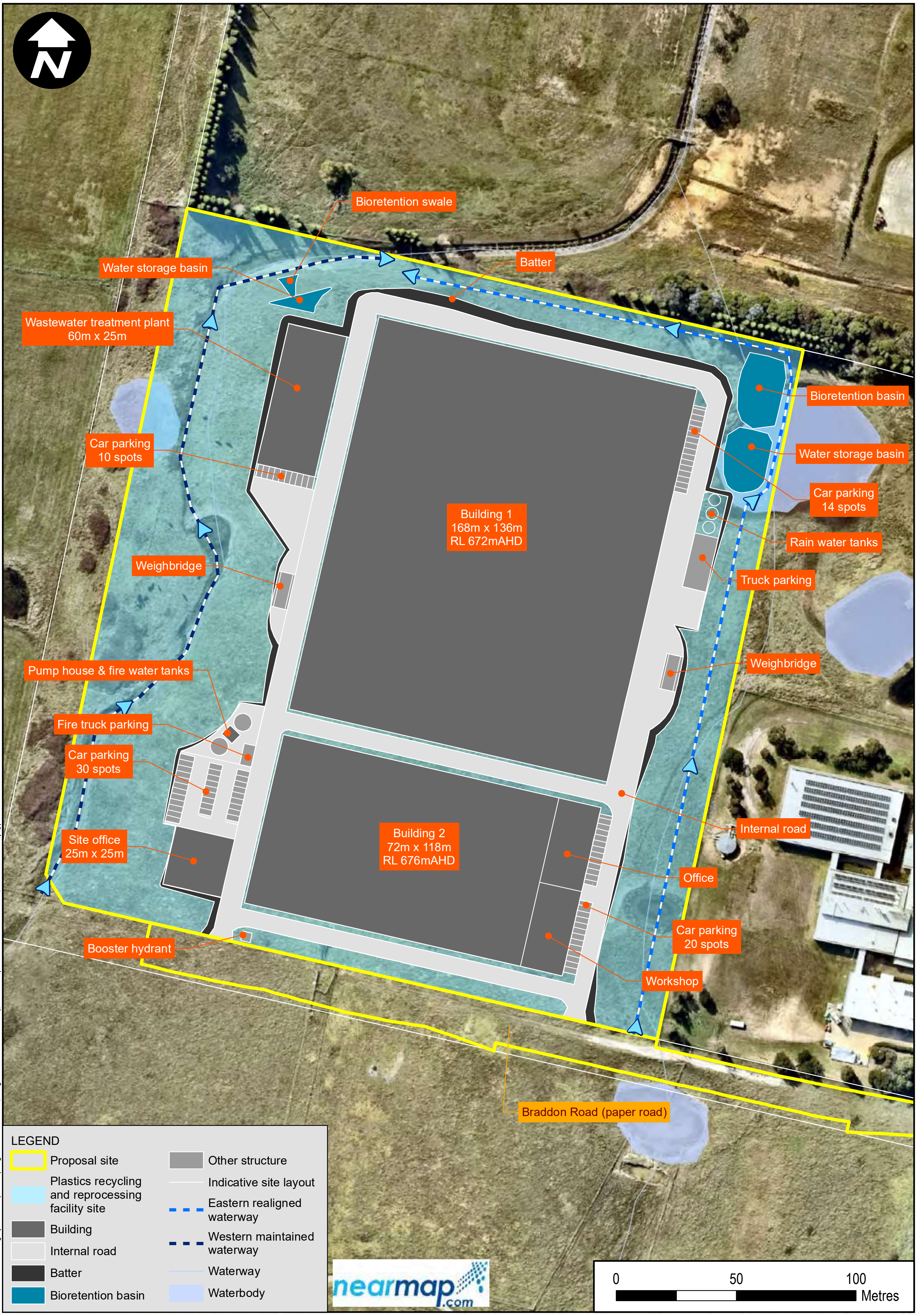


Figure 7.1 **Concept plastics recycling and reprocessing facility layout**

Figure 7.2 Visual representation of the plastics recycling and reprocessing facility, no vegetation screening (from Beaconsfield Road looking north-west)

7.2.2 Key plastics recycling and reprocessing facility infrastructure

The plastics recycling and reprocessing facility would include two buildings, a wastewater treatment plant and a range of ancillary infrastructure. These are described in this section.

Building 1 (northern building)

Building 1 would be the main processing building and used for receival of mixed plastics and sorting, cleaning, crushing and extrusion granulation. Process residues would also be temporarily stored in Building 1 before being removed off-site for disposal.

Building 1 would be an enclosed structure placed on a slab-on-ground. The concrete slab would be sealed and sloped to drain towards a bunded drain to facilitate clean out. The building would have a floor space of about 22,800 square metres. The walls would be precast concrete panels up to three metres with an insulated metal cladding wall above. The roof would comprise metal insulated sheeting with sky lights, solar panels and fixed platform access to all plant and equipment. The roof elevation of the building would range from about 11.5 to 15 metres in height.

High speed roller doors would be located on the western side of the building to allow vehicles to enter and exit. An elevated process plant control room would be located on the eastern side of the building with external access.

Building 2 (southern building)

Building 2 would be used for reprocessing of the flakes and pellets (produced in Building 1) into more advanced products as well as storage of finished products.

The reprocessing and finished product storage area would have a floor space of about 8,400 square metres and a building roof elevation also ranging from 11.5 to 15 metres. A three storey (up to 18 metres high roof elevation) office and workshop would be located on the eastern side of Building 2 with a floor space of around 1,300 square metres. The building materials used for this building would be similar to Building 1 with a combination of glazed windows and solid walls for the office.

Building 2 would be configured as follows:

– Ground floor: deep processing area
– First floor: products manufacturing lab

- Second floor:
  - standard lab
  - exhibition room
  - office room
  - training room
  - document room

High speed roller doors would be located on the northern side of the building.

Wastewater treatment plant

A wastewater treatment plant would be provided on-site to facilitate re-use of water used for washing of the plastics. The water used in the facility for washing of incoming plastics would be treated at the wastewater treatment plant and re-used back in the process. The plant would have a processing capacity of about 60 kilolitres per hour. About 30 to 40 kilolitres per hour of wastewater would be generated by processing activities. The vast majority of wastewater would be treated and reused. Initial estimates of wastewater discharges related to the washing process are of the order of 10 kilolitres per day.

The treatment plant would be located to the west of Building 1 and have a floor space of approximately 1,500 square metres. The wastewater treatment plant would be an enclosed structure placed on a slab-on-ground with a building height of at least six metres. The walls would be a combination of glazed windows and solid walls with an insulated metal roof.

Dissolved air flotation would be used within the treatment plant to purify the water and make it suitable for re-use within the plant. This process injects compressed air into the incoming water, and once the aerated water is released into the flotation tank, fine air bubbles attach themselves to the particles, making them float. The floating material is then skimmed off the top of the tank and dewatered in a screw press. To assist the processes, pH adjustments would be made using acid and alkali solutions and other chemicals such as polyelectrolytes would be added.

A dissolved air flotation system treatment plant configuration would typically include:

- Wastewater collection tank
- Filtration system
- Deposition tank
- Flotation tanks
- Air compressor and storage tank
- Polyelectrolyte dosing and pH adjustment system
- Sludge tank
- Sludge treatment system and press
- Processed water storage tank

Figure 7.3 shows the process flow diagram for the wastewater treatment.

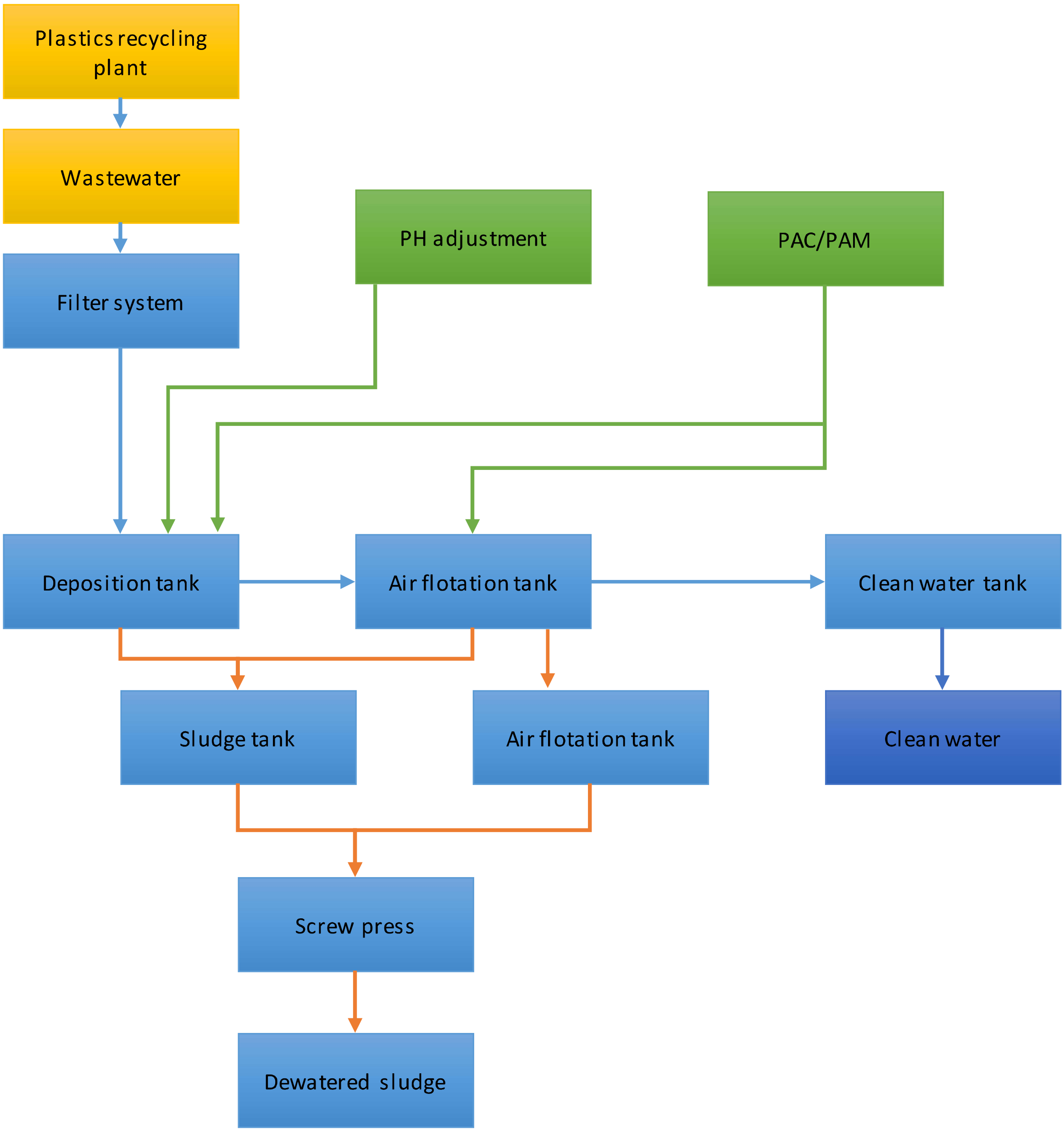


Figure 7.3 Waterwater treatment process flow diagram

The plant would utilise a disinfectant solution patented in Australia by the operator, to assist in treating the water used in the process for washing the plastics. This solution contains tea tree oil, essential oils and other natural plant-based ingredients. It contains approximately 300 millilitres of turpentine per 20,000 litres, as turpentine accounts for approximately 0.0015 percent by volume. The disinfectant solution is therefore not flammable or classified as a dangerous good.

The disinfectant solution would arrive on-site as concentrated liquid and be diluted before use. Up to 20 cubic metres of the concentrated solution would be stored on-site at any one time, in small stackable containers, rather than drums. The solution would also be used for disinfecting plastic bales when they are delivered to the facility.

7.2.3 Ancillary infrastructure

The plastics recycling and reprocessing facility would be supported by a range of ancillary infrastructure. A description of this infrastructure is provided below.

Offices

The offices would be located at the front of the plastics recycling and reprocessing facility site, near the entrance, and to the west of Building 2. Access to the offices would be directly from the car park. The building would be constructed across three levels and be connected by a south end stairwell and elevator. The offices would have a floor space of approximately 625 square metres for each floor. They would include:

– Reception
– Kitchen
– Dining area
– Toilets
– Activity room
– Exhibition
– Drivers/resting room
– Training room
– Meeting room
– Offices

The offices would be used for both administration, staff amenities and for conducting educational activities for school groups and other interested parties.

Truck parking

Parking would be provided on the eastern side of the facility for up to eight medium rigid sized vehicles on-site. This is to allow for Plasrefine Recycling to operate its own fleet of collection vehicles, for plastic waste collection, if required.

Staff and visitor parking

70 car parking spaces for staff and visitors would be provided at the facility, across a number of car parks. The main staff car park would be located north of the office building near the site entrance.

Internal roadways and weighbridges

Upon entry to the plastics recycling and reprocessing facility site in the southwest corner, vehicles would circulate in a one-way clockwise direction with trucks unloading within Building 1 following access via the weighbridge. Vehicles would then exit the site via the weighbridge at the eastern side of the facility.

Vehicles would use the one-way middle lane to access Building 1. Vehicles can either enter in a forward direction or reverse to enter into Building 1. Upon leaving either buildings, vehicles would continue in a clockwise direction around the site, prior to exiting in the south east corner of the site. Vehicles would enter and exit the plastics recycling and reprocessing facility site in a forward direction.

Water management infrastructure

It would be necessary to realign the existing eastern watercourse to allow development of the plastics recycling and reprocessing facility site. The existing western watercourse alignment would be retained in its existing alignment, and not be modified in any way.

The proposed water management infrastructure is shown on Figure 10.1 and would include:

– rainwater tanks to capture roof water (150 kilolitres)
– gross pollutant traps for primary treatment of runoff from impervious ground surfaces
– for the western watercourse:
  - retention of the existing western watercourse alignment
  - an online 70 kilolitres water storage basin
  - a bio-retention swale (with 50 square metre filter area)

– for the eastern watercourse:
  - realignment of the eastern watercourse
  - an online 450 kilolitres water storage basin
  - an online bio-retention basin (with 500 square metre filter area)

The two water storage basins would be lined with a compacted clay liner or other lining method of similar performance.

Bioretention systems are commonly used within Australia. They are systems designed to treat and filter large areas of stormwater runoff as part of a treatment train. The filtered stormwater is collected in pipes below the systems and flows through to the stormwater system, natural waterways or detention basins.

The primary function of bioretention systems is to filter out excess pollutants and nutrients. These excess nutrients typically come from fertilisers and primarily consist of nitrogen, phosphorous, and potassium. These nutrients can cause algae bloom if left within the water, and therefore filtering them out through the bio-media and vegetation assists in providing better water quality.

Figure 7.4 shows a typical perspective view of a bioretention basin. The bioretention basin proposed as part of the water quality treatment train would provide 500 square metres of filter area.

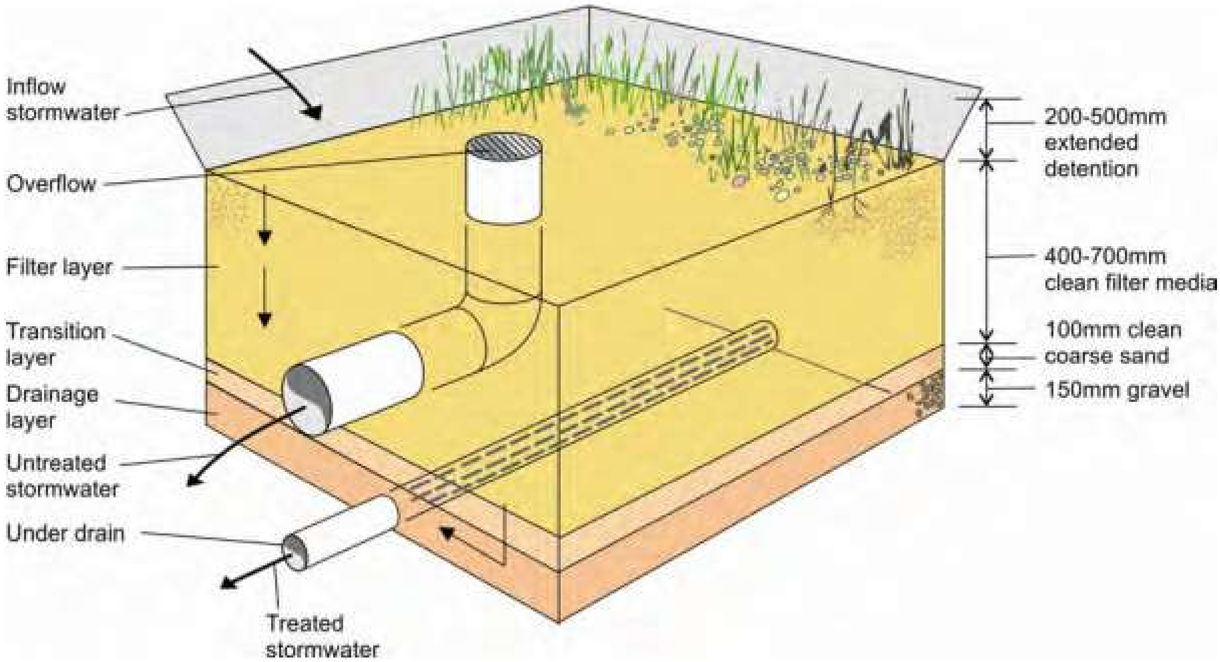


Figure 7.4 Typical bioretention basin perspective view

Source: WaterNSW (2019) *Using MUSIC in the Sydney Drinking Water Catchment, p56*

It is also noted that the existing north-eastern dam is currently co-located within the neighbouring site. It is proposed that the portion of the dam within the plastics recycling and reprocessing facility site would be filled so that each site can individually manage and verify water management performance. Therefore, after the dam portion is filled, the area would be repurposed as a realigned watercourse alongside the proposed basins at this location.

Fire management infrastructure

Emergency fire water tanks and a pumping station would be installed to manage fire hazards on-site. These would be located on the south western side of the facility, adjacent to the main office car park. A hydrant and sprinkler booster assembly would be located adjacent to the site entry point on Braddon Road.

Further detail on the proposed fire control systems including fire hydrant system is provided in chapter 14.

Landscaping and fencing

A two metre high security fence would be constructed around the perimeter of the facility and a CCTV system would be installed for monitoring of remote areas.

Existing vegetation outside of the proposal site would be maintained including the existing vegetation buffer along the western side of the plastics recycling and reprocessing facility site.

7.3 New access road

A new public access road is proposed which would extend from the plastics recycling and reprocessing facility site to Lackey Road via the currently unformed Braddon Road, traversing Lot 1 DP 26490 and Lot 10 DP 1084421 (the 'Braddon Road east extension').

Figures 4.2 and 4.3 show two possible concept plans for the access road (Options 2a and 2b). The road would be constructed by the proponent, but the roadway and the land on which it is constructed would be owned by Council. Maintenance of the new access road would fall under Council's existing rate paying plan. As the new access road would be included within the MVEC, it would also be subject to the Section 94 developer contributions plan which stipulate that as other land is developed within the precinct, monetary contributions would be required to fund and maintain roads within the precinct.

The western end of the access road would commence near the western entrance of the plastics recycling and reprocessing facility and would connect to Lackey Road in the east. The access road would be about 915 metres in length, two ways with four metre lane widths (6.5 metres including the verge). Some battering would be required on the eastern end of the road and retaining walls south of the plastics recycling and reprocessing facility site to tie in with existing surface levels.

If construction of the new access road is delayed because of land acquisition issues, the proponent would need to use Beaconsfield Road for construction access until the new road is available. There would be limitations on the number of heavy vehicle movements on Beaconsfield Road to ensure that it meets noise criteria.

7.4 Utilities and services

Figure 7.5 provides an overview of the existing services within proximity to the proposal site.

7.4.1 Electricity

An electrical connection would be required to supply electricity to the plastics recycling and reprocessing facility as described in Table 1.1. An application to Endeavour Energy has been made to confirm the requirements for the power supply to the site and any substation requirements. It is estimated that the expected maximum load demand would be of the order of 22,000 kWh. Solar panels would be installed on the roofs of Building 1 and Building 2 to provide a supplementary power supply. Estimates for how much power would be sourced from solar would be made during the next stage of design.

7.4.2 Communications

The facility would be provided with telephone, computer and data cable access. Standard telephone cabling and two-way radio / mobile telephones would provide the required telecommunication services. Internet access would be provided via NBN or Wi-Fi. These services are already available at the plastics recycling and reprocessing facility site.

7.4.3 Water supply

The plastics recycling process and amenities would have a net water demand of about 40.5 kilolitres and 5.8 kilolitres of water per day respectively.

Roof water would be collected in rainwater tanks (with a total capacity of 150 kilolitres) to the west of Building 1. Additional roof water storage is potentially available within the wastewater treatment plant. This would be determined during detailed design.

Runoff from impervious ground surfaces would flow to storage basins. The harvested rainwater and ground surface runoff would be re-used on-site for toilet flushing and in the plastics recycling process, which would reduce potable water demand. As discussed in section 10.3.3, preliminary modelling indicates a longer-term average of about 80 percent of net water demand could be sourced from rainwater and ground surface runoff, the balance would be supplied from the potable water main.

An existing 150 millimetre diameter asbestos concrete water main pipe runs along the southern and western boundary of the plastics recycling and reprocessing facility site (as shown on Figure 7.5).

The mains water supply would also provide water for firefighting services with a booster hydrant located at the southwest corner of the plastics recycling and reprocessing facility site.

Further detail including an assessment of water infrastructure and identification of a suitable connection point is provided in chapter 10.

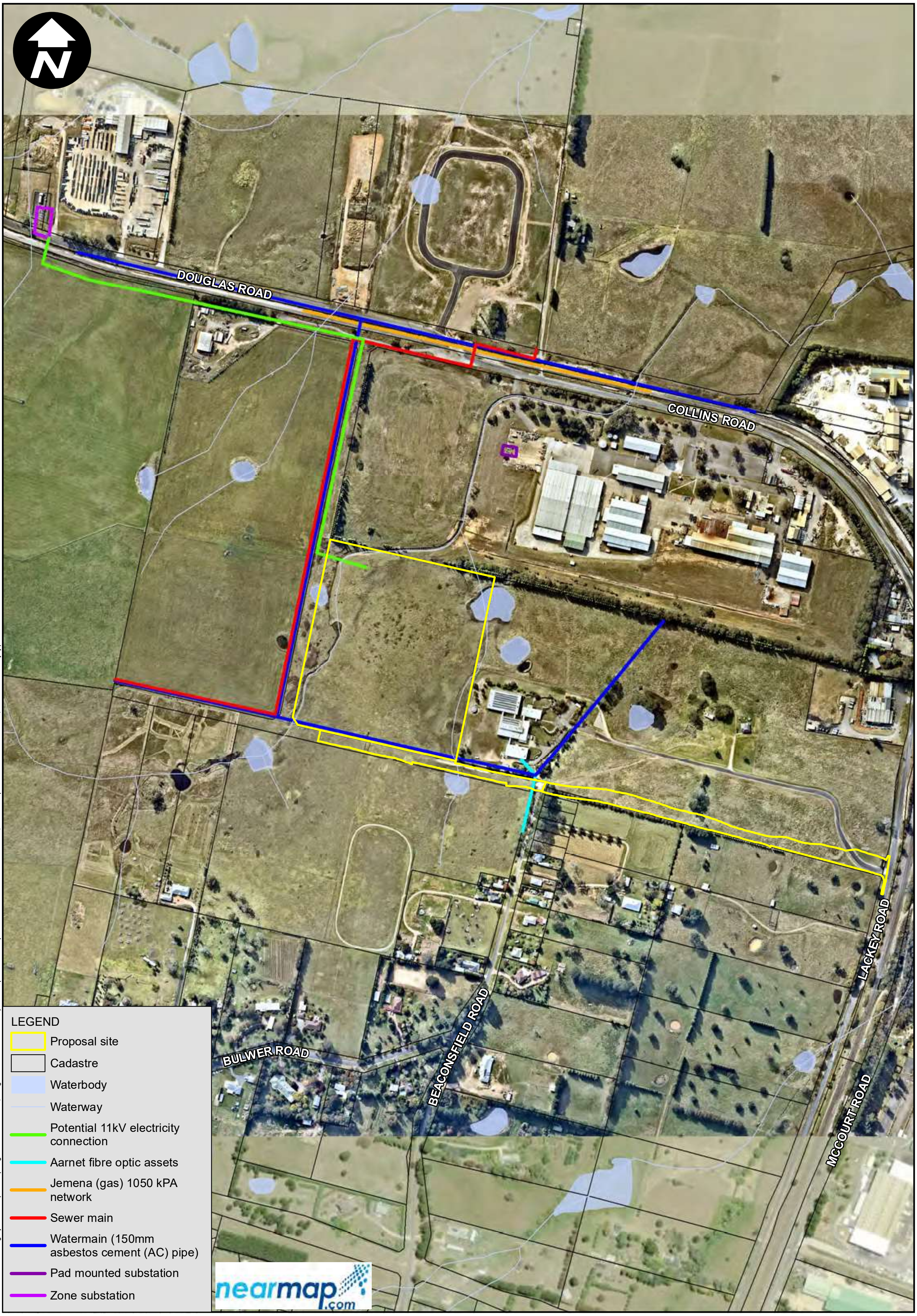
7.4.4 Wastewater management

The proposal includes an on-site wastewater treatment plant (see section 7.2.3) which would facilitate re-use of water used for washing of the plastics.

However, it is estimated that the plastics recycling activities and wastewater treatment plant operations would generate up to 10 kilolitres per day of effluent requiring off-site disposal. In addition, about 5.8 kilolitres per day of sewage would be generated from the amenities which would be discharged to the Council sewerage system.

A sewer rising main is located along the western boundary of the plastics recycling and reprocessing facility site, but this cannot be directly accessed. A new gravity sewer would be required to be constructed by the proponent to transfer sewage and process wastewater to an existing manhole on Douglas Road.

Further detail including an assessment of existing sewerage infrastructure and identification of a suitable connection point is provided in chapter 10.



Data source: Aerial imagery - nearmap 2021 (image date 24/04/2021, image extracted 30/06/2021) & sixmaps 2021 © Department of Customer Service 2020; General topo - NSW LPI DTDB 2020, 2015. Created by: jrprice

0 200 400 Metres

Figure 7.5 **Existing and proposed services**

7.5 Plastics recycling and reprocessing operations

7.5.1 Feedstock quantities and characteristics

Feedstock types, volumes and composition

The proposal would have capacity to receive up to 120,000 tonnes per year of mixed plastic waste feedstock. At full scale operation, this is expected to comprise about 100,000 tonnes of mixed plastics and up to 20,000 tonnes of polyvinyl chloride (PVC) and plastic films.

The facility would have the capability to process the following plastic types received as mixed plastic:

- Polyethylene terephthalate (PET) bottles
- High-density polyethylene (HDPE) bottles
- Polypropylene (PP) bottles
- Acrylonitrile butadiene styrene (ABS)
- Low-density polyethylene (LDPE) films
- Unplasticized polyvinyl chloride (UPVC) pipes

The mixed plastics and plastic film is expected to be received and stored in bales.

Further information on the expected feedstock quantities and composition is provided in chapter 9.

Excluded wastes

Putrescible waste, liquid waste, clinical waste, hazardous waste, asbestos and other chemical waste would not be accepted at the facility.

7.5.2 Plastics recycling and reprocessing process overview

Figure 7.6 provides a high-level overview of the proposed plastics recycling and reprocessing process.

After unloading the incoming mixed plastic waste feedstock, it would undergo a series of mechanical, manual and optical screening and sorting processes to separate the plastics into different types and colours. The first process would be to separate the bales of plastic.

Mixed plastics would first be sorted by colour. The sorted materials would then undergo crushing (flaking), washing and batch mixing. Depending on the plastic type and intended end use, some of the flakes would either be pelletised (via extrusion granulation) or milled into powder. The resulting flakes, pellets or powder would be either processed further on-site to produce advanced plastic products (deep processing) or transported off-site for direct sale.

The following sections provides further detail on each of the key proposed recycling and reprocessing processes.

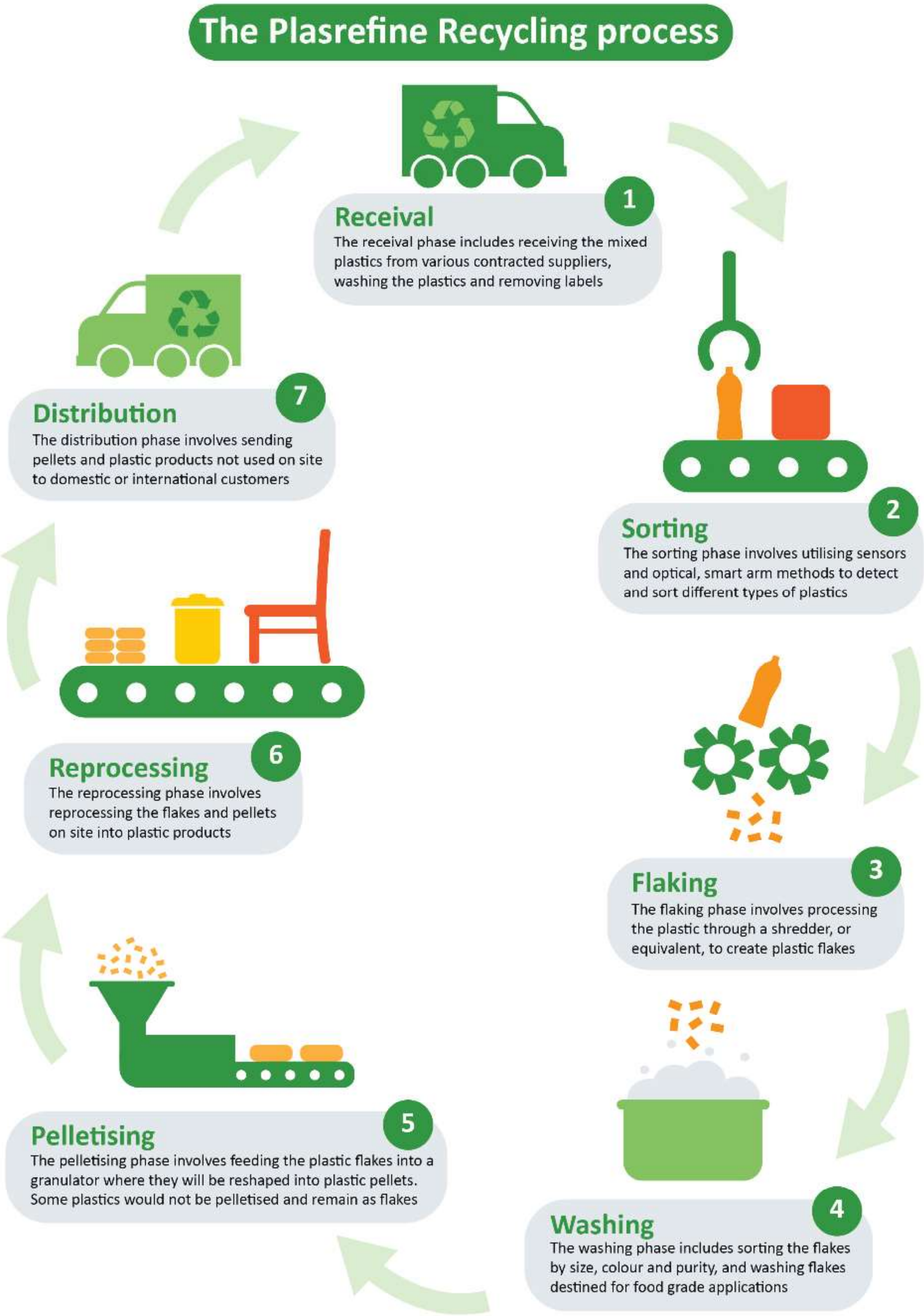


Figure 7.6 High level process overview

7.5.3 Feedstock receival and unloading

All vehicles would enter the facility at the western entry point and pass over the weighbridge before reversing into Building 1 and entering it via high-speed roller doors on the western side of the building. The roller doors would open to allow truck entry/exit, and close once trucks have entered or left the building. This would help prevent noise or any plastics from unloading activities from escaping the building.

The waste unloading zone would be located in the central west portion of Building 1 (see Figure 7.11). The unloading zone would provide sufficient space for three vehicles to be unloaded concurrently. In this zone, the trucks would be unloaded using skid steers or other similar plant. The unloaded material would be inspected and then moved immediately into designated storage pens. Waste plastics would not be stored in the unloading zone for any extended period of time. Further detail on the proposed feedstock storage arrangement is provided in section 14.2.3.

7.5.4 Sorting, cleaning, crushing and extrusion granulation

Plastics sorting, cleaning, crushing and extrusion granulation processes would occur in Building 1.

Once unloaded, raw incoming mixed plastics (in bales) would be transferred to one of two mixed plastics sorting lines. After bale opening, the material would be passed through trommel screens to remove small impurities such as stones, silt and other debris. This material would then be separated by eddy current equipment to recover non-ferrous metals such as aluminium and copper. The screened material would be sent to the first manual sorting platform where oversized objects (such as large plastic film and other larger non-plastic impurities) would be picked out manually.

The material would then pass through magnetic separators, where ferrous metals (such as iron and steel) would be removed and recovered. Paper, small pieces of plastic film and other light materials would then be separated and recovered by blower. The material would then be sent to a second manual sorting platform where any further remaining large pieces of film and other large non-plastic impurities would be removed manually to ensure that only plastic bottles enter the subsequent process.

Following initial screening, separation and picking, the remaining PET, PP, HDPE and ABS bottles would be sorted by type and colour using a series of vibrating screens and optical sorting and smart arm manipulator technologies. The label paper from PET bottles would be removed by a label removal and label blowing process, before being packaged and stored.

The sorted PET, PP, HDPE and ABS bottles would be crushed, cleaned and sterilised using steam and a patented alkaline water disinfectant solution heated to 193 °C. The condensed steam would be treated at the on-site wastewater treatment plant and re-used back into the process. The crushing would produce flakes which would then be mixed in batches before being pelletised using extrusion granulation, transferred to Building 2 for deep processing directly into finished products or transported off-site for direct sale. Figure 7.8 shows a flow diagram of the mixed plastics processing activities.

Raw incoming LDPE film and UPVC pipe streams would be transferred to other processing lines (separate from the mixed plastics sorting lines). Bales of LDPE film would be manually opened and sorted into clear and mixed colours. Both the sorted LDPE film and UPVC pipe streams would also be cleaned using a patented alkaline water disinfectant solution and steam and crushed before being either milled or pelletised using extrusion moulding. Process flow diagrams for the LDPE film and UPVC pipe streams are shown in Figure 7.9.

The extrusion moulding process involves plastic flakes travelling through a heated feeder to a die. Due to the generated heat, the granules melt into thick, consistent liquid. The molten material is pushed through the die cavity and extruded from its end. As the extruded part cools down, the product acquires the desired shape. The machine then cuts or mills the extruded shape into pellets.

The milled PVC or pellets from all the LDPE film and UPVC lines would be either be transferred to Building 2 for further deep processing or transported off-site for direct sale.

Figure 7.7 shows an example of various waste sorting operations, including open conveyors, enclosed process and wet processes. The recyclable materials (such as recovered metals) not suitable for further deep processing on-site would be sent off-site to other recycling facilities. The remaining non-recyclable materials would be stored temporarily within Building 1 before being transported off-site for disposal at EPA licenced facilities.

Figure 7.7 Example PET bottle washing and recycling lines (Beier Machinery)

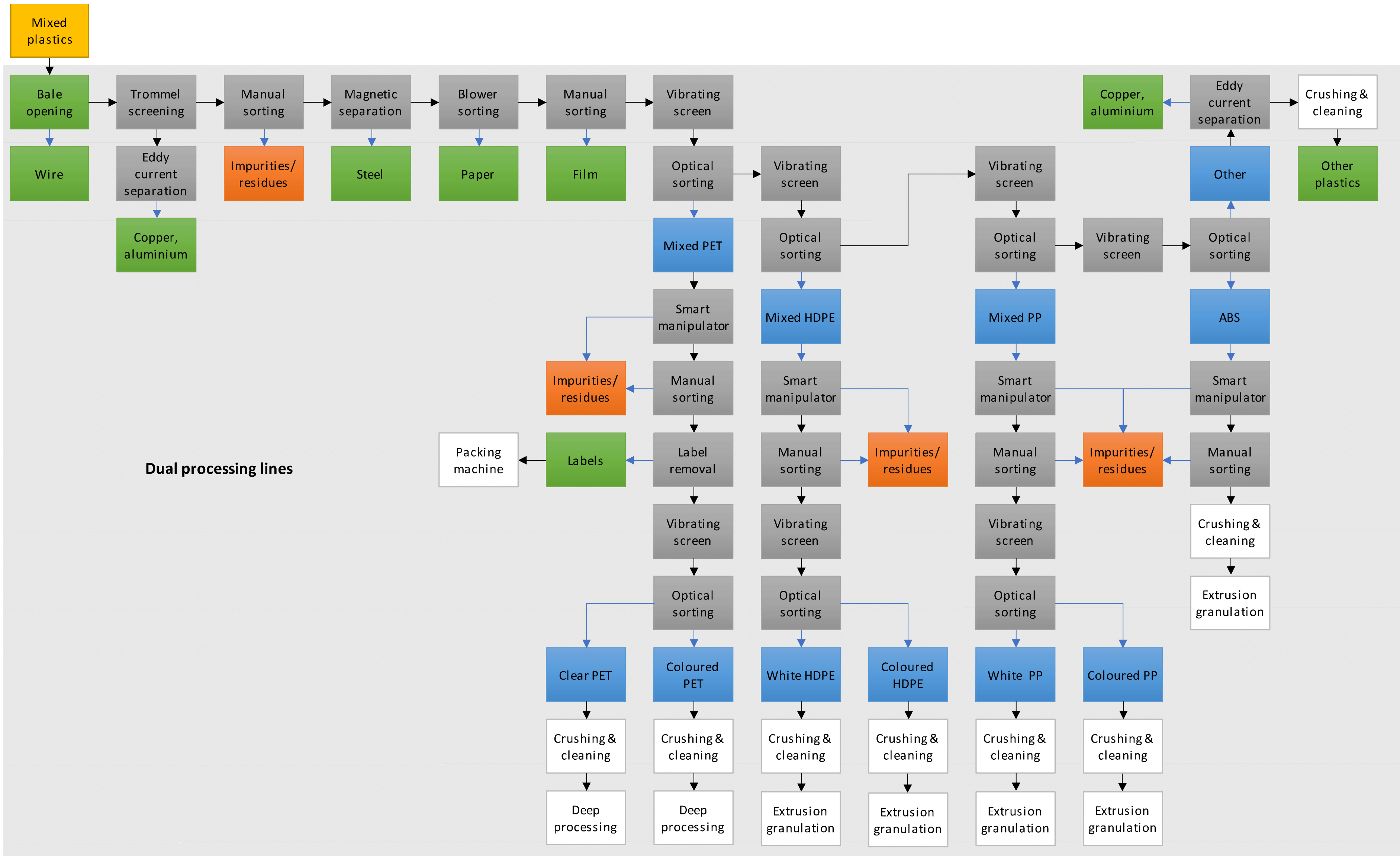


Figure 7.8 Mixed plastics process flow

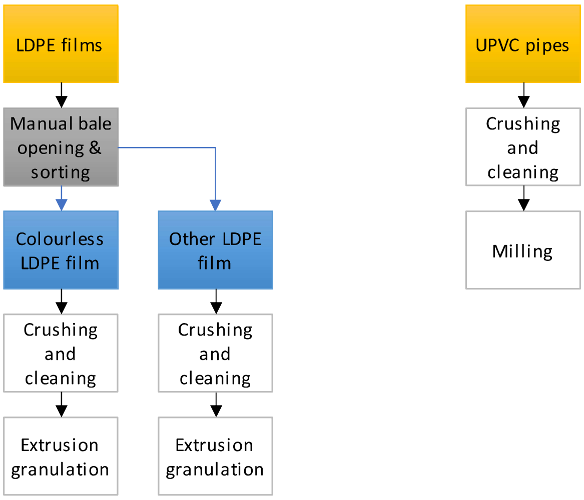


Figure 7.9 LDPE film and UPVC process flows

The following plant and equipment are expected to be used for operations in Building 1:

– Waste plastics sorting production lines:
  - 2 bale openers
  - 2 trommels
  - 12 manual sorting platforms
  - 2 magnetic separators
  - 2 blower sorters
  - 2 eddy current sorters
  - 9 screens
  - 9 optoelectronic sorters
  - 4 smart manipulators
  - 2 bottle label removers
  - 1 packing machine
  - 8 crushers
  - 8 mixing silos
– Crushing and cleaning lines:
  - 3 PET crushing and cleaning units
  - 5 miscellaneous plastic crushing and cleaning units
  - 2 PE film crushing and cleaning units
  - 1 PVC pipe crushing and cleaning unit
– Granulation and extrusion lines:
  - 8 PE extrusion granulation production units
  - 6 PP extrusion granulation production units
  - 2 ABS extrusion granulation production units
  - 3 PE film extrusion granulation production units
  - 4 PVC mill production units
  - 22 batch mixing units

Figure 7.11 shows an indicative internal layout of Building 1 and 2.

7.5.5 Reprocessing (deep processing)

Deep processing activities would be undertaken in Building 2. This would involve reprocessing of the flakes, pellets or powder produced in Building 1 into more advanced products. The finished end products would be stored in Building 2 ready for sale.

The flakes and pellets would be moulded using extrusion or injection moulding processes to produce more advanced plastic products such as PET sheets, PET packing belts, wood plastic composites, plastic pallets, furniture or turnover boxes etc. This would involve heating the plastic to its melting point, less than 280 °C, and reforming it into the desired shapes.

The extrusion moulding process involves plastic flakes or pellets travelling from a feeder to a die through a screw-thread pattern, for even heat distribution. The feeder is headed by heat jackets on the outer casing. Due to the heat, the granules melt into thick, consistent liquid. The die has a small cavity in the desired shape. The molten material is pushed through the die cavity and extruded from its end. As the extruded part cools down, the product acquires the desired shape. Extrusion moulding is applicable for seamless product manufacturing, such as continuous products like pipes, tubes, and T-sections. It is also used to make pellets from plastic flakes, which is what occurs in Building 1.

For injection moulding, the plastic flakes or pellets are filled into a feed section via a hopper, then compressed inside the feed section. Here the granules melt, due to frictional heat, forming a thick liquid called melt. The melt travels to an injector, which injects it into die cavities. Different types of injectors exist, including screw-driven, piston-driven, manual, and hydraulic. The liquid material expands inside the die and fills the shape. The material cools and solidifies within the mould. Injection moulding is used for almost all types of plastic product manufacturing, including continuous as well as part manufacturing. Toys, chairs, baskets and casings are manufactured using this process. Figure 7.10 shows an example of an extrusion moulding production line for PE and PP pipes. Elements of the production line involving heating of plastics or handling of melted plastics would be fully enclosed, with air flow from these elements directed to an air handler (pollution control device) which would be fitted to each unit. The finished products would be sold to domestic or international markets.

Material testing associated with manufacturing and processing would also be undertaken at the laboratories located in Building 2.

Figure 7.10 Example extrusion moulding production line for PE and PP pipes (Beier Machinery)

The following plant and equipment are expected to be used for operations in Building 2:

- 2 PET tray moulding machines
- 4 turnover box injection moulding machines
- 2 beach chair injection moulding machines
- 1 PE wood plastic floor production line

Figure 7.11 shows an indicative internal layout of Building 1 and 2. More detailed views of the internal layout of each building are provided in Appendix I.

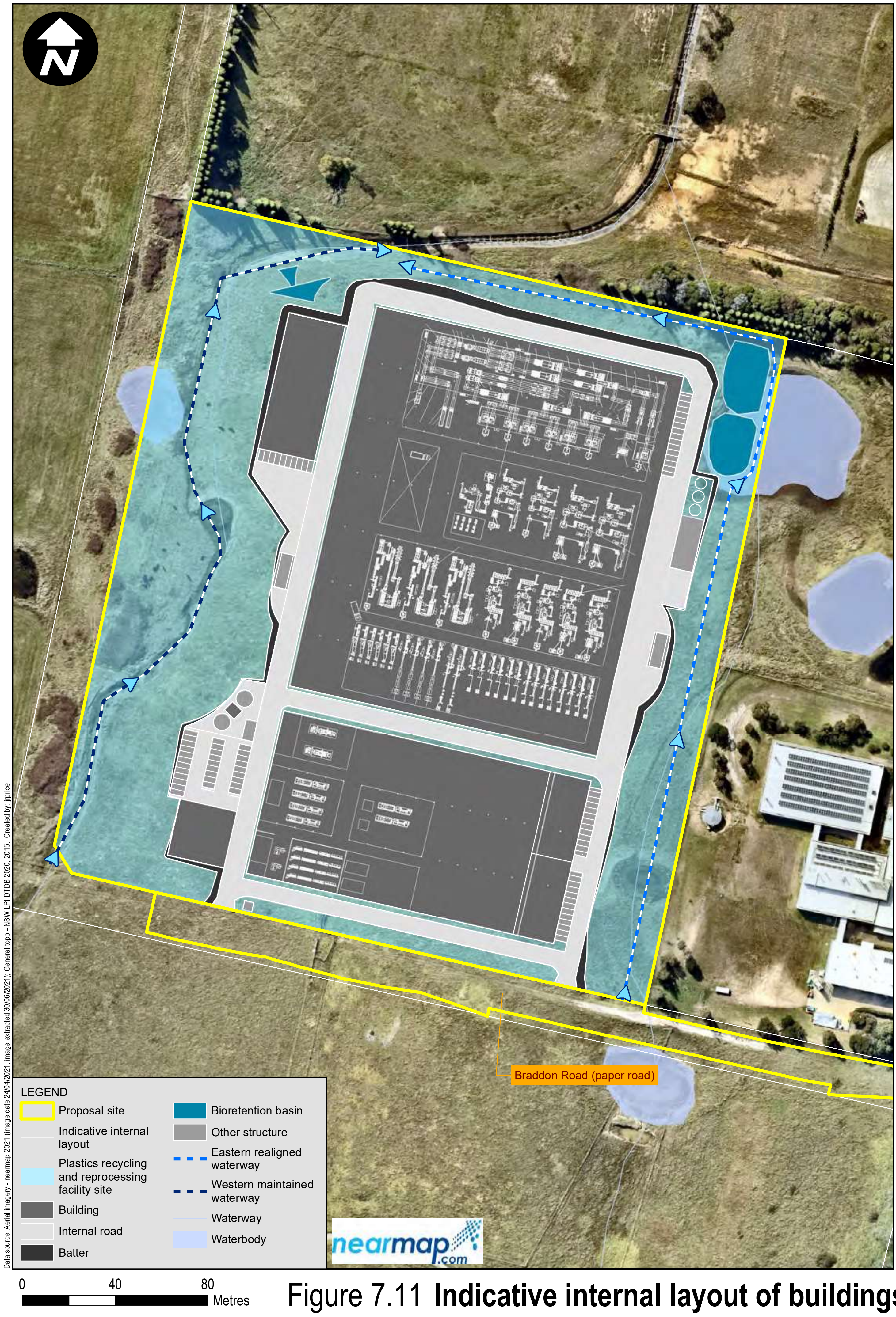


Figure 7.11 **Indicative internal layout of buildings**

7.5.6 Recycling and reprocessing outputs

Table 7.5 lists the expected product outputs from the plastics recycling and reprocessing operations. Up to 107,000 tonnes per year of plastic products, metals or refuse derived fuel would be recovered or produced at full scale operation. Process residues are described in section 7.5.7.

Table 7.2 Recycling and reprocessing product outputs

Product name	Output (t/y)	Destination
Metals (includes iron, steel, copper, aluminium etc.)	2,000	Direct sale
Refuse derived fuel (RDF)	15,000	Direct sale (energy recovery)
Recycled PET flakes - colourless	16,000	PET flakes directly processed into PET sheet without granulation
Recycled PET flakes - deep colour	4,000	PET flakes directly processed into PET packing belt without granulation
HDPE pellets - deep colour	3,000	After modified granulation, deep processing into logistics pallets
HDPE pellets - white	18,000	Deep processing into PE wood plastic composites (part) Balance to direct sales
HDPE pellets - deep colour	9,000	Deep processing into logistics pallets (part) Balance to direct sales
PP pellets - white	9,000	Deep processing into PP wood plastic composites, leisure products, etc (part) Balance to direct sales
PP pellets - deep colour	9,000	Deep processing into logistics pallets (part) Balance to direct sale
ABS pellets - deep colour	5,000	Direct sale
LDPE pellets - white	4,000	Direct sale
LDPE pellets - deep colour	4,000	Direct sale
UPVC powder - deep colour	9,000	Direct sale
TOTAL	**107,000**	

Figure 7.12 shows an example of plastic flakes and pellets similar to what would be produced in Building 1. These would either be processed further on-site in Building 2 or sold for further processing off-site.

Figure 7.12 Flakes and pellets (examples)

The deep processing in Building 2 could be used to produce a variety of advanced plastics products such as:

- PET sheeting
- PET packing
- Plastic pallets
- PE or PP wood plastic composites
- Furniture, bins, crates and other lifestyle products

Figure 7.13 shows some examples of more advanced plastic products that could be produced on-site.

Figure 7.13 Advanced products (examples)

7.5.7 Process wastes

Table 7.3 lists the expected process wastes (residues), quantities at full scale operation and the proposed method of managing/disposing of the wastes.

About 10,000 tonnes per year of residues from the sorting process would require off-site landfill disposal and a further 9,000 tonnes per year of mostly filter cake residue from the on-site wastewater treatment plant would be sent off-site for either further processing into refuse derived fuel or otherwise, disposal at landfill.

The wastewater generated from the plastics crushing and cleaning process would be treated at the on-site wastewater treatment plant and the majority would be re-used back in the process. The balance (effluent from wastewater treatment), up to 10 kilolitres per day, would need to be discharged to sewer.

Table 7.3 Process wastes

Residue	Estimated quantity (tonnes per year)	Proposed management/disposal method
Sorting		
Entrained non-renewable solid waste (such as stones, wood blocks etc)	10,000	Landfill disposal
Crushing and cleaning		
Dewatered sludge (filter cake residue) from the wastewater treatment plant	9,000	Off-site processing into refuse derived fuel (due to high plastic content), or otherwise landfill disposal
Wastewater from plastics cleaning	288,000 kL per year (total) Up to 10 kL per day (net)	Treatment at on-site wastewater treatment plant for re-use, net amount discharged to sewer
Exhaust steam	4,500	Collected and condensed for re-use back in the process
Extrusion and granulation		
Filter residue and waste filters	1,800	Landfill disposal

7.5.8 Operational workforce

Approximately 40 staff would be required per shift (three shifts) within the receival and processing buildings and up to 20 staff for maintenance, administration, engineering and technical support and management. With three shifts, this would be equivalent to a total of up to 140 full time equivalent staff during full scale operation. It is expected to be quite a number of years before these staff numbers are achieved.

7.5.9 Hours of operation

Plastics recycling and reprocessing would occur seven days per week, 24 hours per day. Waste delivery would take place on weekdays only, between 7am and 6pm.

The proposed hours of operation are shown in Table 7.4.

Table 7.4 Operational hours

Activity	Period
Recycling and reprocessing	Continuous (24 hours a day, seven days a week) Up to 4 weeks planned shutdown/maintenance per year
Waste delivery	7am to 6pm weekdays
Administration and waste education at the visitor and education centre	9am to 5pm weekdays

7.6 Decommissioning

The proposed plastics recycling and reprocessing facility has an estimated life of 25 to 30 years. Once at the end of its operational life Plasrefine Recycling would make a commercial decision as to whether to re-invest in the proposal and extend the operating life or choose to decommission the facility.

Should the facility be fully decommissioned, the infrastructure would be demolished and the proposal site would be rehabilitated. However, given that the site is within the Moss Vale Enterprise Corridor, is zoned industrial, and would by this time be located amongst other industrial facilities, restoration of the plastics recycling and reprocessing facility site back to its current state is unlikely. It is most likely that the plastics recycling and reprocessing facility site would find another industrial use. This might involve re-using the buildings for other purposes, as the buildings are likely to last more than 50 years, if properly maintained. Once the buildings reach their economic end of life, or a new use is required that involves clearing the site, the following sequence of events is anticipated.

Prior to demolition, all residues and operating chemicals would be removed from the facility and disposed of in accordance with the requirements of Protection of the Environment Operations (Waste) Regulation 2014 and the NSW EPA (2014) *Waste Classification Guidelines*. This would include any raw mixed plastics, finished products and any remaining wastewater treatment plant chemicals (ie. flocculants).

Prior to any demolition, an assessment of the buildings, civil infrastructure, plant and equipment would be undertaken to identify which materials are able to be re-used or recycled. All plant, equipment and materials suitable for re-use (eg. sale) or recycling would be classified and removed from the proposal site and for directly re-use or transferred to suitably licensed waste recovery or recycling facilities. Material unsuitable for re-use or recycling would be classified and removed from the plastics recycling and reprocessing facility site for disposal at a suitably licensed waste disposal facility.

Following demolition and removal of all plant, equipment and materials, the plastics recycling and reprocessing facility site may be rehabilitated, including planting of grass and or vegetation where appropriate. Plantings would be selected to ensure the final visual character is consistent with landscape character of the surrounding land. As mentioned above, it may be the case that the buildings are demolished, and just replaced with new buildings of different size and shape, and the working platform on which the buildings would stand would be maintained, but reconfigured.

A decommissioning environmental management plan would be prepared prior to any decommissioning works commencing. This plan would include details on all relevant legislative and regulatory requirements, potential environmental risks associated with decommissioning and measures to mitigate and manage risks. The plan would also include details of the proposed waste classification, demolition waste stockpiling, storage, handling and re-use, recycling and disposal requirements.

All demolition work would be undertaken by a suitably qualified and experienced contractor in accordance with contemporary legislation.

7.7 Construction of the proposal

7.7.1 Overview

The construction period would commence in 2022 with an estimated duration of 12 months and an additional three months for commissioning.

Construction activities would be undertaken in three stages and include:

– Early works and site establishment (one month):
  - Construction of site access road
  - Utilities connection
  - Establishment of construction compound including construction staff amenities
  - Installation of temporary fencing
– Main site works (11 months):
  - Clearance of vegetation within the construction footprint, stripping and stockpiling of topsoil for re-use
  - Bulk earthworks for site shaping and surface water drainage and the bioretention ponds
  - Pouring concrete foundation slabs, footings, hardstand and slabs for the buildings
  - Construction of pavement areas for the truck and car park, internal roads and the site entrance/egress points
  - Installation of steel truss framework for structures
  - Erection of pre-cast concrete panels for external and internal partition walls and metal roof sheets for site buildings
  - Installation of processing equipment

- Building finishing works including fit out
- Installation of firewater and other tanks
- Installation of weighbridges
- Installation of permanent fencing and signage
- Restoration works including removal of temporary construction compound, general site clean up and landscaping following construction

– Testing and commissioning (3 months)

7.7.2 Construction workforce

The construction workforce is likely to include a maximum of 200 staff working across the entire span of the proposal construction. The peak workforce is expected during major concrete pours to up to 30 people.

7.7.3 Construction hours

Construction working hours would be undertaken during the periods specified in the *draft Construction Noise Guidelines* (NSW EPA 2020a). Those are:

– 7 am to 6 pm Monday to Friday
– 8 am to 1 pm Saturdays
– No work on Sundays or Public Holidays

7.7.4 Construction traffic

Vehicles associated with construction of the proposal would include staff light vehicles and heavy vehicles delivering construction plant and equipment and materials to site. The estimated average and peak daily construction traffic movements are summarised in Table 7.5.

Table 7.5 Indicative construction traffic

Vehicle type	Estimated average daily vehicle movements	Estimated peak daily vehicle movements
Light vehicles	40	60
Heavy vehicles	15	40

7.7.5 Plant and equipment

Typical plant and equipment required for construction of the proposal is summarised in Table 7.6.

Table 7.6 Indicative plant and equipment

Plant and equipment	Site establishment and earthworks	Road construction	Building construction	Equipment installation
5 tonne excavator, 20 tonne excavator	8	3	3	
Dozers	6	1		
Trucks	6	6	6	2
Compaction equipment	1	2		
Graders		1		
Asphalt mixers		1		
Paver machine		1		
Bobcats			2	
Forklifts			2	8

Plant and equipment	Site establishment and earthworks	Road construction	Building construction	Equipment installation
Mobile concrete pump			1	
Concrete vibrators			2	
Concrete saw			2	
Welders			2	
Boom lifts			5	
Mobile crane			2	2
Elevated working platform				5
Mini loader				2

7.7.6 Construction environmental management

The construction of the proposal would be undertaken in accordance with the construction environmental management plan to be developed for the proposal. The plan would detail mitigation measures to manage risks associated with generation of dust, noise, and other environmental impacts during construction as identified in chapter 20 and the conditions of approval.

8. Assessment approach and method

This chapter provides a description of the overall approach and method used to undertake the EIS. The detailed methodologies for individual technical assessments are described in the technical reports and are summarised in chapters 9 to 18.

8.1 EIS requirements

The EP&A Act (section 4.12(8)) provides that a development application for State significant development needs to be accompanied by an EIS prepared by or on behalf of the applicant in the form prescribed by the regulations. The EP&A Regulation (Schedule 2, clause 3(1)) provides that, before preparing an EIS, an applicant must make a written application to the Planning Secretary for the environmental assessment requirements for the EIS (the SEARs). The written application was duly made by Plasrefine Recycling in September 2020. The application was supported by a scoping report (the *Moss Vale Plastics Recycling Facility EIS Scoping Report* (GHD 2020) ('the scoping report')), which was prepared in accordance with the (then) draft guideline *Preparing a Scoping Report* (DPIE 2020b)[1].

The purpose of an EIS is to assess the economic, environmental and social impacts of a project and to help the community, councils, government agencies and the consent authority to get a better understanding of the project and its impacts so they can make informed submissions or decisions on the merits of the project (DPIE 2021e). The EIS must be prepared in accordance with the SEARs and the requirements defined by the EP&A Regulation.

The form and content requirements for an EIS are provided by the EP&A Regulation (Schedule 2, clauses 6 and 7). The EP&A Regulation (Schedule 2, clause 3(2)) also provides that an EIS for a State significant development project must be prepared with regard to the *State Significant Development Guidelines* (DPIE 2021e). The *State Significant Development Guidelines* provide a detailed explanation of the assessment of State significant development in NSW, describing the steps of the assessment process and requirements in accordance with the process. The guidelines seek to ensure all State significant development projects are subject to a comprehensive assessment in accordance with government legislation, plans, policies and guidelines, and that this assessment is proportionate to the scale and impacts of the project.

Appendix B to the *State Significant Development Guidelines* provides guidance in relation to the form and content requirements for EISs (DPIE 2021f) ('the EIS guidelines'). The EIS guidelines seek to ensure that EISs for State significant projects in NSW are consistent and prepared to a high standard.

8.2 Impact scoping and environmental risk assessment

The first step of the impact assessment process involved identifying key potential environmental issues, impacts and risks that would be subject to detailed assessment as part of the EIS. This was undertaken as part of the process of preparing the scoping report, which involved a preliminary environmental assessment to identify relevant environmental matters for consideration in the EIS. This process involved describing the existing environment and identifying activities that could impact the relevant environmental, social and economic matters.

Activities were identified by reviewing previous reports, investigations, studies and assessments. This process was also informed by the desktop searches and site inspections carried out in 2020 and meetings with DPIE and Council.

The scoping report identified the following as key issues requiring further assessment in the EIS:

– traffic and access
– hazards and fire risks
– flora and fauna
– noise
– air quality

[1] It is noted that subsequent to preparing the scoping report, the guidelines have been finalised and are now called *State significant development guidelines – preparing a scoping report* (DPIE 2021d).

- hydrology
- soils and water
- waste

Further information is provided in the scoping report, which is available at: **Major Projects**

The SEARs were prepared by DPIE with reference to the scoping report and consideration of public authority responses to DPIE's request for input to the SEARs.

The SEARs identify the following as key environmental issues for the EIS:

- waste management
- soils and water
- traffic and transport
- noise and vibration
- air quality and odour
- fire and incident management
- infrastructure requirements
- hazards and risk
- cultural heritage and Aboriginal cultural heritage
- urban design and visual
- biodiversity
- ecologically sustainable development

The SEARs require that the EIS must include 'a risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment'.

An environmental risk assessment was undertaken. The aim of the assessment was to identify – for each key issue – key potential impacts for consideration as part of the detailed impact assessments, which may be in addition to those specified by the SEARs.

The approach to the environmental risk assessment was informed by the principles of the Australian/New Zealand Standard *AS/NZS ISO 31000:2009 Risk management – Principles and guidelines* (Standards Australia/Standards New Zealand Standard Committee 2009). The assessment involved a preliminary, desktop level risk assessment, to broadly identify potential environmental impacts and risks associated with constructing and operating the proposal. Potential impacts and risks were identified based on the results of preliminary investigations, previous experience and professional judgement.

Potential risks/impacts rated as 'very high' and 'high' were considered the highest priority and, where present, were the focus of the concept design and environmental assessment. In general, the following was applied (in conjunction with the SEARs) when scoping the requirements for the environmental assessment:

- Very high risks/impacts – Assessment and planning is necessary to avoid these impacts to the greatest extent possible.
- High risks/impacts – Detailed specialist investigation and assessment is necessary to enable identification of appropriate management and mitigation options.
- Medium risks/impacts – Further investigation as part of the environmental assessment is desirable, to address some uncertainties. In general, impacts could be mitigated by applying best-practice environmental management measures and controls.
- Low risks/impacts – May not require specialist investigations, particularly where identifiable management/mitigation guidelines exist. Impacts could be mitigated through other working controls (such as detailed design requirements, normal working practice, safety and quality controls).

The results of the environmental risk assessment are provided in Appendix F.

Risks and impacts identified were considered by the relevant impact assessments (as appropriate), which were undertaken as described in section 8.3.

8.3 Impact assessment method

A description of the general approach to the assessment of the potential impacts of the project on the bio-physical and human environment is provided in the following sections.

8.3.1 Defining the environmental baseline/existing environment

The identification and assessment of baseline environmental values/conditions provides the foundation against which potential impacts are assessed. The approach to describing and defining the existing environment was specific to each impact assessment and was undertaken in accordance with relevant guidelines and best practice. Specific tasks employed included mapping, fieldwork, review of previous studies, database searches, stakeholder interviews and modelling.

The environmental baseline (or existing environment) is described in detail in the technical reports. A summary of the key features of the existing environment is provided in chapter 2 and chapters 9 to 18.

Further information is provided in individual technical reports.

8.3.2 Assessment of potential impacts

Potential impacts considered by individual impact assessments include those specified by the SEARs and identified as an outcome of the environmental risk assessment.

The assessment methodologies applied were specific to each key issue and defined in accordance with the requirements of the SEARs and relevant issue-specific guidelines and policies. For many of the key issues, the SEARs specify the guidelines that define the assessment methodologies.

Potential impacts were assessed using a (predominantly) qualitative or quantitative approach, depending on the nature of the issue and the requirements of relevant guidelines and policies. In general, these requirements include the need to undertake either a compliance or significance type of assessment.

The decision as to the appropriate assessment type was influenced by the requirements of relevant NSW assessment guidelines for individual impact assessments. For example, the *Noise Policy for Industry* (NSW EPA 2017) requires compliance type assessments. The *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW 2011) requires significance type assessment.

A general explanation of how each broad type of assessment methodology was applied is provided below. A summary of individual assessment methodologies is provided in chapters 9 to 18, with further detail provided in the technical reports.

The impacts have been assessed assuming that a number of design features are incorporated into the proposal to minimise the potential for impacts. These features form part of the baseline proposal for which approval is sought.

Compliance assessment

A compliance form of assessment was used where a potential impact (or the majority of potential impacts associated with an environmental issues) is able to be quantified, compliance with a known guideline or standard (eg. published limits or thresholds) can be quantitatively assessed, and/or quantitative assessment calculations are required.

Compliance assessments used mapping, modelling and/or spatial analysis to assess the degree to which the proposal complies with quantified guidelines and/or criteria. Individual assessment methodologies were determined based on the requirements of relevant assessment guidelines; however, the general methodology was as follows:

- Identify criteria where these are specified in guidelines (such as noise and vibration criteria)
- Identify and quantify potential impacts using mapping, modelling, calculations and/or spatial analysis
- Assess potential impacts against criteria (where these exist) or guideline values
- Identify any appropriate additional mitigation measures required

The following key issues listed by the SEARs were subject, either broadly or specifically, to compliance type assessments:

- soils and water
- traffic and transport
- noise and vibration
- air quality and odour
- fire and incident management
- hazards and risk
- biodiversity.

It is noted that for some of the above issues, although a predominantly quantitative approach has been taken, it may not be possible to quantify all potential impacts. As a result, there have been some elements of a significance assessment in relation to these issues.

Significance assessment

A significance form of assessment was used for those issues where:

- The impact (or the majority of the impact) is not able to be quantified – there are no relevant quantified criteria or models to measure potential impacts
- The impact depends on the sensitivity or vulnerability of the environmental value or receptor, and the magnitude of the impact at this receptor
- Relevant guidelines require this form of assessment.

Significance assessments broadly involved:

- Identifying the key environmental values or sensitive receptors
- Rating the sensitivity of each in accordance with the relevant impact assessment guideline
- Identifying and assessing potential impacts
- Rating the magnitude of impacts in accordance with the relevant impact assessment guideline
- Rating the potential significance of impacts according to sensitivity and magnitude
- Recommending appropriate best-practice mitigation measures for significant impacts.

The following key issues listed by the SEARs were subject to significance type assessments:

- cultural heritage and Aboriginal cultural heritage
- urban design and visual.

8.3.3 Cumulative impacts

For an EIS, cumulative impacts can be defined as the successive, incremental, and combined effect of multiple impacts. Each of the impacts considered may in themselves be minor but could become significant when considered together.

The SEARs require 'an assessment of the potential impacts of all stages of the development, including any cumulative impacts, taking into consideration relevant guidelines, policies, plans and statutes'.

An assessment of potential cumulative impacts has been undertaken for relevant key issues in accordance with the SEARs. A summary of the results is provided in section 18.4.

8.3.4 Mitigation and management

Mitigation and management measures were identified to minimise or avoid the key potential impacts identified. The aim of these measures is to protect existing environmental values and sensitive receptors, and to achieve the objectives and requirements of relevant legislation, policies and guidelines.

Issue-specific measures are provided in each of the impact assessment chapters. An overview of the approach to environmental management and mitigation, including a consolidated summary of the proposed environmental management and monitoring measures is provided in chapter 20.

8.4 Guide to how the impact assessment results are provided in the EIS and where the requirements are addressed

The assessment results are presented as follows:

- Chapters 9 to 18 provides impact assessment results as they relate to constructing and operating the plastics recycling and reprocessing facility, including the ancillary infrastructure and the new access road including the new Braddon Road east extension)
- Chapter 19 provides details of proposed planning agreement/development contributions
- Chapters 20 and 21 provide an evaluation of the results of the assessments as a whole and includes the overall approach to environmental management of the proposal.

Table 8.1 provides a summary of the SEARs and where these are addressed. A detailed list of the SEARs and further information about where individual SEARs are addressed is provided in Appendix A. Appendix B details the EIS form and content requirements defined by Schedule 2 (clauses 6 and 7) of the EP&A Regulation, and where these have been addressed.

Chapter 9 to 18 summarise the detailed assessment results that are provided in Technical Reports 1 to 11.

The EIS guidelines include (in section 3) a description of the sections that must be included in the main EIS report. Table 8.2 shows where the required sections are included in the EIS.

Table 8.1 Where SEARs are addressed

Requirement (summary)	Where addressed?
General requirements	
A detailed description of the development	Chapter 7
Consideration of all relevant environmental planning instruments	Chapter 4
Consideration of issues discussed in the public authority responses to request for key issues	Chapter 4
A risk assessment of the potential environmental impacts of the development	Appendix F
A detailed assessment of the key issues specified	A summary of the issues raised in public authority responses and a reference to where these are addressed is provided in Appendix A (Table A.4).
A consolidated summary of all the proposed environmental management and monitoring measures	Chapter 20
Key issues	
Waste management	Chapter 9
Soils and water	Chapter 10
Traffic and transport	Chapter 11
Noise and vibration	Chapter 12
Air quality and odour	Chapter 13 and section 18.1
Fire and incident management	Chapter 14
Hazards and risk	Chapter 14
Cultural heritage and Aboriginal Cultural Heritage	Chapter 15
Urban design and visual	Chapter 16

Requirement (summary)	Where addressed?
Biodiversity	Chapter 17
Ecologically sustainable development	Chapter 21

Table 8.2 Where the required contents of the EIS guidelines are addressed?

Content requirements	Where addressed?
Summary	Executive summary
Introduction	Chapter 1
Strategic context	Chapter 3
Project description	Chapter 7
Statutory context	Chapter 4
Community engagement	Chapter 6
Assessment and mitigation of impacts	Chapters 9 to 18
Project justification	Chapter 21

9. Waste management

9.1 Approach and method

9.1.1 Legislative and policy context to the assessment

The waste management assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

- The EP&A Act and POEO Act
- Protection of the Environment Operations (Waste) Regulation 2014 (the Waste Regulation)
- *NSW Waste and Sustainable Materials Strategy 2041* (NSW DPIE 2021a)
- *New South Wales Plastics Action Plan* (NSW DPIE 2021b)
- Guidelines relevant to the assessment:
  - *Waste Classification Guidelines* (NSW EPA 2014)

9.1.2 Method

The waste management assessment involved:

- Reviewing the policy and regulatory framework for waste management as it applies to the proposal
- Assessing mixed plastic waste feedstock availability and potential sources
- Identifying potential waste generating activities during construction and operation of the proposal
- Identifying the likely classification of key waste streams in accordance with relevant legislation and guidelines
- Estimating quantities of wastes generated during construction and operation of the proposal
- Describing waste handling, storage and management for waste during construction and operation of the proposal
- Addressing suitability of output materials
- Recommending waste management mitigation measures

9.1.3 How potential impacts have been avoided

The proposal has been design to maximise the recovery, recycling and beneficial reprocessing of plastic waste that would otherwise be landfilled. The proposal also includes a number of measures to ensure wastes generated from the proposal would be reduced as far as practicable and that all waste would be handled in a way as to minimise potential impacts and meet regulatory and legislative requirements. These measures include:

- enclosure of all plastic waste receival, recycling, reprocessing and storage within buildings with automatic fast opening doors to prevent waste materials from entering the environment
- careful design of processing lines and selection of advanced, high-tech sorting and separation equipment to maximise the recovery of plastics and other recyclable materials
- providing an on-site wastewater treatment plant to recycle water used in the plastic cleaning processes in order to maximise water re-use
- providing sufficient internal storage within the buildings to allow for safe stockpiling of incoming waste materials in accordance with *Fire safety guideline - Fire safety in waste facilities* (FRNSW 2020)
- no storage of finished products external to buildings
- construction and operational waste management strategies that are consistent with the aim, objectives and guidance in the NSW Waste Strategy, and follow the waste hierarchy

9.2 Existing environment

9.2.1 NSW plastics recycling capacity

The Infrastructure Needs Report (DPIE 2021c) identifies that there is currently 90,000 tonnes per year of plastics recycling capacity across 18 facilities in NSW. Some capacity is limited to one or two stages of secondary processing (eg. sorting/washing and drying different polymer types and not pelletising).

Capacity is broken down to include:

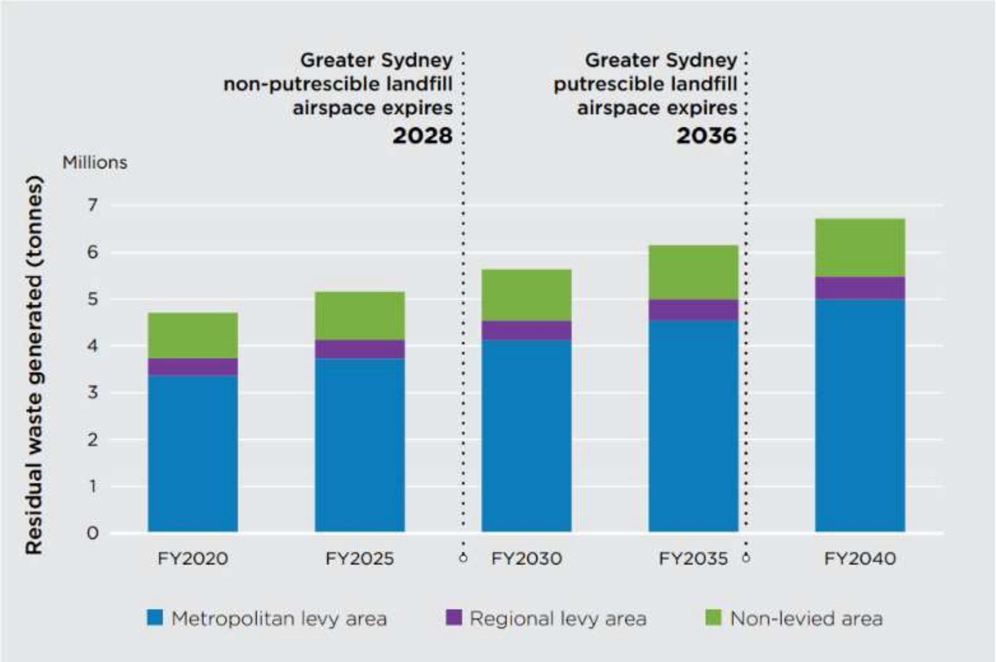
– Polypropylene (PP): 2,000+ tonnes per year
– High-density polyethylene (HDPE): 15,000 to 20,000 tonnes per year
– Polyethylene terephthalate (PET): 20,000+ tonnes per year
– Low-density polyethylene (LDPE): 5,500+ tonnes per year

In addition, there is at least 57,000 tonnes per year of energy recovery throughput capacity for plastic RDF.

9.2.2 NSW landfill capacity

The NSW Waste Strategy notes that NSW is running out of space to deal with residual waste. The strategy identifies that over the next 20 years, NSW waste volumes are forecast to grow from 21 million tonnes in 2021 to nearly 37 million tonnes in 2041.

Right now, about seven million tonnes of residual waste from all of NSW (including more than three million tonnes of unrecyclable wastes from the Sydney metropolitan area) goes to landfill every year. At NSW's current rates of generation and recycling, the putrescible landfills (which accept household waste) servicing Greater Sydney are likely to reach capacity within the next 15 years (see Figure 9.1).



Source: *NSW Waste and Sustainable Materials Strategy 2041* (DPIE 2021a)

Figure 9.1 Projected residual waste by levy area

9.2.3 Plastic waste generation and feedstock availability

In 2018-19 Australia exported a total of 190,700 tonnes waste plastics (Envisage Works 2020). However, in July 2021 a ban on the export of waste plastic came into effect. Exporters can no longer export plastics that have not been sorted into a single resin/polymer type and/or require further sorting, cleaning and processing before re-use in manufacturing. In addition, from July 2022) exporters will not be able to export single resin/polymer plastics that have not been re-processed for further use.

Based on 2018-19 export data the COAG response strategy identified that 81,000 tonnes of plastic, including 69,000 tonnes of mixed plastics currently exported from NSW would be affected by the export bans.

The *2020 National Waste Report* (Blue Environment 2020) estimated that the Australian plastics consumption in 2018-19 was 3.36 million tonnes, and approximately 2.1 million tonnes (85% of discarded plastics) was sent to landfill.

The Infrastructure Needs Report identifies that 760,000 tonnes of plastic entered the waste management system in NSW in 2018-19. Of that, only 19% was recycled into new plastic products or recovered as refuse derived fuel. Therefore over 424,000 tonnes of potentially recyclable plastics were disposed in NSW landfills in 2018-19.

Significant costs apply to plastics disposed in landfills in NSW, particularly when disposed with mixed waste within the Metropolitan Levy Area. Over the next several years, targeted planning and significant funding by the Australian and New South Wales Governments is expected to drive investment in technologies and other facilities or businesses to recover plastics from mixed waste streams currently going to landfill and/or to recover plastic wastes at source.

Feedstock from at-source recovery is likely to come from commercial plastic waste collections, including both manufacturing scrap and post-consumer industrial recovery. Manufacturing scrap includes offcuts produced during the manufacturing process as well as rejected parts and those which have not passed quality inspections. Post-consumer recovery refers to packaging collected through comingled recycling collection (typically processed through a materials recovery facility), as well as business-to-business packaging material such as pallet wrap. Smaller quantities may be collected through alternative collection systems – for example the Redcycle program where soft plastics are returned to supermarket collections bins.

It is expected that the plastics recycling and reprocessing facility would initially primarily receive mixed plastic wastes that were previously sent offshore (exported), but which is no longer permitted. A smaller proportion of initial feedstock would also be from commercial plastic waste collections and other recycling programs.

Feedstock is expected to be sourced from a wide geographic region including Sydney, Wollongong, Canberra and the Southern Highlands/local area. Yellow lid bin waste collected in Wingecarribee Shire Council is currently transferred to the SUEZ Spring Farm Resource Recovery Park, a medium sized NSW material recovery facility (MRF) for sorting and sale to local markets. According to the Wingecarribee Shire Council Annual Report for 2020/2021, approximately 3,988 tonnes of domestic recycling material was diverted from landfill in 2020/21.

Kerbside waste audit data (Office of Environment and Heritage 2011) shows typically 6.6% of dry recyclables bin material is recyclable plastic of which only a portion would be the mixed plastics stream after processing at the MRF. The Spring Farm MRF processes approximately 35,000 tonnes per year of which 2,100 is recovered plastics. This would represent approximately 1.8% of the total processing capacity of the proposal.

Table 9.1 provides an breakdown of the estimated current mixed plastic availability. Over time, feedstock availability including from at-source recovery (commercial waste collections and recycling programs) is expected to grow, particularly as the cost of landfill continues to increase and financial and other strategic developments drive diversion of waste from landfill.

Initial processing volumes are expected to therefore start off at moderate levels and grow over time as targeted programs for commercial plastics collection are developed and rolled out.

Table 9.1 Feedstock distribution

Source	Estimated available plastic feedstock supply (tonnes per year)[1]	Proportion %
Mixed plastic material produced by large NSW MRFs	16,500	19%
Mixed plastic material produced by small and medium sized processors of mixed plastic	10,200	12%
NSW Plastic segregators	19,680	23%
Commercial plastic waste collections	40,000	46%
Total	**86,380**	**100%**

1. Source: MRA Consulting, 2021. Plastic Feedstock Study

9.3 Impact assessment – construction

9.3.1 Waste generating activities, waste streams and classifications

Table 9.2 outlines the waste generating activities, key waste streams predicted to be generated during construction, and the likely classifications based on the *Waste Classification Guidelines*. Waste types and classifications would be confirmed during detailed design and construction planning.

Table 9.2 Indicative construction waste streams and likely waste classifications

Activity	Waste stream	Likely waste classification
Early works and site establishment: – vegetation clearing and removal where required, including slashing, mulching and stockpiling within the proposal site for re-use – spoil from geotechnical investigations – excess construction materials from construction of road pavement for site access road including installation of new kerbs and gutters, line marking and signage as required – Spoil from trenching for installation of/connection to underground services and utilities	– Virgin excavated natural material / Excavated natural material	General solid waste (non-putrescible)
	– Green waste	
	– Concrete – Metal – sand/soil	
Main site works: – Excess spoil from site shaping and creation of surface water drainage and water storage/bioretention ponds – Excess construction materials from construction of operational access roads, services and utility connection – Excess construction materials from erection and fit out of buildings and installation of building services – demobilise construction compound, temporary workforce accommodation and facilities – remove all materials, waste and redundant structures from the proposal site – decommission all temporary work site signs – remove temporary fencing	– Virgin excavated natural material / Excavated natural material	General solid waste (non-putrescible)
	– Concrete – Metal – Sand/soil – Plastics – Bricks – Timber – Internal fit out materials (gyprock, other)	General solid waste (non-putrescible)
Construction site office and amenities		
Operation of site office and amenities	– Food waste	General solid waste (putrescible)

Activity	Waste stream	Likely waste classification
	– Recyclable material: • Paper and cardboard • Beverage and other containers (plastics, aluminium cans, steel cans, glass bottles, liquid paperboard cartons etc) • Printer/toner cartridges – General waste: • Soft plastics and plastic wraps	General solid waste (non-putrescible)
	– Batteries	Hazardous waste
	– Sewage	Liquid waste
Maintenance and cleaning of site office and amenities	– Electrical/electronics – Light bulbs (LEDs) – Office furniture	General solid waste (non-putrescible)
	– Cleaning products (eg. lubricants, oils)	Liquid waste

9.3.2 Waste quantities

Typical waste generation factors as presented in Table 9.3 have been applied to estimate waste volumes during construction of the proposal. The Hills Shire Council (2012) *Development Control Plan* provides guidance on typical quantities of construction wastes for factories based on floor space area which have been adopted for the plant area. In the absence of waste generation guidelines for Wingecarribee Shire Council, these typical rates have been applied.

Table 9.3 Building waste estimate factors

Building type	Timber	Concrete	Bricks	Gyprock	Sand/Soil	Metal	Other
Factory (assumed to be tonnes per 1,000 m²)	0.25	2.1	1.65	0.45	4.8	0.6	0.5

The waste generated by the construction site office for the duration of the construction program (including commissioning phase) were estimated based on waste generation rates presented in the City of Sydney (2020) *Guidelines for Waste Management in New Developments* in the absence of guidance from Wingecarribee Shire Council. The rate for commercial offices in Table 9.4 was adopted for the construction site office. NABERS waste standard densities were applied to estimate the total volume.

Table 9.4 Construction site office waste estimate factors

Development type	Waste (litres/100m^2/day)	Recycling (litres/100m^2/day)	Food waste (litres/100m^2/day)
Commercial offices	15	25	5

Indicative waste generation quantities during construction are outlined in Table 9.5. Once the construction contractor has been appointed, a detailed construction waste management plan would be prepared.

Table 9.5 Preliminary construction waste quantities

Material	Volume (tonnes)
Proposal site construction	
Virgin excavated natural material / Excavated natural material	26,405
Topsoil	495
Timber	9.0

Material	Volume (tonnes)
Concrete	75.3
Bricks	59.2
Gyprock	16.1
Sand/soil	172.2
Metal	21.5
Other	17.9
Construction site office and amenities	
General waste	0.6
Recyclable material	0.6
Food waste	0.6
Liquid waste	942
Hazardous waste	Minimal

9.3.3 Potential impacts

Potential impacts associated with aspects of waste generation during construction are summarised in Table 9.6.

Table 9.6 Potential impacts associated to waste management during construction

Aspect of waste management	Potential impacts
Generation of excess spoil material during excavation	– generation and migration of dust during earthworks – erosion and sedimentation due to runoff from disturbed areas – uncontrolled sediment laden runoff from disturbed areas
Stockpile management	– migration of dust from uncovered stockpiles – erosion and sedimentation due to runoff from stockpiling areas – uncontrolled sediment laden runoff from stockpiling areas
Storage and segregation of waste	– cross contamination of wastes due to improper segregation – odour from waste storage area – attract disease vectors
Waste transportation	– dust generation from loading and unloading activities – migration of wheel generated dust on haul roads – litter and tracking waste on local roads
Non-compliant waste classification	– regulatory non-compliance – contamination of receiving facility
Unlicenced waste contractors or facilities handling waste	– regulatory non-compliance – potential illegal dumping of waste from construction activities

Potential impacts associated with erosion and sediment control are assessed in chapter 10. Sediment and erosion control measures proposed to be implemented during construction would manage potential environmental impacts to surface water and groundwater quality associated with earthworks and stockpiling. Construction waste management activities are not expected to have a significant impact on soil and water provided that the control measures identified in the chapter 10 are implemented.

Chapter 13 provides an assessment of the potential impacts associated with dust generation during construction of the proposal, including earthworks, stockpiling and transport. Management measures identified in the technical report for dust suppression and stockpile management would be implemented to manage environmental impacts to air quality during construction in line with air quality criteria.

Section 9.3.4 describes the proposed handling and management of construction waste, including waste classification, how waste would be segregate and stored to avoid cross-contamination, maximise re-use and resource recovery and to reduce the potential for odour and attraction of disease vectors.

Construction waste management activities are not expected to have a significant impact on the environment or human health provided that the controls measures identified in chapter 10 and 13, the waste handling and management measures described in section 9.3.4 and mitigation measures outlined in section 9.5 are implemented.

9.3.4 Waste handling and management

Approach to waste minimisation and re-use

All waste generated during construction would be managed using the waste hierarchy approach of avoidance and re-use before consideration is given to disposal. Procurement of excess materials would be avoided in accordance with relevant guidelines and policies, including use of precast building materials.

All wastes would be managed in accordance with the waste provisions contained within the POEO Act and other relevant legislative and policy requirements, as outlined in section 9.1.1

Should waste be found to be unsuitable for re-use or recycling, disposal methods would be selected based on the classification of the waste material in accordance with the *Waste Classification Guidelines*.

The proposed approach to managing the different types of construction waste in accordance with the waste management hierarchy, including measures to facilitate segregation and prevent cross contamination, are provided in Table 9.7.

The contractor would prepare a detailed construction environmental management plan that addresses key regulatory requirements and environmental management measures and procedures.

The contractor would prepare a detailed construction environmental management plan that addresses key regulatory requirements and environmental management measures and procedures.

Table 9.7 Construction waste management measures

Waste	Hierarchy	Management measures
Spoil	Reduce	Detailed design would include measures to minimise excess spoil generation. This would include a focus on optimising the design to minimise spoil volumes and the re-use of material on site.
	Re-use	Spoil from earthworks for the proposal would be stockpiled on site for use as construction fill and landscaping purposed on site if suitable.
	Recycle	Any excess spoil material would be stockpiled on-site and options to recycle the material would be investigation, where practicable.
	Dispose	Any excess spoil that is not suitable for re-use would be disposed of at a suitably licensed facility in accordance with the waste classification. Given the nature of the previous land use, contaminated soil or fill is not expected to be encountered as detailed in section 10.3.1.
Green waste and topsoil	Avoid	The access road and plastics recycling and reprocessing facility would be sited to minimise disturbance to existing vegetation and utilise already cleared land as far as practicable. This is further discussed in chapter 17.
	Reduce	The construction footprint would be set out during site establishment to manage the risk of incidental clearing.
	Re-use	Cleared vegetation and topsoil material for construction would be segregated and stockpiled for re-use on site for landscaping and finishing works.
	Dispose	Weeds would be disposed of in accordance with relevant guidelines and requirements.
General waste	Recycle	Labelled and colour coded receptacles would be provided at the construction site office for general waste from construction personnel to ensure source separation of recyclable materials and residual landfill waste. These wastes would be collected on a regular basis

Waste	Hierarchy	Management measures
		by authorised and appropriately licensed waste collection contractors for offsite recycling or disposal.
	Dispose	Residual general solid waste would be transferred off-site for disposal at a suitably licensed facility.
Food waste	Dispose	Putrescible waste would be stored in designated bins and collected by an authorised contractor for disposal to a suitably licensed facility.
Wastewater	Dispose	Wastewater generated by the construction staff from the site office would be tankered off site for disposal at a suitably licensed facility.
Excess construction materials	Avoid	Procurement of surplus construction materials would be avoided and precast building components utilised, where practicable.
	Recycle	Any excess materials generated on site would be segregated using separate bins for different waste and recyclable materials. The recyclable material would be removed from site for further processing or re-use at appropriately licensed facilities.
	Dispose	Residual construction waste that cannot be recycled would be collected and removed offsite for disposal at a suitably licensed facility.
Hazardous waste	Dispose	Minimal amounts of hazardous waste are expected to be generated during construction. The batteries would be collected and stored in designated collection containers and disposed of to an appropriately licensed facility.

Waste storage locations

Construction waste would be temporarily stored on-site in an area of compacted hardstand material that would be graded to facilitate drainage. The storage area would be bunded to contain sediment laden run off in accordance with the sediment and erosion control plan that would be developed for construction. Stockpiles would be segregated according to classification and clearly signposted in order to maximise the stockpile fitness for use and reduce the risk of cross contamination. Bins would also be located in the storage area to temporarily store segregated recyclable materials.

Waste generated by construction staff would be stored in mobile garbage bins in designated storage areas. Signage identifying the waste storage area at the construction site office would be prominently displayed. All waste receptacles would be clearly and correctly labelled to identify which materials are to be placed in which bin and colour-coded in accordance with the *AS 4123*.7-2006*: Mobile Garbage Containers* (Standards Australia 2008).

Off-site recycling and disposal

Table 9.8 identifies potential options for off-site disposal and recycling for the key construction waste streams. The destinations would be confirmed by the construction contractor and included in the construction waste management plan for the proposal prior to construction commencing.

Table 9.8 Potential recycling and disposal options for construction waste – construction

Material	Recycling/disposal options
Virgin excavated natural material / excavated natural material	– On-site re-use for landscaping purposes – Recycling facility
Green waste	– On-site re-use for landscaping purposes – Composting facility such as SoilCo
Timber	– Timber recycling facility such as Bowral Waste Centre or Soil Co
Concrete	– Recycling facility such as Wingecarribee Shire Council Resource Recovery Centre or Bowral Waste Centre
Bricks	– Recycling facility such as Wingecarribee Shire Council Resource Recovery Centre or Bowral Waste Centre
Gyprock	– Recycling facility such as Wingecarribee Shire Council Resource Recovery Centre

Material	Recycling/disposal options
Sand/soil	– On-site re-use for landscaping purposes – Recycling facility such as Bowral Waste Centre
Metal	– Metal recycling facility such as Anderson Waste Services
General waste	– Licenced landfill sites such as Bowral Waste Centre
Recyclable material	– Recycling facility such as Wingecarribee Shire Council Resource Recovery Centre
Food waste	– Licenced landfill sites such as Bowral Waste Centre
Wastewater	– Wastewater treatment plant such as Moss Vale sewage treatment plant
Liquid waste	– Liquid waste management facility such as Cleanaway Port Kembla Liquid Waste Services
Hazardous waste	– Battery collection service

9.4 Impact assessment – operation

9.4.1 Mixed plastic waste feedstock

Quantities, classification and composition

The proposal would receive up to 120,000 tonnes of plastic waste per year. At full scale operation, this is expected to comprise about 100,000 tonnes of mixed plastics and up to 20,000 tonnes of polyvinyl chloride (PVC) and plastic films. The incoming plastic waste is expected to be classified as general solid waste (non-putrescible).

The quantity received each week or day may fluctuate but is not expected to exceed 2,800 tonnes per week or 400 tonnes per day. There would be an allowance for three days storage capacity in Building 1 for a total volume of 4,800 cubic metres. The maximum stockpile height within the bunkers is four metres.

The facility would have the capability to process the following plastic types received as mixed plastic:

– PET bottles
– HDPE bottles
– PP bottles
– ABS
– LDPE films
– UPVC pipes

Table 9.9 provides an overview of the expected plastic waste feedstock composition at full scale operation.

Table 9.9 Expected feedstock composition

Feedstock stream		Colour	Quantity (tonnes/year)	Proportion
Mixed plastics	PET bottles	Colourless	20,000	20%
	PET bottles	Other	5,000	5%
	HDPE bottles	White	20,000	20%
	HDPE bottles	Other	10,000	10%
	PP bottles	White	10,000	10%
	PP bottles	Other	10,000	10%
	ABS		5,000	5%
	Other plastics		5,000	5%
	Paper, films, etc.		10,000	10%

Feedstock stream		Colour	Quantity (tonnes/year)	Proportion
	Metals		2,000	2%
	Residual waste		3,000	3%
		Sub-total	**100,000**	**100%**
LDPE films	Mulching film, shed membrane, vest bag, etc.	Other	10,000	
UPVC pipes	Used UPVC pipes	Other	10,000	
		Sub-total	**20,000**	
		Total	***120,000***	

Feedstock sources

As discussed in section 3.2, the primary source of feedstock is expected to be material recovery facilities operating in NSW with a smaller contribution coming from other collection services such as commercial plastic waste collections of manufacturing scrap, post-consumer industrial recovery and other recycling programs.

Excluded wastes

Putrescible waste, liquid waste, clinical waste, hazardous waste, asbestos and other chemical waste would not be accepted at the facility.

9.4.2 Plastic recycling and reprocessing processing

Section 7.5 provides a description of the proposed plastics recycling and reprocessing operations including:

- Feedstock receival and unloading
- Sorting, cleaning, crushing and extrusion granulation processes
- Reprocessing (deep processing) activities
- Expected recycling and reprocessing outputs

Material handling

Articulated vehicles would unload mixed plastic bales within the unloading zone of Building 1 using skid steers or other similar plant. The mixed plastic would be inspected and transferred to the designated storage areas prior to sorting. The mixed plastics bales would be opened prior to screening and sorting. An automated conveyor system would move the mixed plastics through the initial sorting system. Conveyors would deliver the sorted plastics to covered containers or bags.

The sorted plastics would be transferred within the building by skid steer or other small vehicle to the crushing and cleaning lines. The resulting plastic flakes would then be transferred within enclosed containers to the granulation production line to be pelletised. The pellets would be transported in enclosed containers by electric forklift or other small vehicle to Building 2 for further processing or storage for transfer off site.

9.4.3 Waste generating activities

Some wastes would be generated on-site from operation and maintenance of offices and amenities, the wastewater treatment plant and the recycling and reprocessing activities.

Table 9.10 provides the key wastes expected to be generated during operation of the plastics recycling and reprocessing facility and the likely classifications based on the *Waste Classification Guidelines*.

Table 9.10 Operational waste streams

Activity	Waste stream	Likely waste classification
	– Food waste	General solid waste (putrescible)

Activity	Waste stream	Likely waste classification
Operation of offices and amenities	– Recyclable material: • Paper and cardboard • Beverage and other containers (plastics, aluminium cans, steel cans, glass bottles, liquid paperboard cartons etc) • Printer/toner cartridges – General waste: • Soft plastics and plastic wraps	General solid waste (non-putrescible)
	– Batteries	Hazardous waste
	– Sewage	Liquid waste
Maintenance and cleaning of offices and amenities	– Recyclable material: • Electrical/electronics • Light bulbs (LEDs) • Office furniture	General solid waste (non-putrescible)
	– Cleaning products (eg. lubricants, oils)	Liquid waste
Operation of wastewater plant	– Effluent	Liquid waste
	– Dewatered sludge (filter cake residue)	General solid waste (putrescible)
Plastics recycling	– Wastewater	Liquid waste
	– Entrained non-renewable solid waste (such as stones, wood blocks etc)	General solid waste (non-putrescible)
	– Residual liquid (such as liquid in beverage containers etc)	Liquid waste
	– Exhaust steam	Not applicable
Plastics reprocessing (deep processing)	– Filter residue and waste filters	General solid waste (non-putrescible)

9.4.4 Waste quantities

The estimated quantities of waste and process residues expected to be generated by the plastics recycling and reprocessing facility during operation are summarised in Table 9.11. The waste generated by the operational staff were estimated based on waste generation rates presented in the City of Sydney Guidelines for Waste Management in New Developments (2020) in the absence of guidance from Wingecarribee Shire Council. The rate for commercial offices in Table 9.4 was adopted for the office and administration areas. NABERS waste standard densities were applied to estimate the total volume.

Table 9.11 Operational waste quantities

Material	Quantity (t/year)
Food waste	9.6
General waste	10.8
Recyclable material	10.3
Batteries	Minimal
Cleaning products (eg. lubricants, oils)	Minimal
Sewage	9.7 kL per day
Cleaning products (eg. lubricants, oils)	Minimal
Sorting	
Entrained non-renewable solid waste (such as stones, wood blocks etc)	10,000
Crushing and cleaning	

Material	Quantity (t/year)
Dewatered sludge (filter cake residue) from the wastewater treatment plant	9,000
Process wastewater	288,000 kL per year (total generated) Up to 10 kL per day (effluent, requiring disposal)
Exhaust steam	4,500
Extrusion and granulation	
Filter residue and waste filters	1,800

9.4.5 Potential impacts

Potential impacts associated with aspects of waste generation during operation are summarised in Table 9.12.

Table 9.12 Potential impacts associated to waste management during operation

Aspect of waste management	Potential impacts
Acceptance of non-conforming waste	– cross contamination of wastes – attract disease vectors – exposure to potentially hazardous materials – impact to facility performance causing shut-down
Odour emissions from the wastewater treatment plant or other air emissions from deep processing	– odour nuisance at nearby receptors – air emissions impacting nearby receptors
Leachate management	– uncontrolled release of leachate – contamination of soil or groundwater
Storage and segregation of waste	– cross contamination of wastes due to improper segregation – exceedance of storage capacity – fire risk
Waste transportation	– dust generation or litter from loading and unloading activities – migration of wheel generated dust on haul roads – litter and tracking waste on local roads
Unlicenced waste contractors or facilities handling waste	– regulatory non-compliance – potential illegal dumping of waste from construction activities

All mixed plastics receival, unloading, stockpiling, recycling and reprocessing activities and finished product storage would occur inside buildings with roller doors being closed once vehicles enter the building. This would minimise the potential for dust or plastics litter entering the environment. It would also ensure that rainwater would not come into contact with the incoming feedstock or any residual wastes. Therefore, risks to surface water and groundwater quality from waste storage and handling would be negligible.

Fire risks from storage/stockpiling waste have been assessed in chapter 14. All stockpile dimensions, separating walls and clearance requirements for potentially combustible wastes and the proposed fire protection equipment would be in accordance with the *Fire safety guideline - Fire safety in waste facilities* (FRNSW 2020).

An assessment of the potential operational air quality and odour impacts of the proposal has been undertaken and a summary of the results of the assessment is provided in chapter 13. It considered potential odour emissions from the wastewater treatment plant and other air emissions from the recycling and deep processing activities. It concluded that the proposal would not result in any significant impacts to odour or air.

Section 9.4.7 describes waste tracking, record keeping and quality control measures that would be implemented during operation and how non-conforming waste would be dealt with.

Section 9.4.6 describes the proposed approach to the management of operational wastes, waste storage and of-site recycling and disposal. This includes how waste would be segregated and stored to avoid cross-contamination and maximise reuse and resource recovery.

Operational waste management activities are not expected to have a significant impact on the environment or human health provided that the waste handling and management measures described in section 9.4.6 and mitigation measures outlined in section 9.5.2 are implemented.

9.4.6 Waste handling and management

Approach to waste minimisation and re-use

All waste generated during operation would be managed using the waste hierarchy approach of avoidance and re-use before consideration is given to disposal. Operational waste generated by staff would be source separated to recover recyclable materials and divert wastes from landfill. Process waste including wastewater would be reduced as far as practicable through on-site treatment and re-use in processing activities.

All wastes would be managed in accordance with the waste provisions contained within the POEO Act and other relevant legislative and policy requirements, as outlined in section 9.1.1.

Should waste be found to be unsuitable for re-use or recycling, disposal methods would be selected based on the classification of the waste material in accordance with the *Waste Classification Guidelines*.

The measures for operational waste proposed to align with the waste management hierarchy are listed in Table 9.13. This table also outlines the contingency measures (disposal) for wastes and residues that cannot be avoided, re-used, recycled or treated.

Table 9.13 Operational waste management measures

Waste	Hierarchy	Management measures
Food waste	Dispose	General waste materials would be collected and transferred off-site to a licenced waste management facility
General waste	Dispose	General waste materials would be collected and transferred off-site to a licenced waste management facility
Recyclable materials	Recycle	Recyclable materials generated by the office and administration system would be source separated and transferred off site to licenced recycling facilities
Batteries	Dispose	A licenced waste contractor would be engaged for collection and disposal of batteries
Sewage	Dispose	Sewage from offices and amenities would be discharged to sewer
Cleaning products (eg. lubricants, oils)	Dispose	General waste materials would be collected and transferred off site to a licenced liquid waste management facility
Entrained non-renewable solid waste	Dispose	Entrained non-renewable solid waste (such as stones, wood blocks etc) separated from the plastics stream would be removed from site and disposed of to a suitably licensed facility
Process wastewater	Reduce/re-use	Wastewater generated from cleaning of plastics would be treatment at on-site wastewater treatment plant and re-use in the process
	Dispose	Excess effluent from the wastewater treatment plant would be discharged to sewer
Exhaust steam	Reduce/re-use	Steam would be condensed and re-used in the process
Dewatered sludge (filter cake residue)	Dispose	Filter cake residue from the wastewater treatment plant would be sent off-site for further processing into refuse derived fuel, or otherwise disposed of to a suitably licensed facility
Filter residue and waste filters	Dispose	Residues from the extrusion and granulation process would be disposed of to a suitably licensed facility

Waste storage locations

Process wastes such as stones, wood blocks and other impurities separated from the plastics stream, residues from the extrusion and granulation process and filter cake residues would be stored temporarily in designated stockpile pens in Building 1 and before being disposed of off-site to a suitably licensed facility.

Waste generated by operational staff would be stored in interim waste receptacles strategically located throughout the working floors of the offices and workshop and in communal areas for source separation of garbage (general waste) and comingled recyclables. Recycling stations throughout the offices would promote further source separation of plastics and paper and cardboard. The cleaning contractor would empty the receptacles at the end of the day and transfer the waste to a waste bin storage area to await collection. The source separated waste streams would be segregated and placed into appropriate bins.

Adequate signage identifying the waste storage area would be prominently displayed. All waste receptacles would be clearly and correctly labelled to identify which materials are to be placed in which bin and colour-coded in accordance with the *AS 4123: Mobile Garbage Containers* (Standards Australia 2008).

Off-site recycling and disposal

Table 9.14 identifies quantities of materials and potential options for off-site disposal and recycling of operational wastes, process residues and product outputs. The final destinations for all off-site recycling and disposal would be confirmed prior to operations commencing and updated throughout the life of the facility based on the availability of suitably licensed facilities.

Table 9.14 Potential off-site recycling and disposal options – operation

Material	Quantity (t/year)	Recycling/disposal options
General waste	10.8	– Licenced landfill sites such as Bowral Waste Centre
Recyclable material	10.3	– Recycling facility such as Wingecarribee Shire Council Resource Recovery Centre
Food waste	9.6	– Licenced landfill sites such as Bowral Waste Centre
Liquid waste	Minimal	– Liquid waste management facility such as Cleanaway Port Kembla Liquid Waste Services
Hazardous waste	Minimal	– Licensed waste facility such as the Bowral Waste Centre
Treated effluent	3,650	– Wastewater treatment plant such as Moss Vale sewage treatment plant
Filter cake	9,000	– Licenced landfill sites such as Bowral Waste Centre or Wollongong Waste and Resource Recovery Park
Filter residue and waste filters	1,800	– Licenced landfill sites such as Bowral Waste Centre or Wollongong Waste and Resource Recovery Park

9.4.7 Waste tracking, record keeping and quality control

Specifications for feedstock materials would be developed as part of commercial agreements with feedstock suppliers to ensure materials received at the plastics recycling and reprocessing facility are suitable (conforming). All incoming loads would be visually inspected upon unloading and before being moved immediately into designated storage pens. As the majority of feedstock is expected to be received in bales, this initial visual inspection would focus on identifying loads which are clearly non-conforming.

Non-conforming wastes would include putrescible waste, liquid waste, clinical waste, hazardous waste, asbestos and other chemical waste. Small quantities of impurities such as stones, dirt, small wood blocks, loose wrappers, small amounts of beverage liquid inside bottles/containers etc are expected to be received and feedstock containing these impurities would not constitute a non-conforming load as they can be handled by the sorting and separation processes.

Where a non-conforming load is identified during the initial visual inspection, the load would not be unloaded. If some of the material has been unloaded when it is identified as non-conforming, it would be reloaded onto the vehicle it was delivered in and the full load would be rejected. Records of the date, time, vehicle and reasons for load rejection would be maintained.

For loads that pass initial visual inspection, after bale opening, the feedstock would undergo a first pass of screening and manual sorting to identify and remove large impurities. The sorting and separating process (as discussed in section 7.5) would be designed to progressively remove impurities from the process stream.

The quality control measures proposed during operation to track incoming waste and outgoing products and ensure the quality of outgoing products are listed in Table 9.15.

Table 9.15 Quality control, record keeping and waste tracking measures

Aspect	Measures
Signage at entrance	Signage at the entrance clearly identifying the permitted waste/feedstock types and non-conforming waste types
Specifications for feedstock material	Agreed specifications for feedstock materials to control the risk of receiving non-conforming materials.
Rejected loads (non-conforming waste) register	Maintenance of a rejected loads register – including records of date, time of load rejected, registration of vehicle(s), type of waste(s) rejected and reason for rejection
Feedstock and output/product storage	Labelling or signposting of incoming feedstock and outgoing product storage areas in a way which is clearly visible Separation/segregation of individual separated output/product types
Inspections	Daily inspections by trained staff of incoming and outgoing waste storage areas to ensure storage is being undertaken in accordance with the operations plan for stockpile management and implementation of any required corrections immediately Maintenance of inspection records
Training	Training of staff in roles which require visual inspection of loads Maintenance of training records
Specifications, sampling and testing of product material	Where applicable, development of specifications, sampling and testing procedures in conjunction with product/recovery stream customers
Incoming and outgoing waste/product records	Accurate recording of all incoming and outgoing (waste and product outputs) using weighbridge data in accordance with the record keeping requirements of the Environment Protection Licence for the facility, the *NSW Energy from Waste Policy Statement* (for RDF outputs)

9.5 Mitigation and management measures

9.5.1 Construction

Table 9.16 lists the proposed mitigation measures to be implemented to minimise the potential for waste management impacts during construction.

Table 9.16 Waste management measures – construction

Mitigation measure	Timing
Detailed design would include measures to minimise quantities of waste requiring off-site disposal including cut and fill balance and careful procurement of construction materials to minimise excess waste materials	Detailed design
All construction waste would be classified and recycled or disposal of in accordance with the *Waste Classification Guidelines* and the waste provisions contained within the POEO Act and other relevant legislative and policy requirements	Construction
Construction waste management plan A construction waste management plan would be prepared and implemented as part of the construction environmental management plan for the proposal. The plan would adopt the waste hierarchy principles contained in the *Waste Avoidance and Resource Recovery Act 2001* and detail processes, responsibilities and measures to manage waste and minimise the potential for impacts during	Construction

Mitigation measure	Timing
construction. This would include waste separate, handling, storage, transport and off-site re-use, recycling and disposal locations.	

9.5.2 Operation

Table 9.17 lists the proposed mitigation measures to be implemented to minimise the potential for waste management impacts during operation.

Table 9.17 Waste management measures – operation

Mitigation measure	Timing
Operational waste management plan An operational waste management plan would be developed and implemented which incorporates the requirements of relevant guidance documents, waste management hierarchy principles contained in the *Waste Avoidance and Resource Recovery Act 2001*. This would include: – All key operational waste streams and expected quantities – Waste handling, management and storage procedures including for both plastic waste feedstock as well as wastes generated on-site – Procedures for identifying and managing unacceptable and non-conforming feedstock – Waste classification procedures and details of how all waste streams would be recycled or disposal of in accordance with the *Waste Classification Guidelines* and the waste provisions contained within the POEO Act, Waste Regulation and other relevant legislative and policies – Details of off-site recycling and disposal locations – Detailed product sampling and validation program for refuse derived fuel, in accordance with agreed end use specifications – Record keeping and reporting requirements	Operation

10. Soils and water

The chapter provides a summary of the assessment of potential soil and water impacts of constructing and operating the plastics recycling and reprocessing facility. Full copies of the assessment results are provided in Technical Report 4 – Preliminary Site Investigation (Contamination), Technical Report 10 – Soils and Water and Technical Report 11 – Water and Wastewater Modelling.

10.1 Approach and method

10.1.1 Legislative and policy context to the assessment

The soils and water assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

- The *Contaminated Land Management Act 1997*
- The *Water Management Act 2000*
- The Wingecarribee LEP 2010
- Guidelines relevant to the assessment of construction impacts:
  - *Contaminated Land Guidelines, Consultants reporting on contaminated land* (NSW EPA 2020b)
  - *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC 2013)
  - *Managing Urban Stormwater: Soils and Construction – Volume 1* (Landcom 2004)
- Guidelines relevant to the assessment of operation impacts:
  - *Controlled Activities on Waterfront Land: Guidelines for riparian corridors on waterfront land* (NSW Office of Water 2012)
  - *Australian Rainfall and Runoff: A Guide to Flood Estimation* (Ball et al 2019)
  - *Using MUSIC in the Sydney Drinking Water Catchment* (WaterNSW 2018)

10.1.2 Method

Key tasks

The soils and water assessment generally involved:

- assessing the likelihood of contamination to exist on the proposal site from past or present activities through a preliminary site investigation
- assessing the potential for riparian zone, water quality and flooding impacts during construction and operation
- assessing the impact of the proposal water and wastewater demands on existing water and wastewater infrastructure performance through water and wastewater modelling
- identifying mitigation and management measures.

Likelihood of contamination

The assessment of the likelihood of contamination involved:

- completing a desktop study of the site history including:
  - reviewing historical title records
  - reviewing historic aerial photographs
  - holding interviews with persons familiar with the history of the plastics recycling and reprocessing facility site

  - completing a search of the WaterNSW groundwater bore database and NSW EPA databases, Council planning records (Section 10.7 (Parts 2 & 5) certificates and information provided by the *Government Information (Public Access) Act*)
- conducting a site inspection to understand the site conditions and environmental setting and to identify any apparent evidence of potential contamination
- preparing a preliminary conceptual site model (CSM) to identify potential contaminant sources, pathways and receptors, as well as to establish potential pollutant linkages
- conducting a preliminary assessment of potential source-pathway-receptor linkages based on the proposed future land use (commercial/industrial) by means of a tier 1 qualitative risk assessment

Riparian zone, water quality and flooding

The assessment of riparian zone, water quality and flooding impacts involved:

- identifying the existing environmental factors influencing surface water management and erosion and sediment control
- developing a soil and water management strategy for the proposal and incorporating appropriate riparian preservation and management measures into the concept design
- developing a stormwater quality treatment train and undertaking MUSIC modelling in accordance with *Using MUSIC in the Sydney Drinking Water Catchment* to confirm that the proposed stormwater quality treatment train would achieve a neutral or beneficial effect (NorBE) on water quality during operation
- assessing potential flood risk by
  - estimating the 1 in 100 year average exceedance probability (AEP) peak flows adjacent to the plastics recycling and reprocessing facility site according to the Regional Frequency Estimation method
  - determining the 1 in 100 year AEP peak flood level using a HECRAS flood model
  - assessing the encroachment of the peak flood levels on the plastics recycling and reprocessing facility site in existing conditions and with proposal infrastructure in place

Water and wastewater modelling

The modelling assessment involved:

- identifying the expected water demands and wastewater generation quantities
- assessing the existing water and wastewater infrastructure performance with 2021 flows
- assessing the impact of the proposed plastics recycling and reprocessing facility demands on the existing performance for both systems
- determining if any infrastructure augmentations are needed to service the proposal
- confirming appropriate sourcing of the expected water demands and sewer network capacity

10.1.3 How potential impacts have been avoided

A number of water management and water quality treatment features have been incorporated into the proposal design to ensure compliance with the *Water Management Act 2000* and minimise the potential for soil and water impacts as far as practicable.

A key feature in the design of the facility to avoid potential water quality impacts is the design of buildings to have sufficient size to ensure that all mixed plastics receival, unloading, stockpiling, recycling and reprocessing activities and finished product storage would occur inside buildings.

In order to maximise water re-use and minimise the demand for potable water supply, an on-site wastewater treatment plant is proposed. Rainwater tanks would be installed to capture roof water for use in the plastics recycling process and for toilet flushing which would further reduce the demand for potable water.

The proposed key water management and water quality treatment design features are shown on Figure 10.1 and include the following:

- Flood risk management

  - all key infrastructure (buildings, roadways etc) would be positioned above the 1 in 100 year AEP flood level
- Riparian preservation and management
  - The eastern watercourse would be realigned to allow development of the facility, but the overall layout would avoid the need to amend the existing alignment of the western watercourse
  - Other than basins, no infrastructure would be located within the vegetated riparian zone of either the western watercourse or realigned eastern watercourse
  - Where basins are provided within the outer vegetated riparian zone of the watercourses, corresponding offsetting areas would be provided
- Maximising re-use and reducing potable water demand
  - Rainwater tanks (150 kilolitres) would be provided on-site to capture roof water for use in the process and for toilet flushing, in order to reduce the demand on potable water supply
  - A wastewater treatment plant would be provided on-site to enable process wastewater to be treated and re-used in the process, and thereby reduce potable water demand
- Protecting water quality
  - Buildings would be provided with sufficient size and arrangement to ensure that no mixed plastics receival, stockpiling, recycling and reprocessing activities and finished product storage would need to occur outside
  - Gross pollutant traps would be provided for primary treatment of runoff from impervious ground surfaces
  - Storage basins would be provided for rainwater tank overflow and gross pollutant traps outflow
  - Storage basins would be lined with a compacted clay liner (or other lining of similar performance)
  - A bioretention basin (with 500 square metre filter area) would be provided immediately downstream of the eastern storage basin and a bio-retention swale (with 50 square metre filter area) would be provided immediately downstream of the western storage basin to ensure that all water discharged off-site would have a neutral or beneficial effect on water quality.

The water management and water quality treatment design measures have been developed in accordance with the SEARs as well as relevant clauses in the Wingecarribee LEP including Clause 5.21 (Flood planning) and Clause 7.5 (Natural resources sensitivity – water).

10.1.4 NorBE criteria

To ensure that a development and its associated treatment systems (measures) achieves NorBE, the 2019 Water NSW Standard *Using MUSIC in the Sydney Drinking Water Catchment* requires the proposal to meet the following criteria for mean annual pollutant loads for the post-development case (including mitigation measures):

- 10% less than the pre-development case for total suspended solids (TSS), total phosphorus (TP) and total nitrogen (TN).
- equal or less that the post-development load for gross pollutants.

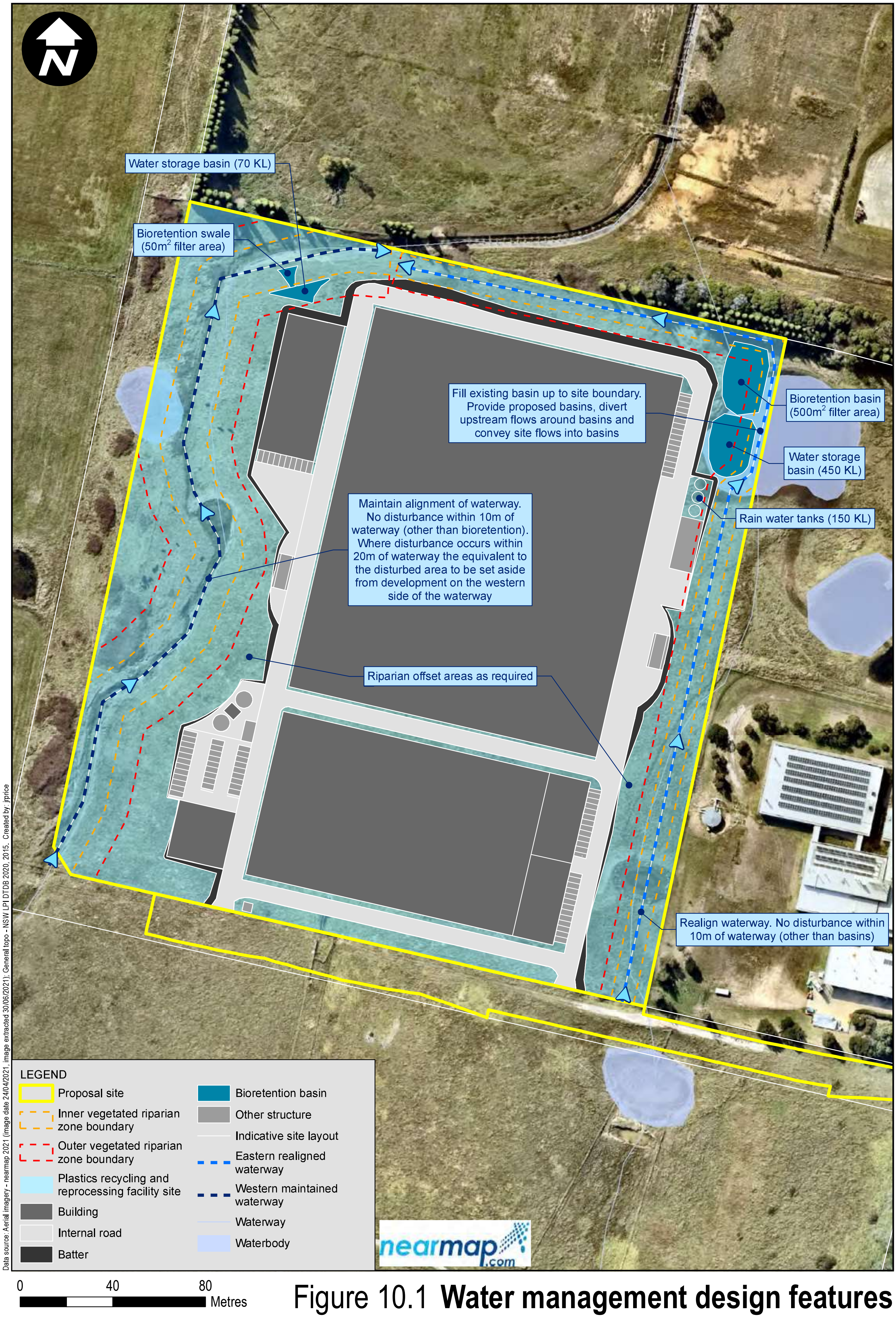


Figure 10.1 **Water management design features**

10.2 Existing environment

10.2.1 Hydrology

The plastics recycling and reprocessing facility site is undulating and falls from the southern-central portion towards the north and north-east. Surface elevations vary between about 681 m relative to Australian height Datum (m AHD) in the southern-central portion to 666 m AHD along the northern boundary. Four ponds are located in the low points and two watercourses run along the western and eastern boundaries (hereafter referred to as the western and eastern watercourses respectively).

In accordance with the Strahler stream ordering system, the western watercourse is a 2nd order stream. The stream flows in a north-westerly direction and crossing multiple constructed farm dams when flowing along the western boundary of the proposal site. The western watercourse then passes into a concrete channel.

The eastern watercourse, as per the Strahler stream ordering system, is a 1st order stream. The watercourse passes the eastern boundary of the proposal site, through a large dam shared with the neighbouring site, and enters the same concrete channel as the western watercourse. The combined flow passes an industrial site and flows in a north-easterly direction, under Collins Road, until it reaches the Wingecarribee River. Wingecarribee River eventually outflows to Wingecarribee Reservoir.

The proposal site is located within the Sydney drinking water catchment. This catchment covers 16,000 square kilometres and services more than four million people in Sydney, Wollongong, Goulburn, Lithgow, the Blue Mountains, Bowral and Nowra (DPIE 2020a).

The plastics recycling and reprocessing facility site is relatively elevated from regional waterways and as such not in a floodplain location. However, due to its proximity to local drainage lines there is potential for short duration overland flow inundation.

10.2.2 Soils

Site inspections undertaken by GHD in March 2021 identified several soil profiles exposed by the western watercourse. The soil is generally comprised of about 50 mm of topsoil underlain by residual light-brown sandy clay (stiff, medium-plasticity and dry). No odours, no staining and no anthropogenic material was found in the soil profiles.

The *Atlas of Australian Acid Sulfate Soils* indicates that the plastics recycling and reprocessing facility site is within a zone classified as B - low probability of occurrence (i.e., 6-70% chance of occurrence). It is also noted that the elevation of the proposal (approximately 670 m AHD) would have precluded the generation of acid sulfate soils. Acid sulfate soils are therefore unlikely to be on-site based on available information.

10.2.3 Hydrogeology

A search of the groundwater bore database provided by the Bureau of Meteorology indicated that there were no registered groundwater bores within 500 metres of the plastics recycling and reprocessing facility site. The nearest groundwater bore was located approximately 569 metres to the east and was registered for coal exploration. 17 bores are registered between 596 and 2,000 metres of the plastics recycling and reprocessing facility site for irrigation, stock, industrial, domestic, and monitoring purposes.

The local aquifer is described as porous, extensive, and highly productive by the Hydrogeology Map of Australia (Lotsearch). Standing groundwater levels reported in the Bureau of Meteorology database were measured between 5.4 metres below ground level (m bgl) and 85 m bgl. The plastics recycling and reprocessing facility site is situated on a localised high point in the area and based on topography groundwater is expected to flow towards the north to north-east in the direction of Wingecarribee River.

10.2.4 Water and wastewater infrastructure

An existing 150 millimetre diameter ID146.3 asbestos concrete main runs along the southern and western boundary of the plastics recycling and reprocessing facility site (as shown on Figure 7.4). This main is fed from the Hill Road Reservoir which has a total capacity of 2.27 megalitres

A DN150 UPVC pipe sewer rising main is located along the southern and western boundary of the plastics recycling and reprocessing facility site (see Figure 7.4). This flows downstream to the sewage pump station SPS-MV15. Sewage is then pumped to the Moss Vale Wastewater Treatment Plant (WWTP), via an ID150 HDPE rising main and a gravity main of varying sizes and material type.

The current capacity of the Moss Vale WWTP is 9,000 equivalent population (EP).

10.3 Impact assessment – construction

10.3.1 Contamination

A preliminary site investigation was undertaken to assess the likelihood for contamination to exist on the plastics recycling and reprocessing site and surrounding area from past or present activities. This section provides a summary of the findings of the investigation. Further detail is provided in Technical Report 4 – Preliminary Site Investigation (Contamination).

Site history

The plastics recycling and reprocessing facility site is situated within a mixed agricultural and industrial area to the north of Moss Vale. Several individuals, registered as farmers and graziers, have owned the site between 1920 and 1977. Between 1977 and today the site ownership was transferred five times to companies and private individuals.

The desktop study indicated that the plastics recycling and reprocessing facility site had been used for agricultural activities since at least 1949 and no potentially contaminating activities were noted. Off-site commercial / industrial development commenced to the north and east of the site in the 1960s. Two ponds located immediately to the north of the plastics recycling and reprocessing facility site have been backfilled with unknown material and then capped in circa 2010.

A search of the NSW EPA databases, historical business directories, and Council records did not identify evidence of current or past contamination on-site or in the vicinity (eg. 500 to 1,000 metres from the plastics recycling and reprocessing facility site). The only exception was the possible application of pesticide and herbicide in local watercourses until 2000. Overall, the site history did not identify material contamination issues.

Site observations

A detailed site inspection was conducted on 10 March 2021 to understand the site conditions, environmental setting and identify obvious visual or olfactory evidence of potential contamination. The site inspection did not reveal the presence of obvious sources of contamination.

Preliminary conceptual site model

Based on available information, the following possible sources of contamination were identified:

- historical agricultural land use: pesticides and fertilisers may have been used at the site resulting in soil, groundwater, and surface water contamination. The use of vehicles could have resulted in fuel and oil spills, particularly near the cattle infrastructure
- filling and import of material including waste (eg. near cattle loading ramp and artificial drainage channel)
- ponds and channels collecting contaminated water from upgradient on- and off-site areas
- surface water originated in surrounding industrial and agricultural areas and discharging into the site
- two former off-site ponds located approximately 100 metres north of the site that were backfilled with unknown material between 1989 and 2010. The ponds are located hydraulically downgradient or cross-gradient of the site; hence, migration of contaminants to the site is unlikely

The identified receptors of potential contamination were:

- future on-site commercial / industrial workers, including construction and intrusive workers, and visitors
- flora and fauna

- surface water bodies on-site (ponds and channels) and off-site (Wingecarribee River)
- the aquifer

A preliminary CSM was developed to evaluate the risk posed by the potential contamination sources to the identified receptors and whether remediation or management are required to manage that risk. A preliminary assessment of potential source-pathway-receptor linkages was then undertaken based on the proposed future land use (commercial/industrial) by means of a tier 1 qualitative risk assessment.

The assessment identified no complete source-pathway-receptor linkages at the plastics recycling and reprocessing facility site. The potential risk from contamination is therefore considered acceptably low.

10.3.2 Erosion and sedimentation

There would be a relatively large area of disturbance during construction, located adjacent to a waterway, and significant erosion and sediment control measures would be required to manage the disturbance associated with site clearing and construction works, which are unavoidable.

A detailed Soil and Water Management Plan would be developed prior construction, dealing specifically with erosion and sediment control. It would be prepared in accordance with *Managing Urban Stormwater: Soils and Construction – Volume 1,* more commonly known as the 'Blue Book'. The plan would be developed when details of the construction approach and method are confirmed, however key principles that would be adopted in the development of the plan are presented in section 10.5.

In addition, a Concept Soil and Water Management Plan has been prepared for the proposal and this is provided in Appendix B of Technical Report 10 – Soils and Water. This plan would form an initial basis for the detailed plan.

With appropriate implementation of detailed Soil and Water Management Plan, the proposal is anticipated to be acceptable in relation to construction phase erosion and sediment control.

10.3.3 Water sourcing

During construction, water demands would be limited primarily to dust suppression activities and would be sourced by the potable connection (when available) or otherwise by water trucked in via trucks used for applying the dust suppression water.

10.3.4 Wastewater management

The small quantities of wastewater generated from amenities associated with temporary construction compounds/offices would be removed by tanker as required.

10.4 Impact assessment – operation

10.4.1 Water quality

Approach

In order to minimise the potential for impacts to water quality, the proposal includes two buildings which have been appropriately sized to provide sufficient internal space so that no mixed plastics receival, stockpiling, recycling and reprocessing activities or finished product storage would occur outside buildings.

Therefore, the nature of the risks posed by the proposal would be equivalent to those posed for a typical industrial development. That is, those associated with the provision and utilisation of urban impervious surface areas.

As the proposal site is located within the Sydney drinking water catchment, a best-practice method of assessing stormwater quality impacts (and therefore developing an appropriate treatment train) due to typical industrial urbanisation activities was adopted. This included:

- the development of a MUSIC stormwater quality model in accordance with *Using MUSIC in the Sydney Drinking Water Catchment*

– development of a stormwater treatment train that could achieve NorBE criteria

The proposed stormwater quality treatment train and results of MUSIC modelling are described in the following sections.

Stormwater quality treatment train

The proposed stormwater quality treatment train is shown on Figure 10.1 and includes the following:

– roof water would be captured in rainwater tanks (150 kilolitres) and re-used for toilet flushing in the offices as well as in the plastics recycling operations
– runoff from impervious ground surfaces would be conveyed to gross pollutant traps for primary treatment
– rainwater tank overflow and gross pollutant trap outflow would flow to water storage basins for re-use in the plastics recycling operations (after treatment), in particular:
  - all rainwater tank overflow along with ground surface runoff form the east of the plastics recycling and reprocessing facility site would be conveyed to the eastern basin (450 kilolitres)
  - runoff from the ground surface of the western portion of the plastics recycling and reprocessing facility site would be conveyed to the western basin (70 kilolitres)
  - both the eastern and western basins would be lined with a compacted clay liner or other lining method of similar performance
– overflow from water storage basins would be conveyed to bio-retention systems:
  - for the eastern basin this would be a bioretention basin (with a filter area of 500 square metres)
  - for the western basin this would be a bioretention swale (with a filter area of 50 square metres)

The eastern storage and bio-retention basins would be constructed by filling the portion of the existing dam and repurposing it for the stormwater quality treatment train.

MUSIC modelling results

MUSIC modelling was undertaken to assess the pollutant loads pre and post development with implementation of the proposed stormwater quality treatment train. Parameters for the modelling were adopted from WaterNSW (2019) including source node pollutant generation and runoff parameters, as well as treatment node parameters.

Table 10.1 shows the results of the MUSIC modelling with the above treatment train implemented.

Table 10.1 MUSIC modelling pollutant load results

Scenario	Annual pollutant load (kg/y)			
	Total suspended solids	Total phosphorus	Total nitrogen	Gross pollutants
Pre-development	1110	4.443	24.72	0
Post-development	172.2	1.98	22.55	0
Neutral or beneficial effect? (Y/N)	Y	Y	Y	Y

The modelled post-development total suspended solids, total phosphorus, total nitrogen and gross pollutant loads show a minimum of approximately a 10 percent improvement from the pre-development scenario. The MUSIC model therefore demonstrates conceptually that the NorBE criteria (section 10.1.4) would be achieved for the proposal.

Based on the above, and on the basis that all mixed plastics receival, storage and processing activities would be undertaken indoors, the proposal is expected to result in a neutral or beneficial effect on water quality.

The MUSIC model also allowed for quantification of the range of potential discharge rates and volumes from the plastics recycling and reprocessing facility site. This corresponded to the discharge from the two bio-retention basins combined which form the two outlets from the site. Approximately 90 percent of the time, flows would be very small (less than 0.1 litres per second) and likely to be effectively zero within the range of error of the modelling. Where discharges occur they fluctuate broadly to over 1000 litres per second. The fluctuation observed is consistent with the fluctuating rate of rainfall and the intermittent characteristics of bioretention overflow/bypass, which would form the primary component of outflows during large rainfall events. The annual discharge is predicted to be about 25 megalitres per year.

10.4.2 Riparian corridors

The *Guidelines for Riparian Corridors on Waterfront Land* identifies the key constraints for controlled activities occurring on waterfront land. This guideline is regulated by the *Water Management Act 2000*. In particular, the guideline provides:

– vegetated riparian zone (VRZ) width limitations for controlled activities
– allowance for stream realignment depending on stream order
– whether basins can be located within the VRZ and whether they can be located online to the stream

Table 10.2 summarises the requirements for the two watercourses within plastics recycling and reprocessing facility site.

Table 10.2 Riparian requirements

Watercourse	Stream order	Vegetated riparian sone (VRZ) (m)	Detention basins permitted?		Stream realignment permitted?
			Only within 50% outer VRZ	Online	
Western	2nd	20	Yes	Yes	No
Eastern	1st	10	Yes	Yes	Yes

The *Guidelines for Riparian Corridors on Waterfront Land* also allows for encroachment of the outer 50% of the VRZ if the equivalent area is offset through provision of additional VRZ along the same waterway alignment.

The water management strategy is shown on Figure 10.1. The strategy includes:

– For the western watercourse:
  - retention of the existing western watercourse alignment
  - provision of an online 70 kilolitres water storage basin within the outer VRZ
  - provision of a bio-retention swale (with 50 square metres filter area) within the VRZ
  - no infrastructure or disturbance, other than the online water storage basin and bio-retention swale, within the VRZ
  - provision of riparian offset areas along the watercourse as required
– For the eastern watercourse:
  - realignment of the eastern watercourse
  - provision of an online 450 kilolitres water storage basin within the VRZ
  - provision of an online bio-retention basin (with 500 square metres filter area) within the VRZ
  - no infrastructure or disturbance, other than the online water storage and bio-retention basins, within the VRZ
  - provision of offset areas along the watercourse as required

The proposed water management strategy would therefore fully comply with the riparian requirements specified in the *Guidelines for Riparian Corridors on Waterfront Land*.

It is also noted that the existing north-eastern dam is currently co-located within the neighbouring site. It is proposed that the portion of the dam within the plastics recycling and reprocessing facility site would be filled so that each site can individually manage and verify water management performance. Therefore, after the dam portion is filled, the area would be repurposed as a realigned watercourse alongside the proposed basins at this location.

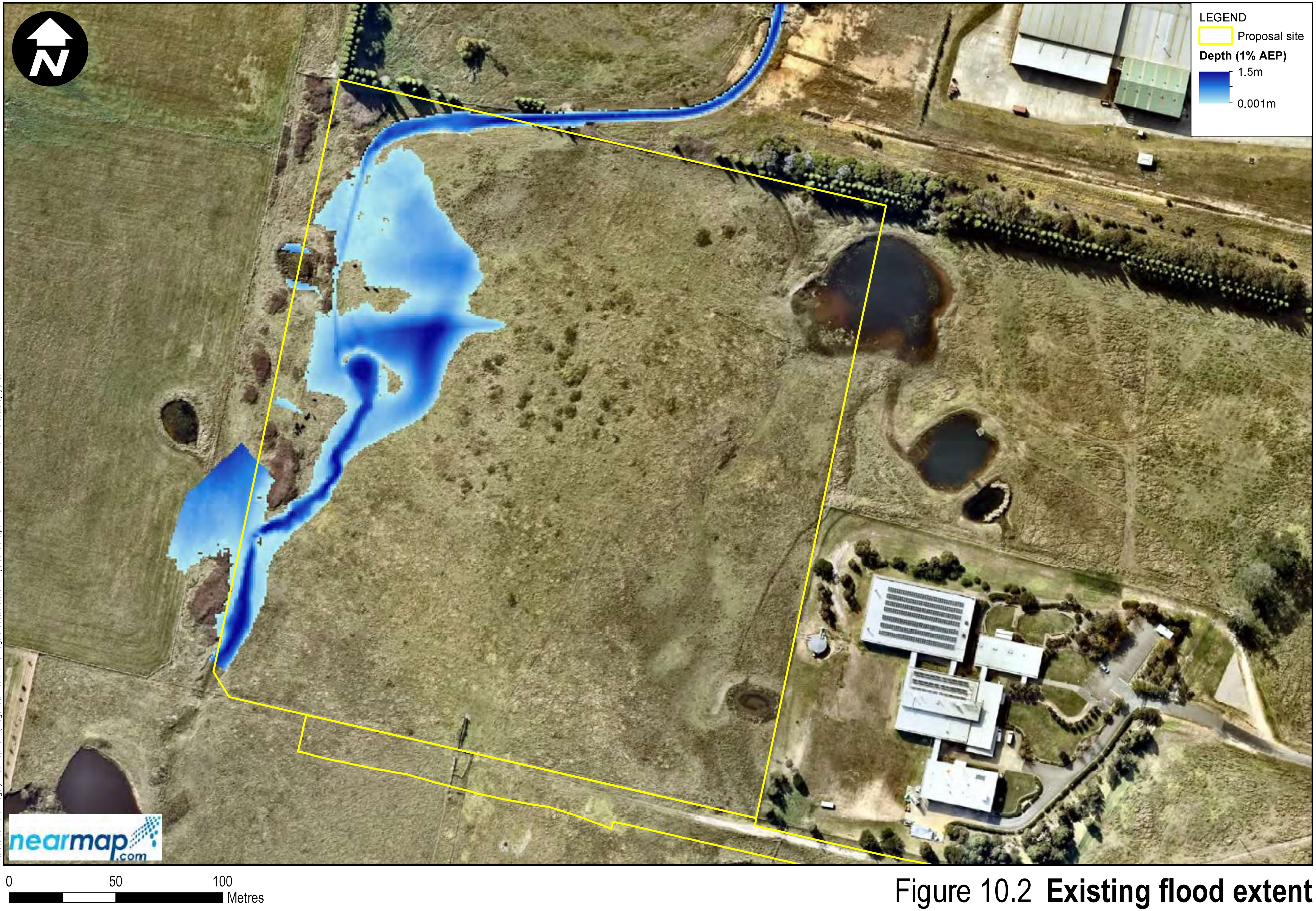
Riparian vegetation would be managed in accordance with a riparian vegetation management plan to be developed for the proposal. The plan would provide details on the proposed vegetation management measures, maintenance and monitoring. A concept riparian vegetation management plan has been developed and is provided in Appendix A of Technical Report 10 – Soils and Water.

10.4.3 Flooding

A one-dimensional hydraulic model was produced for the western watercourse, where it flows adjacent to the plastics recycling and reprocessing facility site, in order to assess:

- the potential impacts on the proposal infrastructure from local flooding in the western watercourse
- if the proposal would significantly impact the flood conditions of the surrounding areas

The results of the flood modelling are shown in Figure 10.2 and Figure 10.3.



Data source: Aerial imagery - nearmap 2021 (image date 24/04/2021, image extracted 30/06/2021) ; General topo - NSW LPI DTDB 2020, 2015. Created by: jrprice

Figure 10.2 **Existing flood extent**

Data source: Aerial imagery - nearmap 2021 (image date 24/04/2021, image extracted 30/06/2021) ; General topo - NSW LPI DTDB 2020, 2015. Created by: jrprice

Figure 10.3 **Design flood extent**

Figure 10.2 shows that existing 1 in 100 AEP peak flood would encroach into the plastics recycling and reprocessing site as well as the adjacent lots to the west. However, as shown on Figure 10.3, the flood modelling indicates that:

– the 1 in 100 AEP plus 500 millimetres freeboard would not encroach on the proposed building areas, and
– in the 1 in 100 AEP event, the proposal would not significantly impact the flood conditions of the surrounding areas outside of the plastics recycling and reprocessing facility site boundary.

In addition, the flow depth in the 1 in 100 AEP event adjacent to the fill pad would be about 500 millimetres compared to a pad height of 4,000 millimetres. Therefore, even with any realistic increase in rainfall intensity due to climate change, the flood immunity of the proposed works would be adequate.

10.4.4 Water balance

Water demand, supply and re-use

It is estimated that the following water demands would be required during operation of the proposal:

– About 40 kilolitres per day net water input for the plastics recycling process.
– 5.8 kilolitres per day for activities in the offices, with 1.7 kilolitres per day of this associated with toilet flushing and therefore able to be sourced from roof water.

However, MUSIC modelling (refer section 10.4.1) confirmed that by providing the re-use associated with the stormwater treatment train (tanks and storage basins) reliance on potable demand could be significantly reduced. The modelling predicted that over the longer-term an average of approximately 80 percent of water demands could be sourced from on-site water collection. However, during dry periods the potable supply would need to provide fully for site demands.

Storage volumes of water on-site have been confirmed to not exceed harvestable rights capacities under the *Water Management Act 2000*. Therefore, it is not anticipated that water access licencing requirements under the act would be required. Furthermore, it is anticipated that the storage of water would be exempt from licencing based on the purpose of the storages being largely the capture and reuse of water to minimise the pollutant load discharged. Accordingly, the exemption outlined in Clause 3 of Schedule 1 of the *Water Management Act, General Regulation* is anticipated to apply.

Wastewater generation

It is estimated that the following wastewater disposal capacity would be required during operation of the proposal:

– up to 10 kilolitres per day from the plastics recycling process
– 5.8 kilolitres per day for activities in the offices

The overall water balance is shown on Figure 10.4.

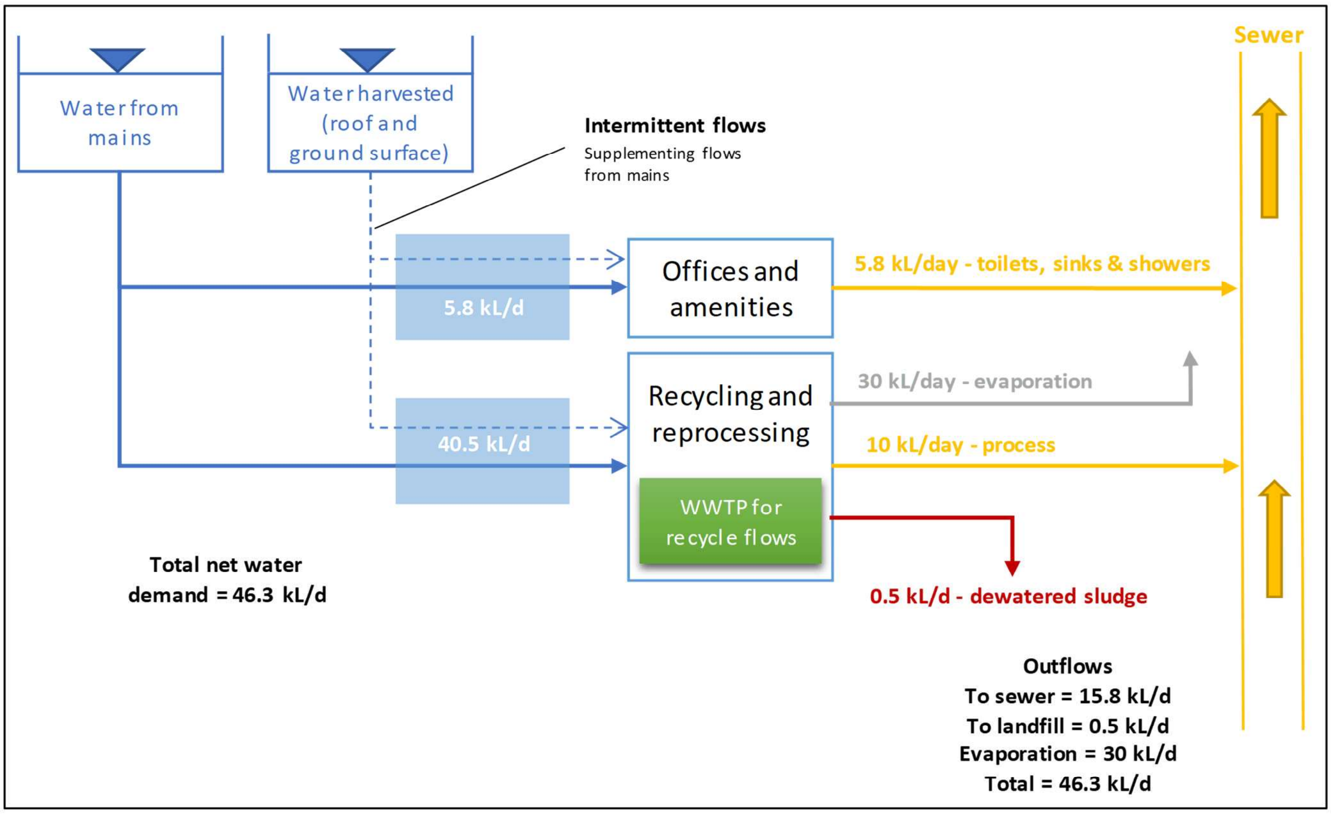


Figure 10.4 Water balance

10.4.5 Water and wastewater infrastructure

Water supply infrastructure

The current water network can accommodate the additional water demands of the proposed facility. The following outcomes were determined from the water modelling, using the 2021 demands:

– The minimum pressure for all customer points is always above the required 12 metres of pressure during the peak day demand.
– Maximum head losses within the network are greater than five metres per kilometre for reticulation mains and three metres per kilometre for trunk mains. However, these head losses do not cause any customer points to fall under the minimum pressure criteria of 12 metres (which is the greater concern).
– The Hill Road Reservoir passes both the static and dynamic performance requirements.
– The proposal would store 1,200 kilolitres of firefighting water on-site. Under the Australian Standard AS 2419.1-2005 a total volume of 432 kilolitres is required for firefighting purposes. Therefore, the proposed facility would not be reliant on the existing water network for firefighting flows as it would have more than 432 kL of water stored on-site for firefighting purposes.
– The sensitivity analysis for the 2026 horizon indicates that the system will be overloaded, with and without the demands from the proposal. By 2026, Council plans to complete several major water projects to increase the water supply to Moss Vale area.

Overall, the water modelling indicates that the water demands of the proposal would not adversely impact on the performance of Council's water network. Further detail is provided in Technical Report 11 – Water and Wastewater Modelling.

Wastewater infrastructure

Wastewater network

The current wastewater network can accommodate the additional wastewater discharges from the proposal. The following outcomes were determined from the wastewater modelling, using the 2021 wastewater flows:

- The addition of the proposal's wastewater flows is not expected to cause any dry or wet weather overflows.
- The existing SPS-MV15 would have over eight hours emergency storage with the addition of the proposal's flows.
- A new DN225 550 metre long gravity main is required to connect proposal to the existing wastewater network.
- The SPS-MV15 has capacity to accommodate the additional wastewater flows from the proposal.

Overall, the modelling indicates that the inclusion of the proposal's wastewater flows to the existing 2021 flows would not adversely impact the Council's wastewater network. Further detail is provided in Technical Report 11 – Water and Wastewater Modelling.

Moss Vale Wastewater Treatment Plant

The current capacity of the Moss Vale WWTP is 9,000 EP. Council has advised that it is nearing capacity in 2021 and there are plans to upgrade the plant to 18,000 EP capacity in 2025/26.

The expected wastewater flows from the proposal are equivalent to flows from 20 houses. Therefore, the additional load from the proposal would have an insignificant impact on the Moss Vale WWTP.

If required, wastewater flows from the proposal could be temporarily stored on-site and discharged overnight when there are much lower domestic flows in the Council wastewater system.

10.5 Mitigation and management measures

10.5.1 Construction

Table 10.3 lists the proposed mitigation measures to be implemented to minimise the potential for soils and water impacts during construction.

Table 10.3 Soils and water mitigation measures – construction

Mitigation measure	Timing
Detailed soil and water management plan A detailed soil and water management plan would be developed after the construction contractor has been engaged and a detailed construction method has been developed. The detailed soil and water management plan would be developed in accordance with *Managing Urban Stormwater: Soils and Construction – Volume 1 and* include management procedures, operations and controls as well as monitoring and maintenance processes to ensure compliance requirements are satisfied. It would also include: – the final water management configuration and staging of key activities – final sediment basin sizing requirements, with the basins operating as Type D/F 'wet' basins based on the soil conditions at the site – construction phase water quality monitoring of the sediment basins, as well as any discharge during construction hours. A daily rainfall record would also be kept. Where a discharge of greater than 50 mg/L of suspended solids occurs when the design rainfall event has not been exceeded this would be considered a non-compliance and remedial action taken.	Pre-construction/ construction
Embankment engineering during the detailed design phase would be undertaken to confirm the ongoing stability of the basins. The proposed basin in the northeast section of the site would be particularly focused on due to the limited area and interaction with the existing water storage (to be partially decommissioned).	Pre-construction
Unexpected finds procedure An unexpected finds procedure would be developed and incorporated into the construction environmental management plan for the proposal. The unexpected finds procedure would describe the	Construction

Mitigation measure	Timing
measures to manage unexpected finds such as buried waste including asbestos containing materials, and contamination indicators (such as odours, staining or sheens).	
Riparian vegetation management plan A detailed riparian vegetation management plan would be developed before commencement of construction. The plan would meet the requirements of the *Water Management Act 2000* for controlled activities on waterfront land and detail the vegetation restoration associated with the realignment of the eastern waterway and revegetation of the western waterway. The plan would include: – the final riparian vegetation management approach – riparian vegetation management measures – details of riparian vegetation monitoring, review and reporting	Pre-construction/ construction

10.5.2 Operation

Table 10.4 lists the proposed mitigation measures to be implemented to minimise the potential for soils and water impacts during operation.

Table 10.4 Soils and water mitigation measures – operation

Mitigation measure	Timing
Operational water management plan A detailed operational water management plan would be developed before commencement of operations and updated yearly. The plan would be based on specifying and maintaining all mixed plastics waste receival, storage, recycling and reprocessing activities and finished product storage within the buildings. The plan would also include daily visual inspection by a specified person(s) of the plastics recycling and reprocessing facility site for plastic waste or litter and – collection of any plastic waste or litter found outside of buildings during inspections – maintenance of an incident log where plastic waste or litter found outside of building during inspections	Operation

11. Traffic and transport

The chapter provides a summary of the potential traffic and transport impacts of constructing and operating the plastics recycling and reprocessing facility. A full copy of the assessment results is provided in Technical Report 6 – Traffic and Transport.

11.1 Approach and method

11.1.1 Legislative and policy context to the assessment

The traffic and transport assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

- *Moss Vale Enterprise Corridor Development Control Plan 2008* (Connell Wagner 2008)
- *Wingecarribee Shire Council DCP*
- Guidelines relevant to the assessment of construction impacts:
  - *Guide to Traffic Generating Developments* (NSW Roads and Maritime Services 2002)
- Guidelines relevant to the assessment of operation impacts:
  - *National Construction Code (NCC) Building Code of Australia (Vol 1) 2019* (ABCB 2019)
  - *Guide to Traffic Generating Developments* (Roads and Traffic Authority 2002)
  - *Fixing Local Road Program Guideline* (Transport for NSW 2021)
  - *NSW Planning Guidelines for Walking and Cycling* (NSW Government 2004)
  - *Bicycle Parking Facilities: Updating the Austroads Guide to Traffic Management* (Austroads 2016)
  - *Guide to Traffic Management Part 3: Transport Studies and Analysis Methods* (Austroads 2020)

Pursuant to the provisions of Clause 11 of the SRD SEPP, development control plans do not apply to SSD. Notwithstanding this, the proposal has been designed to have regard to the DCP wherever possible.

11.1.2 Method

Study area

The study area for the traffic and transport assessment has been defined as the road network in the vicinity of the proposal site including Berrima Road, Douglas and Collins Road, Lackey Road, Bulwer Road, Lytton Road, Beaconsfield Road as well as the proposed road access corridor.

The study area for the public and active transport review considered key public transport within 800 metres of the proposal site, in line with the *NSW Planning Guidelines for Walking and Cycling*. This document outlines a recommended walkable distance of 400 to 800 metres to public transport and other local amenities or a 1.5 kilometre bicycle riding distance.

Key tasks

The traffic and transport assessment generally involved:

- reviewing the existing road and transport conditions and crash data in the study area
- undertaking traffic surveys to identify existing traffic volumes in the study area (see below)
- analysing existing traffic flows at key intersections using SIDRA 8 to obtain the current operating performance of the key intersections
- assessing the trip generation characteristics of the proposal and the performance of the intersections using SIDRA 8 during construction and operation of the proposal
- assessing the potential parking demand with reference to the *Wingecarribee Shire Council DCP* and *Guide to Traffic Generating Developments* and information provided by Plasrefine Recycling

- reviewing the access and parking layout within the plastics recycling and reprocessing facility site, with reference to relevant Australian Standards
- undertaking a swept path assessment using AutoTURN 11 to review the design vehicle turn paths within the plastics recycling and reprocessing facility site
- identifying mitigation and management measures

Traffic surveys

Intersection traffic turning counts were undertaken on Thursday 3 December 2020 during the following time periods:

- Weekday AM peak (three hours): 6:30 am to 9:30 am
- Weekday PM peak (three hours): 3:30 pm to 6:30 pm

The intersection turning count surveys were performed at the intersections shown on Figure 11.1 and included:

- Site 1: Lackey Road / Access Road (to Australian BioResources)
- Site 2: Berrima Road / Lytton Road / Gibbons Road

An automatic seven day tube counts were also undertaken between Monday 7 December and Sunday 6 December 2020 at the following locations (see Figure 11.1):

- Lytton Road (west of Beaconsfield Road; eastbound and westbound)
- Beaconsfield Road (between Roche Close and Stables Place; northbound and southbound)

11.1.3 How potential impacts have been avoided

The concept layout for the plastics recycling and reprocessing facility has been designed to enable all waste delivery vehicles to queue entirely within the site and therefore avoid any queuing on Braddon Road (the new access road). The concept layout also provides allowance for on-site parking to accommodate the expected staffing numbers.

In addition, three key road access options were considered and assessed during development of the proposal. A summary of the results of the assessment is provided in section 4.3.

The selected road access option (Option 2) was selected in order to:

- avoid the need for heavy vehicles to carry out a hook turn across a level rail crossing required under Option 3, and thereby avoid potential road/rail conflicts and the associated major road safety risks
- avoid impacts to nine *Eucalyptus macarthurii* required for Option 3, which is an endangered species under the BC Act and EPBC Act
- avoid the need for heavy vehicles to use Beaconsfield Road (Option 1) during operation of the plastics recycling and reprocessing facility, which the community raised as a concern during engagement undertaken for the EIS

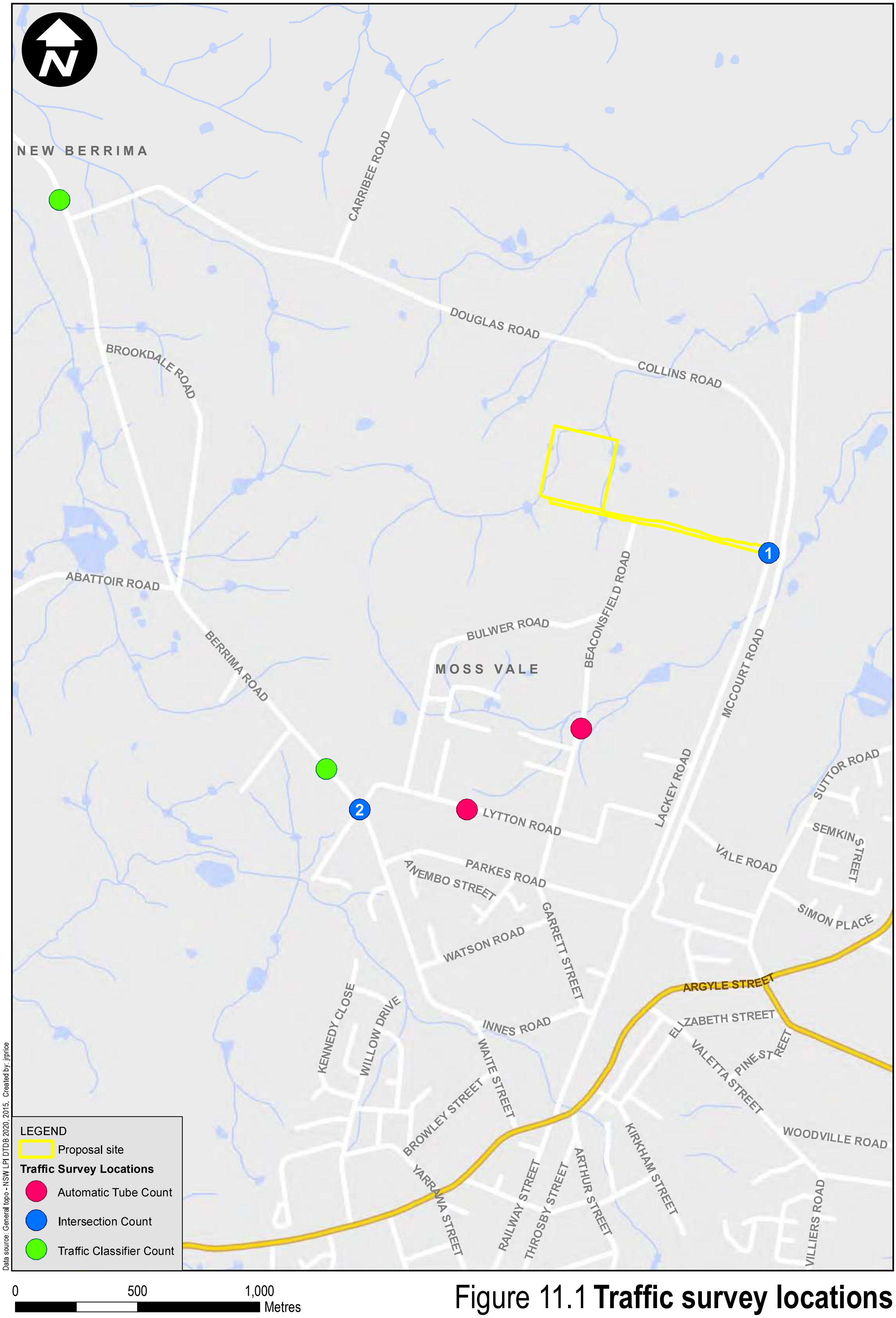


Figure 11.1 **Traffic survey locations**

11.2 Existing environment

11.2.1 Existing road network characteristics

The surrounding road network is shown in Figure 11.3.

Berrima Road

Berrima Road is a regional sub-arterial road that runs between Berrima and Moss Vale in generally a north-south direction. Within proximity of the proposal. Berrima Road intersects Douglas Road and Lytton Road with a give-way priority-control at both locations.

Berrima Road has the following key features within the study area as outlined in Table 11.1 and general configuration image in Figure 11.2 north of Brookvale Road.

Table 11.1 Berrima Road key features

Feature	Description
Carriageway	Undivided carriageway, with a single travel lane in each direction. Dedicated turn lanes are provided on Berrima Road to access Douglas Road and to access industrial/commercial area near Bowman Road. There is also a level rail crossing south of Taylor Avenue.
Parking	Unrestricted except in proximity to warehouse access points (eg. Boex)
Speed limit	Primarily 80 km/h with 70 km/h on approach to Brookdale industrial/commercial area and 50 km/h south of Lytton Street
Pedestrian facilities	No dedicated pedestrian facilities.
Bicycle facilities	No dedicated bicycle facilities
Public transport	There are five bus stops in the southbound and two bus stops in the northbound direction. These service private bus routes 812 (Berrima to Moss Vale) and 816 (Moss Vale Loop; south of Lytton Rd only)

Source: Street View (Google Maps 2020)

Figure 11.2 Berrima Road viewed north (north of Brookvale Road)

Douglas Road and Collins Road

Douglas Road and Collins Road are both local collector roads that connect Berrima Road and Lackey Road in an east-west direction. There are two level rail crossings, one along Douglas Road and one at the connection between Douglas Road and Collins Road. Douglas Road and Collins Road have the following key features within proximity of the site as outlined in Table 11.2 and a general configuration image in Figure 11.4 at the rail crossing at connection with Douglas Road and Collins Road.

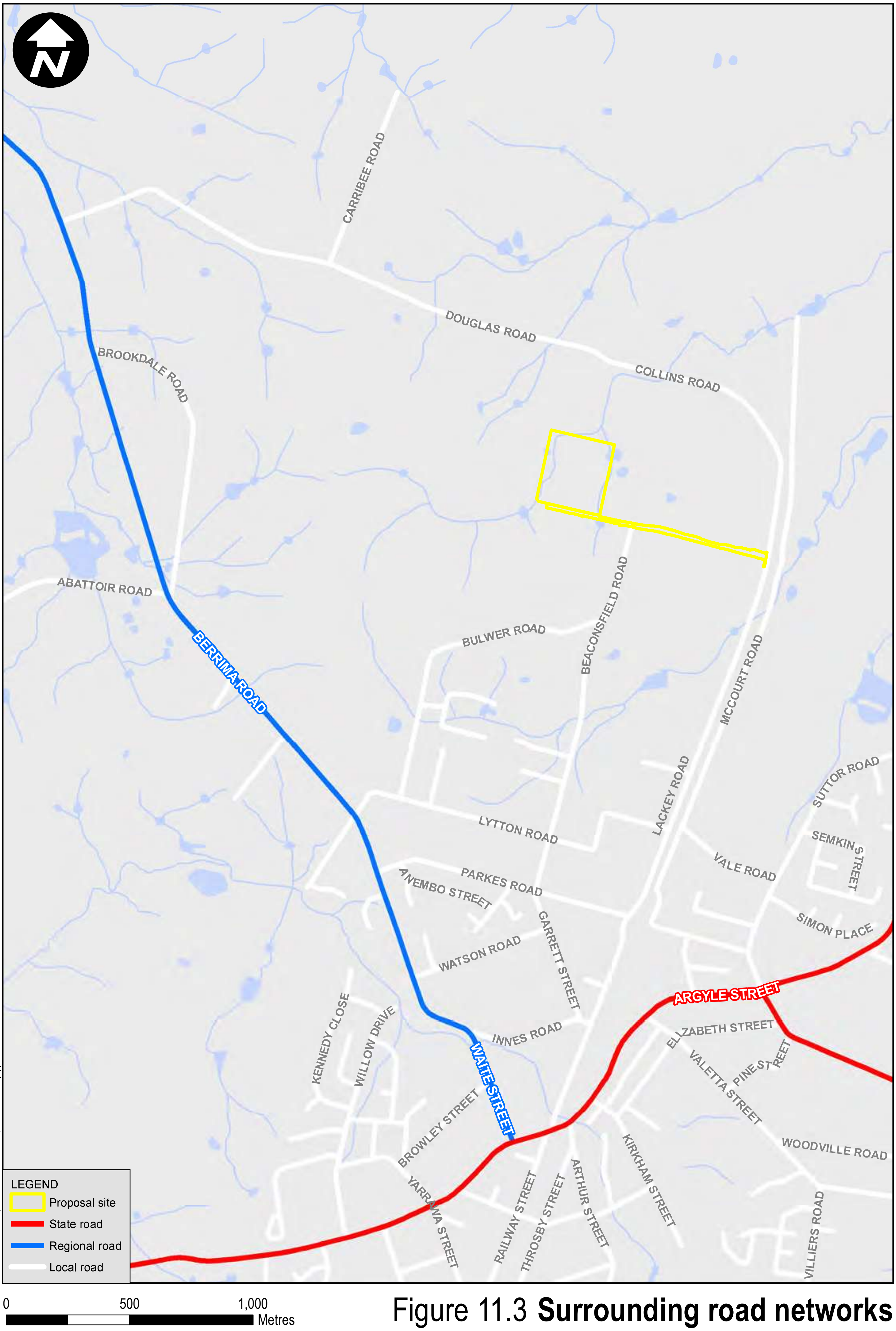


Figure 11.3 **Surrounding road networks**

Table 11.2 Douglas Road and Collins Road key features

Feature	Description
Carriageway	Undivided carriageway, with one travel lane in each direction. There is a dedicated left turn lane to access Ingham Enterprises development as well as an overtaking lane
Parking	Unrestricted
Speed limit	80 km/h
Pedestrian facilities	No dedicated pedestrian facilities
Bicycle facilities	No dedicated bicycle facilities
Public transport	No dedicated public transport facilities. The nearest bus stop is located on Berrima Road and services private bus route 812 (Berrima to Moss Vale)

Source: Site inspection (GHD 2020)

Figure 11.4 Douglas Road and Collins Road rail crossing viewed west

Lackey Road

Lackey Road is a local collector road that connects Collins Road and the Illawarra Highway in a north-south direction. Lackey Road intersects Lytton Road with give-way priority-control.

Lackey Road has the following key features within proximity of the site as outlined in Table 11.3 and a general configuration image in Figure 11.5 at the intersection with Lytton Road.

Table 11.3 Lackey Road key features

Feature	Description
Carriageway	Undivided carriageway, with one travel lane in each direction. The road alignment follows the Southern Highlands and Southern NSW rail line.
Parking	Unrestricted
Speed limit	60 km/h and 50 km/h south of Lytton Road with a 40 km/h school zone at the southernmost end
Pedestrian facilities	No dedicated pedestrian facilities
Bicycle facilities	No dedicated bicycle facilities
Public transport	No dedicated public transport facilities. The nearest bus stop is located on Argyle Street and services private bus route 816.

Source: Street View (Google Maps 2020)

Figure 11.5 Lackey Road viewed north (near Lytton Road)

Beaconsfield Road

Beaconsfield Road is a no through local road that connects Parkes Road / Garrett Street to residential and local business oriented in a north-south direction. Beaconsfield Road also intersects with Lytton Road (give-way priority-control), Bulwer Road (give-way priority-control) and Parkes Road / Garrett Street (stop-sign priority-control).

Beaconsfield Road has the following key features within proximity of site as outlined in Table 11.4 and a general configuration image Figure 11.6 looking towards the intersection with Lytton Road.

Table 11.4 Beaconsfield Road key features

Feature	Description
Carriageway	Undivided carriageway, with one travel lane in each direction
Parking	Unrestricted
Speed limit	50 km/h
Pedestrian facilities	No dedicated pedestrian facilities
Bicycle facilities	No dedicated bicycle facilities
Public transport	No dedicated public transport facilities. The nearest bus stop is located on Garrett Street and services private bus routes 812 (Berrima to Moss Vale) and 816 (Moss Vale Loop).

Source: Street View (Google Maps 2020)

Figure 11.6 Beaconsfield Road viewed north

Bulwer Road

Bulwer Road is a local road that connects Lytton Road and Beaconsfield Road in an north-east direction, with a give-way priority controlled intersection at both these locations.

Bulwer Road has the following key features within proximity of the site as outlined in Table 11.5 and a general configuration image in Figure 11.7.

Table 11.5 Bulwer Road key features

Feature	Description
Carriageway	Undivided carriageway, with one travel lane in each direction
Parking	Unrestricted
Speed limit	No sign-posted speed limit (50 km/h) with 15 km/h advisory speed for the sharp bend north of Jopling Way
Pedestrian facilities	No dedicated pedestrian facilities
Bicycle facilities	No dedicated bicycle facilities
Public transport	No dedicated public transport facilities. The nearest bus stop is located on Lytton Road and services private bus routes 812 (Berrima to Moss Vale) and 816 (Moss Vale Loop).

Source: Street View (Google Maps 2020)

Figure 11.7 Bulwer Road viewed north

Lytton Road

Lytton Road is a local road that connects Berrima Road / Gibbons Road and Lackey Road in an east-west direction. Lytton Road also intersects with Bulwer Road (give-way priority-control) and Beaconsfield Road (give-way priority-control). Lytton Road has the following key features within proximity of the site as outlined in Table 11.6 and a general configuration image in Figure 11.8.

Table 11.6 Lytton Road key features

Feature	Description
Carriageway	Undivided carriageway, with one travel lane in each direction
Parking	Unrestricted
Speed limit	No sign-posted speed limit (50 km/h) with 25 km/h advisory speed for the sharp bend near Lackey Park
Pedestrian facilities	No dedicated pedestrian facilities
Bicycle facilities	No dedicated bicycle facilities

Feature	Description
Public transport	No dedicated public transport facilities. The nearest bus stop is located at the intersection with Berrima Road and services private bus routes 812 (Berrima to Moss Vale) and 816 (Moss Vale Loop).

Source: Street View (Google Maps 2020)

Figure 11.8 Lytton Road viewed west

11.2.2 Existing road network performance

Existing intersection operations

Table 11.7 provides a summary of the results of SIDRA 8 analysis of the current performance of key intersections in the study area. This shows that each of the analysed intersections currently operate with good operation performance with Level of Service A in both the weekday morning and evening peak periods.

Table 11.7 Existing intersection operations

Intersection	Control Type	AM Peak			PM Peak		
		Average delay (s)	LoS	Degree of saturation	Average delay (s)	LoS	Degree of saturation
Site 1: Lackey Road / Access Road (to Australian BioResources)	Give-way	6	LoS A	0.05	6	LoS A	0.03
Site 2: Berrima Road / Lytton Road Access Road / Gibbons Road	Give-way / Stop	14	LoS A	0.19	13	LoS A	0.19

Notes:

- The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay
- The level of service (LoS) for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement
- The degree of saturation is defined as the ratio of the arrival flow (demand) to the capacity of each approach
- Average delay is given in seconds per vehicle

Detailed SIDRA results of these intersections are provided in Appendix A of Technical Report 6 – Traffic and Transport.

Existing traffic volumes

Lytton Road traffic volumes

The surveyed traffic volumes (per day and direction) for Lytton Road are shown in Figure 11.9. Hourly (two-way) traffic volumes recorded for the five-day (weekday) average and peak weekend (Saturday) are shown in Figure 11.10 and a list of the key traffic data summary is outlined in Table 11.8.

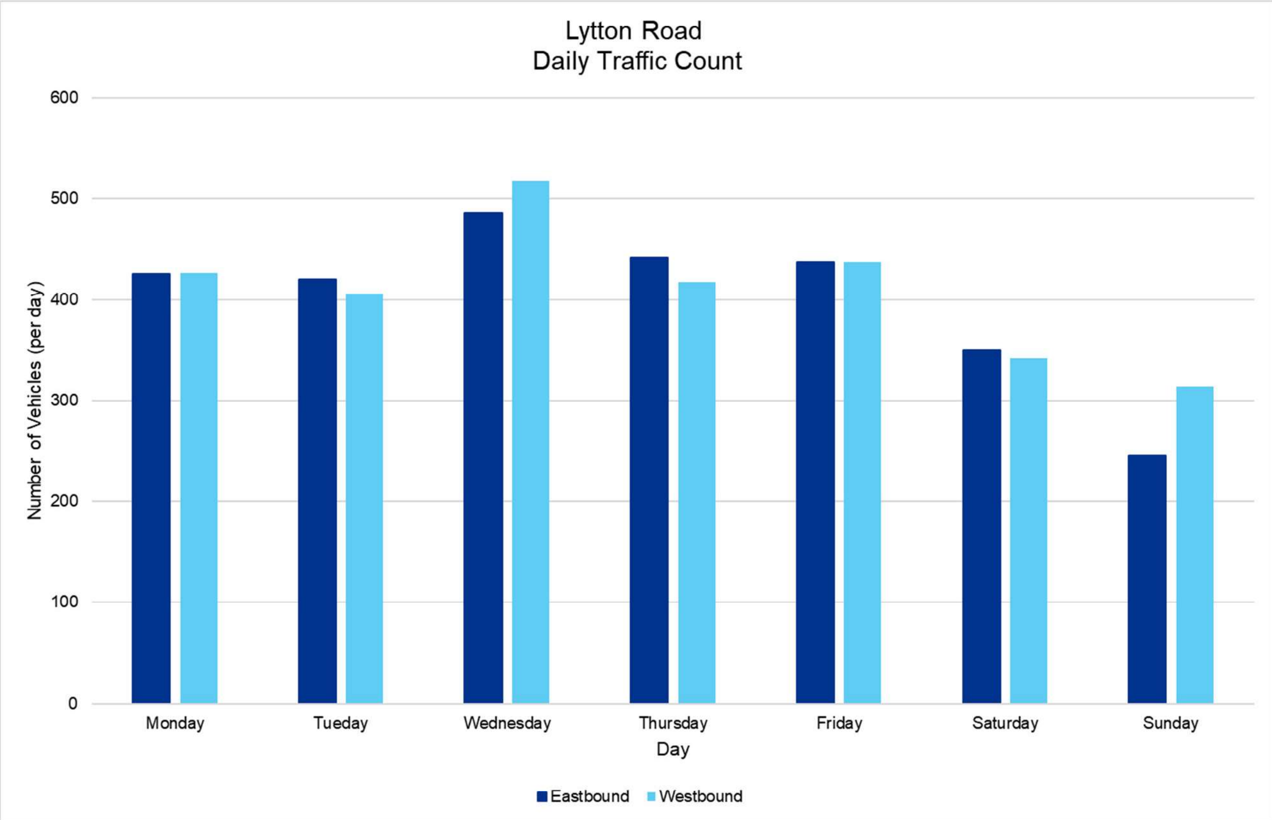


Figure 11.9 ***Lytton Road: Daily traffic volumes***

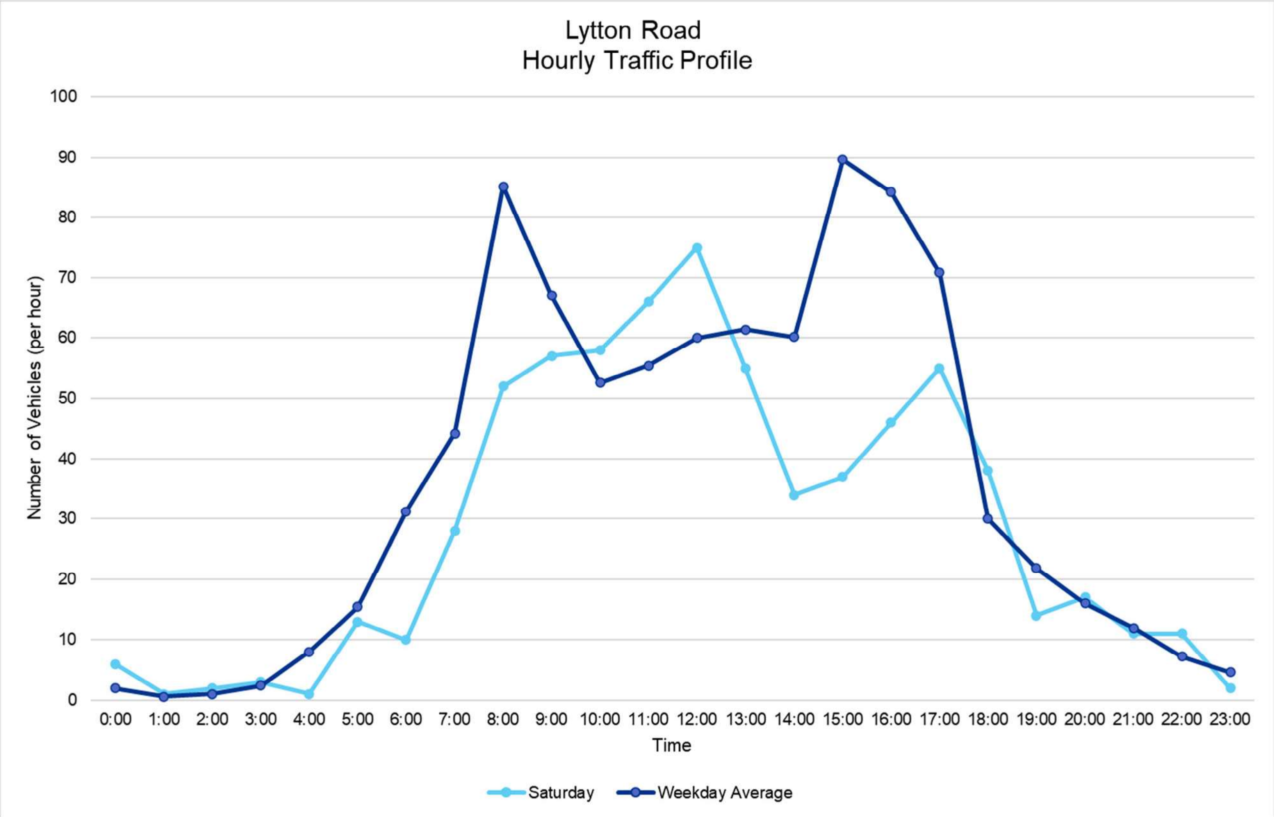


Figure 11.10 Lytton Road: Five-day (weekday) and Saturday hourly traffic profile

Table 11.8 Lytton Road: Key traffic data summary

Key data description	Data summary			
Traffic volume				
		AM peak hour (veh/h)*	**PM peak hour (veh/h)***	**Saturday peak hour (veh/h)***
Peak hour **	Eastbound	46	57	38
	Westbound	53	54	37
5-day (weekday) average daily volume (two-way)	(veh/d)^	883		
Weekend average daily volume (two-way)	(veh/d)^	626		
Vehicle classification				
	5-day weekday average		**Weekend average**	
Light	89.6%		96.7%	
Medium	8.9%		3.2%	
Heavy	1.5%		0.1%	
Unclassifiable	0%		0%	
Vehicle speed				
85% speed (km/h)[#]	Eastbound	59.7 km/h		
	Westbound	60.4 km/h		

Notes:
(*) veh/h = vehicles per hour
(^) veh/d = vehicles per day
(#) km/h = kilometres per hour
(**) Maximum peak volume recorded during the survey. Such opposing traffic volume may not necessarily coincide on the same day.

Beaconsfield Road traffic volumes

The surveyed traffic volumes (per day and direction) for Beaconsfield Road are shown in Figure 11.11. Hourly (two-way) traffic volumes recorded for the five-day (weekday) average and peak weekend (Saturday) are shown in Figure 11.12 and a list of the key traffic data summary outlined in Table 11.9.

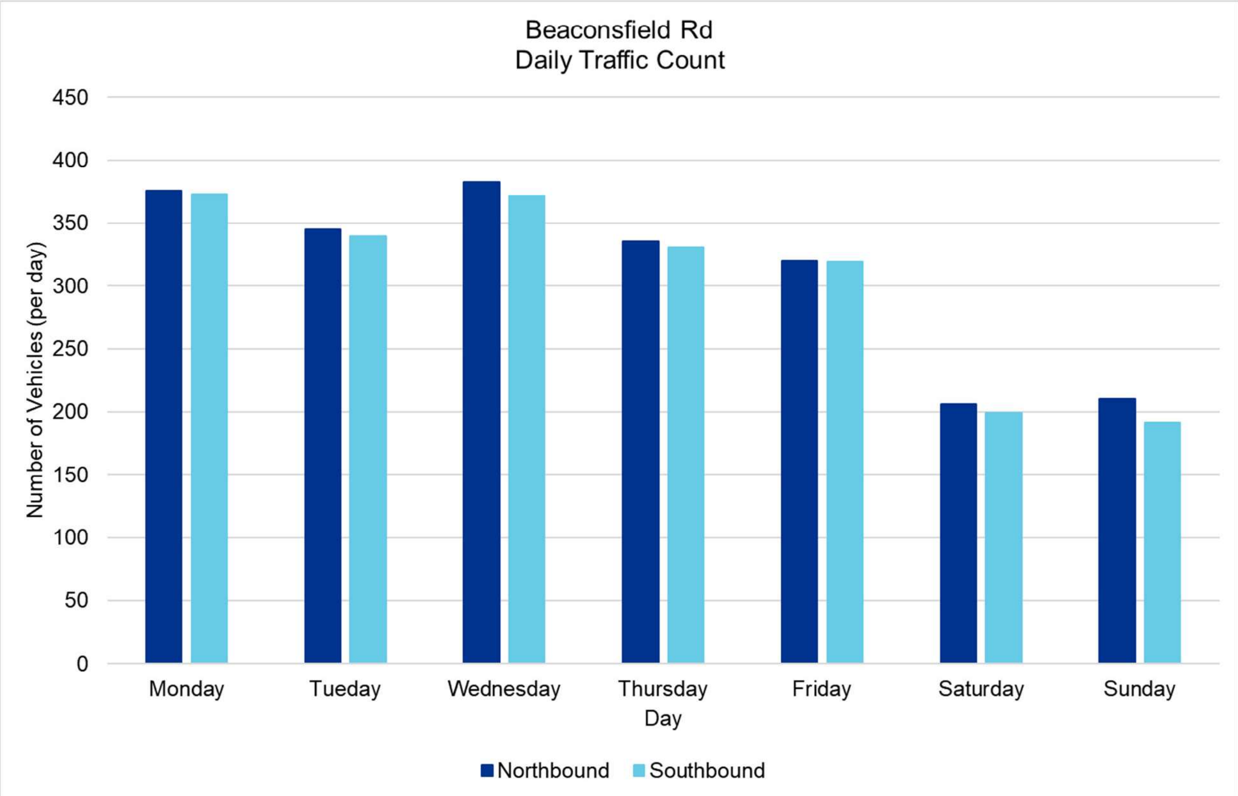


Figure 11.11 *Beaconsfield Road: Daily traffic volumes*

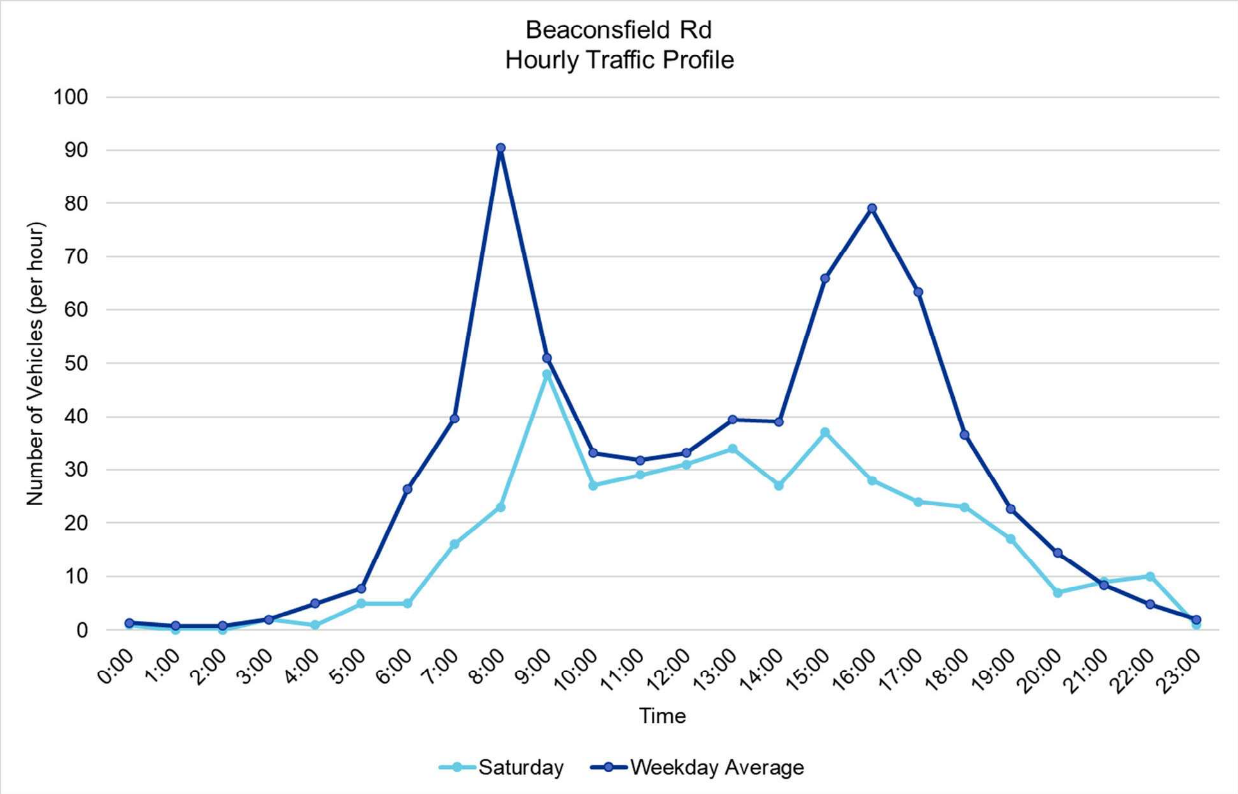


Figure 11.12 Beaconsfield Road: Five-day (weekday) and Saturday hourly traffic profile

Table 11.9 Beaconsfield Road: Key traffic data summary

Key data description	Data summary			
Traffic volume				
		AM peak hour (veh/h)*	**PM peak hour (veh/h)***	**Saturday peak hour (veh/h)***
Peak hour **	Northbound	47	54	25
	Southbound	52	39	23
5-day (weekday) average daily volume (two-way)	(veh/day)^	669		
Weekend average daily volume (two-way)	(veh/day)^	403		
Vehicle classification				
	5-day weekday average			**Weekend average**
Light	88.4%			90.7%
Medium	11.1%			8.9%
Heavy	0.5%			0.4%
Unclassifiable	0%			0%
Vehicle speed				
85% speed (km/h)#	Northbound	58.6 km/h		
	Southbound	58.6 km/h		

Notes:

(*) veh/h = vehicles per hour

(^) veh/d = vehicles per day

(#) km/h = kilometres per hour

(**) Maximum peak volume recorded during the survey. Such opposing traffic volume may not necessarily coincide on the same day.

Mid-block capacity

Mid-block analysis was carried out for Beaconsfield Road and Lytton Road in accordance with *Traffic Management Part 3 – Traffic Studies and Analysis Methods*. The analysis indicated that that both Lytton Road and Beaconsfield Road are currently operating well within capacity in the morning (AM), evening (PM) and weekend peak hour periods. Details are provided in Section 2.2 of Technical Report 6 – Traffic and Transport.

Heavy and light vehicle ratio

The existing average heavy vehicle percentage for Lytton Road and Beaconsfield Road in the study area is shown in Table 11.10. This indicates that heavy vehicles constitute a higher percentage of vehicle movement on the local and regional collector road network when compared to the local road network.

Table 11.10 Peak hour heavy vehicle ratio

Location	% Heavy Vehicles	
	AM	PM
Lytton Road ^	2.1 %	1.1 %
Beaconsfield Road ^	0.7 %	0.9 %
Berrima Road *	11 %	5 %
Lackey Road *	13 %	10 %

Notes:

(*) Berrima Road and Lackey based on intersection survey data

(^) Lytton Road and Beaconsfield Road based on automatic tube count survey

11.2.3 Crash data

Crash data was obtained from the *Centre for Road Safety website* for roads within the study area and analysed for the five-year period between 2015 and 2019. The locations of recorded crashes are shown in Figure 11.13.

There were 12 crashes recorded between 2015 and 2019 in the study area. A summary of the five-year crash data is outlined in Table 11.11.

Table 11.11 Crash summary (2015 – 2019)

Location type	Number of injuries				No injury crashes
	Fatal	Serious	Moderate	Minor	
2-way undivided	0	2	2	1	5
T-junction	0	1	1	1	3
X-intersection	0	0	3	1	4
Predominate crash type	**RUM Code**	**Number of crashes**			
Cross traffic	10	4			
Off road on left, hit object	71	2			
Off road on right, hit object	73	2			
Off right on right turn bend, hit object	83	2			
Off left on right turn bend, hit object	81	1			
Right rear	32	1			
TOTAL		**12**			

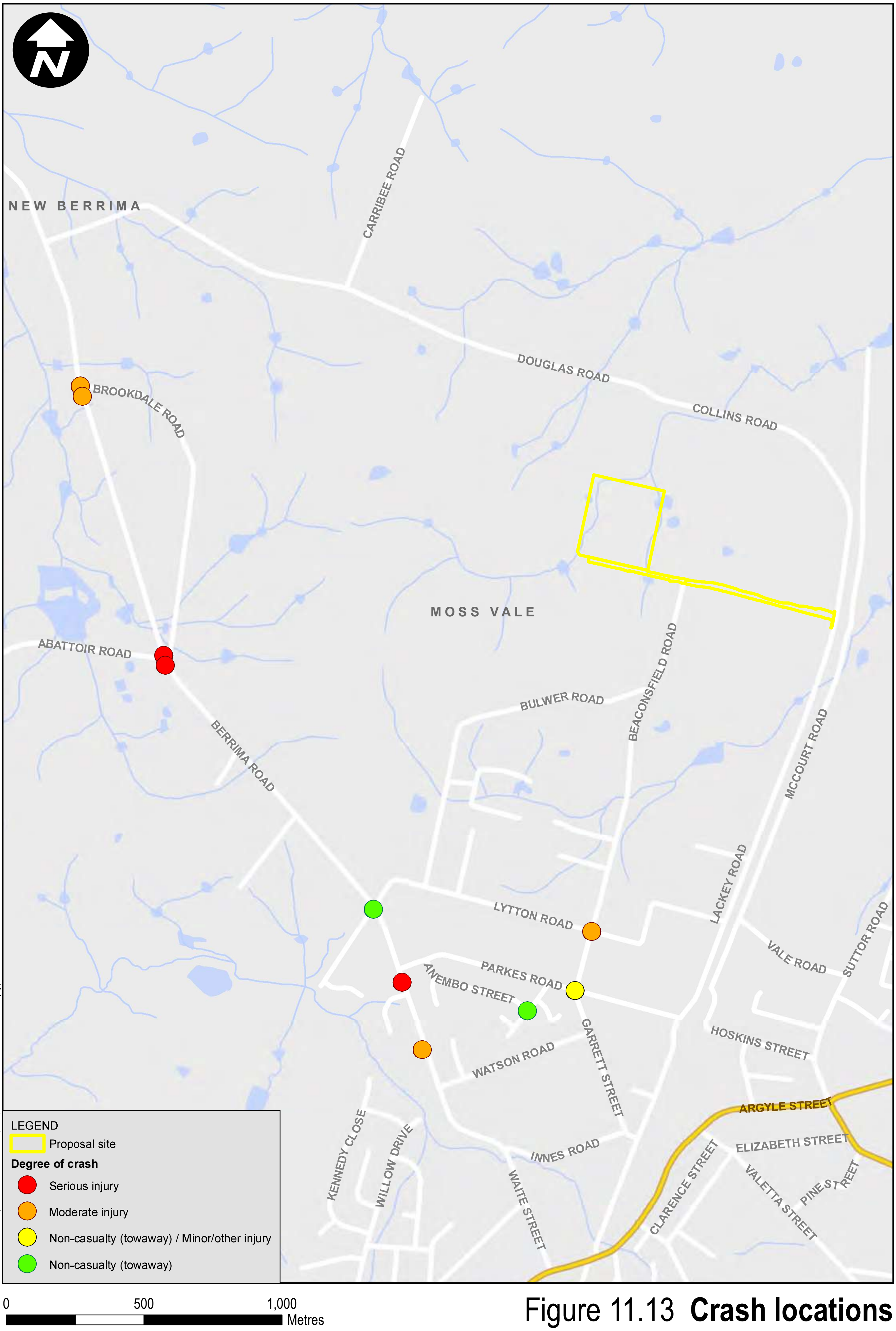


Figure 11.13 **Crash locations**

11.2.4 Public and active transport

Bus stops are located along Berrima Road (approximately 1.7 kilometres south-west of the plastics recycling and reprocessing facility site). Route 812 and 816 operate covering Berrima and Moss Vale and Moss Vale (loop) respectively.

The nearest rail station is Moss Vale train station, located approximately 2.4 kilometres south-west of the plastics recycling and reprocessing facility site. Rail services typically operate between 50-to-60-minute intervals during the AM and PM peak periods and 120-minute intervals on weekends, providing access to the Sydney CBD (via Campbeltown) and Goulburn on the following train lines:

- Southern Highlands (Intercity Trains)
- Southern NSW (Regional Trains)

Moss Vale train station is also a stop along the route between Central (Sydney) to Melbourne and Sydney (Central) to Canberra.

There are currently no dedicated pedestrian facilities in the study area.

No bicycle parking facilities are currently providing in the study area. However, an off-road cycle route exists on part of Berrima Road in both directions to provide a connection to Cosgrove Park and, to an extent, Cecil Hoskins Nature Reserve.

11.3 Impact assessment – construction

11.3.1 Construction traffic activity

Although construction workers arrival and departure are likely to occur outside the road network peak, for assessment purposes and for the worst-case scenario, a maximum of 30 light vehicles (equivalent to the expected peak workforce) and was assumed to enter the site during AM peak with two entering and two exiting heavy vehicles (equivalent to ten percent of peak daily heavy vehicle traffic) occurring concurrently.

Conversely in the PM peak a maximum of 30 light vehicles were assumed to exit the site with two heavy vehicles entering and two exiting heavy vehicles.

The anticipated peak vehicle movements during construction are summarised in Table 11.12.

Table 11.12 Estimated vehicle movements during construction

Vehicle type	Estimated average daily vehicle movements	Estimated peak daily vehicle movements	Estimated AM Peak vehicle movement		Estimated PM Peak vehicle movement	
			In	Out	In	Out
Light vehicles	40	60	30	0	0	30
Heavy vehicles	15	40	2	2	2	2

11.3.2 Construction road network performance

Construction traffic would access the plastics recycling and reprocessing facility site via Berrima Road, Lytton Road and Beaconsfield Road while the new access (Braddon Road and Braddon Road east extension) is under construction.

As outlined in section 11.2.2, the existing road network has sufficient mid-block capacity, and would be able to cater for traffic flow associated with construction of the proposal, with negligible impact to road operation.

Traffic modelling was undertaken using SIDRA 9 to assess the level of performance of the intersection of Lackey Road and the proposed new access road. The results of the analysis are shown in Table 11.13. This indicates that the analysed intersection would have an acceptable Level of Service (ie. better than Level of Service E) with spare capacity in both the weekday morning, evening weekday and weekend peak periods during construction.

Detailed SIDRA results are provided in Appendix A of Technical Report 6 – Traffic and Transport.

Table 11.13 Intersection performance – construction

Intersection	Control type	AM Peak			PM Peak		
		Average delay (s)	LoS	Degree of saturation	Average Delay (s)	LoS	Degree of saturation
Site 1: Lackey Road / Access Road (Braddon Road east extension)	Giveway – T intersection	6	LoS A	0.06	6	LoS A	0.05

Notes:

- The average delay for priority-controlled intersections is selected from the movement on the approach with the highest average delay.
- The level of service for priority-controlled intersections is based on the highest average delay per vehicle for the most critical movement.
- The degree of saturation is defined as the ratio of the arrival flow (demand) to the capacity of each approach.
- Average delay is given in seconds per vehicle.

11.4 Impact assessment – operation

11.4.1 Road infrastructure works and access points

The proposal includes construction of a new public road to provide access to the plastics recycling and reprocessing facility site.

The new access road would extend from the east of the plastics recycling and reprocessing facility site along the existing "paper road" west of Beaconsfield Road and then along the southern boundary of the Australian BioResources site (Braddon Road east extension) to Lackey Road, as shown on Figure 4.2.

The new access road follows the future east-west road corridor proposed in the MVEC and requires the acquisition (or lease agreement) of portions of the following parcels of land for the construction of this road:

- Lot 10 DP 1084421 (9-11 Lackey Road, Moss Vale) – the Australian BioResources site
- Lot 1 DP 26490 (77 Beaconsfield Road, Moss Vale).

Two access points to the plastics recycling and reprocessing facility site are proposed off the new access road (Braddon Road), as shown on Figure 7.1.

11.4.2 Operation traffic activity

Worst-case scenarios were adopted for assessment purposes. In practice however, there is likely to be a reduced number of staff exiting the site in both the AM and PM periods, with night shift staff being less and administration, technical support and management not operating during the night shift period. Further to this, for assessment purposes, it has also been assumed that staff would arrive and depart the facility by individual private transport, with no reduction factor applied in relation to carpooling, which in reality is likely to occur and would reduce the trip generation.

The assessment also assumed that ten percent of heavy vehicles (five heavy vehicles) would enter the facility during AM delivering plastics and five heavy vehicles would exit the site. This is equivalent to approximately the average distribution of daily traffic over the operational period (11 hours).

Table 11.14 provides a summary of the assumed vehicle movements during operation of the plastics recycling and reprocessing facility.

Table 11.14 Estimated vehicle movement during operation

Vehicle type	Estimated number of daily vehicle movements	Estimated AM Peak vehicle movements		Estimated PM Peak vehicle movements	
		In	Out	In	Out
Light vehicles	280 *	60	60	60	60
Heavy vehicles	100	10	10	10	10

Note (*) Assumes all FTE staff inbound and outbound daily

For assessment purposes vehicle trips were distributed with 60 percent arrival and departure from the south and 40 percent arrival and departures from the north.

11.4.3 Operation road network performance

Operational vehicles would access the plastics recycling and reprocessing facility site along the Hume Highway (Old Hume Highway), Medway Road, Taylors Avenue, Douglas Road/ Colins Road and Lackey Road before turning into the new access road (Braddon Road via the Braddon Road east extension).

As outlined in section 11.2.2, the existing road network has sufficient mid-block capacity, and would be able to cater for traffic flow associated with operation of the proposal, with negligible impact to road operation.

Traffic modelling was undertaken using SIDRA 9 to assess the level of performance of the intersection of Lackey Road and the proposed new access road during worst-case operation of the proposed plastics recycling and reprocessing facility for the following scenarios:

- 2020 post development – incorporating base 2020 traffic volumes and operational traffic flows
- 2030 post development – incorporating 2030 background traffic growth volumes (assumed to be two percent per year) and operational traffic flows

The results of the analysis are shown in Table 11.13 and Table 11.16.

The analysis indicates that the analysed intersection will have an acceptable Level of Service (ie. better than Level of Service E) with spare capacity in both the weekday morning, evening weekday and weekend peak periods in both the future 2020 post development and 2030 post development scenarios.

Table 11.15 Operational Intersection performance (2020) – post development

Intersection	Control Type	AM Peak			PM Peak		
		Average Delay (s)	LoS	Degree of Saturation	Average Delay (s)	LoS	Degree of Saturation
Site 1: Lackey Road / Access Road (Braddon Road east extension)	Giveway – T intersection	6	LoS A	0.07	6	LoS A	0.10

Table 11.16 Operational Intersection performance (2030) – post development

Intersection	Control Type	AM Peak			PM Peak		
		Average Delay (s)	LoS	Degree of Saturation	Average Delay (s)	LoS	Degree of Saturation
Site 1: Lackey Road / Access Road (Braddon Road east extension)	Giveway – T intersection	6	LoS A	0.08	6	LoS A	0.11

11.4.4 Parking

Parking provision

A total of 70 parking spaces are proposed to be provided which would accommodate 60 staff parking and approximately 10 during peak staff changeovers.

Due to the location, there is no public transportation available in the vicinity of the plastics recycling and reprocessing facility site. However, staff would be encouraged to use carpooling as an alternative transport option which would minimise traffic movements and decrease parking demand. The proposed car park locations are shown on Figure 7.1.

It is noted that bus stop facilities are proposed along Douglas Road (approximately 500 metres from the plastics recycling and reprocessing facility site) and Bulwer Road as part of the development of the MVEC (Connell Wagner 2008). Staff who live close to the facility would be strongly encouraged to use public transport and active transport facilities once these facilities are developed by Council.

Parking layout and accessible parking

A general review of the proposed car parking layout was undertaken which found that the proposed parking spaces and aisles would meet the minimum requirements for employee use in *AS2890.1 – Parking Facilities: Off-street car parking*.

The car park also has provision for accessible car spaces which is compliant with the minimum dimensions, aisle width and shared area requirements in Section 2.2 of *AS2890.6 – Parking Facilities: Off-street parking for people with disabilities*.

11.4.5 Site access

The sight distance requirements are based on the sign posted speed limit or 85th percentile vehicle speeds along the frontage road.

Egress from the plastics recycling and reprocessing facility would be via the new access road through to through Lackey Road. Lackey Road has a posted speed limit of 60 kilometres per hour. Assuming the new access road retains the posted speed limit of 60 kilometres per hour and the approach speed of 60 kilometres per hour to the facility driveway, the desirable visibility distance would be 84 metres.

The entry and egress driveways would be located on the straight sections of the new access road alignment. A detailed review would be undertaken during detailed design of the new access road to ensure a suitable sight distance is available from the proposed egress driveways. No permanent obstructions within the above visibility zone would be erected to affect the visibility of the driver when exiting.

11.4.6 Internal circulation and swept turn path assessment

Upon entry to the plastics recycling and reprocessing facility site in the southwest corner, vehicles would circulate in a one-way clockwise direction with trucks unloading within Building 1 following access via the weighbridge. Vehicles would then exit the site via the weighbridge at the eastern side of the facility before turning left and returning to Lackey Road via the new access road (refer to Figure 11.14).

Vehicles would use the one-way middle lane to access Building 1. Vehicles can either enter in a forward direction or reverse to enter into Building 1. Upon leaving either buildings, vehicles would continue in a clockwise direction around the site, prior to exiting in the south east corner of the site. Vehicles would enter and exit the plastics recycling and reprocessing facility site in a forward direction.

The driveway crossover would be designed in accordance with AS 2890.2 – Parking Facilities: Off-street commercial facilities suitable for the designated design vehicle. Swept path assessments were undertaken using AutoTURN 11 to confirm that the proposed layout would allow vehicles to safely enter / exit the facility. It is expected that a semi-trailer, 19 metres in length would be the maximum size vehicle to be utilised to deliver plastic waste to the facility.

Swept path assessments indicated that the design vehicle is expected to generally manoeuvre with appropriate clearances within the plastics recycling and reprocessing facility site.

The results of the turn path assessment are provided in Appendix B of Technical Report 6 – Traffic and Transport.

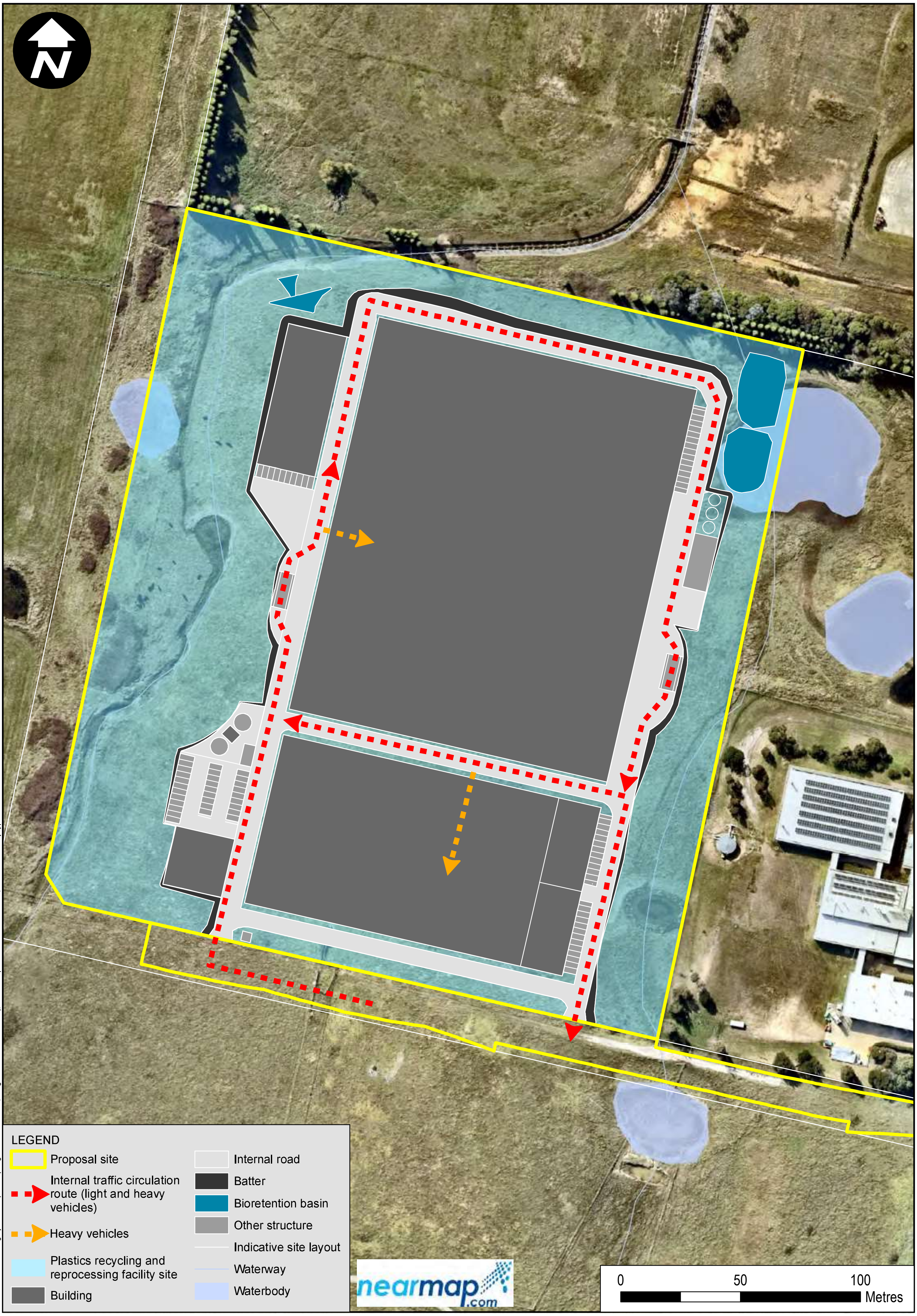


Figure 11.4 **Internal circulation of light and heavy vehicles**

11.5 Mitigation and management measures

11.5.1 Construction

Table 11.17 shows the measures proposed to be implemented to manage traffic during construction of the proposal.

Table 11.17 Traffic and transport mitigation measures – construction

Mitigation measure	Timing
Construction traffic management plan A construction traffic management plan (CTMP) would be prepared prior to the commencement of construction with site induction for construction personnel being undertaken to outline the requirements of the CTMP. The CTMP would aim to maintain the safety of all workers and road users within the vicinity of the proposal site.	Construction

11.5.2 Operation

Table 11.18 shows the measures proposed to manage traffic during operation of the proposal.

Table 11.18 Traffic and transport mitigation measures – operation

Mitigation measure	Timing
Green travel plan A green travel plan would be developed to encourage and promote alternate transport opportunities to the plastics recycling and reprocessing facility. The green travel plan would summarise alternate transport options to access the facility, outlining where and how these services can be accessed and the frequency of the service.	Operation

12. Noise and vibration

The chapter provides a summary of the potential noise and vibration impacts of constructing and operating the plastics recycling and reprocessing facility. A full copy of the assessment results is provided in Technical Report 2 – Noise and Vibration.

12.1 Approach and method

12.1.1 Legislative and policy context to the assessment

The assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

- The EP&A Act and POEO Act
- Guidelines relevant to the assessment of construction impacts:
  - *Interim Construction Noise Guideline* (DECC 2009)
  - *Draft Construction Noise Guideline* (NSW EPA 2020b)
  - *Construction Noise and Vibration Guideline* (Transport for NSW 2016)
  - *Construction Noise and Vibration Strategy* (Transport for NSW 2019)
  - BS 7385-2 *Evaluation and measurement for vibration in buildings Part 2 – Guide to damage* (British Standards 1993)
  - BS 6472 *Guide to Evaluation of Human Exposure to Vibration in Buildings* (British Standards 2008)
  - *Assessing Vibration: A Technical Guideline* (DEC 2006)
- Guidelines relevant to the assessment of operation impacts:
  - *Noise Policy for Industry* (NSW EPA 2017)
  - *NSW Road Noise Policy* (DECCW 2011).

12.1.2 Method

Study area

The study area for the assessment has been defined as a radius of about 1.2 kilometres around the plastics recycling and reprocessing facility site, as there is not considered to be the potential for noise or vibration impacts beyond this distance.

Key tasks

The key potential sources of noise and vibration impacts considered by the assessment are:

- Noise and vibration generated by construction activities
- Noise generated by construction traffic travelling to and the plastics recycling and reprocessing facility site
- Noise generated by operating the recycling and processing facility
- Noise generated by vehicles travelling to and from the plastics recycling and reprocessing facility during operation.

The noise and vibration assessment generally involved:

- identifying and classifying sensitive receivers
- characterising the existing background and ambient noise environment based on noise monitoring at representative locations in the study area (see below)
- determining appropriate assessment criteria for potential construction and operation impacts based on the guidelines listed in section 12.1.1

- assessing the potential impacts of construction and operation
- identifying mitigation and management measures.

Due to the distance between the plastics recycling and reprocessing facility site and the nearest sensitive receivers that the potential for vibration impacts during operation is considered to be negligible. As such, no assessment of operational vibration was undertaken.

Noise monitoring

Background noise monitoring, using the *Noise Policy for Industry* long-term method, was undertaken from Friday 5 March 2021 to Wednesday 17 March 2021. Monitoring was undertaken at three residential locations near the plastics recycling and reprocessing facility site to determine background noise levels.

Unattended noise loggers were installed at each location to record existing noise levels for various noise descriptors for the monitoring period. Three attended noise measurements using hand-held noise loggers were also taken at each monitoring location to identify ambient noise sources and to characterise the existing noise environment.

Noise monitoring was also undertaken at the western boundary of the Australian BioResources site to quantify the existing L_{max} noise levels during the day, evening and night period. Third-octave band L_{Amax} noise levels were measured between the frequencies of 1 kHz and 20 kHz (frequencies mice are susceptible to hear and that have the potential to cause a disturbance).

Monitoring locations are shown in Figure 12.2.

Construction noise and vibration assessment

The assessment of potential construction noise and vibration impacts involved:

- determining construction noise and vibration management levels/criteria in accordance with the methods provided in the *Interim Construction Noise Guideline, Draft Construction Noise Guideline, NSW Road Noise Policy*, and *Assessing Vibration: A Technical Guideline* and *BS 6472: Guide to Evaluation of Human Exposure to Vibration in Buildings* including calculating the rating background noise levels from noise monitoring data
- identifying potential noise sources during construction, including a list of likely construction activities and plant and equipment
- sourcing noise levels for the construction plant and equipment from AS 2436 *Guide to Noise Control on Construction, Maintenance and Demolition Site* and the *Construction Noise and Vibration Guideline*
- defining construction scenarios with indicative durations of impact, based on worst-case assumptions about the use of several items of construction plant and equipment at the same time within individual construction scenarios
- undertaking noise modelling for the identified construction scenarios using SoundPLAN 8.2 noise modelling software
- Identifying safe working distances to comply with the human comfort and the cosmetic damage criteria for the expected construction plant and equipment based on the buffer distances in the *Construction Noise and Vibration Strategy*
- identifying if any residential receivers or structures were within the minimum vibration working distances for human comfort and cosmetic damage
- assessing the significance of predicted noise levels by comparing the modelling results to the management levels/criteria
- recommending feasible and reasonable measures, with reference to the work practices section of the *Interim Construction Noise Guideline*, to mitigate predicted exceedances of the management levels/criteria.

Operation noise assessment

The assessment of potential construction noise and vibration impacts involved:

- determining operational noise management levels/criteria in accordance with the *Noise Policy for Industry* and *NSW Road Noise Policy*
- identifying potential operational noise sources and source noise levels based on information provided by the Plasrefine Recycling, typical sound power level data for plant sourced from *AS2436 Guide to noise and vibration control on construction, demolition and maintenance sites* (Standards Australia 2010) and estimations based on GHD's internal database where sound power level data was not provided
- identifying the design features, with input from Plasrefine Recycling, proposed to be incorporated during detailed design to reduce potential noise emissions at source
- undertaking noise modelling using SoundPLAN 8.2 noise modelling software to predict environmental noise levels at the sensitive receivers surrounding the plastics recycling and reprocessing facility site during operation and based on worst-case assumptions about the concurrent operation of noise sources during each assessment period
- assessing the significance of predicted noise levels by comparing modelling results to the management levels/criteria
- recommending mitigation measures with reference to the *Noise Policy for Industry* to minimise the risk of adverse impacts during operation of the plastics recycling and reprocessing facility.

12.1.3 How potential impacts have been avoided

The proposal includes buildings of sufficient size and arrangement to ensure that no unloading, recycling or reprocessing activities would need to occur outside. Fast acting roller doors would allow vehicles to enter and exit the buildings but would otherwise remain closed to reduce the potential for noise escaping the buildings. The overall facility layout has also been designed so that the main doors to allow vehicle entry to Building 1 would be positioned on the western side. Therefore, when the main doors are open, the openings would face to the west, away from the nearest sensitive receivers.

Waste deliveries would be restricted and only occur between 7am and 6pm weekdays so that heavy vehicle movements do not occur in the night period.

Furthermore, a number of features have been incorporated into the design of the buildings and the on-site wastewater treatment plant to ensure compliance with the *Noise Policy for Industry* project-specific noise trigger levels. These include:

- enclosing Building 1, Building 2 and the wastewater treatment plant
- specifying the minimum sound transmission reduction levels of façade construction materials of the buildings
- the use of acoustic louvres where required
- specifying a maximum sound power level for the design of ventilation systems
- specifying a maximum average sound pressure level to be achieved within Building 1, Building 2 and the wastewater treatment plant
- use of automatic fast acting roller doors with an acoustic door system

As the design progresses, the proposal would continue to be refined to minimise the potential for operational impacts and ensure compliance with the requirements of the *Noise Policy for Industry*. Further detail on the design features that would be considered during detailed design are provided in Table 6.2 in Technical Report 2 – Noise and Vibration.

12.1.4 Construction noise and vibration criteria

A summary of the criteria used to undertake the construction noise and vibration assessment is provided in this section. Further information is provided in section 4 of Technical Report 2 – Noise and Vibration.

An individual's perception of noise is influenced by their environment. A noise level that is perceived to be loud in one situation may appear quiet in another. Figure 12.1 shows a comparison of noise levels from common sources.

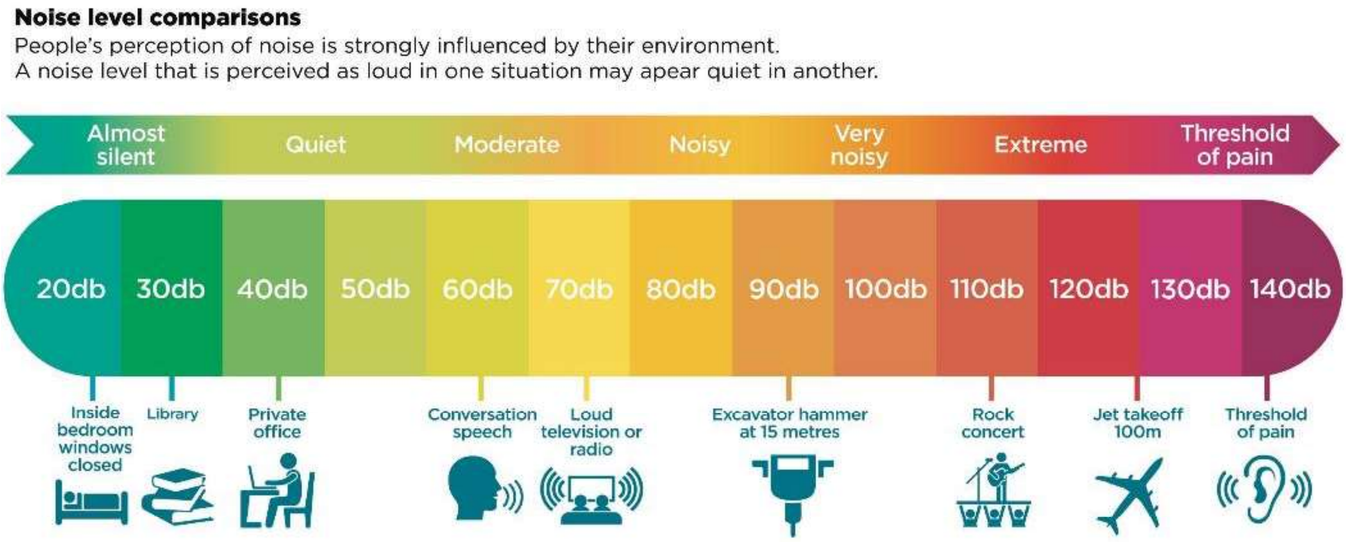


Figure 12.1 Noise level comparisons

Amenity

Noise management levels

Construction noise management levels for noise at residential receivers are defined by the *Interim Construction Noise Guideline* (see Table 12.1).

Table 12.1 Residential construction noise management levels

Time of day	Noise management level, $L_{Aeq(15\ min)}$ (dBA)	Application notes
Recommended standard hours	Noise affected: RBL + 10 dBA	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq(15\ min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level the proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected: 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: – times identified by the community when they are less sensitive to noise (such as before and after school, or mid-morning or mid-afternoon for works near residences) – if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected: RBL + 5 dBA	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable measures have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community.

Noise management levels are also provided in the *Interim Construction Noise Guideline* for other sensitive land uses in Table 12.2.

Table 12.2 Noise at non-residential sensitive land uses

Land use	Management level $L_{Aeq(15min)}$ (dBA) (applies when properties are being used)
Industrial premises	External noise level 75 dBA
Commercial premises	External noise level 70 dBA

Project-specific noise management levels

The noise management levels at sensitive receivers in the study area have been determined based on the levels in Table 12.1 and Table 12.2 and are summarised in Table 12.3.

As the measured rating background levels are lower than the minimum background levels specified in the *Noise Policy for Industry*, the minimum background noise levels have been used.

Table 12.3 Project-specific construction noise management levels

Sensitive receiver type[1]	Construction noise management levels (dBA)				
	Standard construction hours		Outside standard construction hours[2]		
	Noise affected	Highly noise affected	Day	Evening	Night
Residential – NCA1	49	75	44	44	38
Residential – NCA2	46	75	41	44	38
Residential – NCA3	45	75	40	37	35
Industrial premises	External noise level 75 dBA (when in use)				
Commercial premises	External noise level 70 dBA (when in use)				

Notes:

1. NCA1, NCA2 and NCA3 refer to the three discrete noise catchment areas for the assessment, as defined in section 12.2.1
2. Noise management levels for outside of recommended standard construction hours are provided, however construction works are not proposed for non-standard hours

Sleep disturbance

The proposed construction working hours are described in section 7.7.3.

No construction works are proposed during the night period (10pm to 7am Monday to Saturday and 10pm on Saturday to 8am on Sunday). As such, no sleep disturbance impacts are anticipated during construction.

Construction road traffic noise

The assessment considered potential road traffic noise impacts in relation to the use of the Hume Highway, Berrima Road, Lytton Road, Beaconsfield Road, the proposed new Braddon Road and Braddon Road east extension. The Hume Highway is defined by the *NSW Road Noise Policy* as a sub-arterial road (or collector road) and a freeway (or motorway/arterial road) respectively. Lytton Road and Beaconsfield Road are defined as local roads.

The additional traffic during construction is anticipated to have a negligible effect on the existing traffic volumes (and traffic noise) on Hume Highway. As such, no further assessment of potential road traffic noise increases along Hume Highway has been undertaken. In accordance with the *NSW Road Noise Policy*, if the increase in road traffic noise as a result of construction is within 2 dBA of current noise levels then the objectives of the *NSW Road Noise Policy* are met and no specific mitigation measures are required. Mitigation should be applied when road traffic noise levels increase by 2 dBA *and* the controlling noise criterion in Table 12.4 are exceeded at the façade of the residence.

Table 12.4 Road traffic noise criteria

Development type	Applicability to the assessment	Day (7am to 10pm) (dBA)	Night (10pm to 7am) (dBA)
Existing residences affected by noise from **new** freeway/arterial/sub-arterial road corridors	Nil[1]	55 $L_{eq(15hr)}$	50 $L_{eq(9hr)}$
Existing residence affected by **additional traffic** on arterial / sub-arterial / collector roads generated by land use developments	Berrima Road Proposed Braddon Road (including the Braddon Road east extension)[1]	60 $L_{eq(15hr)}$	55 $L_{eq(9hr)}$
Existing residences affected by noise from **new** local road corridors	nil	55 $L_{eq(1hr)}$	50 $L_{eq(1hr)}$
Existing residence affected by **additional traffic** on local roads generated by land use developments	Lytton Road Beaconsfield Road		

Note:

1. Braddon Road is a proposed collector road as part of the Wingecarribee Shire Council MVEC development plan. However, until this road network and surrounding industrial complex is complete, Plasrefine Recycling would likely be the sole user of Braddon Road. Therefore, under this assumption, the more conservative criteria for a new local road has been adopted for the assessment of traffic noise along Braddon Road (and the Braddon Road east extension).

Hearing sensitivity for mice

It is understood that the Australian Bioresources facility (operated by the Garvan Institute of Medical Research) breed and conduct medical research on mice.

Different species of fauna have different hearing sensitivities, depending on the evolutionary structure of the hearing organ. Generally, mice hearing range is in the ultrasound range (1-100 kHz) with the greatest sensitivity between 15 kHz and 20 kHz. Guidance from the Garvan Institute suggests a noise target for the assessment of L_{max} 60 dBA as noise levels below this level are not anticipated to result in adverse impacts. The L_{max} noise descriptor has been used as '*sudden noises are more like to cause disturbance than constant background noise'* and the assessment considers the frequency bands between 1 kHz and 16 kHz to determine potential impacts.

Vibration

Human comfort

The criteria for intermittent vibration from construction are based on the vibration dose value identified in *Assessing Vibration: A Technical Guideline* and are shown in Table 12.5.

Table 12.5 Acceptable peak particle velocity values for human comfort

Receiver	Period	Continuous and impulsive vibration guide goals (mm/s)	
		Preferred value	Maximum value
Residential	Day	0.28 (8.6)	0.56 (17.0)
Offices, schools, educational institutions and places of worship	When in use	0.56 (18.0)	1.1 (36.0)
Workshops	When in use	1.1 (18.0)	2.2 (36.0)

Notes:

– Impulsive goals are shown in brackets – these are most relevant to activities that create up to 3 distinct vibration events in an assessment period, eg. occasional dropping of heavy equipment, occasional loading and unloading.

Humans are capable of detecting vibration at levels well below those that could cause damage to a building. The degrees of perception for humans are suggested by the vibration level categories in *BS 5228-2 Code of practice for noise and vibration on construction and open sites – Part 2: Vibration*, as shown in Table 12.6.

Table 12.6 Guidance on effect of vibration levels for human comfort

Vibration level	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction.
0.3 mm/s	Vibration might be just perceptible in residential environments.
1.0 mm/s	It is likely that vibration at this level in residential environments will cause complaints, but can be tolerated if prior warning and explanation has been given to residents.
10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure.

Structural damage

The minimum working distances for structural (cosmetic) damage used for the assessment were based on *BS 7385-2 Evaluation and measurement for vibration in buildings Part 2 – Guide to damage*. The vibration levels in this standard have been adopted as building damage criteria, as shown in Table 12.7.

Table 12.7 Transient vibration guide values - minimal risk of cosmetic damage

Type of building	Peak component particle velocity in frequency range of predominant pulse[1]	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures industrial and heavy commercial building	50 mm/s at 4 Hz and above	
Unreinforced or light framed structures residential or light commercial type buildings[2]	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Notes:

1. At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) should not be exceeded.
2. Values referred to are at the base of the building.

12.1.5 Operational noise criteria

This section provides a summary of the criteria used to undertake the operational noise assessment. Further information about how the criteria were derived is provided in section 4 of Technical Report 2 – Noise and Vibration.

Intrusiveness and amenity

Project-specific noise trigger levels

The project-specific noise trigger levels for rural residential land uses based on the *Noise Policy for Industry* are shown in Table 12.8. All identified sensitive receivers have been classified as 'rural residential' to be conservative. Compliance with the residential project-specific noise trigger levels ensures compliance with the less-stringent non-residential project-specific noise trigger levels. The project-specific noise trigger levels for non-residential receivers are shown in Table 12.9. The noise catchment areas are defined in section 12.2.1.

Table 12.8 Project-specific noise trigger levels for residential receivers

Noise catchment area	Assessment period	Intrusive noise level, $L_{Aeq(15min)}$ (dBA)	Project-specific amenity noise level, $L_{Aeq(15min)}$ (dBA)	Project-specific noise trigger level, $L_{Aeq(15min)}$ (dBA)
NCA1 – rural residential receivers	Day	**44**	48	44
	Evening	44	**43**	43
	Night	**38**	**38**	38
NCA2 – rural residential receivers	Day	**41**	48	41
	Evening	**41**[1]	43	41

Noise catchment area	Assessment period	Intrusive noise level, $L_{Aeq(15min)}$ (dBA)	Project-specific amenity noise level, $L_{Aeq(15min)}$ (dBA)	Project-specific noise trigger level, $L_{Aeq(15min)}$ (dBA)
	Night	**38**	**38**	38
NCA3 – rural residential receivers	Day	**40**[2]	48	40
	Evening	**37**	43	37
	Night	**35**[2]	38	35

Notes:

1. As per the *Noise Policy for Industry*, the intrusiveness noise level for the evening should be set at a level no greater than the intrusiveness noise level for the day period
2. Minimum assumed rating background levels (RBLs) have been used to establish the intrusiveness noise level

Table 12.9 Project-specific noise trigger levels for non-residential receivers (external)

Type	Time of day	Project-specific noise trigger level, $L_{Aeq(15min)}$ (dBA)[1]
Commercial premises	When in use	63[2]
Industrial premises	When in use	68[2]

Notes:

1. A +3 dB correction has been applied to convert $L_{Aeq(period)}$ to $L_{Aeq(15 min)}$
2. Internal noise level of 40 dBA. External noise level assumes minus 10 dBA for noise through an open window.

Modifying factor corrections

The *Noise Policy for Industry* specifies that corrections for annoying characteristics are applied if the noise sources contain tonal, intermittent or low frequency characteristics, which have the potential to increase annoyance. The modifying factor adjustment is 5 dBA. Where two or more modifying factors is limited to 10 dBA and where a source emits a tonal and low-frequency noise, only one 5 dBA correction should be applied if the tone is in the low frequency range.

Sleep disturbance

To assess sleep disturbance the *Noise Policy for Industry* recommends the following screening criteria, assessed externally at the nearest residence:

– $L_{Aeq(15min)}$ 40 dBA or the prevailing RBL + 5 dBA (whichever is greater) and/or
– L_{AFmax} 52 dBA or the prevailing RBL + 15 dBA (whichever is greater).

As the project-specific noise trigger level for the night period (35 dBA) is lower than the $L_{Aeq(15min)}$ 40 dBA sleep disturbance criteria, the potential for sleep disturbance impacts has been assessed against the L_{AFmax} 52 dBA criteria.

12.2 Existing environment

12.2.1 Sensitive receivers and noise catchment areas

Potentially sensitive receivers are those that may be affected by changes in noise and vibration levels within the study area. Noise sensitive land uses are defined based on the type of occupancy and the activities performed in the land use. Residential, commercial and industrial sensitive receivers have been identified within the study area.

The sensitive receivers are shown on Figure 12.2 and details are provided in Appendix B of Technical Report 2 – Noise and Vibration.

Noise catchment areas are used to classify areas of different noise environments. For the assessment, the residential receivers have been categorised into three discrete noise catchment areas. The dominant noise sources surrounding the plastics recycling and reprocessing facility site include the railway line and other industrial premises along Collins Road and Lackey Road. Residential receptors have been classified into the three noise catchment areas based upon their proximity to these noise sources. Details of each noise catchment area are provided in Table 12.10.

Table 12.10 Residential noise catchment areas

Noise catchment area	Location description	Land use zones	Number of identified lots with dwellings
NCA1	Residential dwellings within approximately 300 metres of Lackey / Collins Road and the railway line	E3 - Environmental Management	1
		IN1 - General Industrial	1
		RU2 - Rural Landscape	1
		RU4 - Primary Production Small Lots	3
NCA2	Residential dwellings between approximately 300 metres and 800 metres of Lackey / Collins Road and the railway line	R2 - Low Density Residential	47
		RU2 - Rural Landscape	8
		RU4 - Primary Production Small Lots	10
NCA3	Residential dwellings beyond 800 metres of Lackey / Collins Road and the railway line	IN1 - General Industrial	3
		R2 - Low Density Residential	72
		RU2 - Rural Landscape	1
		RU4 - Primary Production Small Lots	6

12.2.2 Existing noise levels

A summary of the existing noise levels for each monitoring location are shown in Table 12.11. These measured noise levels were used to characterise the existing noise environment and define the criteria used to assess the potential impacts of the proposal.

The results of noise monitoring at the western boundary of the Australian BioResources site are shown in Table 12.12.

Further detail is provided in section 3.3 of Technical Report 2 – Noise and Vibration.

Table 12.11 Summary of noise monitoring results at receivers

Monitoring location	Result type	Assessment background level L_{90} (dBA)			Ambient L_{eq} noise level (dBA)			Road traffic noise levels, $L_{eq(1hour)}$ (dBA)	
		Day	Evening	Night	Day	Evening	Night	Day	Night
M1 - 7-9 Lackey Road, Moss Vale	Rating background level / average	39	39	33	48	45	43	48	45
M2 - 72 Beaconsfield Road, Moss Vale	Rating background level / average	36	39	33	49	47	42	49	44
M3 - 50 Bulwer Road, Moss Vale	Rating background level / average	32	32	29	50	42	40	-	-

Table 12.12 Noise monitoring results at Australian BioResources site

Period	Third-octave band L_{max} noise level, 1 kHz to 20 kHz – Z-weighted (dBA)														Overall (1-20 kHz) (dB)
	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000	
Day	54	52	48	45	47	51	47	45	40	40	39	44	56	58	**63**
Evening	56	55	59	54	56	54	51	55	53	51	53	52	65	72	**74**
Night	51	50	52	49	52	53	47	56	54	44	43	42	44	44	**62**

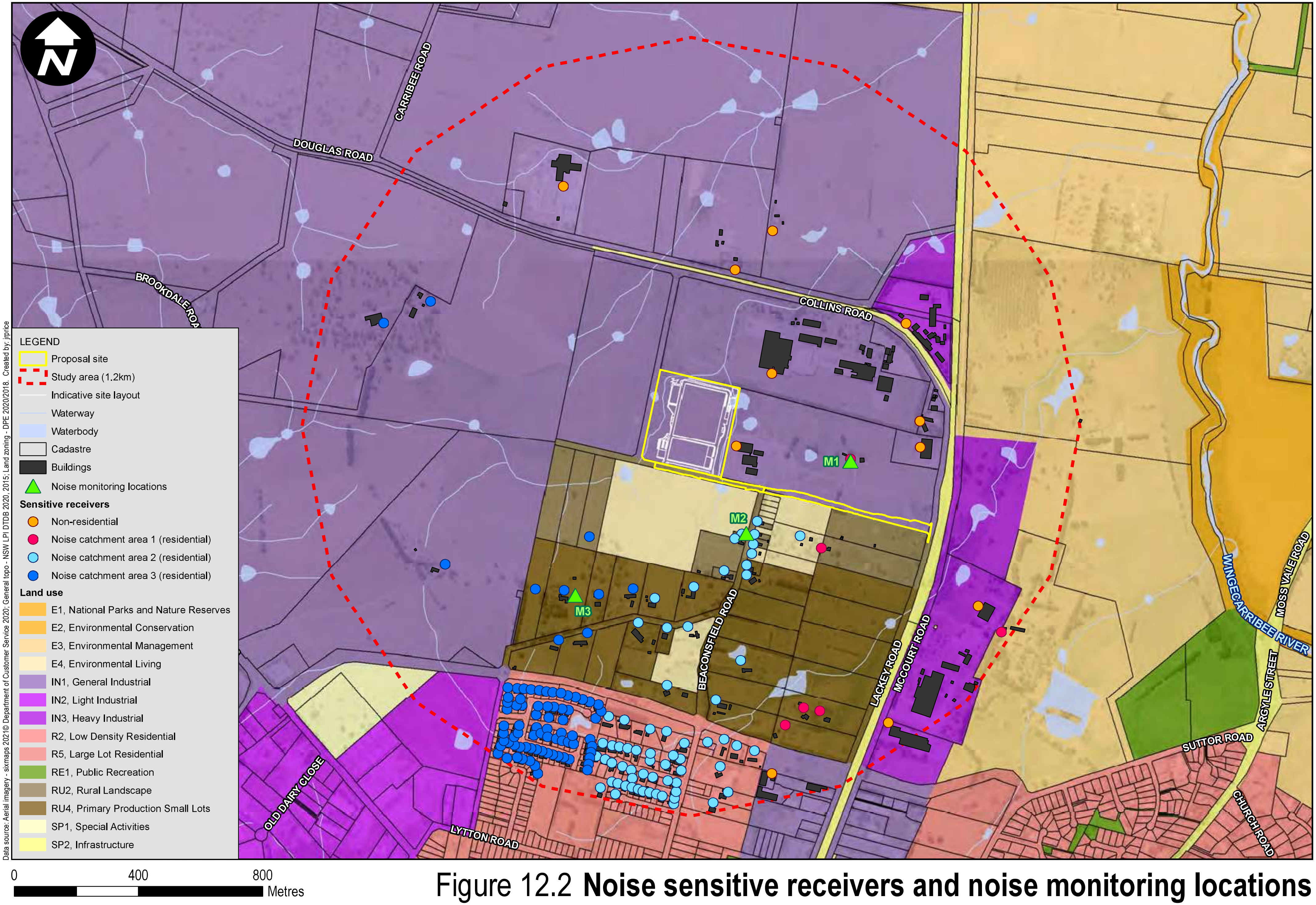


Figure 12.2 **Noise sensitive receivers and noise monitoring locations**

12.3 Impact assessment – construction

12.3.1 Potential noise and vibration sources

Construction would require the use of heavy machinery, which can generate high noise and vibration levels. The potential impacts at nearby receivers may vary greatly depending on the intensity and location of construction activities, the type of equipment used, existing background noise levels, intervening terrain, and prevailing weather conditions.

Potential noise and vibration sources during construction include both operation of mobile and stationary construction plant and equipment as well as construction vehicle movements. The anticipated construction scenarios are described in section 7.7.

Table 12.13 Construction noise scenarios

ID	Scenario name	Activity	Estimated duration
CS1	Stage 1 – Site establishment	– Site establishment	1 month
CS2	Stage 2 – Ground works and excavation	– Bulk earthworks for site shaping and surface water drainage and the bioretention pond – Pouring concrete foundation slab, footings, hardstand and slabs for the buildings – Construction of pavement areas for the truck and car park, internal roads and the site entrance/egress points	1 months
CS3	Stage 3 – Road access construction	– Excavation for placement of road base layers – Installation of concrete kerb and gutters – Paving of access road – Construction of retaining walls and batters	1 month
CS4a	Stage 4 – Construction of the main structures	– Installation of steel truss framework for structures – Erection of pre-cast concrete panels for external and internal partition walls and metal roof for site buildings – Installation of firewater and other tanks – Installation of weighbridges	7 months
CS4b		– Installation of processing equipment	2 months
CS5	Stage 5 – Testing and commissioning	– Testing and commissioning	3 months

The equipment expected to be used in each construction scenario and the associated sound power levels are shown in Table 12.14.

Table 12.14 Construction equipment and sound power levels

Equipment	SWL (dBA)	CS1	CS2	CS3	CS4a	CS4b	CS5
Activity SWL (dBA)		**108**	**115**	**116**	**112**	**112**	**109**
Bobcat	106				✓		
Boom lift	105				✓		
Bulldozer	108		✓	✓			
Compactor	113		✓	✓			
Concrete truck	113			✓			
Excavator	107		✓	✓	✓		
Forklift	106				✓	✓	
Grader	110			✓			

Equipment	SWL (dBA)	CS1	CS2	CS3	CS4a	CS4b	CS5
Hand tools	102	✓					✓
Mini-loader	110					✓	
Mobile crane	104				✓		
Scissor lift	105					✓	
Smooth drum roller	107			✓			
Tipper truck	110		✓	✓	✓		
Trucks	107	✓	✓	✓	✓	✓	✓
Welders	105						✓

12.3.2 Predicted noise levels

Construction noise levels have been predicted for the sensitive receivers within the study area.

A summary of the predicted exceedances of the construction noise management levels at residential receivers, the total number of receivers where the levels may be exceeded, and the most affected receiver is provided in Table 12.15 for the scenarios listed in section 12.3.1. The predicted noise levels calculated for each receiver are provided in Appendix H of Technical Report 2 – Noise and Vibration.

The noise modelling assumes that the two loudest equipment in the scenario are operating at maximum capacity simultaneously at the closest distance between the construction work area and the receiver. As such, the predicted noise levels are highly conservative and actual noise levels are likely to be lower than those presented below for the majority of the time.

Construction noise contours for each construction scenario are provided in Appendix I of Technical Report 2 – Noise and Vibration.

Table 12.15 Summary of predicted exceedances of the noise management levels

Noise catchment area	Aspect	CS1	CS2	CS3	CS4a	CS4b	CS5
NCA1	No. of exceedances	2	1	3	0	0	0
	Max. level (dBA)	54	50	62	46	46	46
	Max. exceedance (dBA)	5	1	13	-	-	-
	Most affected receiver	R016	R010	R016	R010	R010	R010
NCA2	No. of exceedances	10	12	13	10	10	10
	Max. level (dBA)	57	60	65	56	56	56
	Max exceedance (dBA)	11	14	19	10	10	10
	Most affected receiver	R018	R019	R018	R019	R019	R019
NCA3	No. of exceedances	1	5	5	2	2	2
	Max. level (dBA)	46	51	54	48	48	48
	Max. exceedance (dBA)	1	6	9	3	3	3
	Most affected receiver	R160	R160	R160	R160	R160	R160

Notes:

– R10 – 9-11 Lackey Road, Moss Vale

– R016 – 77 Beaconsfield Road, Moss Vale

– R018 – 79 Beaconsfield Road, Moss Vale

– R019 – 72 Beaconsfield Road, Moss Vale

– R160 – 50A Bulwer Road, Moss Vale

Construction noise levels are predicted to be below the construction noise management level for the majority (151 out of 164) of the sensitive receivers in the study area. During worst-case construction conditions (when construction works are at the closest distance between the source and receiver), there are predicted to exceedances of the noise management level at the closest receivers to the proposal site (exceedances of up to 19 dBA).

In summary, during construction:

– Site establishment and enabling works (construction scenario CS1):
  - up to 13 residential receivers are predicted to experience noise levels above the noise management level, including two in noise catchment area 1, one in noise catchment area 3 and 10 in noise catchment area 2
  - the maximum exceedance is predicted to be 11 dBA at R018 (79 Beaconsfield Road, Moss Vale)
  - the loudest equipment in this scenario are anticipated to be hand tools and use of trucks

– Ground works and excavation (construction scenario CS2):
  - Up to 19 residential receivers are predicted to experience noise levels above the noise management level during ground works and excavation
  - noise catchment area 2 has the highest number of exceedances with R019 (72 Beaconsfield Road, Moss Vale) anticipated to receive the highest exceedance of 14 dBA
  - the loudest equipment in this scenario are anticipated to be dozers, compactors and use of trucks.
  - The commercial premises, Australian BioResources (R001), is predicted to receive noise levels above 70 dBA during the excavation and ground works when works are located at the nearest location. An assessment for the impact from construction works on the mice is provided in section 12.3.4.

– Road access construction (construction scenario CS3):
  - Works associated with the construction of Braddon Road are predicted to lead to up to 22 residential receivers experiencing noise levels above their respective noise management level with 14 of these within noise catchment area 2
  - R018 (79 Beaconsfield Road, Moss Vale) is anticipated to experience the highest noise levels, with an exceedance of 19 dBA above the noise management level
  - The loudest equipment in this scenario are anticipated to be compactors, graders and use of concrete trucks.

– Construction of the main structures (construction scenarios CS4a and CS4b):
  - Up to 15 residential receivers are predicted to experience noise levels above their noise management level
  - R019 (72 Beaconsfield Road, Moss Vale) is anticipated to receive the highest noise levels
  - The loudest equipment used in this scenario is anticipated to be use of mini-loaders, tipper trucks and other trucks

– Testing and commissioning (construction scenario CS5):
  - Up to 15 residential receivers are predicted to experience noise levels above the noise management level
  - R018 (79 Beaconsfield Road, Moss Vale) is anticipated to receive the highest noise levels
  - The loudest equipment in this scenario is anticipated to be use of a welder

The predicted noise levels assume there is no acoustic shielding provided by the buildings and as such are highly conservative. The application of the proposed reasonable and feasible mitigation measures at the source are also anticipated to reduce the predicted noise levels by about five to 10 dBA.

12.3.3 Construction traffic

Construction traffic would access the plastics recycling and reprocessing facility site via Berrima Road, Lytton Road and Beaconsfield Road while the new access road (Braddon Road and Braddon Road east extension) is under construction. While the total construction period is estimated to be about 12 months (not including commissioning), construction traffic would use the new access road once constructed. Construction vehicles would then access the plastics recycling and reprocessing facility site using the same haulage route proposed for operational access, along Berrima Road, Douglas Road and then Collins Road and Lackey Road before turning into Braddon Road via the Braddon Road east extension.

Beaconsfield Road and Lytton Road

Results of the noise modelling for impacts to Beaconsfield Road and Lytton Road are shown in Table 12.16. The predicted noise level at the worst affected residence on Beaconsfield Road is 58 dBA. Residences within 19 metres of Beaconsfield Road are likely to be impacted by construction traffic noise, these residences are shown on Figure 12.3.

Table 12.16 Summary of construction traffic noise results

Road	Distance of nearest receiver (m)	Controlling criteria, $L_{Aeq(1hour)}$ (dBA)	Period	Predicted noise level, $L_{Aeq(1hour)}$ (dBA)	Noise level increase (dBA)	Mitigation distance (m)	Consideration for mitigation
Lytton Road	12	55	Peak hour (8 am – 9 am)	60	1.5	27	No
			Min hour (12 pm – 1 pm)	60	1.9	24	No
Beaconsfield Road	12	55	Peak hour (8 am – 9 am)	60	1.7	26	No
			Min hour (12 pm – 1 pm)	58	3.1	19	Yes

New access road (Braddon Road and Braddon Road east extension)

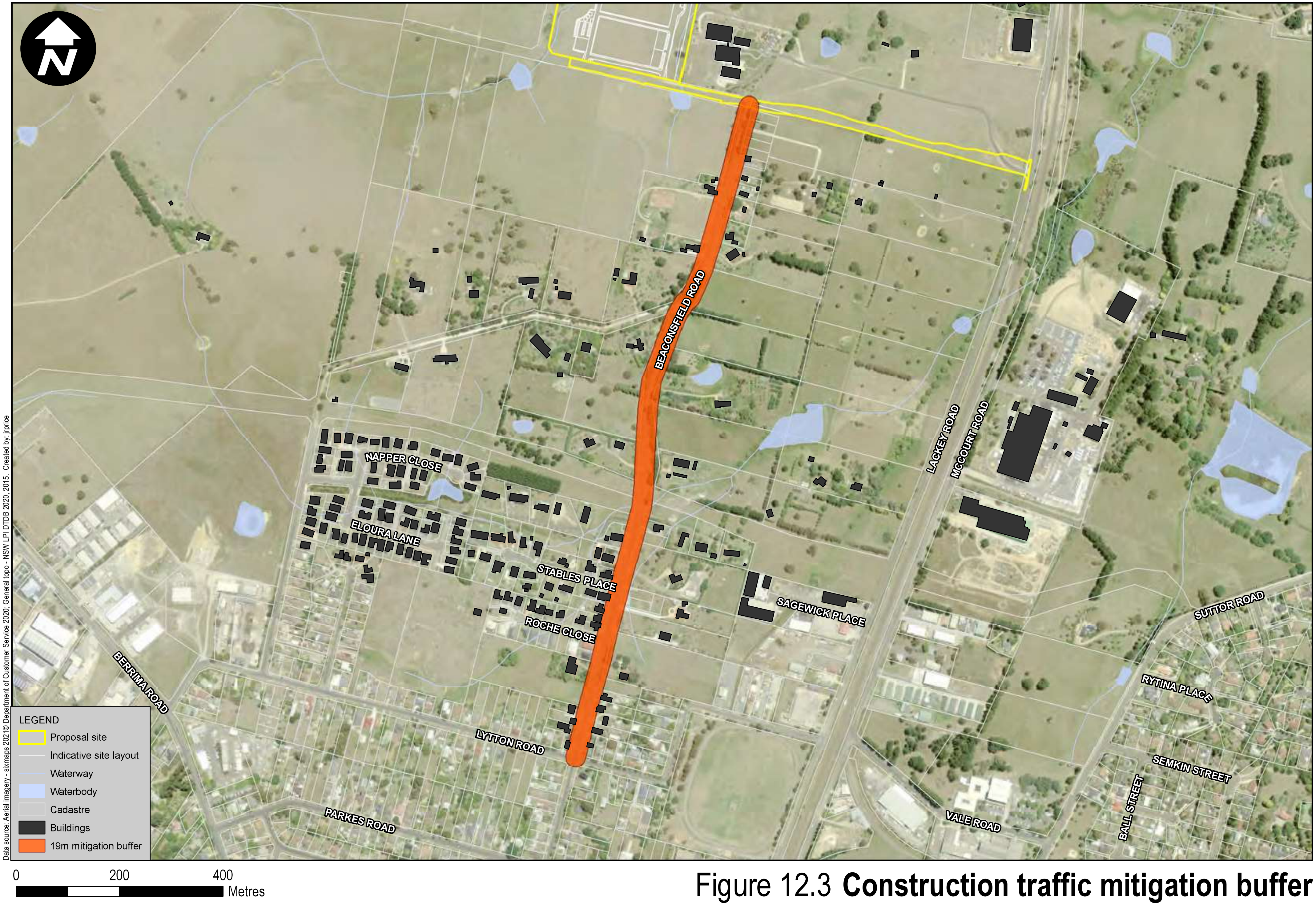
Lytton Road and Beaconsfield Road would be used for construction access until the construction of Braddon Road is complete, which is anticipated to result in about one months of impact.

Once the new access road has been constructed, it would provide access to the plastics recycling and reprocessing site for construction traffic. Construction of the new access road would be prioritised to reduce impacts to residential receivers along Lytton Road and Beaconsfield Road.

The predicted noise levels from operational traffic on Braddon Road and the Braddon Road east extension are provided in section 12.4.3. This shows that the predicted noise levels at the nearest sensitive receivers to the access road would be below the noise criteria. As construction traffic generation volumes are expected to be lower than the operational traffic volumes, it is anticipated that noise levels during construction would also not result in impacts from the use of Braddon Road during construction.

Other roads

The separation distance to residential receivers along Douglas Road, Collins Road and Lackey Road is over 130 metres, and as such the noise criteria is not anticipated to be exceeded from the traffic generated by the construction of the proposal.



Data source: Aerial imagery - sixmaps 2021© Department of Customer Service 2020; General topo - NSW LPI DTDB 2020, 2015. Created by: jrprice

Figure 12.3 **Construction traffic mitigation buffer**

12.3.4 Potential impacts to mice

A high-level noise assessment was undertaken for transient construction activities that may cause adverse responses for the mice housed at the Australian Bioresources facility (R001). As a worst-case, a dump truck (dumping load) has been modelled with a noise level of L_{max} 118 dBA at the closest distance between the construction area and the Australian Bioresources building. To predict the internal noise level, the façade of the building has been assumed to provide a sound transmission loss performance of Rw 38 and this is considered conservative.

Table 12.17 Predicted L_{max} octave band noise levels

Location	Third-octave band L_{max} noise level, 1 kHz to 20 kHz – Z-weighted (dBZ)					Overall (1 kHz-16 kHz)
	1,000	2,000	4,000	8,000	16,000	
Dump truck noise level at façade of Australian Bioresources	68	66	60	50	47	71
Internal noise level of dump truck	22	15	16	6	3	24

The Z-weighted octave band results indicate:

– The external noise level at the façade is predicted to be 71 dBZ (1 kHz to 16 kHz)

– The internal noise level is predicted to be 24 dBZ (1 kHz to 16 kHz)

In view of the above, the worst-case noise levels associated with the proposal are not anticipated to result in noise levels above 60 dB when assessed at the internal areas of the Australian Bioresources facility. As such, no adverse noise impacts to the mice are anticipated as a result of the proposal.

12.3.5 Vibration

Vibration safe working distances

Safe working distances to comply with the human comfort and cosmetic damage criteria were identified (as shown in Table 12.18). These buffer distances (the distance between the nearest receiver and the closest point that works are proposed) have been adopted from the *Construction Noise and Vibration Strategy*. Works undertaken outside these distances from the nearest receiver are not expected to result in human comfort or cosmetic damage impacts.

Table 12.18 Vibration safe working distances

Equipment	Human comfort	Cosmetic damage
Piling rig – Bored <800 mm	N/A	2 m (nominal)
Piling rig – Hammer (12 tonne down force)	50 m	15 m
Piling rig – Vibratory (sheet piles)	20 m	2 m to 20 m
Vibratory roller (>18 tonnes)	100 m	25 m
Vibratory roller (13-18 tonnes)	100 m	20 m
Vibratory roller (7-13 tonnes)	100 m	15 m
Vibratory roller (4-6 tonnes)	40 m	12 m
Vibratory roller (2-4 tonnes)	20 m	6 m
Vibratory roller (1-2 tonnes)	15 m	5 m
Small hydraulic hammer 300 kg (5-12 tonne excavator)	7 m	2 m
Medium hydraulic hammer 900 kg (12-18 tonne excavator)	23 m	7 m
Large hydraulic hammer 1600 kg (18-34 tonne excavator)	73 m	22 m

Equipment	Human comfort	Cosmetic damage
Jackhammer (handheld)	Avoid contact with structure	1 m (nominal)

Human comfort

The most vibration-intensive activity associated with the construction works are anticipated to be vibratory rolling works with 26 tonne excavator and vibratory rolling. Excavation activities have the potential to exceed the human comfort vibration criteria should these works occur within 73 metres of residences, while rolling works have the potential to exceed human comfort levels within 100 metres (as identified in Table 12.18). No residences have been identified within 100 metres of any works and as such, no adverse human comfort vibration impacts are anticipated as a result of construction of the proposal.

Structural damage

Excavation works have the potential to exceed the cosmetic damage criteria should these works occur within 22 metres of residences (as identified in Table 12.18 for a roller up to 18 tonnes). No buildings have been identified within 22 metres of any works and as such, no adverse cosmetic and therefore also structural damage vibration impacts are anticipated as a result of the construction of the proposal.

12.4 Impact assessment – operation

12.4.1 Potential noise sources

A conservative approach was adopted to estimate the internal noise levels of both Building 1 and Building 2. A spatially averaged internal noise level of 85 dBA has been used for Building 1 as equipment noise levels are required to be reduced at the source to comply with the Work Healthy and Safety Regulation noise exposure requirement of 85 dBA for operators working within the buildings. Similarly, a spatially averaged internal noise level of 80 dBA has been assumed for Building 2 and 85 dBA for the wastewater treatment plant.

The source noise levels used in the noise model are presented in Table 12.19. The source noise levels would be refined further during the detailed design phase once vendor technical data sheets for the selected equipment have been made available, in the case of the stack as they have the potential to result in low frequency noise at the nearest sensitive receivers.

Table 12.19 Indicative operational noise source levels

Noise source	Noise source level - overall (dBA)
Building 1 – main processing building	85
Building 2 – deep processing building	80
Wastewater treatment plant	80
Building 1 roof fans – x 6 (indicative)	80 (each)
Building 1 stacks – x 2	85 (each)
Building 2 roof fans – x 6 (indicative)	75 (each)
Building 2 stacks – x 2	85 (each)
Wastewater treatment plant roof fans – x 3 (indicative)	85 (each)
Delivery truck – 5 per hour (day period)	107
Staff vehicles – 60 per hour	85

The assessment was based on worst-case assumptions about the concurrent operation of noise sources during each assessment period.

A number of design features would be incorporated during detailed design, particularly for sources with the highest potential noise, to reduce noise levels at source in order to minimise noise emissions to the external environment. The proposed design features are discussed in section 12.1.3.

Full details of the operational noise sources and assumptions for each source is provided in Appendix E of Technical Report 2 – Noise and Vibration.

12.4.2 Predicted noise levels

Operational noise

A summary of the predicted noise levels at the most-affected sensitive receivers within each of the noise catchment areas is shown in Table 12.20. Detailed results for all receivers are provided in Appendix G of Technical Report 2 – Noise and Vibration.

This shows that compliance is predicted at all sensitive receiver locations.

Noise contours at 1.5 metres above ground are presented in Figure 12.4 and Figure 12.5 for the day (neutral conditions) and night period (adverse conditions), respectively.

The dominant noise sources from the proposal site include the delivery truck during the day period and the emission of noise from Building 1 through the walls and roller doors and from the stacks of both buildings during all periods.

Table 12.20 Predicted operational noise levels at sensitive receivers

Receiver ID	Noise catchment area	Project-specific noise trigger level, $L_{Aeq(15min)}$ (dBA)			Predicted $L_{Aeq(15min)}$ noise level (dBA)				Complies?
		Day	Evening	Night	Day Neutral	Evening Neutral	Night Neutral	Night Adverse	
R010	NCA1	44	43	38	33	32	32	34	Yes
R019	NCA2	41	41	38	39	37	37	38	Yes
R160	NCA3	40	37	35	34	33	33	35	Yes

Notes:

- R10 – 9-11 Lackey Road, Moss Vale
- R019 – 72 Beaconsfield Road, Moss Vale
- R160 – 50A Bulwer Road, Moss Vale

Sleep disturbance

There is the potential for sleep disturbance only if there are short-duration, high noise level noise events. While the proposal would be operation during the night period, the noise generating activities would all occur within the enclosed buildings and are expected to be in practice, continuous in nature. Furthermore, no deliveries are proposed during the night period and as such all roller doors would remain closed for the entire evening and night periods. As such no maximum noise events are predicted from the internal operations during the night period.

However, significant maximum noise level events could occur from staff members slamming car doors on arrival to or departure from the plastics recycling and reprocessing facility. The maximum sound power levels for the car door slammed was modelled at 95 dBA. No residential receivers are predicted to receive L_{Amax} noise levels over 52 dBA, with a highest predicted noise level of 43 dBA at R019 (72 Beaconsfield Road, Moss Vale), and therefore no sleep disturbance impacts are predicted.

The predicted L_{AFmax} noise levels for all sensitive receivers are presented in Appendix G of Technical Report 2 – Noise and Vibration.

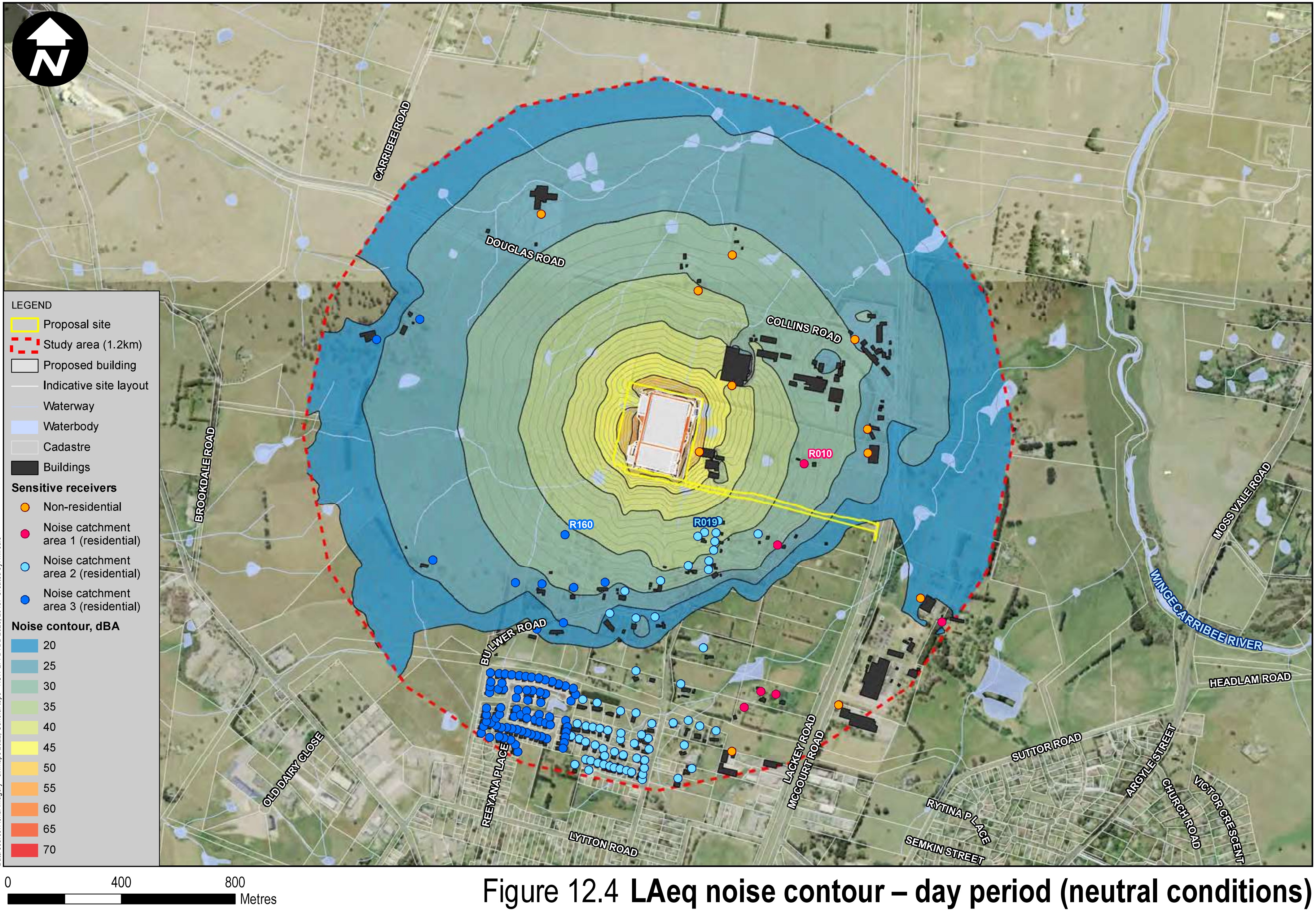
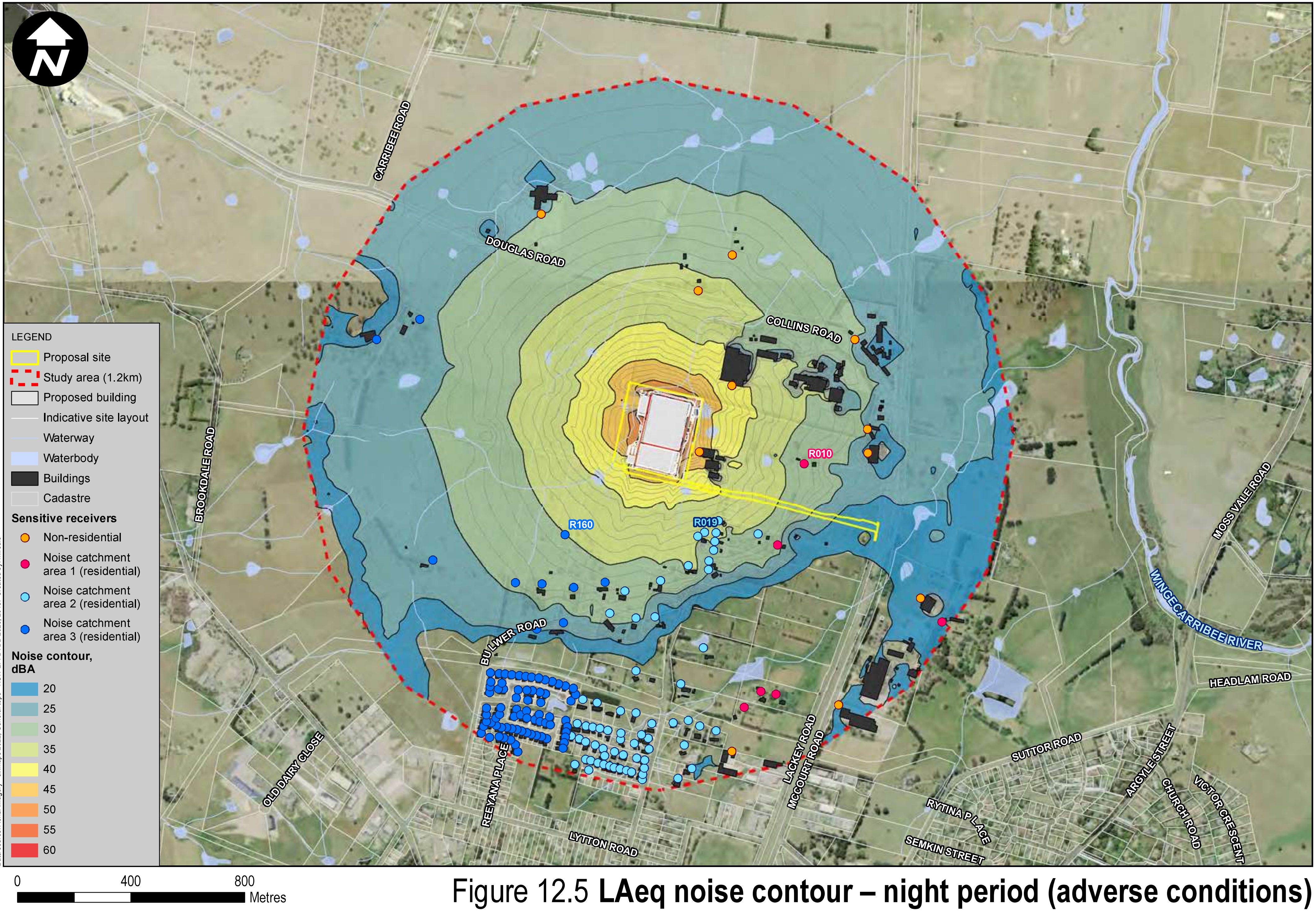


Figure 12.4 **LAeq noise contour – day period (neutral conditions)**

Data source: Aerial imagery - sixmaps 2022; General topo - NSW LPI DTDB 2020, 2015. Created by: mfredle



Data source: Aerial imagery - sixmaps 2022; General topo - NSW LPI DTDB 2020, 2015. Created by: mfredle

Figure 12.5 **LAeq noise contour – night period (adverse conditions)**

12.4.3 Operational traffic

Braddon Road

Modelling was undertaken to predict the noise levels at the nearest sensitive receivers for traffic noise generated from the operation of the proposal along Braddon Road. This road is a planned new collector road as part of the MVEC. As Plasrefine Recycling is likely to be the sole users of the Braddon Road while the MVEC is being completed, the more conservative 1-hour criteria for new local roads has been adopted for the assessment.

Table 12.21 shows the predicted noise levels from the operational traffic generation at the nearest sensitive receivers to Braddon Road. Compliance at these receivers indicates compliance at receivers further away from the road. The results indicate that the highest predicted noise levels, at R018 (79 Beaconsfield Rd, Moss Vale) and R016 (77 Beaconsfield Rd, Moss Vale), are 48 dBA during the day period and 45 dBA during the night period, which is 5 dBA below the noise criteria.

Table 12.21 Modelled results for traffic generation on Braddon Road

Receiver ID	Address	Criteria, $L_{Aeq\ (1\ hour)}$ (dBA)		Noise level, $L_{Aeq\ (1\ hour)}$ (dBA)	
		Day	Night	Day	Night
R010	9-11 Lackey Rd, Moss Vale	55	50	46	43
R014	16 McCourt Rd, Moss Vale			39	36
R016	77 Beaconsfield Rd, Moss Vale			48	45
R017	77 Beaconsfield Rd, Moss Vale			46	43
R018	79 Beaconsfield Rd, Moss Vale			48	45
R019	72 Beaconsfield Rd, Moss Vale			47	44
R020	72 Beaconsfield Rd, Moss Vale			46	43
R021	66 Beaconsfield Rd, Moss Vale			41	38
R022	69 Beaconsfield Rd, Moss Vale			40	37
R023	69 Beaconsfield Rd, Moss Vale			41	38
R149	64 Beaconsfield Rd, Moss Vale			39	36
R150	58 Bulwer Rd, Moss Vale			38	35
R151	54-56 Bulwer Rd, Moss Vale			38	35
R152	52 Bulwer Rd, Moss Vale			37	34
R153	48-50 Bulwer Rd, Moss Vale			36	33
R162	75 Beaconsfield Rd, Moss Vale			46	43
R163	73 Beaconsfield Rd, Moss Vale			44	42
R164	71 Beaconsfield Rd, Moss Vale			41	39

Other roads

The nearest residences located along Douglas Road, Collins Road and Lackey Road are set back over 130 metres from the road and as such the controlling criterion is not anticipated to be exceeded from the traffic generated by the operation of the proposal.

12.5 Mitigation and management measures

12.5.1 Construction

The *Interim Construction Noise Guideline* identifies that, due to the nature of construction, it is inevitable that impacts arise where construction occurs near sensitive receivers. During construction there would be noise impacts on some receivers during certain times and during certain construction activities.

Where noise is above the construction noise management levels, all feasible and reasonable work practices to minimise noise would be implemented, and all potentially affected receivers would be informed.

Table 12.22 Noise and vibration mitigation measures – construction

Mitigation measure	Timing
Construction noise and vibration management plan A construction noise and vibration management plan would be developed after the construction contractor has been engaged and a detailed construction method has been developed. The construction noise and vibration management plan would include a review of the construction noise predictions during the environmental impact assessment phase based. The plan would be based on the construction contractor's method and include a detailed examination of feasible and reasonable work practices and noise mitigation measures to manage sensitive receivers that are predicted to be 'noise affected'. The construction noise and vibration management plan would also include: – details of the construction methodology – feasible and reasonable work practices and mitigation measures to be implemented – updated noise predictions at sensitive receivers – a noise monitoring procedure and program for the duration of works – a community consultation plan to liaise with the noise affected receivers	Pre-construction/ construction

12.5.2 Operation

Table 12.23 lists the mitigation measures that would be implemented to minimise the operational risks of noise and vibration.

Table 12.23 Noise and vibration mitigation measures – operation

Mitigation measure	Timing
Design development As the design progresses, the proposal would continue to be refined to minimise the potential for operational impacts and ensure compliance with the requirements of the Noise Policy for Industry. Table 6.2 in Technical Report 2 – Noise and Vibration lists the design features that would be considered during detailed design. In addition, during detailed design and once vendor noise data is made available, the operational noise model would be updated to include manufacturer noise data (third-octave band) for all significant items of plant associated with the plastics recycling and reprocessing facility. Noise modelling would be undertaken during detailed design, using the updated noise model, to ensure the final design complies with the relevant environment protection licence conditions and the requirements of the *Noise Policy for Industry*.	Detailed design
Operational noise management plan An operational noise management plan would be developed to minimise the risk of adverse noise impacts during the operation. It would be refined throughout the design process and have consideration to: – the relevant license conditions (to be confirmed) – conditions of approval (to be confirmed) – the *Noise Policy for Industry* – *Australian Standard 1055 Acoustics – Description and measurement of environmental noise* (Standards Australia 2010) – *Approved methods for the measurement and analysis of environmental noise in NSW* (NSW EPA 2021b) – currently in draft form	Detailed design / operation

Mitigation measure	Timing
The operational noise management plan would include: – operational noise management measures to be implemented – updated operational noise predictions at sensitive receivers – a noise monitoring procedure and program – a complaints handling protocol Table 6.3 in Technical Report 2 – Noise and Vibration provides draft inclusions for incorporation into the operational noise management plan to minimise the risk of adverse noise impacts at sensitive receivers during the operation.	

13. Air quality and odour

The chapter provides a summary of the potential air quality impacts of constructing and operating the plastics recycling and reprocessing facility. A full copy of the assessment results is provided in Technical Report 3 – Air Quality and Odour.

13.1 Approach and method

A summary of the approach to the assessment is provided in this section, including the legislation, guidelines and/or policies driving the approach and the methodology used to undertake the assessment. A more detailed description of the approach and methodology is provided in Technical Report 3 – Air Quality and Odour.

13.1.1 Legislative and policy context to the assessment

The assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

- The EP&A Act and POEO Act
- The National Environment Protection (Ambient Air Quality) Measure (NEPC 2021)
- The National Environment Protection (Air Toxics) Measure (NEPC 2004)
- The Protection of the Environment Operations (Clean Air) Regulation (2002)
- Guidelines relevant to the assessment of construction impacts:
  - *Institute of Air Quality Management Guidance on the assessment of dust from demolition and construction* (2014) (IAQM guidance) (Institute of Air Quality Management 2014).
- Guidelines relevant to the assessment of operation impacts:
  - *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA 2016) (the Approved Methods)
  - *Assessment and Management of Odour from Stationary Sources in NSW* (DEC 2006).

Further information on these, and other relevant standards and guidelines, is provided in section 2 of Technical Report 3 – Air Quality and Odour.

13.1.2 Method

Study area

The study area for the air quality and odour assessment has been defined as a radius of about 1.2 kilometres around the plastics recycling and reprocessing facility site, as the potential for air quality impacts is not considered to be extend beyond this distance.

Key tasks

The key potential sources of air quality impacts considered by the assessment are:

- dust generated by construction activities
- air emissions generated by recycling and processing operations
- air emissions from operation of the wastewater treatment plant.

The air quality and odour assessment generally involved:

- identifying and classifying sensitive receivers
- characterising the existing background and ambient air quality environment
- determining appropriate assessment criteria for potential construction and operation impacts based on the guidelines listed in section 13.1.1

- assessing the potential impacts of construction and operation
- identifying mitigation and management measures.

Construction air quality assessment

The assessment of potential construction air quality impacts involved:

- undertaking a review of potential fugitive construction air quality emissions
- qualitatively assessing potential dust impacts from construction activities in accordance with the *Institute of Air Quality Management Guidance on the assessment of dust from demolition and construction* using a risk-based approach that included:
  - a conservative screening based on distance to the nearest sensitive receptor (human and ecological receptor). Further assessment is required if a sensitive receptor is located within the screening criteria.
  - assessment of the risk of uncontrolled (no mitigation measures applied) dust impacts (including dust soiling effects, health effects and ecological effects) based on:
    - dust emission magnitude of construction activities (demolition, earthworks, construction and track out)
    - sensitivity of the area (based on sensitivity of nearby receptors, number of nearby receptors and distance from source)
  - determining site specific mitigation measures to appropriately manage all activities with potential to cause dust impacts.
  - assessing the residual risk of dust impacts after site specific mitigation measures have been implemented.

Operation air quality assessment

The assessment of potential operational air quality and odour impacts involved:

- undertaking a review of potential operational air emissions
- a quantitative level 2 assessment of potential operational air quality impacts for the primary operations in accordance with the Approved Methods, including:
  - describing the process and emission generating activities
  - outlining types and scale of emissions expected from each activity, including discussion of influence of emission control
  - undertaking an emission limit assessment with regards to the POEO Clean Air Regulation
  - reviewing available ambient air quality in the local area including other emission sources nearby
  - undertaking a review of local meteorology and preparation of a meteorological file for use in modelling
  - dispersion modelling using AERMOD version 9.5.0 to predict pollutant concentrations in the surrounding environment
  - comparison of predicted pollutant concentrations with the NSW EPA ground level criteria
  - outlining measures for further control and management of air emissions where required.
- qualitatively assessing potential operational air quality impacts for the wastewater treatment plan in accordance with the Approved Methods including:
  - describing the process and emission generating activities
  - outlining types and scale of emissions
  - describing the source to receptor pathway and its influence on the risk of air quality impacts at identified sensitive receptors
  - summarising the air quality risk based on the above steps

Modelling was carried out for the following parameters:

- Particulate matter, including PM_{10} and $PM_{2.5}$

– Individual volatile organic compounds, including benzene, toluene and styrene

As there is no total volatile organic compound criteria available for assessment, total volatile organic compound emissions were not modelled, and volatile organic compounds impacts were instead assessed by modelling of key individual total volatile organic compounds (benzene, toluene, styrene).

13.1.3 How potential impacts have been avoided

The proposal includes buildings of sufficient size and arrangement to ensure that no unloading, recycling or reprocessing activities would need to occur outside. Roller doors would allow vehicles to enter and exit the buildings but would otherwise remain closed to reduce the potential for plastic waste escaping from the buildings.

A number of design features are proposed to be incorporated into the design to minimise the potential for air quality impacts including:

– enclosing all operations within Building 1 and Building 2
– enclosing the wastewater treatment plant
– localised capture of emissions from individual processing units, with emissions directed to emission control systems

13.1.4 Air quality assessment criteria

The assessment criteria used for the proposal was adopted from the Approved Methods, with the exception of $PM_{2.5}$ which was sourced from the National Environment Protection (Ambient Air Quality) Measure (NEPM) air quality objectives. These represent the most recent and stringent standards for protection of the air quality environment.

The adopted air quality assessment criteria are summarised in Table 13.1.

Table 13.1 Air quality impact assessment criteria

Pollutant	Averaging period	Statistic	Impact location	Impact type	Assessment Criteria (µg/m^3)	
					Approved Methods	Air NEPM
PM_{10}	24 hour	Maximum	Sensitive receptor	Cumulative	50	50
	Annual	Maximum	Sensitive receptor	Cumulative	25	25
$PM_{2.5}$	24 hour	Maximum	Sensitive receptor	Cumulative	25	20
	Annual	Maximum	Sensitive receptor	Cumulative	8	7
Benzene	1 hour	99.9th percentile	At or beyond site boundary	Incremental	29	-
Styrene*	1 hour	99.9th percentile	Sensitive receptor	Incremental	120	-
Toluene*	1 hour	99.9th percentile	Sensitive receptor	Incremental	360	-

Note: criteria for styrene and toluene are sourced from Table 7.4a of the Approved Methods – 'Impact assessment criteria for individual odorous air pollutants' (Victorian Government Gazette 2001). These criteria are for the protection against odour impacts.

13.2 Existing environment

13.2.1 Sensitive receptors

The Approved Methods defines air quality sensitive receptors as locations where people are likely to work or reside and may include a dwelling, school, hospital, office or recreation areas.

Air quality sensitive receptors surrounding the plastics recycling and reprocessing facility site include rural residential receptors, various industrial sites and one commercial premises. Figure 13.3 shows the sensitive receptors surrounding the plastics recycling and reprocessing facility site. A full list is provided in section 4 of Technical Report 3 – Air Quality and Odour.

The nearest receptors are the commercial receptor (Australian BioResources) and industrial receptor (Dux Manufacturing Moss Vale). There are 20 residential receptors within 500 metres of the of the plastics recycling and reprocessing facility site.

13.2.2 Climate and meteorology

The Bureau of Meteorology operates the Moss Vale Automatic Weather Station (AWS) (station number: 068239) which is located approximately 5 kilometres east of the plastics recycling and reprocessing facility site. There are no intervening terrain features or significant variance in land use between the AWS and the proposal site. Given the proximity and similarity between the AWS and the proposal site, meteorological data recorded at the AWS is considered to effectively represent the meteorological environment at the proposal site.

Figure 13.1 shows the 5-year (2016-2020) wind rose for the Moss Vale AWS and Figure 13.2 shows the seasonal wind roses for the same AWS for the same period. The wind roses show:

– the frequency of winds blowing from a direction as the length of the 'petal' for that direction
– the frequency and distribution of various wind speeds from a direction as the colour of the 'petal' for that direction.

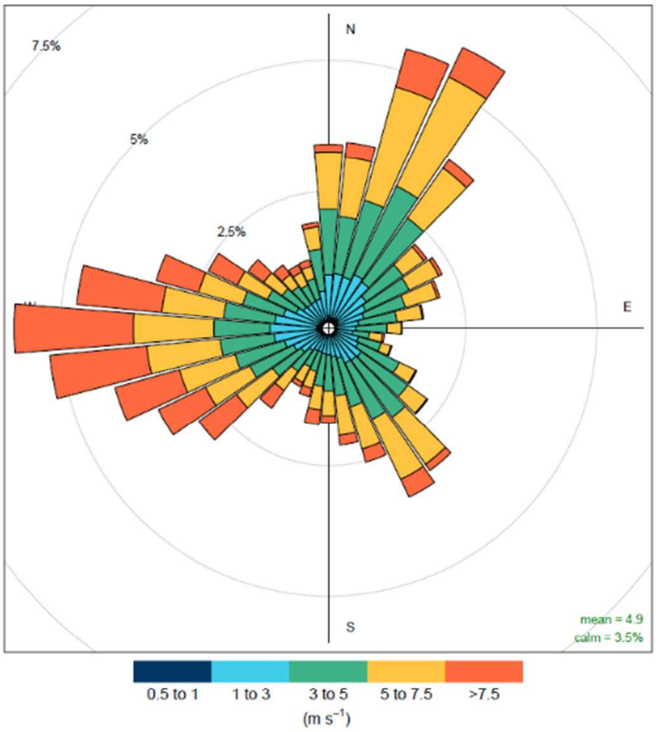


Figure 13.1 5-year wind rose at Moss Vale AWS

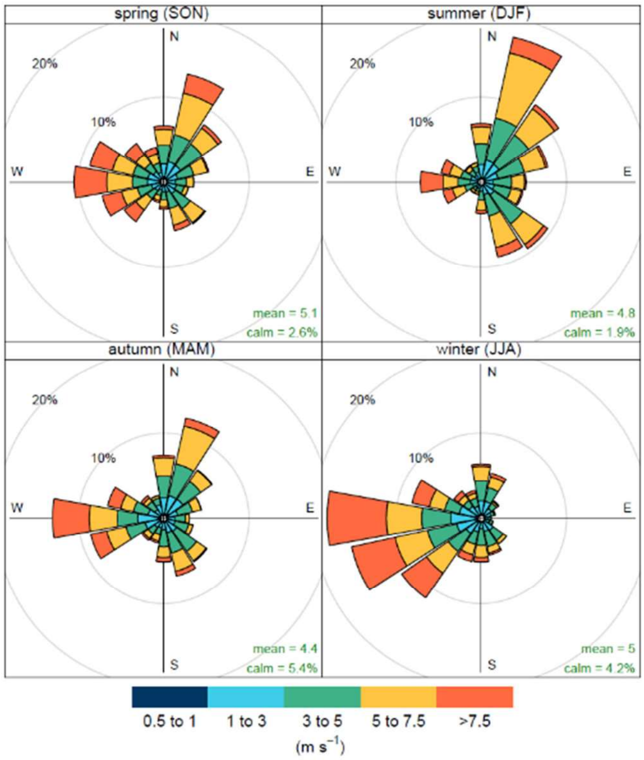


Figure 13.2 5-year seasonal wind rose at Moss Vale AWS

The 10-year climate data from the Moss Vale AWS indicates a temperate climate with the average annual temperature of 13.3° C. The annual average maximum and minimum temperatures are 19.5° C and 8° C respectively. The average annual rainfall at Moss Vale is 736 millimetres with the wettest month being February with an average rainfall of 121 millimetres for the month and the driest month being April with an average of 18.2 millimetres for the month.

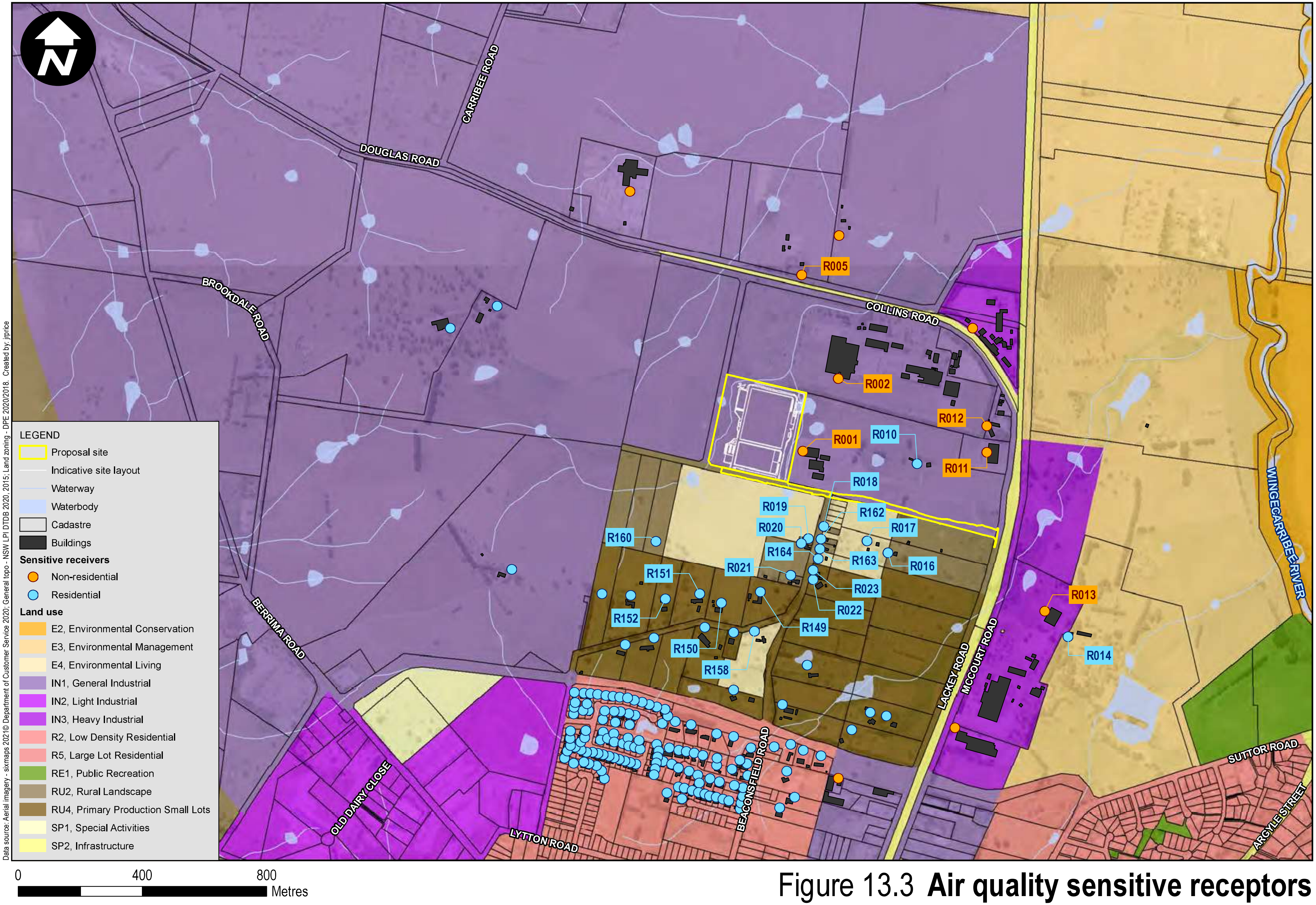


Figure 13.3 **Air quality sensitive receptors**

13.2.3 Ambient (background) air quality

Sources of ambient air pollution

Given the regional location of the proposal, the ambient air quality environment across the proposal site is likely to be largely influenced by natural sources air pollution including wind-blown dusts with major air pollution events likely associated with bushfires and/or dust storms. Generally, ambient concentrations of gaseous and toxic air pollutants (eg. volatile organic compounds) are expected to be low in regional locations such.

However, the above characterisation of the proposal site is likely to be changed at locations close to any existing or proposed sources of ambient air pollution. Key sources of ambient air pollution relevant to the study area were reviewed based on observations on-site, review of aerial imagery, review of Environmental Protection Licences (EPLs) and review of the National Pollutant Inventory database.

The industrial operations identified as likely to emit significant amounts of air pollutants within five kilometres of the plastics recycling and reprocessing facility site are listed in Table 13.2.

Table 13.2 Existing or proposed sources of air pollution within 10 km of the plastics recycling and reprocessing facility site

Description of operation	Proximity to the plastics recycling and reprocessing facility site	Expected impact on air quality at sensitive receptors	Annual emissions (last reporting period)
Dux Manufacturing Moss Vale – metal coating and finishing	100 m northeast	Key emissions from Dux Manufacturing include volatile organic compounds and other gaseous air pollutants including oxides of nitrogen. Emissions from Dux Manufacturing have the potential to lead to elevated concentrations of pollutants at the nearest sensitive receptor locations. Given the proximity of Dux Manufacturing to the proposal site, emissions from Dux Manufacturing have the potential to contribute to cumulative impacts at receptors closest to the proposal.	28,000 kg volatile organic compounds (VOC)
Australian BioResources – breeding of mice for pharmaceutical purposes	100 m east	The key emission from the Australian BioResources is likely to be odour. Odour from animal husbandry are typically associated with animal feed and animal wastes which are likely to produce a complex mixture of odorous pollutants, driven by sulphur compounds. Given the proximity of Australian BioResources to the proposal site, emissions of odour have the potential to contribute to cumulative impacts at receptors closest to the proposal.	-
Moss Vale Meter Station – gas supply metering station	1.4 km southwest	Emissions from Moss Vale Meter Station include volatile organic compounds. The annual emission of volatile organic compounds as reported to the *National Pollutant Inventory* from the facility is very low and therefore emissions from the meter station are not likely to significantly impact air quality surrounding the facility.	1,100 kg VOC
Moss Vale Sewage Treatment Plant	2 km southwest	The odour emissions from the Moss Vale Sewage Treatment Plant have the potential to lead to elevated odour levels surrounding the plant. However, given the distance to the from the treatment plant, odour impacts on receptors closest to the proposal are unlikely. There is a high density of sensitive receptors approximately 200 m northwest of the treatment plant.	2,100 kg ammonia
Moss Vale Refuelling Facility	2 km south	Emissions from the refuelling facility include volatile organic compounds. The annual emission of volatile organic compounds as reported to the *National Pollutant Inventory* from the facility is very low and therefore emissions from the meter station are not likely to significantly impact air quality surrounding the facility.	77 kg VOC

Description of operation	Proximity to the plastics recycling and reprocessing facility site	Expected impact on air quality at sensitive receptors	Annual emissions (last reporting period)
Inghams Berrima Feedmill – stockfeed manufacture	2.5 km northwest	Emissions from Inghams Berrima Feedmill include particulate matter and have the potential to lead to elevated concentrations of pollutants at locations surrounding the facility. Given the distance from the feedmill to the proposal location, particulate matter impacts on proposal sensitive receptors are unlikely.	3800 kg PM_{10}
Berrima Cement Works – cement and lime manufacture	3.8 km northwest	Emissions from Berrima Cement Works including particulate matter, oxides of nitrogen, carbon monoxide, volatile organic compounds and sulfur dioxide have the potential to lead to elevated concentrations of pollutants at sensitive receptors surrounding the works. However, given the distance to the from the cement works, impacts on receptors closest to the proposal are unlikely. There is a high density of sensitive receptors less than 500 m north of the cement works.	11,000 kg VOC 130,000 kg PM_{10}
Bowral Sewage Treatment Plant	4.6 km northeast	The odour emissions from the Bowral Sewage Treatment Plant have the potential to lead to elevated odour levels at sensitive receptors closest to the treatment plant. However, given the distance to the from the treatment plant, odour impacts on receptors closest to the proposal are unlikely. There is a high density of sensitive receptors approximately 200 m east of the treatment plant.	2,900 kg ammonia

Air quality monitoring data

DPIE operates air quality monitoring stations in various locations across NSW. The nearest station to the proposal site is at Goulburn (about 64 kilometres), however this station has been established relatively recently and has only one full calendar year of data available.

The closest station with five years of data in a relatively similar land use is Bargo (about 80 kilometres). The monitoring data for particulate matter at these two stations is shown in Table 13.3. The values presented in Table 13.3 are for comparison against the relevant criteria as presented in the National Environment Protection Measure (Ambient Air Quality).

The data from these stations provides an understanding of the typical levels in similar environments however due to the large distances between the proposal site and the monitoring station, the data is not considered to be entirely site representative.

Table 13.3 Particulate matter (PM_{10} and $PM_{2.5}$) monitoring data for Bargo and Goulburn DPIE stations

Location	Pollutant	Averaging period	Criteria µg/m³	Year				
				2016	2017	2018	2019	2020
Bargo	PM_{10}, µg/m³	Annual average	**25**	14.2 (13.8)	14.1 (13.9)	17.0 (16.4)	21.5 (16.7)	16.3 (13.7)
		24 hour maximum	**50**	57.5 (33.9)	60.2 (33.9)	59.1 (47.8)	307 (44.9)	263 (49.2)
	$PM_{2.5}$, µg/m³	Annual average	**8**	-	6.25	6.77 (6.58)	10.9 (7.07)	7.78 (5.75)
		24 hour maximum	**25**	-	24.6	38.0 (24.7)	298 (24.7)	125 (21.3)
Goulburn	PM_{10}, µg/m³	Annual average	**25**	-	-	-	-	19.3 (11.4)
		24 hour maximum	**50**	-	-	-	-	593 (48.6)
	$PM_{2.5}$, µg/m³	Annual average	**8**	-	-	-	-	12.0 (6.18)
		24 hour maximum	**25**	-	-	-	-	548 (22.7)

Notes:

– Exceedances of the criteria, which are likely associated with extraneous events such as dust storms, backburning and bushfires, have been removed as per the guidance in the Approved Methods and the revised values are shown alongside raw results in brackets.

13.3 Impact assessment – construction

A risk-based approach in accordance with IAQM Guidance was adopted to assess potential particulate matter impacts during the construction of the proposal.

The IAQM Guidance recommends a detailed risk assessment be undertaken where there is a human receptor within 350 metres or an ecological receptor within 50 metres of the construction footprint (i.e. the proposal site), or where there is a human or ecological receptor within 50 metres of any haulage routes up to 500 metres from the site entrance.

Given there are human receptors within 350 metres of the proposal site, a detailed risk assessment has been undertaken.

13.3.1 Construction activities

Table 13.4 summarises the proposed construction activities and sequence.

Table 13.4 Construction activities

Stage	Activities
Stage 1 – Site establishment	– Site establishment
Stage 2 – Ground works and excavation	– Bulk earthworks for site shaping and surface water drainage and the bioretention pond – Pouring concrete foundation slab, footings, hardstand and slabs for the buildings – Construction of pavement areas for the truck and car park, internal roads and the site entrance/egress points
Stage 3 – Road access construction	– Excavation for placement of road base layers – Installation of concrete kerb and gutters – Paving of access road – Construction of retaining walls and batters
Stage 4 – Construction of the main structures	– Installation of steel truss framework for structures – Erection of pre-cast concrete panels for external and internal partition walls and metal roof for site buildings – Installation of firewater and other tanks – Installation of weighbridges
	– Installation of processing equipment
Stage 5 – Testing and commissioning	– Testing and commissioning

13.3.2 Risks identified

The construction program would comprise three activity groups that have potential to cause significant dust emissions. These activities are earthworks, construction and track-out:

- **earthworks** includes the activities described in Stage 2 of Table 13.4
- **construction** includes activities in Stage 3 and Stage 4 of Table 13.4
- **track-out** includes transport actives associated with all stages of the construction.

In order to identify the risk of dust impact from each stage of the construction the size and scale of each activity were determined as well as the sensitivity of the surrounding environment.

Size and scale

The size and scale of the activities are determined by not only the physical size of the project but other factors that are likely to increase or decrease the amount of dust created during each construction activity. Table 13.5 outlines these factors for each activity and the resulting size and scale descriptor as defined by the IAQM Guidance.

Table 13.5 Size and scale of construction activities

Activity	Description	Size and scale descriptor
Earthworks	– Area requiring earthworks is > 54,000 m^2 – Significant leveling of earth required prior to construction of the building – Earth required to be loosened and stockpiled	Large
Construction	– Buildings being constructed are > 400,000 m^3 in volume – Construction of roadway, including mixing and pouring asphalt	Large
Track-out	– Estimated that there will be < 50 vehicle movements per day – Vehicle movements along paved roads	Medium

Sensitivity

The sensitivity of the surrounding environment is determined by the number of high risk, medium risk and low risk receptors within a certain proximity of the construction footprint. High sensitivity receptors include dwellings, educational institutions, and medical facilities. Medium sensitivity receptors include commercial, and industrial premises. Low sensitivity receptors include farmland, recreational parklands, and other public spaces. The sensitivity is determined for three areas of concern, these are:

– Sensitivities of people to dust soiling effects

– Sensitivities of people to the health effects of PM_{10}

– Sensitivities of receptors to ecological effects.

The sensitivities of each area for all construction activities are shown in Table 13.6.

Table 13.6 Sensitivity of areas of concern for all construction activities

Activity	Description	Sensitivity
Sensitivities of people to dust soiling effects	– Two medium sensitivity receptors greater than 20 m from any construction activity – More than 10 highly sensitive receptors within 50 m of the construction activity with none of these within 20 m of the construction areas	Low
Sensitivities of people to the health effects of PM_{10}\	– No representative numerical ambient PM_{10} levels are available and therefore the maximum threshold has been used – Two medium sensitivity receptors over 20 m from the construction activities – More than 10 highly sensitive receptors within 200 m of the construction activity with none of these within 50 m of the construction areas	Low
Sensitivities of receptors to ecological effects.	– No high or medium sensitive ecological features within 50 m of the construction activity	Low

Risk summary

The risk matrix uses the sensitivity and scale to determine the risk of dust impacts on the surrounding receptors. Table 13.7 outlines the risk matrix determined for the construction of the proposal. The risk identified for all construction activities is **Low Risk** for all sensitivity types. Proposed specific mitigation measures and residual impacts are provided in section 13.5 to further minimise the risk of dust impacts at receptor locations during construction works.

Table 13.7 Risk matrix for dust impacts during construction

Impact	Risk		
	Earthworks	Construction	Track-out
Dust soiling	Low risk	Low risk	Low risk
Human health	Low risk	Low risk	Low risk
Ecological	Low risk	Low risk	Low risk

13.4 Impact assessment – operation

An assessment of operational impacts was undertaken for activities associated with the following:

– Primary operations (Building 1 and 2)
– Wastewater treatment plant

13.4.1 Primary operations

Expected emissions

The processes of crushing and granulation of plastic products are expected to result in emissions of particulate matter and volatile organic compounds, while negligible emissions to air are expected from the sorting and cleaning processes.

The crushing processes involve breaking the hard plastics into smaller flakes which are subsequently prepared for sale or use in deep processing using granulation extrusion. Some fine particles may be created during crushing, resulting in potential pollutants such as PM_{10} and $PM_{2.5}$. The crushing processes would be fully enclosed within the processing units. During the process the product would be washed, removing the majority of dust on the surface of the material.

The extrusion granulation process involves creating granulated particles of plastics through heating, extrusion and mechanical (e.g. rotary) processes. During this process, fine particles (as PM_{10} and $PM_{2.5}$) and volatile organic compounds may be emitted. PE, PP and PET are the polymer types that would be used in the extrusion granulation and deep processing activities. Each of these polymer types have different compositions including some volatile organic compounds, which could be released when polymers are heated.

Heating and processing of plastics has the potential to lead to emissions of volatile organic compounds found as impurities in the plastic. The specific types and quantities of volatile organic compounds generated during processing are dependent on a number of factors, including type of plastic, purity of material, processing methodology (injection vs extrusion), residence time and processing temperature.

Products such as doors and chairs produced in Building 2 would require milling to size or profiling. These activities have the potential to lead to the emission of particulate matter. However, they are proposed to be enclosed with air extraction and air treatment systems to minimise particulate matter emitted to the atmosphere.

The pollution control systems proposed to be used to reduce volatile organic compounds and particulate emissions are outlined below.

Emission control

The proposed emission control system includes localised capture of emissions from individual processing units, with emissions ventilated to a total of four emission control systems. Three emission control systems would be for the primary purpose of volatile organic compounds treatment, and would include a pneumatic cyclone spray tower, an electrostatic degreasing device, and activated carbon adsorption prior to treated air being discharged from a stack. The fourth system would be for the treatment of particulate matter from the deep processing operations and would include fabric filters.

The extrusion granulation in Building 1 is expected to produce volatile organic compound emissions that would need to be treated prior to discharge. Two volatile organic compound emission control units are proposed for Building 1. In addition to volatile organic compound emissions, low concentrations of particulate matter are expected from extrusion granulation, which would be reduced further by the emission control system.

Moulding processes in Building 2 would similarly require treatment of volatile organic compound emissions before discharge to the atmosphere. Additionally, profiling activities occurring in Building 2 would require treatment of particulate matter. A single volatile organic compound emission control unit as well as a dust control unit are required to treat exhaust air within Building 2. In addition to volatile organic compound emissions, low concentrations of particulate matter are expected from moulding processes, which would be reduced further by the emission control system.

Emission estimations are presented in Table 13.8.

Table 13.8 Emissions

Pollutant	Maximum emission concentration (mg/Nm^3, 273K, 1 atm)	Maximum normalised air flow per unit (Nm^3/h, 273K, 1 atm)	Maximum emission rate per unit (g/s)
PM	20[1]	45,807	0.25
Total VOC	20[2]		0.25
Benzene	0.8		0.010
Toluene	5		0.064
Styrene	5		0.064

Notes:

1. The maximum emission concentration is equivalent to the relevant POEO limit: General activities and plant (group 6): Solid particles (Total) - Any crushing, grinding, separating or materials handling activity
2. The maximum emission concentration is equivalent to the relevant POEO limit: Afterburners, flares and vapour recovery units – Vapour recovery units and other non-thermal treatment plant (group 6): Volatile organic compounds, as n-propane - Any vapour recovery unit treating air impurities that originate from material containing any principal toxic air pollutant

Predicted impacts

The predicted impacts (impacts from primary operations only) for particulate matter and volatile organic compounds are presented in Table 13.9 and Table 13.10 respectively. There are no predicted incremental exceedances of the assessment criteria.

The worst-case predicted impacts for all pollutants occurs at the commercial receptor R001, the Australian BioResources Facility. Impacts for particulate matter have also been presented for the worst affect residential receptor. However, the results show that the maximum impacts at both receptors are significantly below the assessment criteria (as defined in section 13.1.4).

Contour plots are provided in Technical Report 3 – Air Quality and Odour.

Table 13.9 Predicted incremental particulate concentrations

Receptor	PM_{10}		$PM_{2.5}$	
	24- hour max	Annual average	24- hour max	Annual average
Assessment criteria ($\mu g/m^3$)	**50**	**25**	**20**	**7**
Maximum impact ($\mu g/m^3$) at commercial receptor	14	2.2	14	2.2
Maximum impact ($\mu g/m^3$) at residential receptor	7	0.58	7	0.58
Compliance	Yes	Yes	Yes	Yes

Note: It is conservatively assumed that total PM = PM_{10} = $PM_{2.5}$

Table 13.10 Predicted incremental volatile organic compound concentrations

Receptor	Benzene	Toluene	Styrene
	1-hour 99.9th percentile	1-hour 99.9th percentile	1-hour 99.9th percentile
Assessment criteria ($\mu g/m^3$)	**29**	**360**	**120**
Maximum ground level concentration ($\mu g/m^3$)	9.1	-	-
Maximum impact ($\mu g/m^3$) at commercial receptor	6.2	39	39
Maximum impact ($\mu g/m^3$) at residential receptor	2.7	17	17
Compliance	Yes	Yes	Yes

13.4.2 Wastewater treatment plant

The proposed wastewater treatment plant would be used to recycle water used in the cleaning processes in Building 1. It would not be used to treat sewage from the on-site amenities or offices (sewage would be discharged direct to sewer). The majority of the treatment processes at the proposed plant are not likely to generate significant amounts of odour. However, some odour may be generated from the handling and storage of the sludge generated during the treatment process. The wastewater treatment plant would be fully enclosed, with air flow achieved through natural ventilation of the building.

The nearest residential receptor is greater than 450 metres from the proposed wastewater treatment plant, which is well in excess of the separation distance which would be required for a treatment plant of the proposed scale and nature.

Based on the above characterisation of the activity and the source to receptor pathway, the potential impact is expected to be low to negligible at all sensitive receptors. Therefore, the risk of air quality impacts due to the operation of the wastewater treatment plant is considered low.

13.4.3 Cumulative impacts

Particulate matter

The greatest risk of cumulative impacts (background plus proposal) is associated with $PM_{2.5}$ emissions. This is because $PM_{2.5}$ emissions were assumed to be equivalent to PM_{10} emissions, and the criteria for $PM_{2.5}$ is significantly less than for PM_{10}. The dispersion modelling shows that the incremental (proposal only) impact is well within the criteria levels, however assessment of the cumulative impact is required.

Background 24-hour average $PM_{2.5}$ concentrations are measured at the Bargo DPIE station, as presented in section 13.2.3. The data from Bargo shows that, as for many locations in NSW, short-term ambient $PM_{2.5}$ concentrations are sometimes in exceedance of the air quality objectives. At locations such as Bargo, these exceedance periods are most commonly and likely associated with regional sources such as bushfires and controlled burns.

The maximum cumulative impact can be determined through a contemporaneous assessment where the predicted daily proposal impact and the daily background concentration are added to give the maximum total impact for each 24-hour period. A contemporaneous assessment has been completed using background $PM_{2.5}$ concentrations from Bargo DPIE stations for the years 2017 and 2018. The years 2019 and 2020 have not been included in the assessment as they are heavily affected by bushfire activity.

Figure 13.4 and Figure 13.7 show a time series of the incremental (proposal only) and background data stacked to show the total cumulative impact for the most affected commercial (R001) and residential (R160) receptors respectively. The total cumulative impact has been ranked (high to low) and is shown on Figure 13.5Figure 13. and Figure 13.8 for each of these receptors respectively.

The following observations can be made from these figures:

- Over the two-year period there are a total of five cumulative exceedances of the 24-hour average $PM_{2.5}$ objective at the most affected commercial receptor (R001). This represents approximately 2.5 exceedances per year.
- There are a total of two cumulative exceedances of the 24-hour average $PM_{2.5}$ objective at the most affected residential receptor (R160). This represents 1 exceedance per year.
- Exceedances occur on days where there are significantly elevated background concentrations ($PM_{2.5}$), and the incremental impact from the proposal on the exceedance days is very low. This is further demonstrated through the values presented in Table 13.11 below.

Table 13.11 shows the contribution of the cumulative $PM_{2.5}$ concentration that comes from background and the proposal for each of the exceedance days. The proposal contributed, on average, 18 percent and nine percent of the total cumulative concentration at the most affected commercial (R001) and residential receptors (R160) respectively.

Table 13.11 Analysis of exceedance days (2017 and 2018)

$PM_{2.5}$ exceedance days at R001				$PM_{2.5}$ exceedance days at R160			
Model date	**Background concentration (µg/m³)**	**Proposal impact (µg/m³)**	**Cumulative concentration (µg/m³)**	**Model date**	**Background concentration (µg/m³)**	**Proposal impact (µg/m³)**	**Cumulative concentration (µg/m³)**
9/05/2018	16	8.7	24.7	11/05/2017	19	2.3	21.3
11/05/2017	19	3.1	22.1	26/05/2018	19	1.6	20.6
2/08/2018	18	3.0	21.0	-			
29/07/2017	17	4.0	21.0				
26/05/2018	19	1.4	20.4				

Given the above, it is concluded that the risk of the proposal contributing significantly to cumulative impacts is considered to be **low**. For the proposal to contribute significantly to cumulative impact, the following would need to be true:

– The proposal would need to operate at maximum emission concentration and maximum flow rate continuously, as modelled. This is not considered realistic, as it is expected that the emission control system will perform well within the POEO limit, and consequently actual emissions would be significantly reduced.

– Worst-case emissions (as above), meteorological conditions and background air quality would need to align, which is considered unlikely.

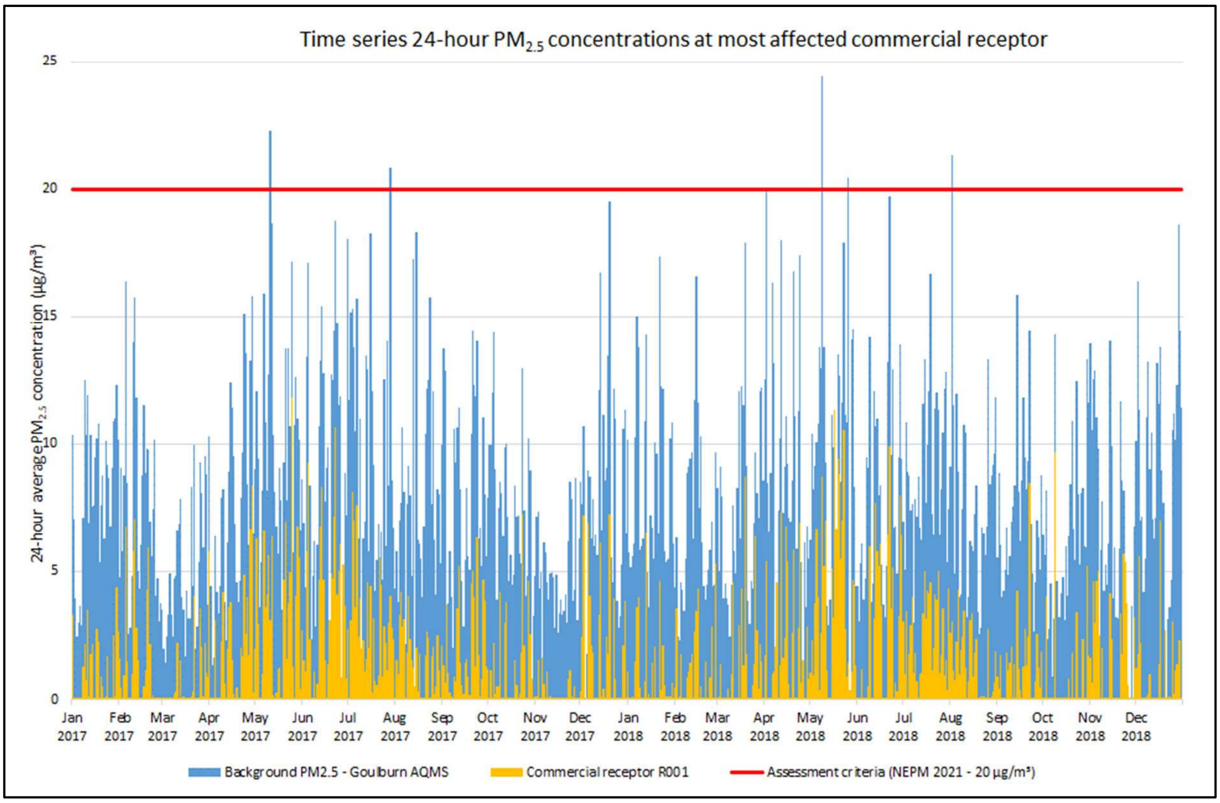


Figure 13.4 Timeseries (2017 – 2018) of cumulative 24-hour average $PM_{2.5}$ concentrations at most affected commercial receptor (R001)

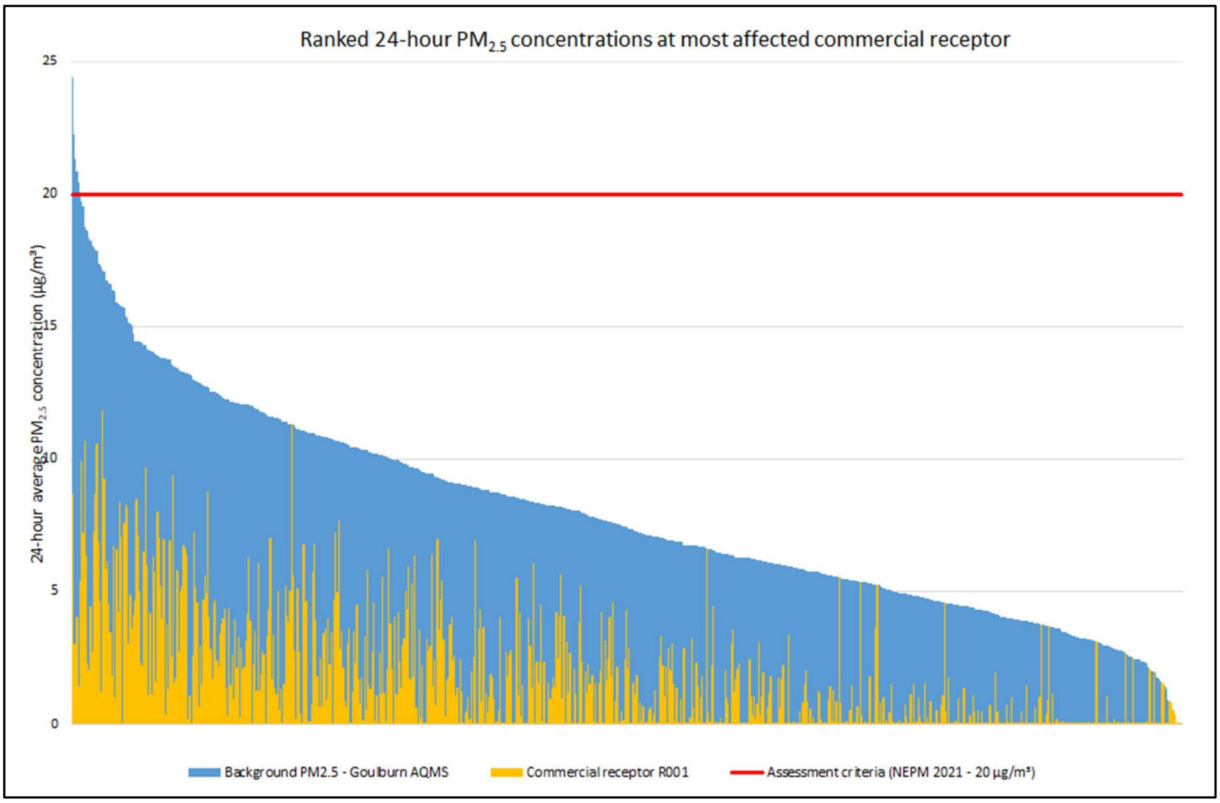


Figure 13.5 ***Ranked (highest to lowest) cumulative 24-hour average $PM_{2.5}$ concentrations at most affected commercial receptor (R001)***

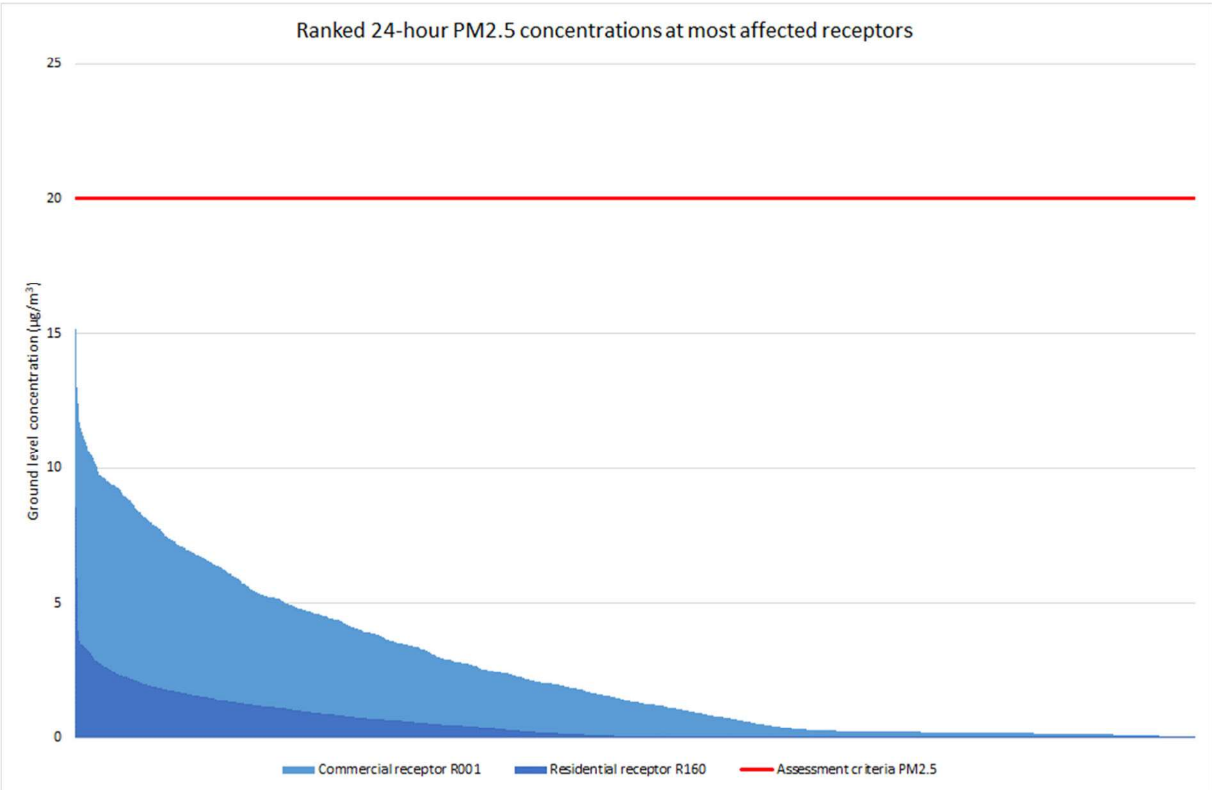


Figure 13.6 ***Ranked 24-hour $PM_{2.5}$ concentrations at most affected commercial and residential receptors***

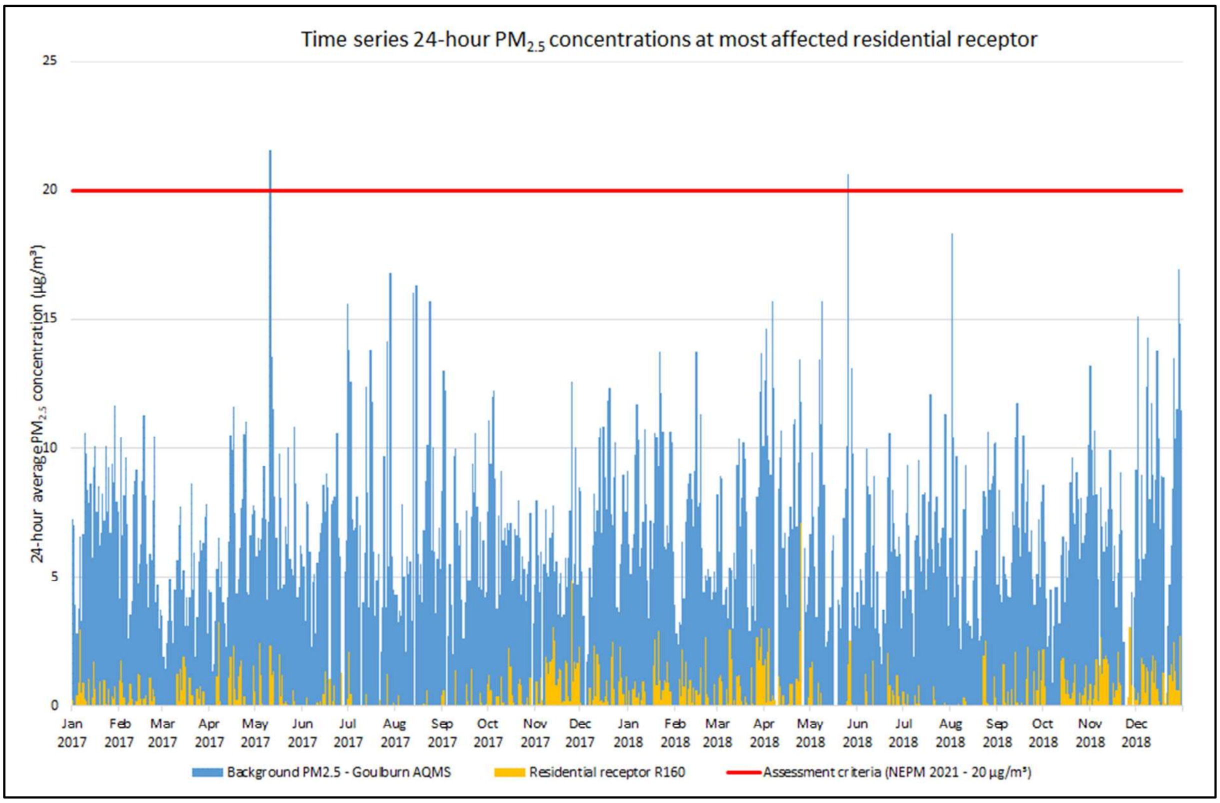


Figure 13.7 ***Timeseries (2017 – 2018) of cumulative 24-hour average $PM_{2.5}$ concentrations at most affected residential receptor (R160)***

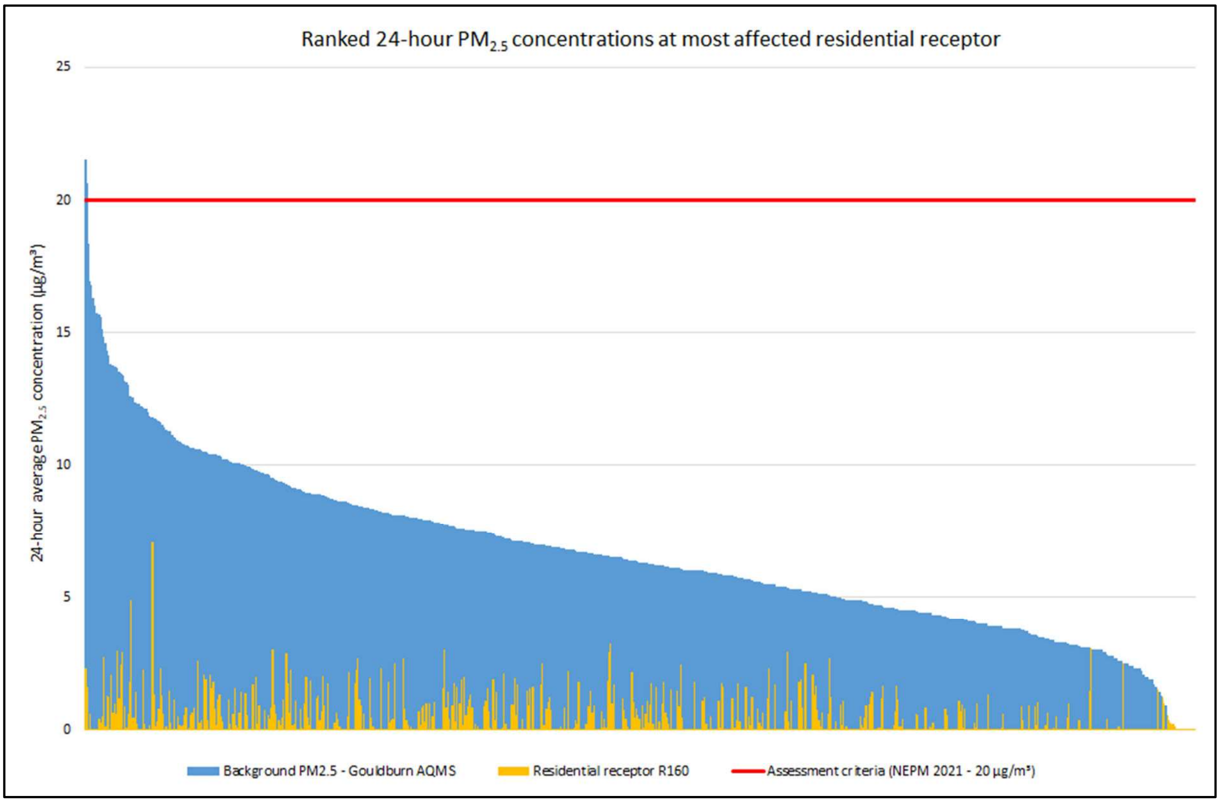


Figure 13.8 ***Ranked (highest to lowest) cumulative 24-hour average $PM_{2.5}$ concentrations at most affected commercial receptor (R001)Cumulative impacts (volatile organic compounds)***

Volatile organic compounds

The industrial operations identified as likely to emit significant amounts of air pollutants within five kilometres of the plastics recycling and reprocessing facility site are described in section 13.2.3. Two of these facilities were identified as having the potential to lead to air quality (volatile organic compounds and odour) impacts at sensitive receptors closest to the proposal site.

As discussed in sections 13.4.1 and 13.4.2, the risk of volatile organic compound and odour impacts due to operation of the proposal is considered low. Emissions generated from the operation of the proposal are considered minor due to proposed emissions control system. Further, the distance from potential sources of emission to the nearest sensitive receptors is significant, and meteorological conditions that make dispersion of ventilation air from the facility in the direction of the nearest sensitive receptors unlikely.

The risk of cumulative volatile organic compound impacts is considered to be **low**.

Based on the above, the proposal is not likely to influence the air quality at the sensitive receptors and therefore the proposal would not lead to any cumulative impact on air quality.

13.5 Mitigation and management measures

13.5.1 Construction

The measures listed in Table 13.12 would be implemented to ensure air quality impacts during construction would be minimised.

Table 13.12 Air quality mitigation measures – construction

Mitigation measure	Timing
Construction dust management plan A dust management plan would be developed for the proposal which would incorporate the general and specific dust management measures for construction and track-out outlined in Table 5.1, Table 5.2 and Table 5.3 of Technical Report 3 – Air Quality and Odour.	Pre-construction/ construction

13.5.2 Operation

No operational air quality impacts are predicted, however the mitigation measure listed in Table 13.13 would be implemented to ensure low levels of emissions are maintained during operation.

Table 13.13 Air quality mitigation measures – operation

Mitigation measure	Timing
Emission control systems – Emission control systems would be kept operational and regularly maintained – Should any unit become faulty, production on those affected lines would halt immediately and not resume until emission control systems are fully operational	Operation
Odour – An odour complaints management procedure would be developed as part of the broader complaints management procedures to ensure that any complaints regarding odour are received by appropriate personnel and that potential issues can be investigated, and site practices adjusted accordingly.	Operation
Monitoring – Once operational, sampling of the proposal operational emissions would be conducted to confirm assumptions made throughout the air quality assessment. – An air monitoring program would be established to ensure workplace exposure limits are maintained. Sampling would be undertaken in each building biannually by a suitable professional in accordance with guidance from Safe Work Australia and relevant Australian Standards.	Operation
General – To minimise dust levels within both Building 1 and Building 2, regular sweeping and housekeeping practices would be undertaken	Operation

Mitigation measure	Timing
– No activities, including stockpiling, would occur external to buildings. Building doors would remain closed at all times except when allowing vehicles to enter or exit	

14. Hazards and fire risks

14.1 Approach and method

14.1.1 Legislative and policy context to the assessment

The assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

– The EP&A Act
– State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33)
– Guidelines relevant to the assessment of impacts:
  - *Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines* (DoP 2011)
  - *Australian Code for the Transport of Dangerous Goods by Road & Rail* (NTC 2020)
  - *Fire safety guideline - Access for fire brigade vehicles and firefighters* (FRNSW 2019)
  - *Fire safety guideline - Fire safety in waste facilities* (FRNSW 2020) (the FRNSW Guidelines)

14.1.2 Method

Key tasks

The assessment of hazards and fire risks generally involved:

– undertaking a preliminary risk screening in accordance with *Applying SEPP 33 – Hazardous and Offensive Development Application Guidelines* (see below)
– identifying potential hazards and safeguards
– undertaking a review of fire and incident management (see below)
– identifying mitigation and management measures.

SEPP 33 preliminary risk screening

The hazards assessment generally involved assessing if the proposal is potentially hazardous or offensive using the SEPP 33 preliminary risk screening procedure, as shown in Figure 14.1. This included:

– identifying the chemicals or dangerous goods proposed to be used, stored or produced on-site (and where applicable, storage locations)
– identifying the weekly and annual number of deliveries and quantities of chemicals, dangerous goods and other hazardous material to and from the facility
– comparing the details of chemicals or dangerous goods against the SEPP 33 hazardous materials and transport screening thresholds
– reviewing the potential emissions from the facility to assess if the proposal would release emissions of a sufficient quantity to be considered 'offensive'.

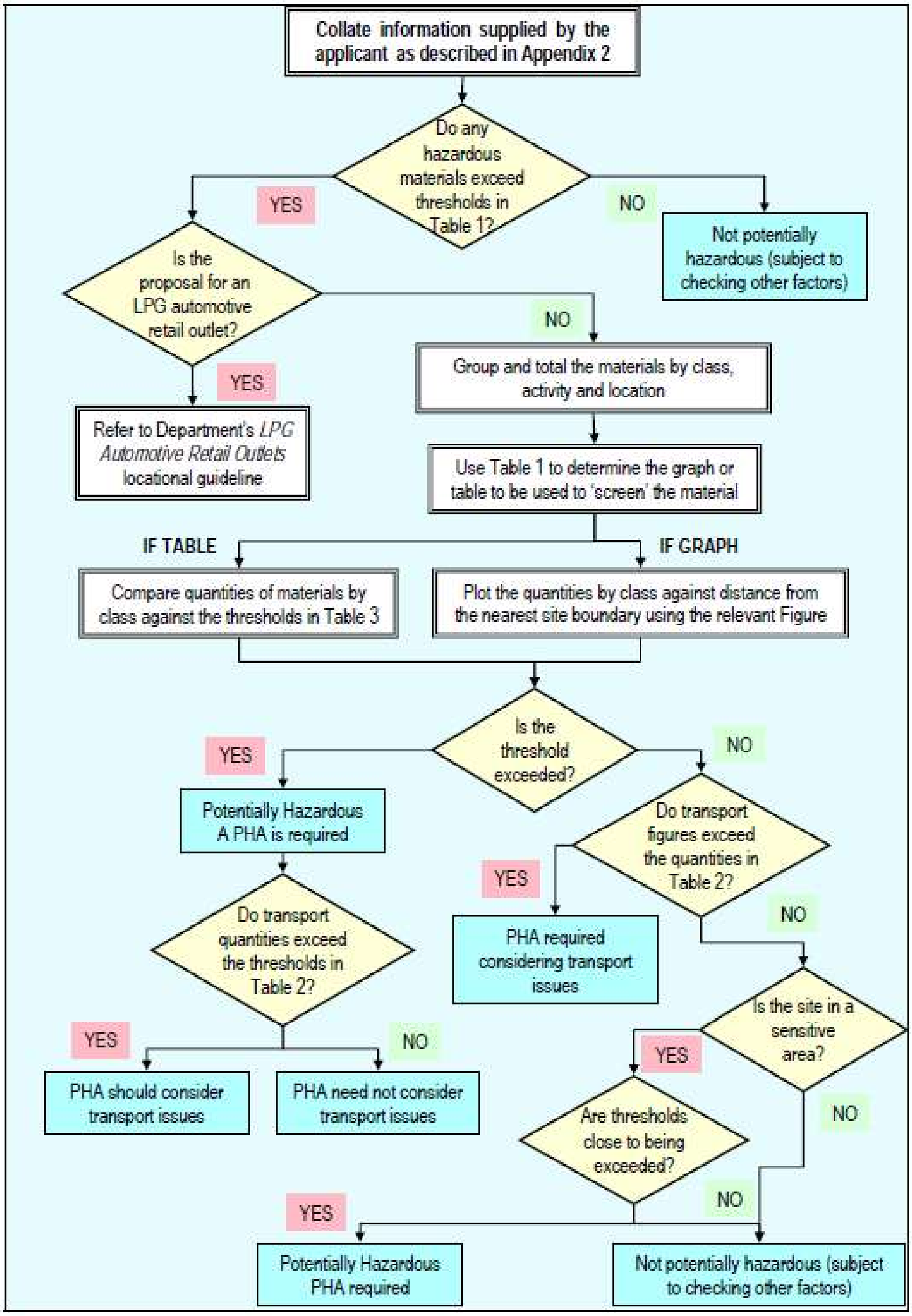


Figure 14.1 SEPP 33 risk screening procedure

Fire and incident management

The fire and incident management review involved:

– identifying the aggregate quantities of combustible waste proposed to be stockpiled on-site
– describing technical information of the proposed fire protection and management system
– developing the fire hydrant system and identifying its minimum water supply capabilities appropriate to the proposed combustible waste stockpiles
– detailing the proposed sizes and volumes of stockpiles and the proposed management and separation in order to minimise fire spread and facilitate emergency vehicle access
– undertaking an assessment of the proposal's consistency with the FRNSW Guidelines

14.2 Impact assessment

14.2.1 SEPP 33 preliminary risk screening

Dangerous goods inventory

A patented disinfectant solution is proposed to be used as part of the plastics recycling operation in Building 1. The solution comprises tea tree oil, essential oils and other natural plant-based ingredients plus 0.0015% turpentine by volume. As the turpentine content of the solution is so small, it is not classed as a dangerous good under the *Australian Code for the Transport of Dangerous Goods by Road & Rail*.

Chemicals used for operation of the wastewater treatment plant would include:

– polyacrylamide (PAM)
– polyaluminium chloride (PAC)

PAM and PAC are two types of water flocculants, and neither are classed as dangerous goods under the *Australian Code for the Transport of Dangerous Goods by Road & Rail*.

Dangerous goods and transport screening

Table 14.1 provides a summary of the chemicals proposed to be stored on-site. The SEPP 33 screening thresholds for the on-site storage of dangerous goods or transport movements are not applicable as none of the proposed chemicals are classed as dangerous goods.

Table 14.1 SEPP 33 dangerous goods inventory

Chemical	DG Class/ PG	Storage type	Max quantity	Storage threshold if stored above ground (tonnes)	Transport movements threshold (weekly peak)	Transport movements threshold (yearly)
Patented disinfectant solution	n/a	Small stackable containers	20 m^3	n/a	n/a	n/a
PAC	n/a	25 kg bags	2000 kg	n/a	n/a	n/a
PAM	n/a	25 kg bags	2000 kg	n/a	n/a	n/a

As no dangerous goods are proposed to be stored on-site, the proposal is not considered to be potentially hazardous.

Similarly, as there would be no site movements for delivery of dangerous goods, the transport of chemicals is also not considered to be potentially hazardous.

Emissions

The design of the proposal includes a variety of measures to reduce and control pollutant emissions (air quality and odour, noise and vibration). Assessment of air quality (chapter 13), noise and vibration (chapter 12) and visual impacts (chapter 16) from the proposal has been undertaken as part of the EIS. Based on the findings from these assessments, the proposal would not release a quantity of pollutant emissions to be considered ‘offensive’

14.2.2 Hazards

While the SEPP 33 preliminary risk screening process confirmed that the proposal is not considered to be a potentially hazardous industry, a hazard identification exercise was undertaken to demonstrate that potential hazards have been identified and control measures would be in place. Table 14.2 provides a summary of the identified potential hazards and proposed safeguards/control measures for each hazard scenario.

Fire hazards are assessed in detail in section 14.2.3. It is also noted that the plastics recycling and reprocessing facility site is not located on bush fire prone land and therefore the risks associated with bush fire are considered to be low.

Table 14.2 Potential hazards and identified safeguards

Hazard scenario	Causes	Consequences	Identified safeguards
Vehicle interaction	Vehicle/loader movements in the vicinity of staff	Personal injury	– Traffic management plan including standard traffic rules, signage etc. – Site speed limits to be imposed and monitored – Site layout to minimise vehicle reversing – Designated pedestrian areas – Driver competency – Workplace Health and Safety plan – Safe Work Method Statements (SWMS) – Machine inductions/licensing – Reversing alarms – Fixed mirrors – High visibility personal protective equipment
Natural hazards	Flooding, earthquake, lightning	Personal injury Possible fire	– Buildings designed to appropriate codes – Housekeeping standards – Site drainage
Fire	Arson, electrical fault, incompatible materials	Asset damage Personal injury Fatality	– Site security (fencing and CCTV) – Fire protection system (see section 14.2.3) – Housekeeping standards – Inspection and maintenance regime
Entanglement	Personnel caught in rotating or moving equipment	Personal injury Fatality	– Isolation procedures – Guarding – Interlocks – Emergency stop systems
Fall from heights	Working at height, working adjacent to drops	Personal injury Fatality	– Working at heights procedures – Working at heights training – Fall prevention equipment – Guarding – Signage
Struck by flying/falling object	Incorrect use of processing equipment Dropped object from height	Personal injury Fatality	– Inspection and maintenance of equipment – Procedure for use of equipment
Manual handling	Poor picking station ergonomics	Personal injury	– Rotation of job roles – Ergonomic assessment of picking station set ups
Slips, trips, falls, collisions, egress	Poor design	Personal injury Fatality	– Building to use Australian Standards – *Building Code of Australia* compliant
Contact with chemicals	Handling chemicals	Personal injury	– Staff handling chemicals to wear appropriate personal protective equipment – Staff handling chemicals to wash hands frequently

14.2.3 Fire and incident management

The section provides a summary of the review of fire and incident management. A full copy of the fire and incident management review is provided in Technical Report 5 – Fire and Incident Management.

Preliminary stockpile details

Table 14.3 provides an overview of the proposed preliminary sizes, locations and contents of combustible stockpiles at the plastics recycling and reprocessing facility.

Table 14.3 Preliminary stockpile information

Stockpile name	Materials	Location	Dimension (L x W x H)	Volume	Average Density	Weight
Stockpile pen	Raw plastic (baled)	Along west part of the Building 1	Each pen 10 m x 10 m x 4 m	400 m^3	~0.28t/m^3	112 t
Unloading zone (transitory zone)	Raw plastic (unbaled)	Western part of the Building 1	40 m x 20 m	800 m^3	TBC	TBC

The indicative locations of internal combustible stockpiles in Building 1 are shown on Figure 14.2. No external stockpiles are proposed. No combustible stockpiles would be located in Building 2.

All of the combustible waste stockpiles would be located within the western portion of Building 1. Each stockpile would be separated by a concrete wall with a height one metre greater than the maximum stockpile dimension and extend for two metres beyond the stockpile width. This would be in accordance with Clause 8.2.6 of the FRNSW Guidelines as illustrated in Figure 14.3.

The dimension of the stockpile bays would be 10 metres by 10 metres by four metres. Therefore, the concrete separating walls between the stockpile bays would be five metre tall and extend 12 metres from the building's external wall.

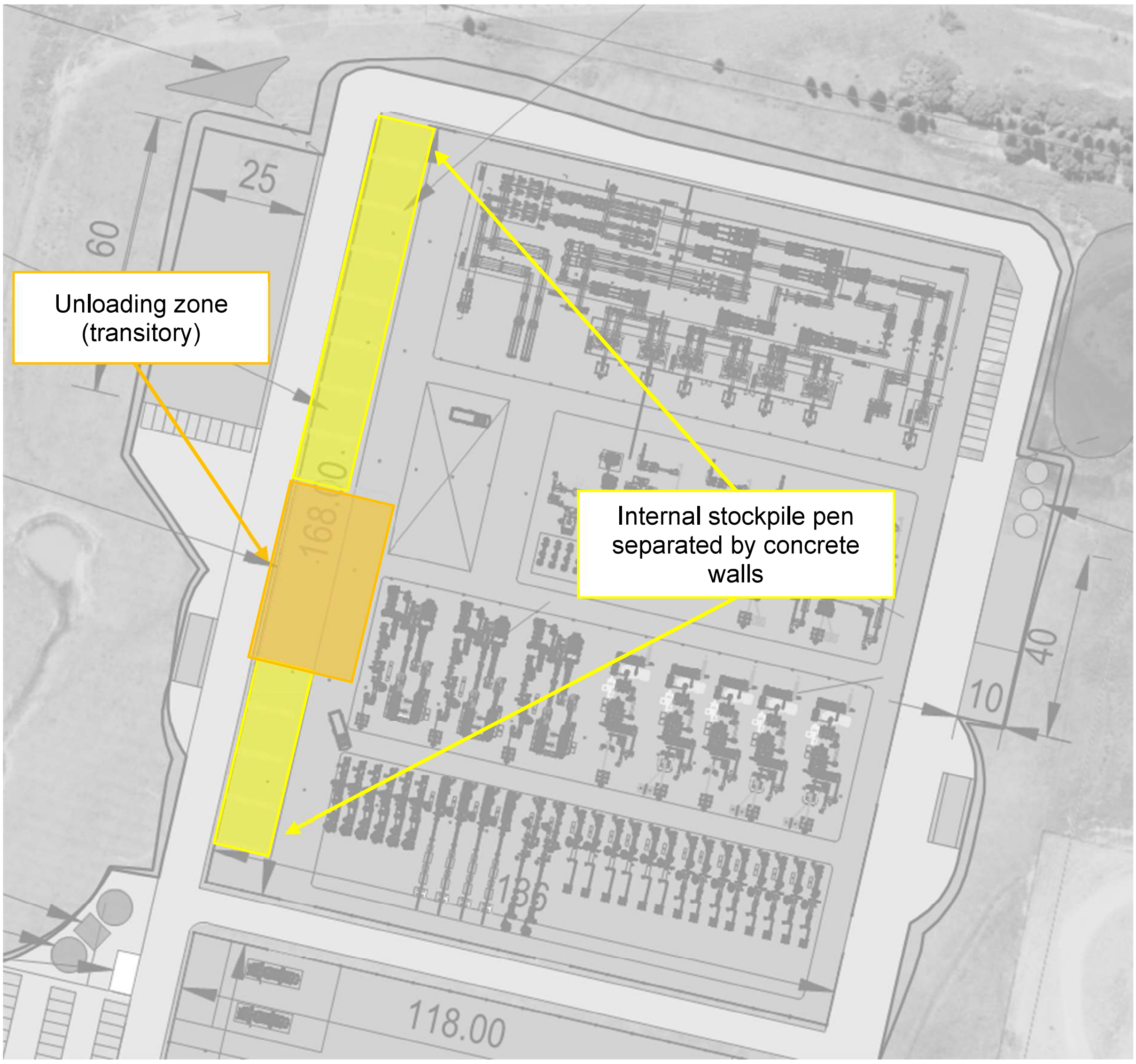


Figure 14.2 Proposed stockpile location (internal)

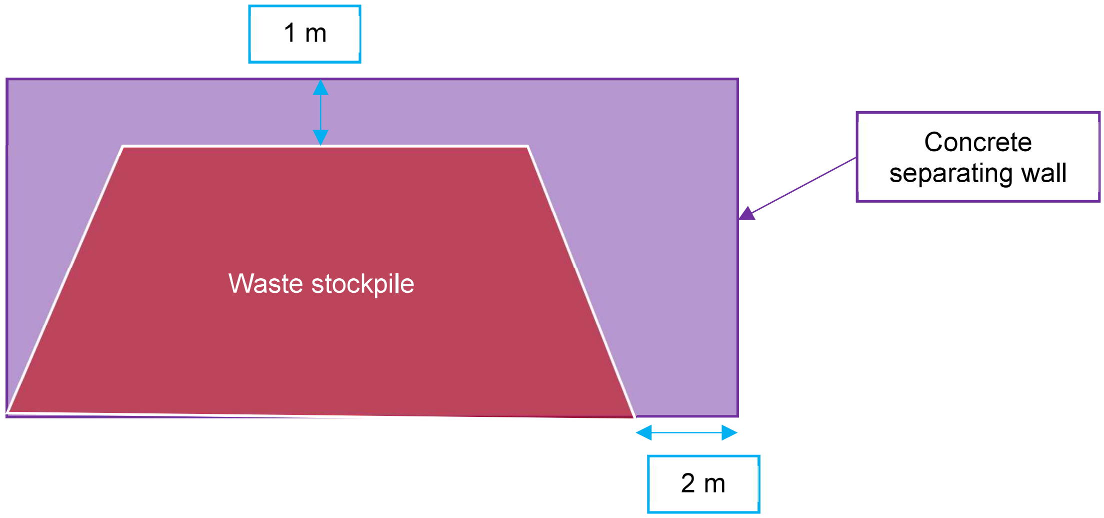


Figure 14.3 Side view of stockpile separating wall

Figure 14.4 shows a plan view of the proposed separating walls and the expected dimensions.

The dimensions for the unloading zone would be approximately 40 metres by 20 metres. This unloading zone would be a transitory space and not for long term storage, therefore cumulative waste volume in this area would be low.

In addition to the above, at least a six metre clear space would be provided in front of each stockpile.

The stockpile dimensions, separating walls and clearance requirements would be in accordance with the FRNSW Guidelines for internal stockpiles.

Access

Perimeter access

Figure 14.5 shows the proposed access to the buildings with a perimeter access for fire appliance use, and indicative six metre wide pathways. The design allows for close range fire brigade access to the buildings from the perimeter access road.

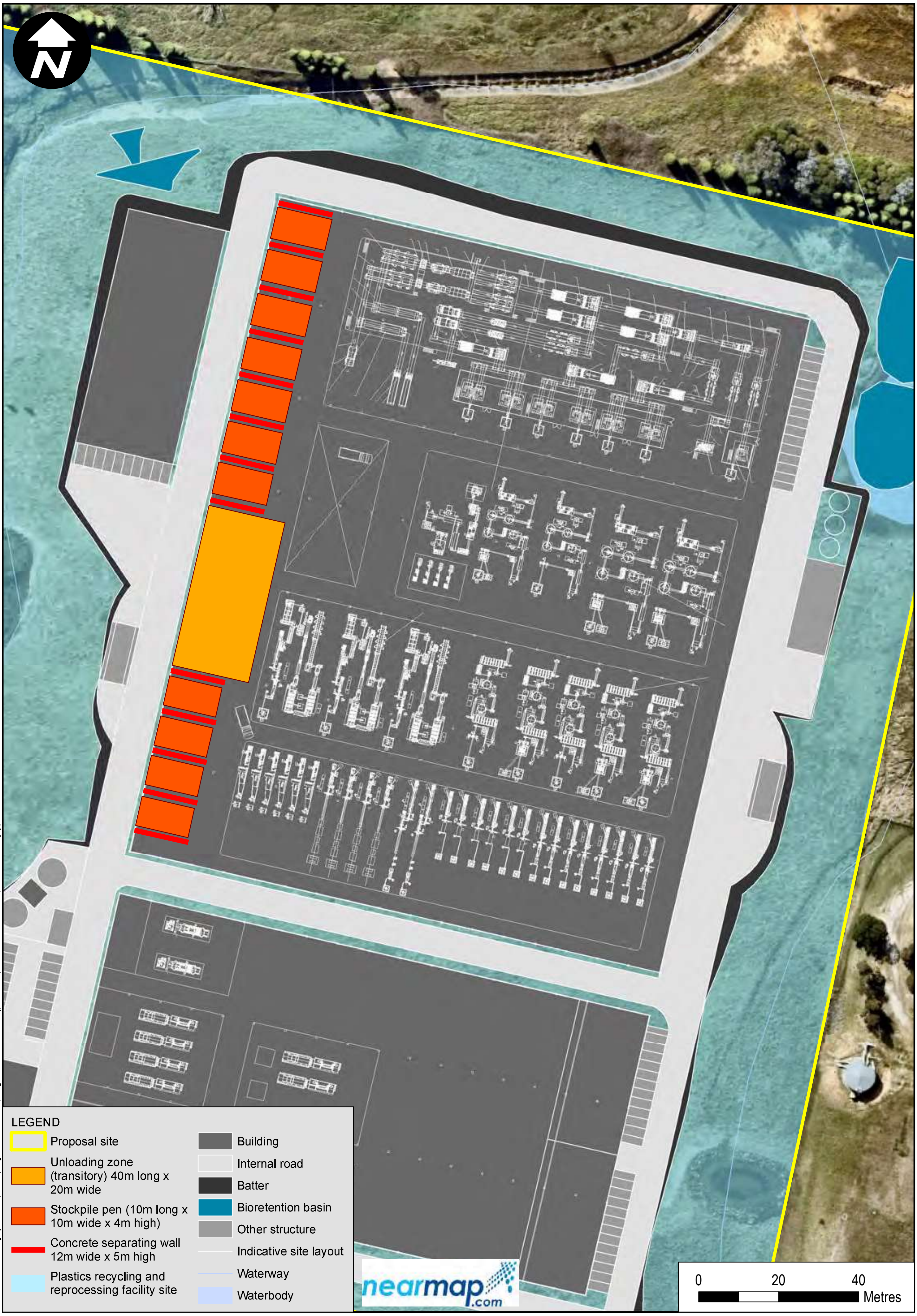
Firefighter access

The high-level design strategy would be to provide perimeter doors to Building 1 and 2, such that multiple access and egress options are available. This perimeter door strategy would facilitate firefighter access from multiple potential vantage points. The hydrant network serving the building would be designed with perimeter door use in mind, with external hydrant design being preferable, so long as coverage can be met.

Figure 14.5 shows the indicative perimeter door strategy. Actual location of doorways would be finalised as the design progresses.

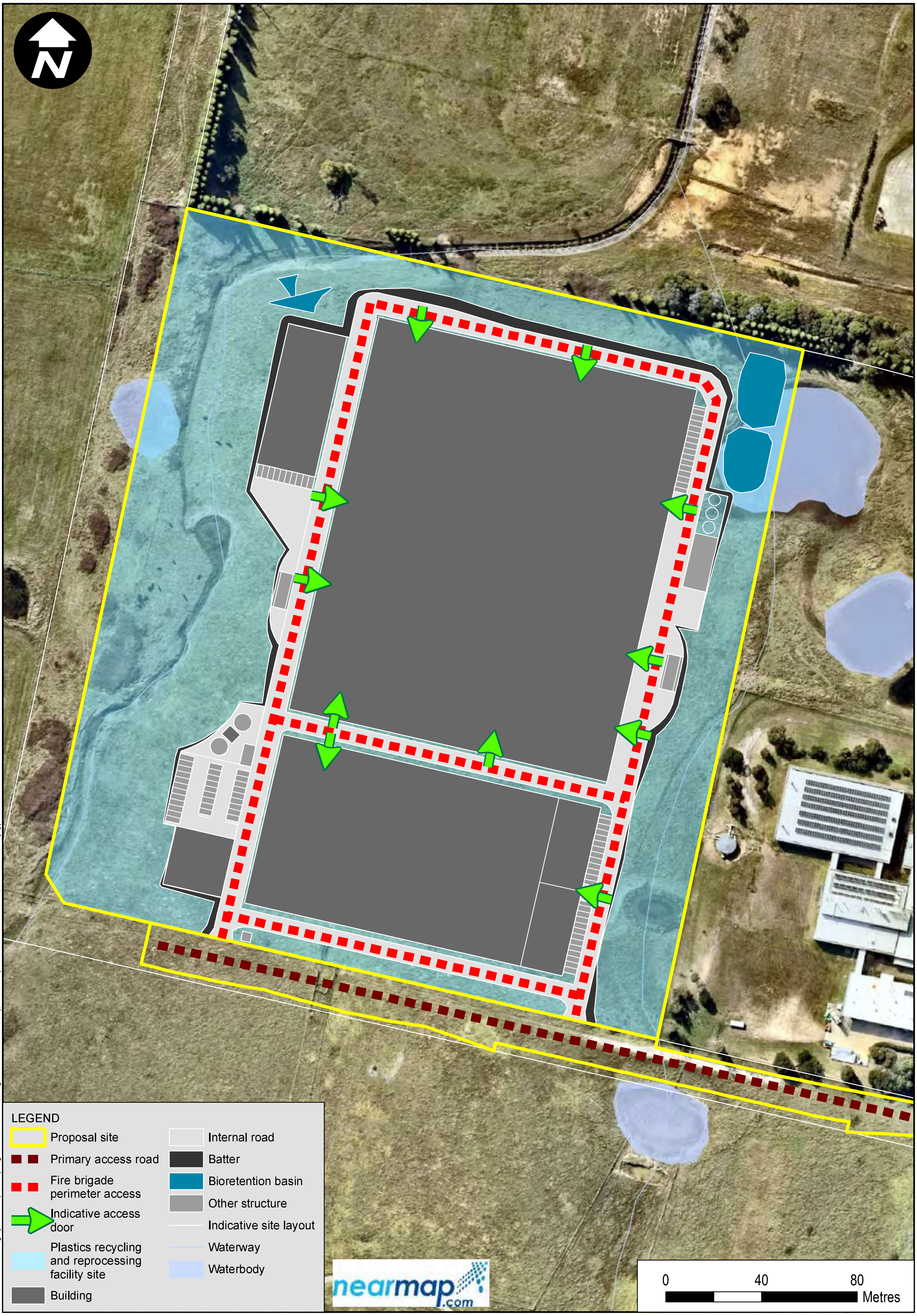
Where internal hydrants are necessary in order to achieve AS2419.1-2005 *Fire Hydrant Installations Part 1: System Design, Installation and Commissioning* coverage requirements, they would be provided. These would be developed as further detailed design progresses.

All other enclosed areas, where no combustible stockpiles are proposed, would also be provided with adequate access to parts of the building for fire brigade, where determined by the *Building Code of Australia* requirements for design.



Data source: Aerial imagery - nearmap 2021 (image date 24/04/2021, image extracted 30/06/2021); General topo - NSW LPI DTDB 2020, 2015. Created by: jrprice

Figure 14.4 **Locations and dimensions of concrete separating walls**



Data source: Aerial imagery - nearmap 2021 (image date 24/04/2021, image extracted 30/06/2021); General topo - NSW LPI DTDB 2020, 2015. Created by: jprice

Figure 14.5 **Indicative access for FRNSW vehicles and access doors to buildings**

Fire protection equipment

The fire protection equipment for the overall plastics recycling and reprocessing facility site would include:

- fire hydrant system
- fire hose reel system
- fire brigade booster connection for the automatic fire sprinkler system, co-located with a hydrant system booster

The fire protection equipment for Building 1 would include:

- automatic fire sprinkler system
- fire detection and alarm system
- an automatic smoke exhaust system
- building occupant warning system

The fire hydrant system in Building 1 would be installed in accordance with AS 2419.1-2005 *Fire hydrant installations, Part 1: System design, installation and commissioning* and the *Building Code of Australia,* which would provide coverage for the proposed internal stockpiles. Based on the concept design layouts, it is anticipated that the hydrant system would utilise both internal and external hydrants placed in and around the building to provide coverage throughout the building based upon a complying two-hose length design.

It would be designed for at least three fire hydrants simultaneously flowing and would provide 30 litres per second simultaneous flow rate for a minimum four hours duration.

The fire sprinkler system would be fed from the sprinkler pump house, connected to fire tanks (capacity to be confirmed during detailed design). The tanks would be refilled through infill connection from the town main. Large bore and small bore connections would be provided from the tanks.

The internal layout directly impacts coverage requirements and would be refined during detailed design and therefore the hydrant system would also be developed further to ensure compliance as the design progresses. However, Figure 14.6 provides a proof of concept for external and internal hydrant coverage at this time.

While it is expected that the hydrant design would be confirmed during detailed design, the requirements of the FRNSW Guidelines for coverage would be adhered to.

A fire hose reel system would be installed with fire hose reels located adjacent to hydrant locations to provide coverage. Additional hose reels, where required for coverage, would be provided. The fire hose reel system would also be developed further during detailed design and in consultation with FRNSW where required.

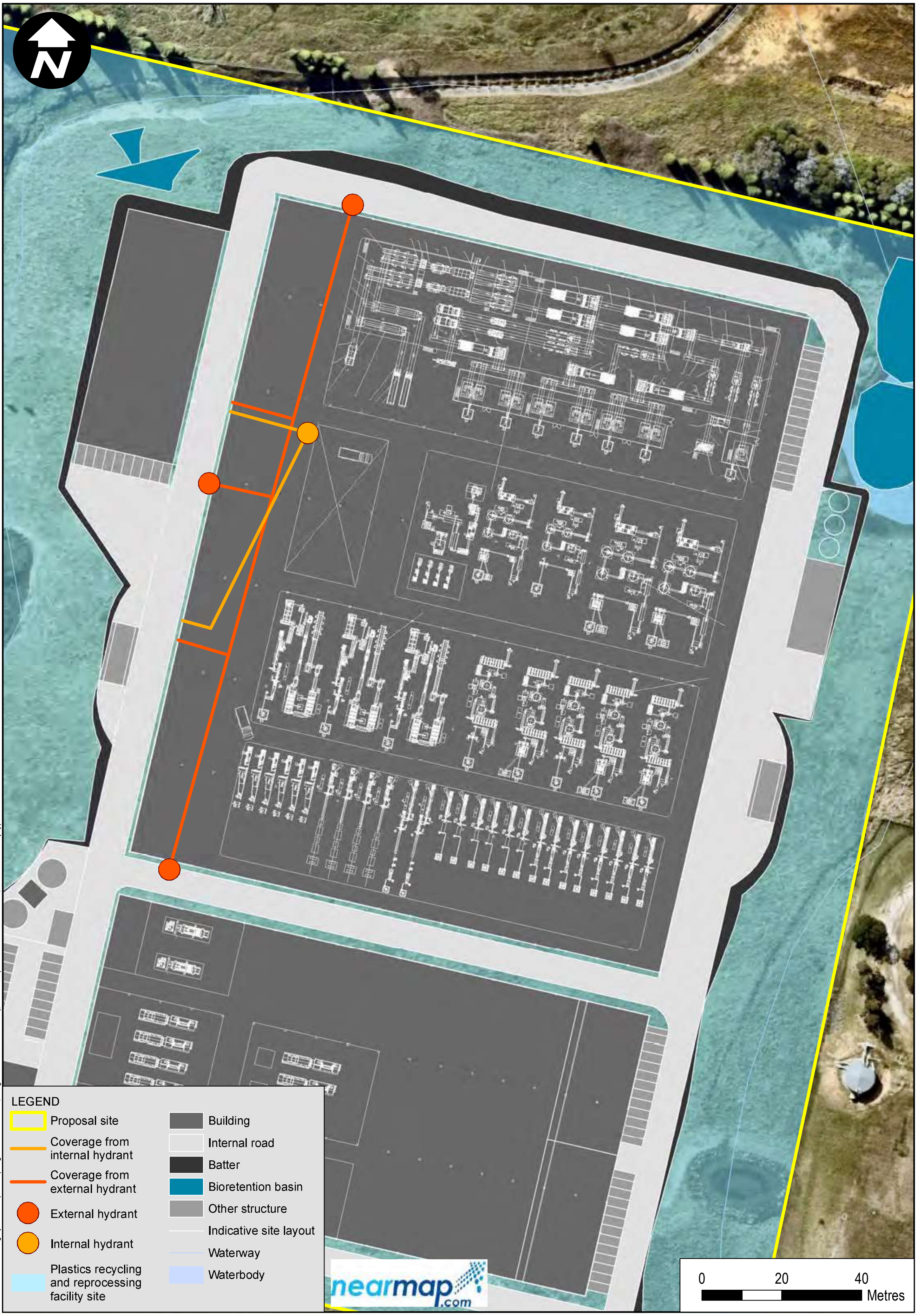


Figure 14.6 **Indicative hydrant coverage to combustible waste stockpiles**

Assessment against FRNSW Guidelines

The FRNSW Guidelines is a document designed to '*provide guidance on fire safety in waste facilities that receive combustible waste material, including adequate provision for fire safety and facilitate safe fire brigade intervention to protect life, property and the environment*'.

The FRNSW Guidelines provide two development pathways for waste facilities, with respect to fire safety at the proposal site. They can be to design as par an 'Acceptable Solution', or a 'Performance Solution'. The Performance Solution pathway would include referral to FRNSW for consultation. Please see below for the figure from the FRNSW Guidelines:

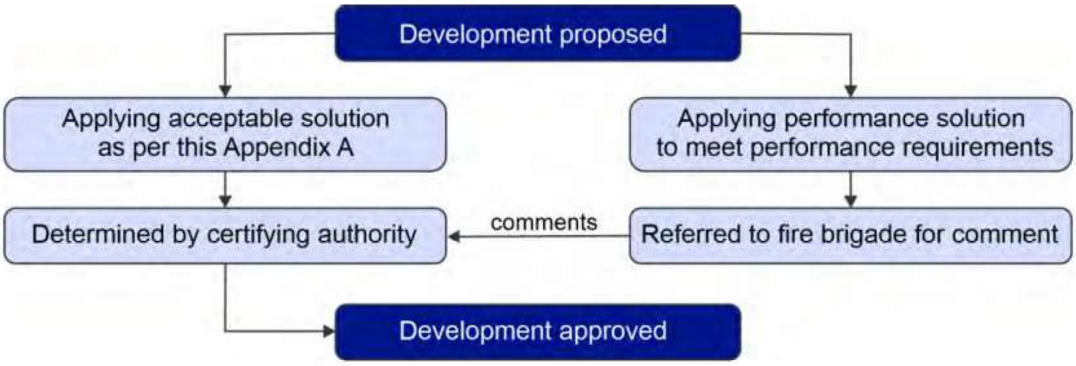


Figure 10 Pathways involving acceptable solution or performance solution

Figure 14.7 Excerpt from the FRNSW Guidelines

The plastics recycling and reprocessing facility would include two buildings and a range of ancillary infrastructure. Building 1 (the northern building) would contain combustible waste stockpiles and was therefore assessed against the FRNSW Guidelines.

The other buildings, including Building 2 (the southern building), are not proposed to contain any combustible waste stockpiles. Therefore, while some of the site-wide FRNSW Guidelines would apply in general (such as access requirement using perimeter roads), Building 2 and the ancillary buildings were not the focus of the assessment. Building 2 (the southern building) and the ancillary buildings, would be still subject to *Building Code of Australia* requirements, which would be undertaken as part of the detailed design.

Table 14.4 and Table 14.5 provide summaries of the proposed fire safety measures for the proposal based on a preliminary assessment of the proposal against the FRNSW Guidelines. The full assessment is provided in Technical Report 5 – Fire and Incident Management.

Table 14.4 Preliminary fire safety requirements – site wide

Fire safety measure	Description
General	If not specifically mentioned herein, the fire safety measures as required by the governing Deemed-to-Satisfy provisions of the *Building Code of Australia* would be installed within the buildings. The detailed design and development of a *Building Code of Australia* report would confirm these requirements.
Fire hydrant system	A fire hydrant system would be provided in accordance with *Building Code of Australia* Clause E1.3 and would be designed to AS2419.1-2005 The following (summarised) FRNSW Guideline requirements would also apply: – The fire hydrant system would be designed for at least 3 fire hydrants simultaneously flowing (30 L/s) – The fire hydrant system would provide the above simultaneous flow rate for at least 4 hours minimum duration Hydrants would not be located within 10 m of any stockpiled storage
Fire hose reels	Hose reels would be provided in accordance with *Building Code of Australia* Clause E1.4
Perimeter access	Perimeter road access of at least 6 m in width, capable of supporting specialist fire appliance use, would be provided around each building as required to satisfy the FRNSW Guidelines

Fire safety measure	Description
Combustible waste stockpile requirements (FRNSW Guidelines)	Each internal (combustible) stockpile would be limited in volume to 1,000 m^3 Separating construction between stockpiles would be of non-combustible construction and extend at least 1 m above maximum stockpile height and 2 m beyond maximum stockpile width. Each internal (combustible) stockpile would maintain a minimum of 6 m unobstructed access on accessible sides The unloading zone with dimensions 40 m x 20 m would be a transient area which would not be used for prolonged storage. The area would serve as a temporary unloading area for trucks prior to being moved to separate storage pens. See the *Management in Use* requirement of this table for details on enforcement.
Fire water containment	An automatic fire water run-off containment system would be provided and designed to contain the total combined hydraulic demand of the fire hydrant and fire sprinkler system
Operational Requirements (FRNSW Guidelines)	Prior to operations of the facility, Plasrefine Recycling would do the following: – An operations plan would be documented and implemented for stockpile management and a copy would be included within the Emergency Services Information Package (ESIP). – An Incident Response Management Plan would be provided for staff and other persons at the facility in the event of fire. – An Emergency Services Information Package (ESIP) would be provided for firefighters in accordance with FRNSW guideline Emergency services information package and tactical fire plans. Further to the above, the fire safety systems for the facility would be inspected and maintained with corresponding fire safety statements being issued. The provision of maintenance would be covered in any leasehold contract. AS1851-2012 would be utilised.

Table 14.5 Preliminary fire safety requirements – Building 1

Fire safety measure	Description
General	If not specifically mentioned herein, the fire safety measures as required by the governing Deemed-to-Satisfy provisions of the *Building Code of Australia* would be installed within the buildings. The detailed design and development of a *Building Code of Australia* report would confirm these requirements.
Fire sprinklers	An automatic fire sprinkler system would be required in accordance with *Building Code of Australia* Clause E1.5 and Specification E1.5 for Building 1 and would be designed to AS2118.1-2017. The following (summarised) FRNSW Guideline requirements would also apply: – The sprinkler system would be designed for High hazard classification – Sprinkler water supply time would be at least 2 hours
Fire detection	A fire detection system complying with AS1670.1-2018 and BCA Clause E2.2 would be required for Building 1
Smoke hazard Management	As per the FRNSW Guidelines, an automatic smoke exhaust system would be required for Building 1 and provide: – Exhaust rates are to be determined depending on CFD modelling results, but would be demonstrated to maintain a smoke layer height above 4 m The following requirements would apply to all smoke hazard management systems: – Initiation switches would be located at the FIP for any power-driven fans – Signs and text alerting the Fire Brigade to the operation of the smoke exhaust system would be provided at the FIP in accordance with Clause 4.15 of AS1668.1 – The fans, fan cabling and the cabling of any doors required for make-up air would be fire rated so fans are capable of operating at 200 °C for 2 hours – On activation of the fans make up air would be drawn via permanent openings or automatic opening doors at low levels. These openings would be on at least two or more separate walls.
Building occupant warning system	A building occupant warning system in accordance with *Building Code of Australia* E2.2 and AS1670.1-2018 would be required for Building 1 Manual alarm points would be installed throughout Building 1, adjacent to each exit door

Fire safety measure	Description
Combustible waste stockpile requirements (FRNSW Guidelines)	Each internal (combustible) stockpile would be limited in volume to 1,000 m^3 Separating construction between stockpiles would be of non-combustible construction and extend at least 1 m above maximum stockpile height and 2 m beyond maximum stockpile width. Each internal (combustible) stockpile would maintain a minimum of 6 m unobstructed access on accessible sides The unloading zone with dimensions 40 m x 20 m would be a transient area which would not be used for prolonged storage. The area would serve as a temporary unloading area for trucks prior to being moved to separate storage pens. See the *Management in Use* requirement of this table for details on enforcement.
Management in use	To prevent the unloading zone from being used as a permanent storage area, the operations plan would include reference that the unloading zone as shown in Figure 14.2 would not be used for long term storage. The purpose of the zone would be for facilitating the offloading of trucks and distribution into stockpile pens.

Compliance with Volume One of the National Construction Code/Building Code of Australia

A detailed *Building Code of Australia* review and assessment would also be undertaken as part of the detailed design to confirm compliance and to identify the requirement for fire detection, automatic fire sprinkler and smoke hazard management systems for the buildings.

14.3 Mitigation and management measures

The measures listed in Table 14.6 would be implemented to manage the risk of hazards and fire risks during operation of the proposal.

Table 14.6 Hazards and fire risks mitigation measures

Mitigation measure	Timing
The fire safety system for the proposal would be refined during detailed design and developed in consultation with FRNSW	Detailed design
A detailed *Building Code of Australia* review and assessment would be undertaken as part of the detailed design	Detailed design
Prior to commencement of operations, the following would be developed: – an operations plan for stockpile management, with a copy to be included within the Emergency Services Information Package – an Incident Response Management Plan for staff and other persons at the facility in the event of fire – an Emergency Services Information Package for firefighters in accordance with the FRNSW (2019) guideline *Emergency services information package and tactical fire plans*	Operation
All safeguards identified in the hazard identification process would be implemented through the development and implementation of a safety management system for the operation of the proposal	Operation

15. Aboriginal cultural heritage

The chapter provides a summary of the potential Aboriginal cultural heritage impacts of constructing and operating the plastics recycling and reprocessing facility. A full copy of the assessment results is provided in Technical Report 8 – Aboriginal Cultural Heritage Assessment Report prepared by OzArk Environment & Heritage. Non-Aboriginal heritage is discussed in section 18.3.

15.1 Approach and method

15.1.1 Legislative and policy context to the assessment

The assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

– The EP&A Act and EPBC Act
– *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
– *National Parks and Wildlife Act 1974*
– Guidelines relevant to the assessment of impacts:
  - *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (the Burra Charter) (International Council on Monuments and Sites 2013)
  - *Aboriginal cultural heritage consultation requirements for proponents* (DECCW 2010a)
  - *Code of Practice for Archaeological Investigation of Aboriginal objects in NSW* (DECCW 2010b)
  - *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011)

15.1.2 Method

Study area

The study area for the archaeological survey initially included the plastics recycling and reprocessing facility site, the road access corridor and the north-south road corridor option considered as part of the road access options assessment (as described in section 4.3). The area subject to the subsequent test excavation program excluded the north-south road corridor, as this road access option was not selected as the preferred access option for the proposal.

Key tasks

The Aboriginal cultural heritage assessment generally involved:

– undertaking a desktop assessment and background research on the study area and surrounding region
– developing a predictive model in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal objects in NSW*
– field survey
– undertaking Aboriginal community consultation (see below)
– identifying and recording Aboriginal cultural heritage values within the survey areas including completing an archaeological survey of the study area and a test excavation program
– assessing the likely impacts of the proposal to Aboriginal cultural heritage values
– providing management recommendations

Aboriginal community consultation

Consultation with Aboriginal community stakeholders was undertaken in accordance with the *Aboriginal cultural heritage consultation requirements for proponents*. This included:

- identifying key Aboriginal stakeholders including individuals and groups
- placing a public notice in the *Highland Times* inviting expressions of interest to be consulted about the proposal and contacting relevant organisations and agencies requesting details of individuals or groups who may be interested in being consulted about the proposal
- notification of the proposal and registration of interest (a total of 10 Aboriginal parties registered interest in the proposal)
- presentation of information about the proposal and invitations to participate in the field survey
- issue of the proposed test excavation method and invitations to participate in the test excavation program
- issue of the draft Aboriginal Cultural Heritage Assessment Report to all registered Aboriginal parties (RAPs) for their consideration

Further information on the consultation process is provided in section 3 of Technical Report 8 – Aboriginal Cultural Heritage Assessment Report.

Archaeological survey

An archaeological survey was carried out on 3 June 2021 to assess and understand the landforms and determine whether any archaeological material from Aboriginal occupation or land use exists within the study area.

The archaeological survey was conducted on foot with a field team of two members (including one RAP). Recording during the survey followed the archaeological survey requirements of the *Code of Practice for Archaeological Investigation of Aboriginal objects in NSW*.

Where possible, identification of natural soil deposits within the study area was undertaken. Photographs and recording techniques were incorporated into the survey including representative photographs of survey units, landform, vegetation coverage, ground surface visibility and the recording of soil information for each survey unit were possible.

Any potential Aboriginal objects observed during the survey were documented and photographed.

Test excavation program

A test excavation program was undertaken between 3 and 6 August 20201 to investigate potential subsurface deposits at eight locations within two identified potential archaeological deposits (PADs). There were four RAP representatives present for each of the hour days of test excavations.

Excavation occurred at 10 metre intervals along the eight transects with six test squares excavated per transect. This resulted in a total of 48 test squares (each 0.5 metres by 0.5 metres) being excavated (or a total of 12 square metres).

The locations of the transects and PADs are shown on Figure 15.1.

Further detail is provided in section 8.5 of Technical Report 8 – Aboriginal Cultural Heritage Assessment Report.

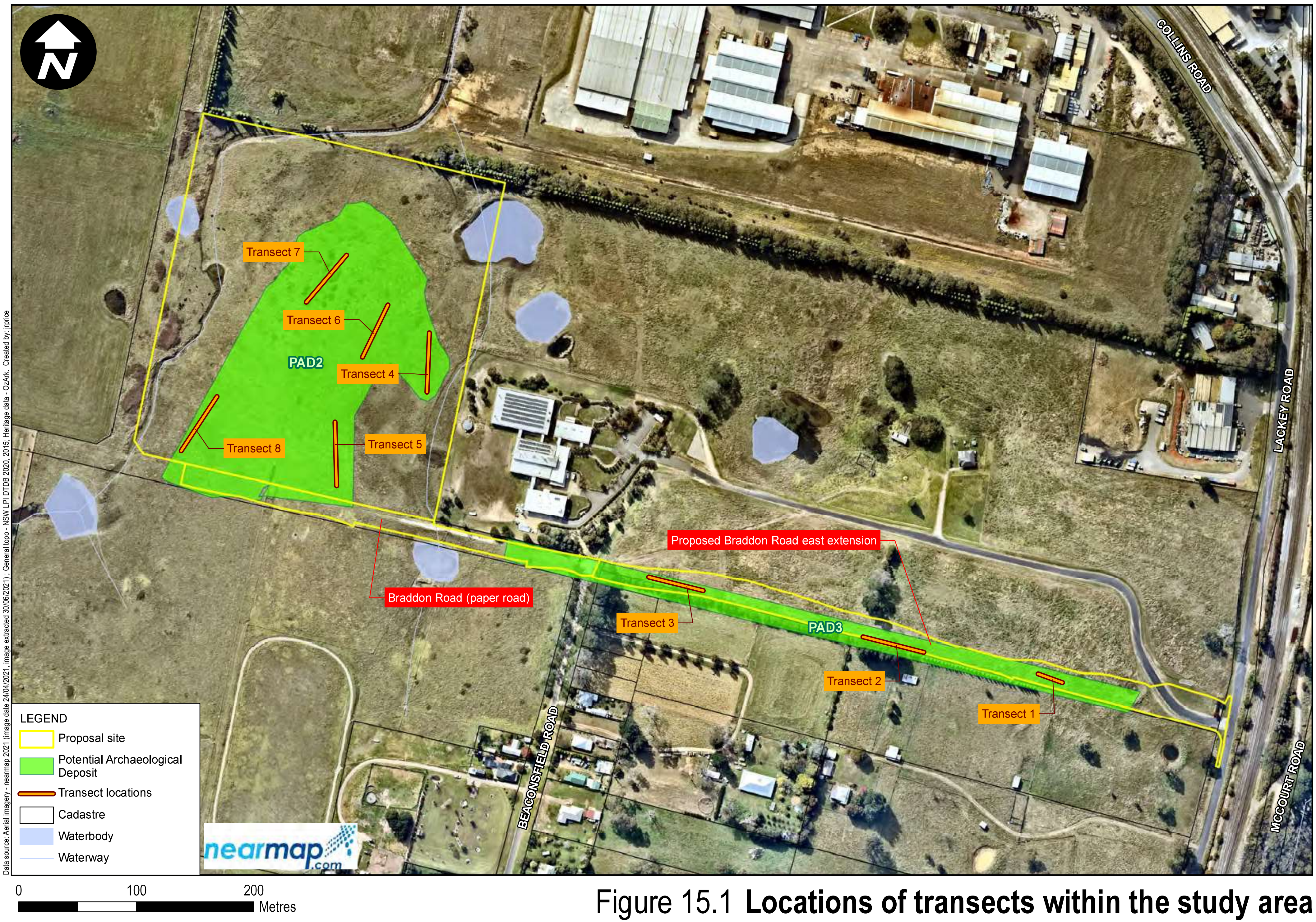


Figure 15.1 **Locations of transects within the study area**

15.2 Existing environment

15.2.1 Aboriginal historical context

A large number of cultural heritage surface (surveys) and sub-surface (excavations) investigations have been conducted throughout this region of NSW in the past 30 years.

The majority of Aboriginal sites in the region date to the last 6,000 years when the sea-level stabilised following the end of the last Ice Age. Prior to this, sea levels were lower and the coast was located much further off shore, about 14 kilometres to the east of its current position. Coastal sites older than 6,000 years are rare, as most would have likely been inundated by the rising sea. Pleistoceneage Aboriginal sites on the south coast include a rock shelter at Burrill lake (located approximately 150 kilometres south of the study area) and a coastal midden at Bass Point.

Further detail on the Aboriginal historical context is provided in Appendix 1 of Technical Report 8 - Aboriginal Cultural Heritage Assessment Report. Non-Aboriginal heritage is discussed in section 18.3.

15.2.2 AHIMS database search

A search of the Aboriginal Heritage Information Management System (AHIMS) database on 2 June 2021 identified 49 Aboriginal archaeological sites within a 10 by 10 kilometre search area, centred on the study area.

The primary site types in the region are artefact sites, making up 84.3% of recorded AHIMS sites. The next most recorded site type consists of grinding grooves making up 7.8% then PAD sites making up 5.9%. One modified tree was also recorded on AHIMS making up 2% of sites.

Two of these registered sites are located within the study area: BR-IF1 and BR-IF2. These are discussed below.

AHIMS 52-4-0386/BR-IF1

BR-IF1 was recorded in Lot 1 DP1000057 Beaconsfield Road, Moss Vale and was situated on an unformed vehicle track along the northern most boundary fence. The site consisted of an isolated artefact made up of a coarse grained grey silcrete with quartz inclusions distal flake fragment. Some edge damage to left hand ventral margin and three negative flake scars on the dorsal surface were also observed.

Kayandel (2005) recorded the site's location at coordinates GDA 56 E258825 N6175904, however, based on the site description and maps provided in Kayandel (2005) this location is more than 200 metres south of the correct location. The correct location of the site places it within the study area. BR-IF1 is shown on Figure 7-3 in Technical Report 8 – Aboriginal Cultural Heritage Assessment Report.

AHIMS 52-4-0387/BR-IF2

BR-IF2 was recorded in Lot 1 DP1000057 Beaconsfield Road, Moss Vale and was situated on an unformed vehicle track along the northern most boundary fence. The site consisted of an isolated artefact made up of a grey silcrete (or quartzite) flaked piece. Kayandel (2005) recorded the site's location at coordinates GDA 56 E258633 N6175948, however, based on the site description and maps provided in Kayandel (2005) this location is more than 200 m south of the correct location. The correct location of the site places it within the study area.

During the survey undertaken by Biosis, an unsuccessful attempt was made to locate both sites, but neither could be found. Biosis suggested that the artefacts may have been moved by water wash or had become obscured by ground vegetation.

15.2.3 Archaeological survey results

One isolated find (MVRec IF1) was recorded during the archaeological survey. This site consisted of an isolated quartz steep edged scraper that was located on the surface of an area of disturbance associated with the removal of a timber fence post on the spur crest.

In addition, three PADs were recorded, two of which were later the focus of the test excavation program. The PADs were:

- PAD1 - located on a crest of a gentle sloping hill spur leading down to the flats surrounding a creek line. PAD1 was within the area of the north-south access road option but would not be impacted by the proposal and therefore was not assessed further
- PAD2 - located on a crest of a gentle sloping hill spur within the plastics recycling and reprocessing facility site. The spur is bounded by drainage lines to the east and west. MVRec IF1 was recorded within this PAD on the surface near of an area of disturbance associated with a fallen fence post
- PAD3 - located on the slopes of a gentle sloping hill spur leading down to the flats surrounding a creek line. This PAD is within the area of the proposed new access road.

Figure 15.2 shows the location of the isolated find and PAD2 and PAD3.

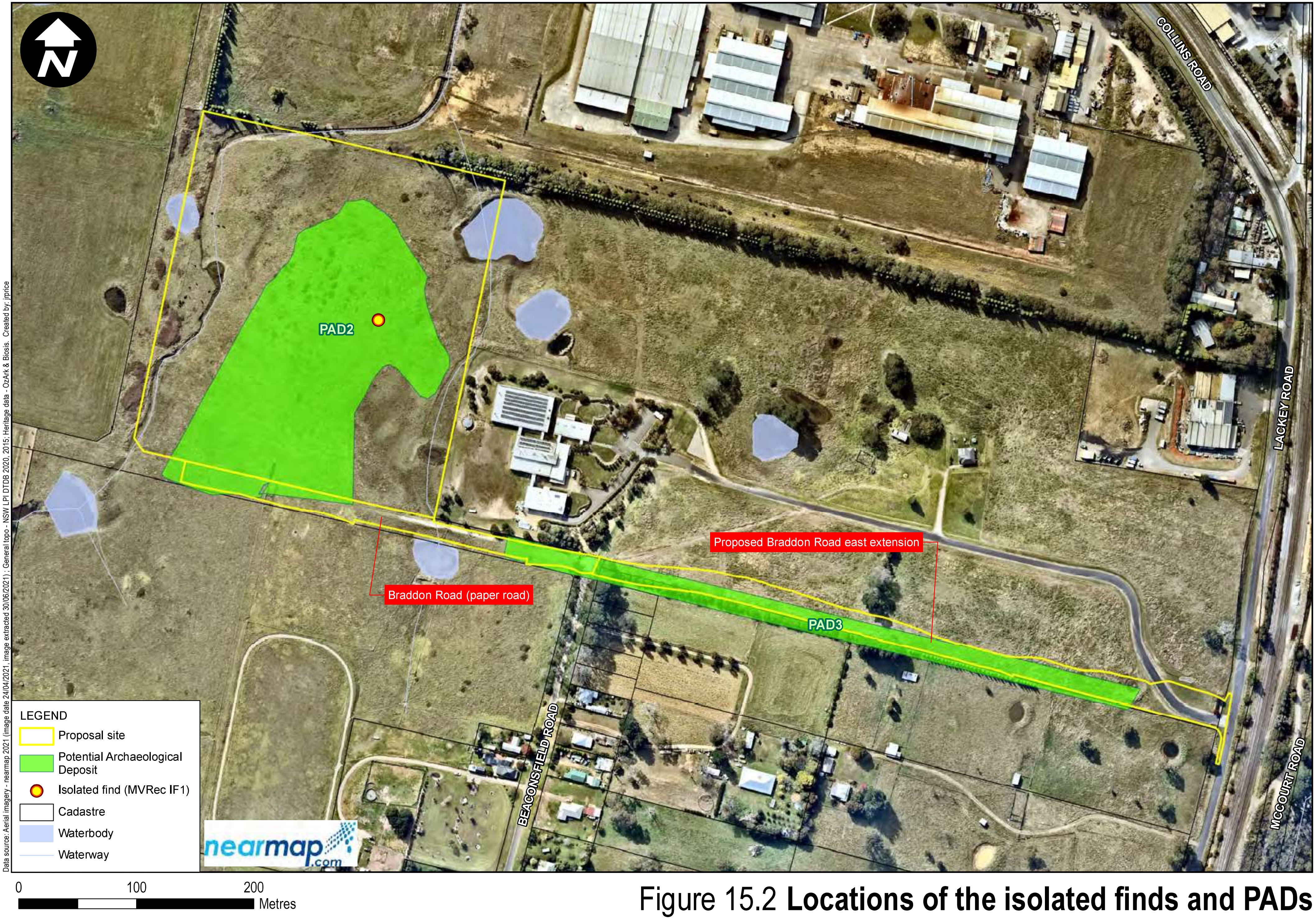


Figure 15.2 **Locations of the isolated finds and PADs**

15.2.4 Test excavation program results

The results of the test excavation of eight transects across the two PADs indicated that there were no subsurface archaeological deposits of conservation value within the areas to be impacted by the proposal.

A total of nine artefacts were recorded during test excavation, an overall artefact density of 0.75 artefacts per square metre. Overall, there is a low artefact density within subsurface deposits recorded by the test excavation investigations. The artefact density represents a standard 'background' expression of artefacts that are common in many New South Wales environments.

Based on the findings of the test excavations, it was concluded that further archaeological excavation at PAD2 and PAD3 is unnecessary because of the low artefact density in subsurface deposits, which have also been subject to land use disturbance.

During the test excavation program, a further isolated artefact was located adjacent to PAD3 and outside of the study area (Beaconsfield Rd IF-1).

15.2.5 Site recordings

As a result of the archaeological survey and test excavation program, six sites were recorded in the study area. These comprised:

- two surface isolated finds (MVRec IF1 and Beaconsfield Rd IF-1)
- four sites registered with the AHIMS register to account for the nine artefacts recovered from the test excavation program (Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3).

In addition, two isolated finds (BR-IF1 and BR-IF2) have been previously recorded in the study area.

The location of the four new site recordings is shown on Figure 15.3 and Figure 15.4. A summary of the site information is provided in Table 15.1.

Table 15.1 Sites recorded because of the test excavation program

AHIMS ID	Site name	Site type	Coordinates (GDA Zone 56)
52-4-0713	Beaconsfield Rd OS-1	Artefact scatter	259253E, 6176010N (centre)
52-4-0714	Beaconsfield Rd OS-2	Artefact scatter	258802E, 6176274N (centre)
52-4-0716	Beaconsfield Rd IF-2	Isolated find	258771E, 6176178N
52-4-0717	Beaconsfield Rd IF-3	Isolated find	258745E, 6176303N

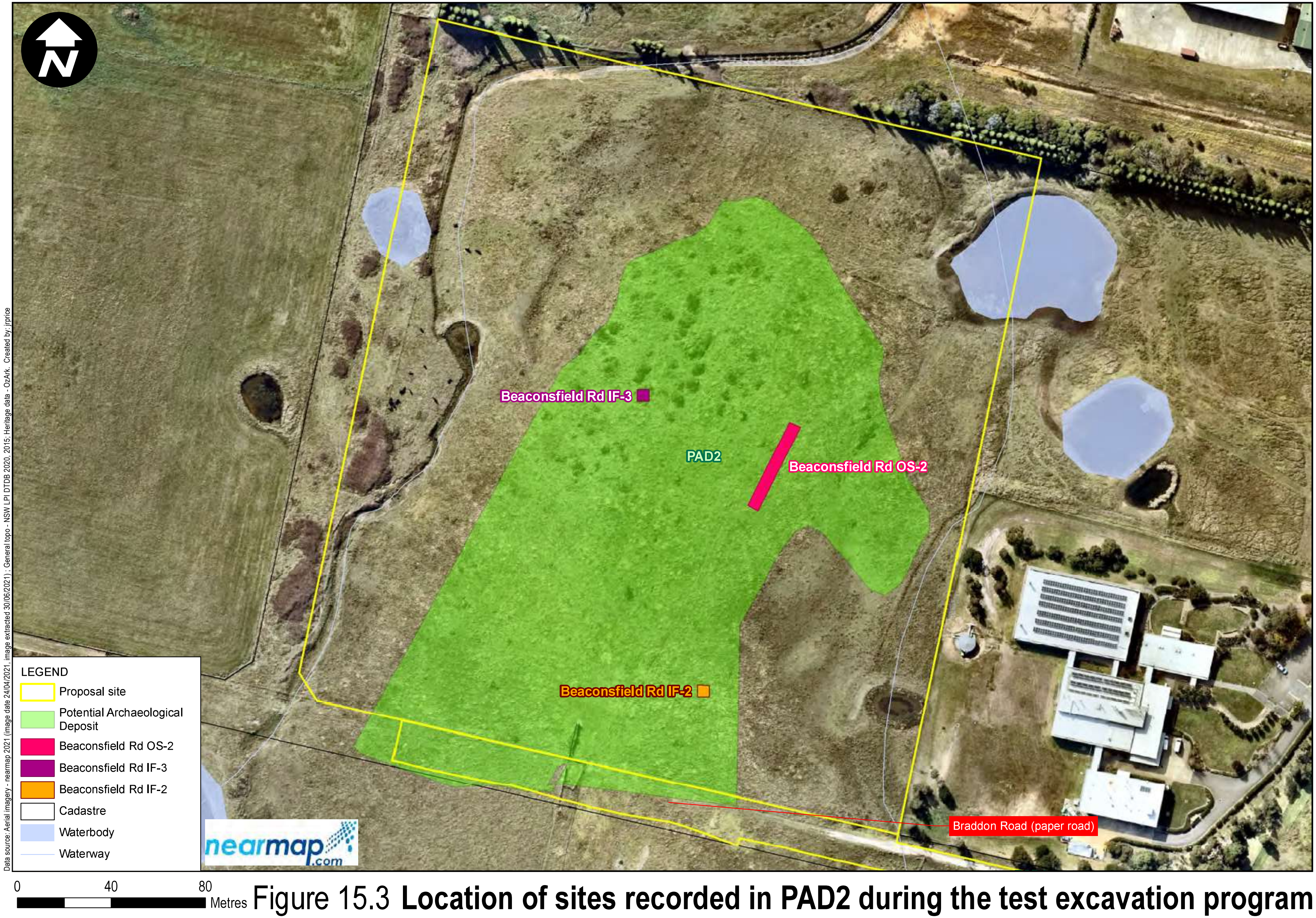


Figure 15.3 **Location of sites recorded in PAD2 during the test excavation program**

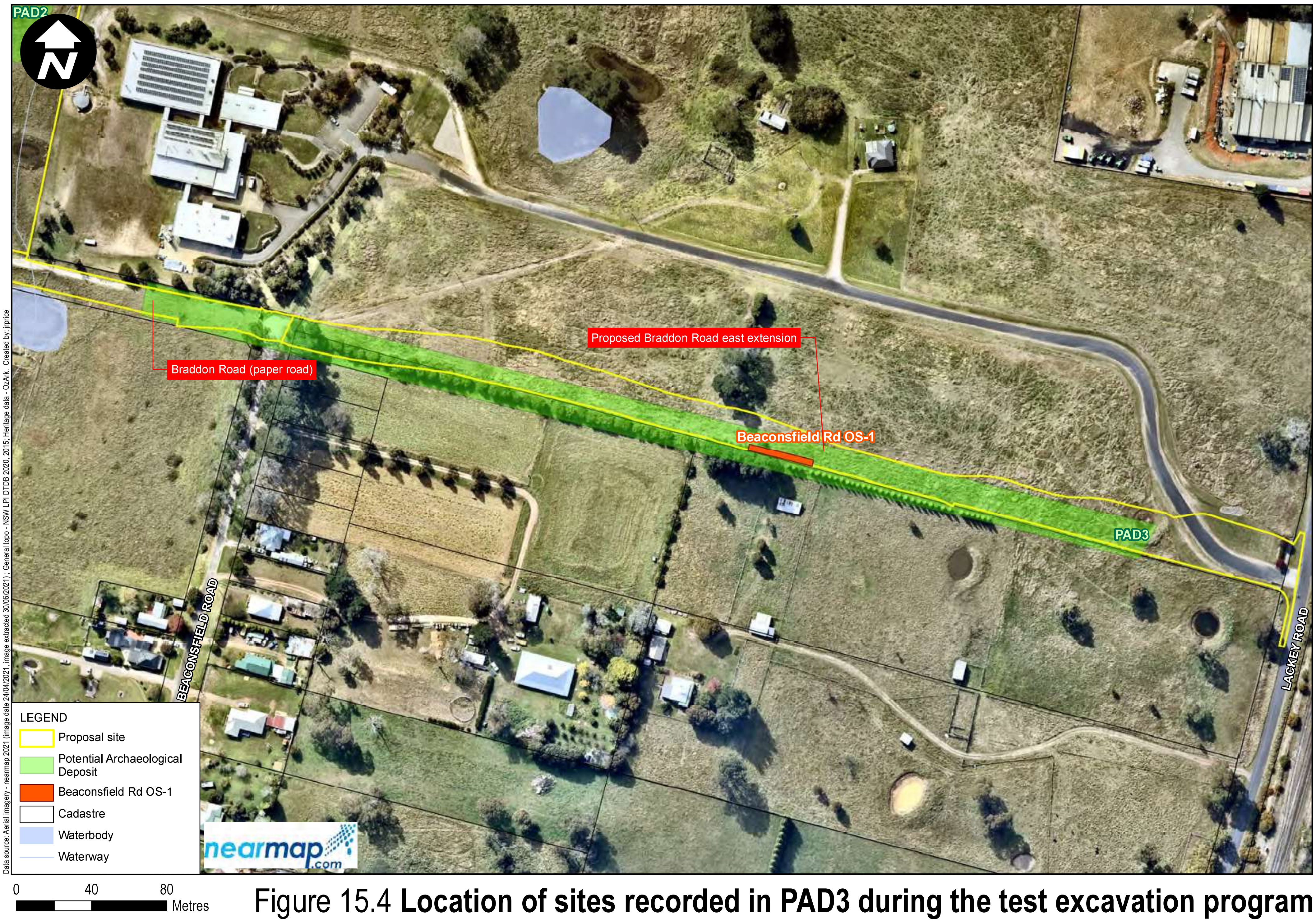


Figure 15.4 **Location of sites recorded in PAD3 during the test excavation program**

15.3 Impact assessment – construction

15.3.1 Assessed significance of the recorded sites

The *Burra Charter* defines cultural significance in terms of aesthetic, scientific, historic, and social values. Aboriginal cultural heritage is typically assessed according to its social and scientific significance. Other values may also be important. The assessment of significance provides a guideline for determining appropriate mitigation and management strategies.

Table 15.2 provides a summary of the significance assessment of Aboriginal cultural heritage sites recorded during the assessment. Further discussion is provided below.

Table 15.2 Aboriginal cultural heritage: significance assessment

Site name	Social or cultural value	Archaeological / scientific value	Aesthetic value	Historic value
MVRec IF1	High	Low	Low	Nil
Beaconsfield IF-1	High	Low	Low	Nil
Beaconsfield OS-1	Nil	Nil	Nil	Nil
Beaconsfield OS-2	Nil	Nil	Nil	Nil
Beaconsfield IF-2	Nil	Nil	Nil	Nil
Beaconsfield IF-3	Nil	Nil	Nil	Nil

Social or cultural value

The two recorded isolated finds (MVRec IF1 and Beaconsfield Rd IF-1) were provisionally assigned high cultural value as it was OzArk's experience that all artefacts are held in high value by the Aboriginal community as markers for past occupation of the Country and as a tangible connection to their ancestors.

The sites recorded during the test excavation program (Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3) were assigned nil significance as the artefacts have been removed from the landscape.

No further cultural values were identified by the RAPs based on their review of the draft Aboriginal Cultural Heritage Assessment Report and nor did anyone object to the fact that these sites have been afforded nil cultural significance as their recording is an administrative action only.

Archaeological/scientific value

The two recorded isolated finds (MVRec IF1 and Beaconsfield Rd IF-1) were assigned low scientific value as they are displaced artefacts without associated archaeological deposits. Both artefacts are representative of artefacts that are recorded in the region, and neither will be able to meaningfully add to our knowledge concerning past Aboriginal use of the area.

The sites recorded during the test excavation program (Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3) were assigned nil scientific significance as the test excavation program demonstrated that there are no associated intact archaeological deposits, and the low density of subsurface artefacts is representative of the broader landscape.

Aesthetic value

None of the recorded sites have aesthetic values as they are difficult for the layperson to interpret, and the historic land use has removed any aesthetic features that may have once existed.

Historic value

None of the sites have any known historic associations and all have nil historic values.

15.3.2 Likely impacts to Aboriginal heritage

Table 15.3 provides a summary of potential impacts to Aboriginal cultural heritage associated with the proposal.

The proposal would harm three isolated finds (MVRec IF1, BR IF1, and BR IF2) assessed as having high cultural values but low scientific values.

Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3 would be harmed by the proposal but these sites no longer have cultural heritage value as the artefacts have been removed from the landscape during the test excavations.

Isolated find Beaconsfield Rd IF-1 would not be harmed by the proposal and would be conserved in the landscape.

Table 15.3 Aboriginal cultural heritage: impact assessment

Site name	Type of harm (Direct/Indirect/None)	Degree of harm (Total/Partial/None)	Consequence of harm (Total/Partial/No Loss of Value)
MVRec IF1	Direct	Total	Total
Beaconsfield Rd IF-1	None	None	No loss of value
Beaconsfield Rd OS-1	Direct	Total	No loss of value
Beaconsfield Rd OS-2	Direct	Total	No loss of value
Beaconsfield Rd IF-2	Direct	Total	No loss of value
Beaconsfield Rd IF-3	Direct	Total	No loss of value
BR-IF1	Direct	Total	Total
BR-IF2	Direct	Total	Total

15.4 Impact assessment – operation

The operational areas of the plastics recycling and reprocessing facility and new access have been assessed in section 15.3. Further impacts on Aboriginal cultural heritage during operation are considered unlikely.

15.5 Mitigation and management measures

The measures listed in Table 15.4 would be implemented to minimise potential impacts to Aboriginal cultural heritage values within the study area during construction of the proposal.

Table 15.4 Aboriginal cultural heritage mitigation measures

Mitigation measure	Timing
Aboriginal cultural heritage management plan An Aboriginal cultural heritage management plan (ACHMP) would be developed prior to construction commencing to manage Aboriginal cultural heritage within the study area. The ACHMP would also provide policies for unexpected finds, including human skeletal material. The ACHMP would be developed in consultation with the RAPs.	Pre-construction/ Construction
To ensure that Beaconsfield Rd IF-1 is not harmed during the construction of the access road, the northern boundary of the study area adjacent to Beaconsfield Rd IF-1 would be temporarily fenced and signed. No vehicle movements or the storage of materials would be permitted to the north of this fence during construction. The fence would be removed following completion of construction.	Pre-construction/ Construction
An attempt would be made to locate the isolated finds MVRec IF1, BR-IF1, and BR-IF2 before the commencement of construction. This would be undertaken with the assistance of the Aboriginal community and all visible artefacts would be collected.	Pre-construction
The artefacts from the sites recorded during the test excavation program would be re-buried with any other artefacts collected within the study area. The way they are reburied, and the location of the reburial would be set out in the ACHMP.	Pre-construction

16. Urban design and visual

The chapter provides a summary of the potential urban design, landscape and visual impacts of constructing and operating the plastics recycling and reprocessing facility. A full copy of the assessment results is provided in Technical Report 7 – Landscape and Visual.

16.1 Approach and method

16.1.1 Legislative and policy context to the assessment

The assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

– The EP&A Act
– *Wingecarribee Local Environmental Plan 2010*
– Moss Vale Enterprise Corridor Development Control Plan 2012
– Design and Place State Environment Planning Policy (Draft)
– Guidelines relevant to the assessment of impacts:
  - *Local Character and Place Guideline* (NSW Government 2019)
  - *Better Placed* (Government Architect NSW 2017)
  - *Environmental impact assessment practice note EIA-N04 - Guideline for landscape character and visual impact assessment*, Version 2.2 (Transport for NSW 2020)
  - *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition (Landscape Institute and Environmental Management Assessment 2013)
  - AS 2482 *Control of Obtrusive Effects of Outdoor Lighting*.

Pursuant to the provisions of Clause 11 of the SRD SEPP, development control plans do not apply to SSD.

Notwithstanding the above, the proposal has been designed to have regard to the DCP wherever possible

16.1.2 Method

Study area

The study area for the landscape and visual impact assessment was two kilometres surrounding the proposal site. The study area was determined based on an analysis of the zone of theoretical visibility, a desktop study of aerial photographs and topographic maps considering both landform and land cover and previous studies.

Key tasks

The landscape and visual impact assessment generally involved:

– undertaking a desktop analysis to complete a preliminary assessment of the landscape and visual environment
– completing a review of legislation and policy
– undertaking a zone of theoretical visibility assessment
– two site inspections
– defining the existing landscape and visual environment
– determining landscape character zones and landscape values
– assessing the impacts to landscape character based on the sensitivity of the landscapes and the magnitude of change to landscape character
– assessing and selecting viewpoints

- preparing panorama photographic images and photomontages
- evaluating potential impacts on visual amenity based on the sensitivity of the viewpoint to change and the magnitude that is likely to occur
- developing mitigation measures to minimise and/ or manage landscape and visual impacts during construction and operation.

The urban design assessment generally involved:

- reviewing the existing surrounding environment with respect to urban design
- assessing the impacts of the proposal on urban design
- developing measures to mitigate and manage potential impacts identified

Zone of theoretical visibility assessment

Zone of theoretical visibility mapping is a computer-generated analysis which identifies land from which it is theoretically possible to view the components of the proposal. These were used primarily to guide the area of site analysis and representative viewpoint selection.

ESRI ArcGIS software was used to model the zone of theoretical visibility of the proposal. A digital elevation model was produced using five metre contour intervals. The zone of theoretical visibility was mapped using the following parameters:

- A viewing height of 1.7 metres, which is the average within the typical viewing level range of an adult
- Topography of the area

Site inspections

Two site inspections were undertaken by a Landscape Architect and Urban Designer on 5 March and 20 April 2021 to:

- inspect the site and appreciate views to / from sensitive visual receivers
- inspect publicly accessible locations identified in the desktop study as likely to provide views of the proposal, including roads and footpaths
- identify sensitive visual receiver locations
- assess the landscape character of the study area and identify landscape sensitivities
- undertake site photography suitable for photomontage preparation

The coordinates of each viewpoint were recorded during the site inspection.

16.1.3 How potential impacts have been avoided

The following measures have been adopted in the concept design to reduce the potential for visual and landscape impacts:

- making use of the existing topography and land slope to site and step down the buildings and external infrastructure to reduce the overall heights and visibility from surrounding receivers
- on the western boundary, setting back buildings by approximately 60 metres to avoid impacts to the western watercourse, and allowing a large open undeveloped area to be maintained as a riparian corridor
- on the eastern boundary, setting back buildings by approximately 35 metres, and enhancing the eastern watercourse with appropriate native wetland planting
- the height of the built form has been kept below the ridgeline, when viewed from viewpoint VP02.
- natural and colours and textures which reflect the surrounding landscape have been recommended.

16.1.4 Assessment criteria

Landscape value

Landscape value looks at designated and undesignated landscapes and holistically at all the elements such as the environmental, cultural, historical and visual/sensory elements that form the landscape. The value of the landscape from an international, national, local and community level is considered when applying a landscape value.

Table 16.1 outlines the landscape value definitions for each rating.

Table 16.1 Landscape value

Landscape Value	Definition
High	Landscape character elements in good or above average condition and/or that make a strong positive contribution to landscape character. May include nationally important features.
Medium	Landscape character elements in reasonably good condition and/or that make an average contribution to the local character, which may include locally important landscape features.
Low	Landscape character elements in below average condition and/or that are not particularly distinctive local features.

Landscape sensitivity and magnitude of landscape effects

The sensitivity of a landscape is judged on the landscape value (refer Table 16.1) and the landscapes susceptibility to change (refer Table 16.2) from a particular type of development. A judgement on the level of sensitivity is made and a rating of high, moderate or low applied.

Table 16.2 Landscape susceptibility to change

Landscape susceptibility	Definition
High susceptibility to change	The type of development proposed could have a detrimental effect on the landscape character, condition or value. Mitigation measures are unlikely to reduce the impacts of the change.
Moderate susceptibility to change	Any change caused by the type of development would be unlikely to have a significant adverse effect on the landscape character, condition or value that could not be mitigated.
Low susceptibility to change	Development of this type is unlikely to have an adverse effect on the landscape character, condition or value. Mitigation measures would be effective in neutralising adverse effects.

Table 16.3 Magnitude of change criteria (landscape)

Rating	Criteria
High	A substantial/obvious change to the landscape character due to total loss of, or change to, elements, features or characteristics of the landscape. Would cause a landscape to be permanently changed and its quality diminished.
Moderate	Discernible changes in the landscape character due to partial loss of, or change to elements, features or characteristics of the landscape, however has potential to be partly mitigated. The change would be out of scale with the landscape character, and at odds with the local pattern and landform and would leave an adverse impact on the landscape character.
Low	Minor loss or alteration to one or more key landscape character elements, features or characteristics, or the introduction of components that may be new but may not be uncharacteristic within the existing landscape character.
Negligible	Almost imperceptible or no change in the landscape character as there is little or no loss of/or change to the elements, features or characteristics of the landscape.

Visual sensitivity and magnitude of change to views and visual amenity

The evaluation of potential impacts on visual amenity is based on the sensitivity of the viewpoint (and the visual receiver it represents) to change (Table 16.4), and the magnitude of change that is likely to occur (Table 16.5).

Table 16.4 Sensitivity criteria (visual)

Rating	Criteria
High	Occupiers of residential properties, at home or going to or from, with long viewing periods, within close proximity to the proposed development; Communities that place value upon the landscape and enjoyment of views of their setting.
Moderate	Outdoor workers who have a key focus on their work who may also have intermittent views of the study area; Viewers at schools, or similar, when outdoor play and recreation areas are located within close proximity but viewing periods are limited; Occupiers of residential properties with long viewing periods, at a distance from or screened from the study area.
Low	Road users in motor vehicles, trains or on transport routes that are passing through or adjacent to the study area and therefore have short term views; Viewers indoor at their place of work, schools or similar.
Negligible	Viewers from locations where there is screening by vegetation or structures where only occasional screened views are available and viewing times are short; Road users in motor vehicles, trains or on transport routes that are passing through/adjacent to the study area and have partially screened views and short viewing times.

Table 16.5 Magnitude of change criteria (visual)

Rating	Criteria
High	A substantial/obvious change to the existing view due to total loss of, or change to, elements, features or characteristics of the view. Would cause a view to be permanently changed and its quality diminished.
Moderate	Discernible changes in the existing view due to partial loss of, or change to elements, features or characteristics of the view, however has potential to be partly mitigated. The change would be out of scale with the existing view, and would leave an adverse impact on the view.
Low	Minor loss or alteration to one or more key view elements, features or characteristics, or the introduction of components that may be visible but may not be uncharacteristic within the existing view.
Negligible	Almost imperceptible or no change in the view as there is little or no loss of/or change to the elements, features or characteristics of the view.

16.2 Existing environment

16.2.1 Land use and built form

The plastics recycling and reprocessing facility site is undeveloped land within a predominately rural landscape, which is in a state of transition to employment land and industrial activities. The site and wider rural landscape afford long range views north to the ridgelines of the Southern Highlands. Land uses in proximity to the plastics recycling and reprocessing facility site include farming and agricultural uses, rural living properties and large format industrial facilities.

The property immediately adjacent is the Garvan Institute's Australian Bioresources facility (refer Figure 16.5), which is a medical research facility, breeding and holding researching mice. The design of this facility is quite modest in terms of its massing and built form design, with the building pad level constructed on a low part of the site, surrounded by perimeter planting, to reduce its visual prominence. A number of other industrial businesses are located within one kilometre of the plastics recycling and reprocessing facility site including:

- Dux Hot Water – industrial manufacturing facility (refer Figure 16.4)
- Omya Australia – mineral processing facility (refer Figure 16.3)
- Moss Vale Recycled Timber Building Centre – recycled building materials
- Cromford Pope Holdings – polyurethane pipe manufacturing facility (refer Figure 16.1)

– A&I Coatings – polyurethane and fluoropolymers manufacturing

Figure 16.1 View of Cromford Pipe industrial premises along Collins Road, north of the proposal site

Figure 16.2 View north-west along Collins Road near proposal site

Figure 16.3 View of Omya Calcium Carbonate processing facility along Collins Road, north-east of the proposal site

Figure 16.4 View south-east along Collins Road of Dux facility

Figure 16.5 View of the proposal site in the foreground and the Australian Bioresources facility, located directly east of the site

Figure 16.6 View of industrial estate along Collins Road, north of the proposal site

These facilities include buildings up to 8,500 square metres area and approximately 12-18 metres in height. Larger structures are generally setback from public roads by at least 60 metres and generally have large areas of landscaped areas with mature vegetation and car parking between the road and the buildings. These large ‘green setbacks' generally help to integrate the facilities into the landscape, screen the industrial structures and reduce the visual impacts.

This wider area (1,100ha) is undergoing change due to the rezoning of land to industrial, supporting the growth of the Moss Vale Enterprise Corridor. Several new roads and new industrial estates are currently under construction, north of the proposal site. Existing industry activities range from light industry warehouses and sheds to large-format factories and processing facilities, with vertical towers and elements evident in some cases. The larger industrial facilities are generally setback from the local roads and accessed via private entrances.

16.2.2 Key visual elements

Key views are typically achieved from elevated locations within the study area. Of note are views from and towards the visually prominent ridgeline south and west of the plastics recycling and reprocessing facility site, protected by a Scenic Protection overlay. Other long-range views of note include views from the elevated areas further north, including Oxley Hill within Bowral.

Other visual elements within the immediate area include:

– a landscape of gently rolling green hills, with field boundary trees and residences dotted throughout
– the adjoining Australian Bio-resources facility (Garvan Institute) and nearby industrial facilities
– area of native woodland, linear mature Cypress tree windbreaks and rows of exotic evergreen trees

From Beaconsfield Road, the plastics recycling and reprocessing facility site levels drop by more than 10 metres, which provides a degree of screening. There are however exposed areas along Collins Road/Douglas Road, with sparse tree and hedgerow planting, from where the plastics recycling and reprocessing facility would be more visible.

16.2.3 Landscape

The surrounding landscape is characterised by a gently undulating or hilly rural setting, grassland pastures with boundary vegetation, and long-range views north, to the Southern Highlands ridgeline near Bowral. Land uses in proximity of the proposal site include farming and agricultural uses, rural living properties and large format industrial facilities.

Part of the study area is covered by a Scenic Protection overlay (on elevated land above 690 m AHD), however the proposal site is outside of this area.

A total of four landscape character zones were identified within the study area, including:

– Pastoral open undulating land (LCZ1)
– Rural residential fringe (LCZ2)
– Moss Vale town (LCZ3)
– Industrial and commercial (LCZ4)

The landscape character zones are shown on Figure 16.7 and described in the following sections.

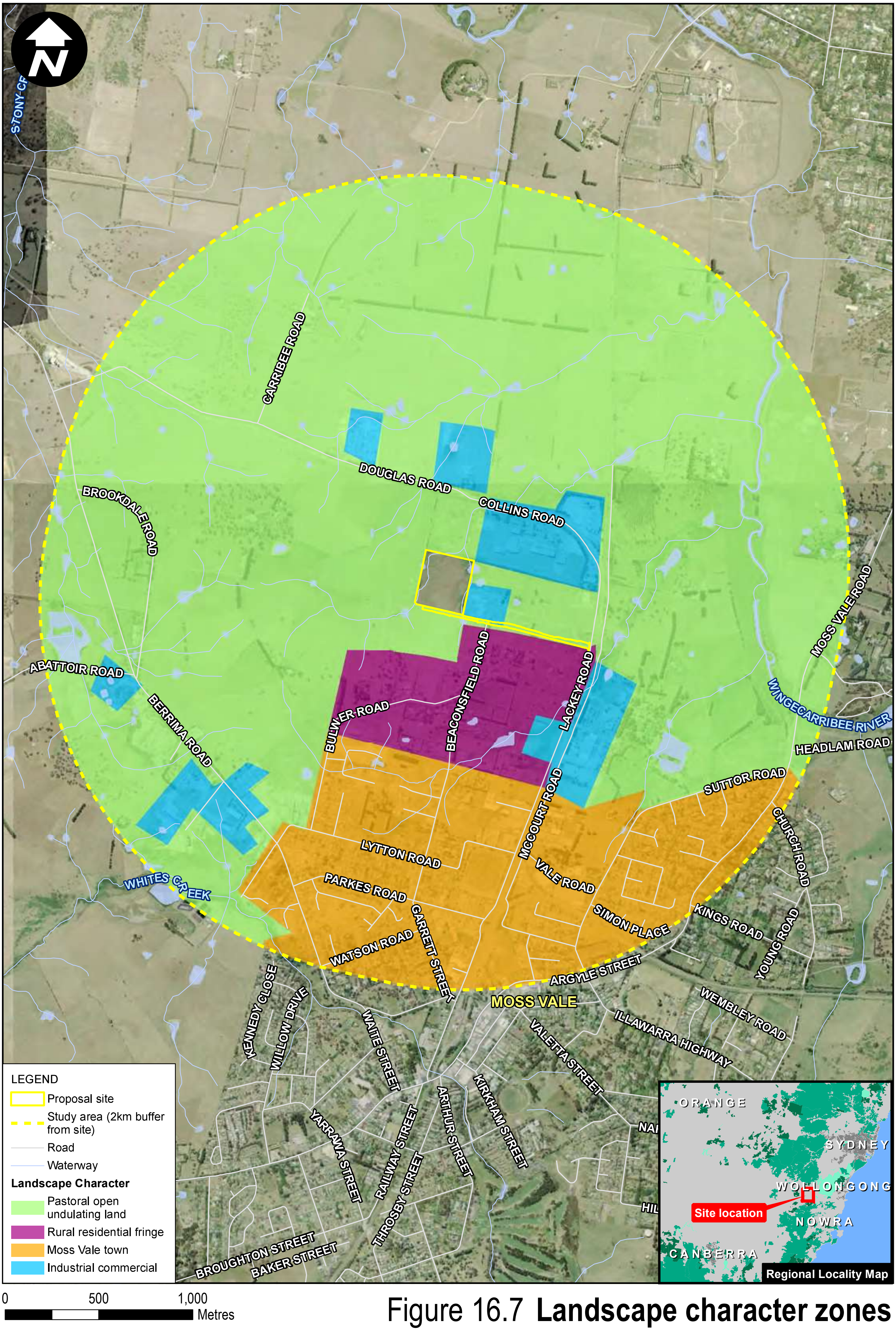


Figure 16.7 **Landscape character zones**

Landscape character zone 1 (LCZ1): Pastoral open undulating land

The key features of LCZ1 are described below and illustrated in Figure 16.8 to Figure 16.11.

Figure 16.8 ***View north from proposal site towards Southern Highlands ridgeline***

Figure 16.9 ***View looking west from proposal site, towards hilly landscape of farmland***

Figure 16.10 ***View looking south-west from proposal site of grassland landscape and scattered vegetation cover***

Figure 16.11 ***View of Wingecarribee River, north of proposal site***

LCZ1 comprises rural living and farmland areas around the periphery of Moss Vale town. This landscape character zone is characterised by a gently undulating and hilly landscape, dominated by paddocks and pastoral landscapes, with discrete areas of woodland, windbreak planting and hedgerow vegetation.

Key characteristics of LCZ1 include the following:

- A relatively large area of open, rural, green, undulating land, with expansive views to rolling hills and far ridgelines
- The landscape is largely comprised of grasslands and paddocks used for farming/pastoral activities
- Moderately sloping to rolling hilly landscape. West of the site, an elevated hillslope area is covered by a Scenic Protection Overlay
- Scattered rural dwellings, farming buildings and associated structures
- Punctuated with occasional industrial and commercial areas that make up LCZ4, located along Lackey Road, Collins Road and Berrima Road
- Areas of hedgerow and dense woodland are present, with vegetation heights of approximately 10-20 metres. Vegetation is typically along property boundaries, adjacent to roads and along drainage paths
- Small tributary network of drainage paths, dams and creeks, including Wingecarribee and Mittagong Creek
- Built form is typically rural residential dwellings of one to two-storeys with associated sheds and ancillary infrastructure associated with farming activities, including post and wire fencing

– Limited road and internal network, except for private driveways to properties setback from the road reserve.

Landscape character zone 2 (LCZ2): Rural residential fringe

The key features of LCZ2 are described below and illustrated in Figure 16.12 to Figure 16.15.

Figure 16.12 View from proposal site looking south towards LCZ2 rural residential properties

Figure 16.13 View looking west from Lackey Road towards rural properties along Beaconsfield Road

Figure 16.14 View looking north along Beaconsfield Road, comprising rural residential properties

Figure 16.15 View of typical rural residential properties along Minnows Drive

LCZ2 includes an area on the northern fringe of the Moss Vale township, comprising larger rural residential allotments. These are typically low-density 'lifestyle blocks' with single or double storey dwellings with large gardens or paddocks.

Key characteristics of LCZ2 include the following:

– Flat to moderately undulating topography, including a hilltop south of the proposal site, covered by a Scenic Protection Overlay
– Cleared land with some perimeter and ornamental garden planting, comprising native and non-native species
– Rural lifestyle properties that range from 1,000 to 3,500 square metres, allowing for hobby activities but are not generally used for farming and grazing activities
– Built form comprising typical residences of one to two-storeys setback approximately 10-15 metres from the road, typical of various architectural eras ranging from Federation and post-war styles to more modern constructions. Properties also feature ancillary structures such as water tanks, sheds and outbuildings
– Local roads providing access to rural residential properties, typically two-way sealed roads, without lighting or piped drainage infrastructure
– Fencing is varied but is predominately standard post and wire fencing, brick and timber feature fencing and aluminium fencing.

Landscape character zone 3 (LCZ3): Moss Vale town

The key features of LCZ3 are described below and illustrated in Figure 16.16 to Figure 16.19.

Figure 16.16 ***View of historic retail frontages along Argyle Street***

Figure 16.17 ***View of heritage listed Railway bridge structure near the main activity centre***

Figure 16.18 ***View of typical residential properties along Napper Close, south-west of the proposal site***

Figure 16.19 ***View of large-format commercial development along Berrima Road***

LCZ3 comprises the northern part of the Moss Vale township, south-east of the proposal site. This expanding area represents the main rural centre within the Southern Highlands region. It comprises low-density residential areas and a range of community and retail services, to support the local and visitor population. Moss Vale has a rich history and is one of the original settlements in this region.

Key characteristics of LCZ3 include the following:

– Flat to gently undulating topography with residential subdivision patterns, following the undulating land and capitalising on views from elevated rises
– A thriving 'high street' retail centre along Argyle Street, east of the rail line and a range of civic, community, open space and recreational facilities around the main retail village
– Low density residential development, typically one to two-storey houses, on standard residential blocks. Housing is typically setback 6-10 metres, with architectural styles that date back to the late 19^{th} Century
– Historic features from early settlement, including the main southern railway and Argyle Street railway bridge
– Strong tree lined street character, with the local road network typically comprising two-way sealed roads with formalised drainage and street lighting.

Landscape character zone 4 (LCZ4): Industrial commercial

The key features of LCZ4 are described below and illustrated in Figure 16.20 to Figure 16.25.

Figure 16.20 ***View of Australian Bioresources facility, located directly east of the proposal site***

Figure 16.21 ***View of industrial estate along Collins Road, north of the proposal site***

Figure 16.22 ***View of industrial premises along Collins Road, north of the proposal site***

Figure 16.23 ***View west along Collins Road near proposal site***

Figure 16.24 ***View of landscaped entry from Lackey Road to Australian Bioresources facility***

Figure 16.25 ***View north-east of railway line, running parallel to Collins Road / Douglas Road***

LCZ4 includes the commercial and industrial areas along the rail corridor and north-west of the main Moss Vale township, in proximity of the proposal site. LCZ4 comprises a mixture of light and heavy industrial activities, taking advantage of the rail and road connections in this part of Moss Vale, with the Greater Sydney Metropolitan region.

Key characteristics of LCZ4 include:

– Generally flat to moderately sloping landform, which is highly modified due to the nature and format of industrial and commercial activities
– Large land holdings with a number of industry business parks and subdivisions, some are currently under construction, on the northern side of Collins Road/Douglas Road
– Built form comprising large format industrial warehouses, sheds and manufacturing facilities, with large open areas for services and storage. Vertical shafts and structures associated minerals processing.
– Industrial building heights range on average from approximately seven metres to 20 metres, with homogenous colours and materiality. Older developments include predominately long corrugated iron sheds and steel structures with large landscape setbacks and mature screening vegetation. Newer developments (like the Australian Bioresources Garvan Institute) include architecturally designed buildings, with façade and roofline articulation, a range of materials and textures, and site-specific landscape design.
– Buildings that are typically set back from the road network by more than 20 to 30 metres, with hedgerow and screen planting along property boundaries and the road network, in some instances
– The network of major roads outside of the township, namely Lackey Road, Collins Road/Douglas Road, which are two-way sealed roads with gravel verges and sporadic planting
– The rail corridor traversing this landscape character zone, providing for freight connections. The railway corridor runs parallel to the main road network, typically at-grade or raised on small embankments with stone ballast and unfenced. There is an at-grade level crossing north of the site where Collins Road becomes Douglas Road. This is currently an uncontrolled crossing.

16.3 Impact assessment – construction

Construction works would result in temporary landscape and visual impacts.

It is anticipated that the majority of construction works would occur within the plastics recycling and reprocessing facility site. There would be a construction compound for the storage of materials, staff offices and laydown areas. It would potentially be visible from along Collins Road and nearby properties along Beaconsfield Road. While the impacts would be temporary in nature, these activities shall result in discernible change to the visual and landscape character of this area which is currently a largely rural landscape, used for pastoral purposes, with the areas along Collins and Lackey Road developed for large-scale industrial and commercial uses, which are typically well screened by perimeter planting.

There is also likely to be an increase in construction related traffic and personnel on site during the entire construction phase.

16.4 Impact assessment – operation

16.4.1 Landscape character impacts

Section 16.2.3 describes the four landscape character zones identified for the assessment. An assessment of the potential impacts on each landscape character zone is provided in this section.

Landscape character zone 1 (LCZ1): Pastoral open undulating land

The broader LCZ1 area has scenic value and makes a strong contribution to the local character. LCZ1 therefore has a **High** landscape value. Table 16.6 provides a summary of the assessment of potential landscape character impacts on LCZ1.

Table 16.6 LCZ1 impact assessment

Landscape character zone 1: Pastoral open undulating land	
Anticipated change to landscape character	The proposal site and planned works would mostly occur within LCZ1. The proposal involves construction and operation of a plastics recycling and reprocessing facility. The key elements include two main buildings approximately 16 metres high, and associated infrastructure for the storage, processing and transportation of finished recycled products. Planned works include a new road access including Braddon Road (currently unformed). Other ancillary infrastructure would include internal roads and hardstand areas for truck access and parking, two weighbridges, staff and visitor carparking, stormwater bioretention ponds and basins, fencing, landscaped bunds around the perimeter, lighting and signage installations.
Susceptibility to change	LCZ1 has a **High** susceptibility to change. As the predominant landscape character, LCZ1 makes a strong contribution to local and broader regional landscape character. It is both a productive landscape for farming/pastoral activities and has scenic value, allowing long-range views of the area. The type of development proposed could have a detrimental effect on the landscape character, condition or value. Mitigation measures are unlikely to reduce the impacts of the change.
Sensitivity to change	LCZ1 has a **High** sensitivity to change due to the high landscape value and susceptibility to change.
Magnitude of change	The magnitude of change would be **Low**. Although the introduction of a large-scale recycling facility would constitute a change to the landscape character for the immediate proposal site, these changes would occur within a small localised section of the wider character zone, and the overall landscape character of LCZ1 would be retained.
Significance of impact	The significance of impact for the proposal would be **Moderate** due to the high sensitivity of the landscape and proposal, although the proposal would introduce new features into the landscape, these changes would be localised and the overall character of LCZ1 would be retained. This landscape is also a newly zoned 'General Industrial' area and falls within the MVEC. It will therefore undergo significant development and a change in character in the future.

Landscape character zone 2 (LCZ2): Rural residential fringe

Parts of LCZ2 have scenic value contributing to the local character. LCZ2 therefore has a **Moderate** landscape character value.

There would be no impact on LCZ2 as the proposal would not affect nor change the elements that define this landscape character zone.

Landscape character zone 3 (LCZ3): Moss Vale town

Moss Vale performs an important administrative and retail/business function for the region. It is also an area with a distinct local character with a high level of amenity. LCZ3 holds significant visual, historic and social value, and as such has a **High** landscape character value.

There would be no impact on LCZ3 as the proposal would not affect nor change the elements that define this landscape character zone.

Landscape character zone 4 (LCZ4): Industrial commercial

Part of this industrial commercial character area includes the MVEC. The MVEC is an area earmarked for a range of commercial and industry activities, supported through provisions of the Wingecarabee LEP and DCP. As such, it is anticipated that this LCZ would expand within the surrounding rural landscape.

This area is a highly modified landscape and has a lower level of amenity and sensitivity however holds social and economic value as an emerging business and enterprise area. LCZ4 therefore has a **Low** landscape character value.

Table 16.7 provides a summary of the assessment of potential landscape character impacts on LCZ4 impact assessment.

Table 16.7 LCZ4 impact assessment

Landscape character zone 4: Industrial / Commercial	
Anticipated change to landscape character	There is no development within LCZ4 and works associated with the proposal are within LCZ1. There is an anticipated change on LCZ1 land which is adjacent to LCZ4, which would include the construction of a new road access connection to Lackey Road.
Susceptibility to change	The susceptibility to change for LCZ4 would be **Low.** The area is a modified landscape which is undergoing change. The proposed development would unlikely have an adverse effect on the landscape character, condition or value, that could not be mitigated.
Sensitivity to change	The sensitivity to change would be **Low** due to the low value and susceptibility to change.
Magnitude of change	The magnitude of change would be **Negligible**. The Moss Vale Enterprise corridor and transport networks within this area are expanding and being upgraded, to support the growth and expansion of this area as an industry and business centre. The introduction of a new road corridor would not be uncharacteristic within the existing landscape character.
Significance of impact	The significance of impact would be **Negligible**.

16.4.2 Visual impacts

Viewpoints

Viewpoint locations and sensitive receivers for the assessment were selected based on the existing environment analysis.

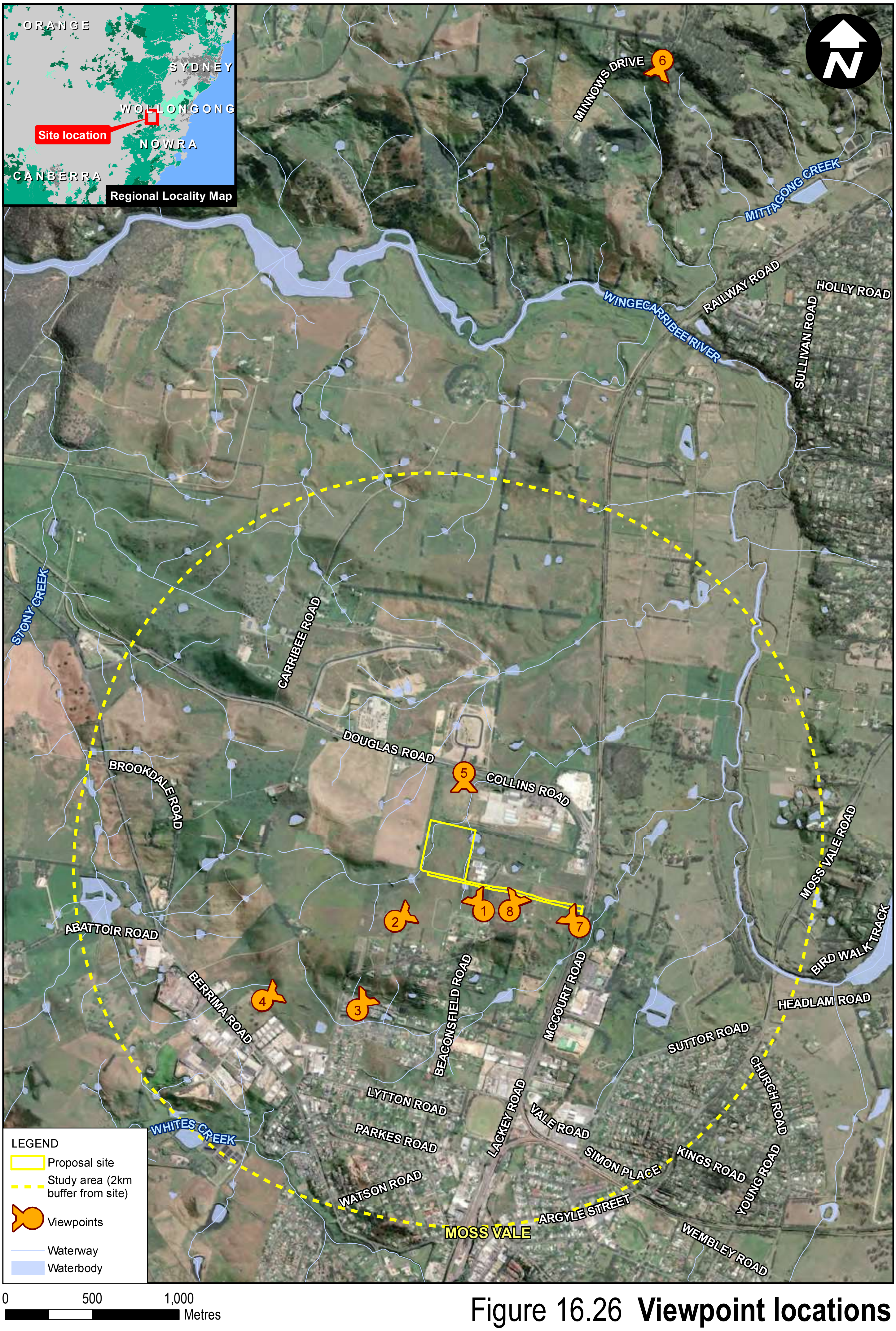
Sensitive visual receivers within the proposal viewshed include the following:

- Residents in dwellings with views to the proposal
- Road Users (including vehicle drivers, passengers, pedestrians and cyclists)
- Workers of the surrounding industrial and commercial areas

Table 16.8 and Figure 16.26 identify representative viewpoints for assessment of views from a range of sensitive visual receivers.

Table 16.8 Viewpoint locations

Viewpoint	Location	Description
Viewpoint location 1 (VP01)	Beaconsfield Road	VP01 is located on Beaconsfield Road representing residential receivers, looking north and west.
Viewpoint location 2 (VP02)	North of Bulwer Road	VP02 is located approximately 250 metres north of Bulwer Road representing residential receivers, looking north and east.
Viewpoint location 3 (VP03)	Napper Close	VP03 is located on Napper Close representing residential receivers, looking north and east.
Viewpoint location 4 (VP04)	Moss Vale General Cemetery	VP04 is located within Moss Vale General Cemetery looking north-east.
Viewpoint location 5 (VP05)	Collins Road	VP05 is located on Collins Road representing workers and road users, looking south.
Viewpoint location 6 (VP06)	Minnows Drive, Bowral	VP06 is located on Minnows Drive representing residential receivers, Bowral, looking south from the hill.
Viewpoint location 7 (VP07)	Lackey Road	VP07 is located on Lackey Road representing road users, looking northwest.
Viewpoint location 8 (VP08)	Residential receivers	VP08 is located within residential properties between Beaconsfield Road and Lackey Road, looking north.



Data source: Aerial imagery - Sixmaps 2021 Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community; General topo - NSW LPI DTDB 2020, 2015; Inset map - Geoscience Australia. Created by: jrprice

Figure 16.26 **Viewpoint locations**

Viewpoint location 1 (VP01): Beaconsfield Road

VP01 is located along Beaconsfield Road, VP01 is facing north-west as shown in Figure 16.27. Photomontages have been prepared for this viewpoint showing the view with the proposal with no mitigation (Figure 16.28), and with mitigation at year 10 post construction (Figure 16.29). Refer to Table 16.9 for assessment.

Figure 16.27 View from VP01 from Beaconsfield Road looking north and west

Figure 16.28 Photomontage from Beaconsfield Road looking north-west, without mitigation measures

Figure 16.29 Photomontage from Beaconsfield Road looking north-west, with mitigation measures at 10 years

Table 16.9 Viewpoint 1 – visual impact assessment

Criteria	Comments
Location and view direction	View from Beaconsfield Road looking north-west Location (MGA Zone 55); E: 809672 N: 6173899 Elevation: 700.1 m
Description of existing view	The view is from the road reservation, looking across a gently undulating rural residential landscape. The foreground shows the sealed road, with gravel and grassed verge, some mature trees and vegetation on the left and right of view along the property boundary. The middle of the view shows a long view across a green pastoral landscape, with an isolated area of industrial or commercial development located in the lower parts of the valley, to rolling wooded hills and a blue-green ridgeline of the Southern Highlands in the background. Linear windbreak planting can be seen at the field boundaries in the middle distance, with wooded hillsides in the far distance. A small section of the Australian Bioresources building is partially visible in the centre right of view, however it is mostly screened by roadside vegetation.
Anticipated change to view	The proposal would be in the centre of view, in the middle ground, comprising a new recycling and processing facility, with two main buildings and associated infrastructure. The proposal's building would be located approximately 200 metres from this location. The southern façade would be approximately 130 metres long and up to 16 metres high. Some residents in this area have properties looking out towards this open rural landscape and the proposal would partially change the character of this view. It is anticipated that this view will change in the near future, due to other industrial developments proposed as part of the MVEC.
Sensitivity to change	**High,** as this view represents occupiers of nearby residential properties along Beaconsfield Road in proximity of the proposal site, with long viewing periods. Value is placed on the landscape and enjoyment of views from their setting.
Magnitude of change	**High,** as there would be a substantial and obvious change to the existing view, due to introduction of new buildings, that are of a different character, scale and density to buildings within the surrounding rural landscape. Due to the size, scale and proximity of the building to the viewpoint, part of the long views towards the surrounding rural landscape would be obscured by the proposal. With the implementation of the proposed landscape plan, the building would be partially screened over time with the establishment of the proposed vegetation, as shown in Figure 16.28.
Significance of impact	**High**, resulting in substantial and obvious changes in the existing view due to partial loss of, or change to elements, features or characteristics of the view, however, has the potential to be partly mitigated by the screening vegetation over time. It should also be noted that the view to the vegetated ridgeline to the north-west remains visible and the built form does not disrupt the viewline to the New Berrima ridgeline. The landscape within this view is also a newly zoned 'General Industrial' and falls within the MVEC. It will therefore undergo significant development and changes to the view in the future would be anticipated.

Viewpoint location 2 (VP02) – Bulwer Road

VP02 is located at along Bulwer Road, VP02 is facing north-east as shown in Figure 16.30. Photomontages have been prepared for this viewpoint showing the view with the proposal with no mitigation (Figure 16.31), and with mitigation at year 10 post construction (Figure 16.32). Refer to Table 16.10 for assessment.

Figure 16.30 View from VP02 north of Bulwer Road looking north-east

Figure 16.31 Photomontage from north of Bulwer Road looking north-east, without mitigation measures

Figure 16.32 Photomontage from north of Bulwer Road looking north-east, with mitigation measures at 10 years

Table 16.10 Viewpoint 2 – visual impact assessment

Criteria	Comments
Location and view direction	View from 250 m north of Bulwer Road, looking north-east towards the proposal site Location (MGA Zone 55); E: 809614 N: 6173871 Elevation: 715.2 m
Description of existing view	The view is from an unnamed access track north of Bulwer Road, looking north-east across an open, pastoral rolling landscape with a prominent ridgeline of Southern Highlands in the far distance. The foreground consists of a steel gate and a grassed paddock, with an informal line of mature trees, logs and dead tree trunks. The mid-ground consists of a large open flat grass landscape, sloping down towards a linear windbreak of conifer trees. The background consists of rolling hills and woodlands, with scenic views towards a prominent blue ridgeline of the Southern Highlands in the far distance.
Anticipated change to view	The proposal would be approximately 350 metres away from this location. The proposed works include a new recycling and processing facility, with two main buildings and associated infrastructure. The southern façade would be approximately 130 metres long and up to 16 metres high. The land drops down away from this viewpoint and the proposal is set within the valley in the middle-ground, the upper part of the facility would be visible. Perimeter planting is proposed to the south of the proposal site on adjacent land, which would partially filter views of the proposal.
Sensitivity to change	**High,** as this view represents occupiers of nearby residential properties, with long viewing periods. Value is placed on the landscape and enjoyment of views from their setting.
Magnitude of change	**Moderate,** as there would be discernible changes in the existing view due to the introduction of the new buildings and partial loss of views to vegetation in the distant valley. However, there are existing buildings within the view along Collins Road and with the implementation of the proposed landscape plan, the proposed building would be partially screened over time with the establishment of the proposed vegetation, as shown in Figure 16.32.
Significance of impact	**High-Moderate**, resulting in discernible changes in the existing view due to the introduction of the proposed buildings within the existing view, however, this change has the potential to be partly mitigated by the screening vegetation over time. The landscape within this view is also a newly zoned 'General Industrial' and falls within the MVEC. It will therefore undergo significant development and changes to the view in the future would be anticipated.

Viewpoint location 3 (VP03) – Napper Close

VP03 is located at Napper Close, VP03 is facing north and east as shown in Figure 16.33. Refer to Table 16.11 for assessment.

Figure 16.33 View from VP03 Napper Close looking north-east

Table 16.11 Viewpoint 3 – visual impact assessment

Criteria	Comments
Location and view direction	View from Napper Close, looking north-east Location (MGA Zone 55); E: 808916 N: 6173374 Elevation: 692.6 m
Description of existing view	The view is looking towards a hilly rise from Napper Close. The foreground consists of a newly built residential subdivision area with dwellings along a bitumen local road, with concrete kerb and channel road edge, grass verges, young street trees, driveways and front gardens. On either side of the residential road are new single-story dwellings, with pitched roofs, garages and surrounding gardens. The middle view consists of houses located on elevated land, with extended driveways connecting the house down towards the street. On the far left of the view, behind the residences is a tall linear windbreak of evergreen trees, blocking the view to the rising hill. In the background to the right of view, a large rural living property is visible at the top of the hill surrounded by an open area of grassland paddock.
Anticipated change to view	The proposal would not be visible from this location due to the hill in the background screening views beyond.
Sensitivity to change	**High,** as this view represents occupiers of nearby residential properties, with long viewing periods. Value is placed on the landscape and enjoyment of views from their setting.
Magnitude of change	**Negligible**, as the proposal would not be visible from this location due to the hill in the background screening views beyond.
Significance of impact	The significance of impact is **Negligible**, as the magnitude of change is negligible.

Viewpoint location 4 (VP04) – Moss Vale General Cemetery

VP04 is located at the Moss Vale General Cemetery, VP04 is facing north-east as shown in Figure 16.34. Refer to Table 16.12 for assessment.

Figure 16.34 View from VP04 Moss Vale General Cemetery looking north-east

Table 16.12 Viewpoint 4 – visual impact assessment

Criteria	Comments
Location and view direction	View from northern boundary of Moss Vale General Cemetery, looking north-east Location (MGA Zone 55); E: 808378 N: 6173458 Elevation: 702.4 m
Description of existing view	This view is looking north-east, towards a gently rising hill, with the peak on the left side of the view. The foreground consists of densely growing grasses spreading continuously across the view, blending into the middle and background. A post and wire fence is visible in the middle-ground of the view. In the background, a linear group of mostly mature native trees can be seen on the top of the hill.
Anticipated change to view	The proposal would not be visible from this location, due to the hill in the background screening views beyond.
Sensitivity to change	**High**, as a cemetery, where communities visit and place value upon the scenic landscapes and sense of place. Viewers may also have longer and/or more frequent viewing periods from this location.
Magnitude of change	**Negligible**, as the proposal would not be visible from this location due to the hill in the background screening views beyond.
Significance of impact	The significance of impact is **Negligible**, as the magnitude of change is negligible.

Viewpoint location 5 (VP05) – Collins Road

VP05 is located along Collins Road, VP05 is facing south as shown in Figure 16.35. Refer to Table 16.13 for assessment.

Figure 16.35 View from VP05 Collins Road looking south

Table 16.13 Viewpoint 5 – visual impact assessment

Criteria	Comments
Location and view direction	View from Collins Road, looking south Location (MGA Zone 55); E: 809615 N: 6174710 Elevation: 684.9 m
Description of existing view	The view is from the Collins Road reservation looking south towards the proposal site. To the left of view, dense vegetation can be seen along the boundary of the Garvan Institute Australia Bioresources facility, which fully screens the facility and partially screens views to the residential buildings in the background. The view shows a relatively flat area of open grassland in the foreground fenced by a galvanized chain-link fence with razor wire top, along the road reserve boundary, with the landform sloping up away from the fence. The middle-ground is of the open paddock area of the proposal site, with densely clusters shrubs and trees to the left. Towards the mid-point of the view are scattered conifer trees on the proposal site's northern boundary. In the distance, at the higher elevation, occasional rural residential properties can be seen with some mature trees and shrubs along the ridgeline.
Anticipated change to view	The proposal would be located in the middle of the view. The proposed works include a new recycling and processing facility, with two main buildings and associated infrastructure. Due to the land levels dropping towards Collins Road, the proposal will be most visible from this location, however perimeter planting would in part, filter views towards the proposal.
Sensitivity to change	**Low**, representative of workers at nearby industrial premises and road users in motor vehicles, trains or on transport routes that are passing through or adjacent to the study area. These viewers would have short term views.
Magnitude of change	**High,** as there would be a substantial and obvious change to the existing view, due to introduction of new buildings, that are of a different character, scale and density to buildings within the surrounding rural landscape.
Significance of impact	**Moderate** as sensitivity to change is low and magnitude of change is high. This area has existing industrial facilities (such as the Dux facility, to the left and just out of view). The landscape within this view is also a newly zoned 'General Industrial' area and falls within the MVEC. It will therefore undergo significant development and changes to the view in the future would be anticipated.

Viewpoint location 6 (VP06) – Minnows Drive

VP06 is located at a clearing along Minnows Drive, VP06 is facing south as shown in Figure 16.35. Refer to Table 16.14 for assessment.

Figure 16.36 View from VP06 Minnows Drive Bowral looking south from the hill

Table 16.14 Viewpoint 6 – visual impact assessment

Criteria	Comments
Location and view direction	View from Minnows Drive, Bowral, looking south from the hill Location (MGA Zone 55); E: 811005 N: 6178763 Elevation: 816.1 m
Description of existing view	This view is from a highpoint on the Oxley Hill ridgeline at Minnows Drive. It is looking south between a gap in vegetation, with long range views over the Moss Vale valley and surrounding hills in the far distance. The foreground consists of a sealed bitumen road followed by tall roadside grasses and an informal row of mature native trees. On the middle right of view, overhead powerlines are visible. On far left and right, mature trees can be seen screening views to the background. Between the trees, the centre far background is a long view over a mostly rural landscape of undulating valleys, hills, paddocks and scattered areas of woodland. The Moss Vale settlement can be seen on hillslope in the far background, with occasional commercial and industrial buildings located in the lower parts of the valley, near the proposal site.
Anticipated change to view	The proposal would be visible from this location, in the middle of the view in the distance.
Sensitivity to change	**High,** as this view represents occupiers of nearby residential properties, with long viewing periods. Value is placed on the landscape and enjoyment of views from their setting.
Magnitude of change	**Negligible**, as the proposal would be an almost imperceptible change in the distance of this view.
Significance of impact	**Negligible**, as the proposal would be an almost imperceptible change in the distance of this view.

Viewpoint location 7 (VP07) – Lackey Road

VP07 is located at along Lackey Road, VP07 is facing north-west as shown in Figure 16.37. Refer to Table 16.15 for assessment.

Figure 16.37 View from VP07 Lackey Road looking northwest Table

16.15 Viewpoint 7 – visual impact assessment

Criteria	Comments
Location and view direction	View from Lackey Road, looking north-west Location (MGA Zone 55); E: 810230 N: 6173781 Elevation: 653.9 m
Description of existing view	This view is from Lackey Road, approximately 20 metres south of the intersection with the Australian Bioresources facility driveway. The view is looking north-west towards an elevated paddock screening views beyond the hilltop. The foreground consists of a sealed bitumen road with tall roadside grasses and occasional small shrubs along a paddock fence line. There are some established trees and shrubs further along the fence line, to the right of the view, screening views into the distance. Within the middle of view, an entry road meanders up and over the elevated paddock, which screens views beyond. The paddock is predominantly cleared with grass species, several fence lines and a couple of scattered established trees. Towards the far left of view, on top of the hill and in the distance, part of a residential property can be seen with a shed surrounded to the north by vegetation.
Anticipated change to view	The anticipated changes would include a new sealed two-lane access road adjacent to the left of the existing Australian Bioresources Facility driveway, in the centre of the view. This road would mostly be in cutting, with a retaining wall to the south side of the new road, and cut and fill earth works altering the existing paddock. Traffic entering the access road and frequent truck movements along the access road will be visible within the middle of the view. There would be possible infrastructure at the gate intersecting with Lackey Road as well as potential entrance lighting and signage. Some of the vegetation along the top of the hill, to the left of the view may be removed for the construction of the road.
Sensitivity to change	**Low**, representative of road users in motor vehicles or on transport routes that are passing through or adjacent to the study area. These viewers would have short term views.
Magnitude of change	**Moderate**, as the proposal would leave a discernible change in the existing view due to the change to the paddocks features and characteristics of the view. The change would be out of scale with the existing view and would leave an adverse impact on the view, however, has potential to be partly mitigated.
Significance of impact	**Moderate-low**, as sensitivity to change is low and magnitude of change is Moderate.

Viewpoint location 8 (VP08) – Residential receivers

VP08 is representative of views within private properties between Beaconsfield Road and Lackey Road, VP08 is facing north as shown in Figure 16.26. This viewpoint was unable to be accessed during the site visit therefore there is no photo and a general discussion of the impacts has been provided based on aerial imagery, refer to Table 16.16. An extensive site visit was undertaken from publicly accessible areas surrounding these properties which assisted the author in understanding the existing topography and vegetation within the area.

Table 16.16 Viewpoint 8 – visual impact assessment

Criteria	Comments
Location and view direction	Representative of views from private properties between Beaconsfield Road and Lackey Road, looking north Location (MGA Zone 55); E: 809831 N: 6173892 Elevation: N/A
Description of existing view	This view represents typical views north from within the residential properties adjacent to the proposal. The views would generally be across an open paddock with vegetation aligning nearby fence lines. The foreground may consist of a residential fence and a grassed paddock or private garden, with mature trees filtering views. The mid-ground would likely consist of an open grass landscape, sloping to the right of view. The background may consist of rolling hills and woodlands, with scenic views towards a prominent blue ridgeline of the Southern Highlands in the far distance.
Anticipated change to view	The proposal would be partially visible from this location, in the middle of the view. The anticipated changes would include a partially sunken road (with retaining walls up to seven metres high) with cut and fill earth works altering the existing paddock. There may be removal of screening vegetation within and along fence lines near the proposal access track, however the design has been aligned to avoid removal of existing vegetation, where possible. Traffic would be expected to run along the new access road, including frequent truck movements within the middle of the view.
Sensitivity to change	**High,** as this view represents occupiers of nearby residential properties, with long viewing periods. Value is placed on the landscape and enjoyment of views from their setting.
Magnitude of change	**Moderate**, as the proposal would leave a discernible change in the existing view due to the change to the paddocks features and characteristics of the view. The change would be out of scale with the existing view and would leave an adverse impact on the view, however, has potential to be partly mitigated.
Significance of impact	**High-Moderate**, as sensitivity to change is high and magnitude of change is moderate.

16.4.3 Urban design

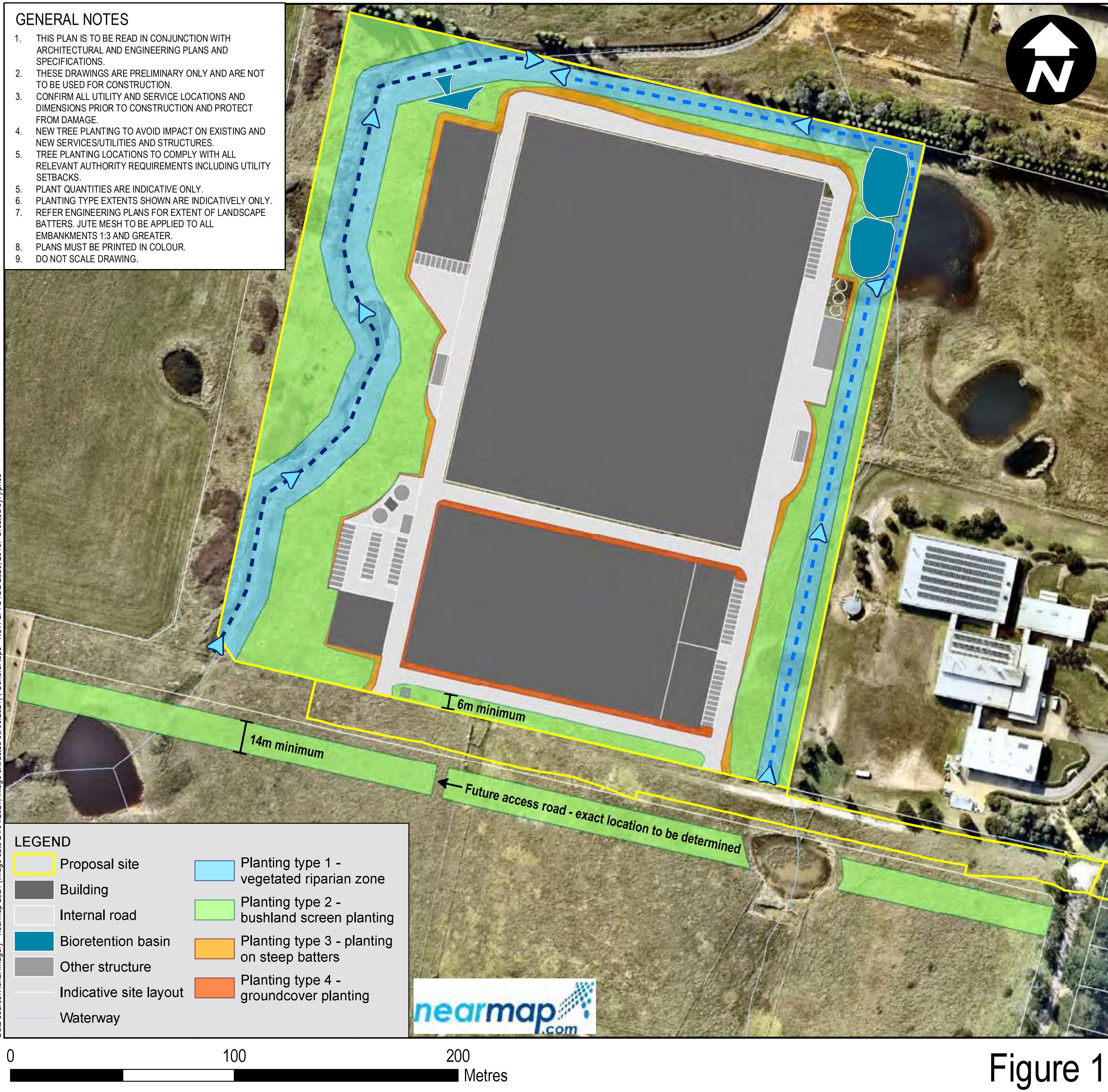
The character of the study area would be changed by the proposal. Whilst the area consists of a mix of land uses and zones, the underlying character of this landscape is mostly pastoral with long views to ridgelines punctuated by low-scale built form. Occasional large scale industrial facilities are present, particularly along Collins Road and Lackey road, however they are typically well screened by vegetation. The anticipated transition to ‘Enterprise Corridor’ industrial zone with predominantly large industrial buildings and associated facilities will require concerted effort to mitigate.

Mitigation would be possible through the use of sensitive and considered architecture and landscape design that considers façade articulation, built-form setbacks, architectural screening, and high-quality landscape treatments for visual amenity and screening. A concept landscape design has been prepared and is shown in Figure 16.38.

The detailed design phase of the proposal would take into consideration the benchmark projects outlined in section C-2 of Technical Report 7 – Landscape and Visual and DCP recommendations, where possible.

GENERAL NOTES

1. THIS PLAN IS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL AND ENGINEERING PLANS AND SPECIFICATIONS.
2. THESE DRAWINGS ARE PRELIMINARY ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION.
3. CONFIRM ALL UTILITY AND SERVICE LOCATIONS AND DIMENSIONS PRIOR TO CONSTRUCTION AND PROTECT FROM DAMAGE.
4. NEW TREE PLANTING TO AVOID IMPACT ON EXISTING AND NEW SERVICES/UTILITIES AND STRUCTURES.
5. TREE PLANTING LOCATIONS TO COMPLY WITH ALL RELEVANT AUTHORITY REQUIREMENTS INCLUDING UTILITY SETBACKS.
5. PLANT QUANTITIES ARE INDICATIVE ONLY.
6. PLANTING TYPE EXTENTS SHOWN ARE INDICATIVELY ONLY.
7. REFER ENGINEERING PLANS FOR EXTENT OF LANDSCAPE BATTERS. JUTE MESH TO BE APPLIED TO ALL EMBANKMENTS 1:3 AND GREATER.
8. PLANS MUST BE PRINTED IN COLOUR.
9. DO NOT SCALE DRAWING.



LEGEND

- Proposal site
- Building
- Internal road
- Bioretention basin
- Other structure
- Indicative site layout
- Waterway
- Planting type 1 - vegetated riparian zone
- Planting type 2 - bushland screen planting
- Planting type 3 - planting on steep batters
- Planting type 4 - groundcover planting

PLANTING SCHEDULE

BOTANICAL NAME	COMMON NAME	HEIGHT (m)	WIDTH (m)	POT SIZE	PERCENTAGE	QUANTITY
Planting Type 1 - Vegetated Basin and Riparian planting						
Trees						
Eucalyptus ovata	Swamp Gum	20	15	Tubestock	1%	116
Eucalyptus quadrangulata	Coast White Gum	50	20	Tubestock	1%	116
Eucalyptus viminalis	Manna Gum	30	15	Tubestock	1%	116
Eucalyptus elata	River Peppermint	30	15	Tubestock	1%	116
Casuarina cunninghamiana subsp. *cunninghamiana*	River Oak	35	15	Tubestock	1%	116
Eucalyptus mannifera subsp. *mannifera*	Brittle Gum	20	10	Tubestock	1%	116
Shrubs						
Acacia dealbata	Silver Wattle	15	12	Plug	3%	1,744
Melaleuca hypericifolia	Hillock Bush	6	4	Plug	3%	1,744
Hakea microcarpa	Small-fruit Hakea	2	2	Plug	3%	1,744
Leptospermum grandifolium	Mountain Tea Tree	4	2	Plug	3%	1,744
Leptospermum morrisonii	Tea Tree	3	1	Plug	3%	1,744
Leptospermum obovatum	River Tea Tree	2	1.5	Plug	3%	1,744
Melaleuca armillaris	Bracelet honey myrtle	5	3	Plug	3%	1,744
Grasses						
Baloskion fimbriatum	Baloskion fimbriatum	0.8	0.5	Plug	4%	465
Persicaria decipiens	Slender Knotweed	0.3	0.5	Plug	4%	465
Baloskion fimbriatum	Baloskion fimbriatum	0.85	0.5	Plug	4%	465
Persicaria hydropiper	Water Peppers	1.2	0.5	Plug	4%	465
Epilobium billardiereanum subsp. *Cinereum*	Epilobium billardiereanum subsp.	1	0.5	Plug	3%	349
Schoenus apogon	Common Bog-rush	0.15	0.3	Plug	3%	349
Myriophyllum variifolium	Myriophyllum variifolium	0.15	1	Plug	3%	349
Schoenoplectus validus	Schoenoplectus validus	2	1	Plug	3%	349
Isolepis fluitans	Floating Scirpus	0.1	1	Plug	3%	349
Isolepis inundata	Swamp Club-rush	0.5	0.5	Plug	3%	349
Centipeda cunninghamii	Old Man Weed	0.2	0.3	Plug	3%	349
Eleocharis acuta	Eleocharis acuta	0.9	0.5	Plug	3%	349
Lilaeopsis polyantha	Creeping Crantzia	0.5	0.5	Plug	3%	349
Centipeda elatinoides	Sneezeweed	0.3	0.5	Plug	3%	349
Basin Planting						
Acacia elata	Mountain Cedar Wattle	20	15	Plug	3%	
Machaerina tetragona	Square Twig-sedge	1	0.5	Plug	3%	1,744
Carex gaudichaudiana	Gaudichaud's Sedge	1	0.5	Plug	3%	1,744
Eleochaeris sphacelata	Tall Spikerush	1	0.5	Plug	3%	1,744
Hydrocotyle peduncularis	Pennywort	0.2	0.5	Plug	3%	1,744
Isachne globosa	Swamp Millet	0.7	0.5	Plug	3%	1,744
Juncus usitatus	Common Rush	1	0.5	Plug	3%	1,744
Lepyrodia anarthria	Scale Rush	0.7	0.5	Plug	3%	1,744
Ranunculus inundatus	River Buttercup	0.15	0.15	Plug	3%	1,744
Planting Type 2 - Bushland screen planting						
Trees						
Eucalyptus cinerea subsp. *cinerea*	Argyle Apple	15	8	Tubestock	1%	72
Eucalyptus cypellocarpa	Monkey Grey Gum	50	20	Tubestock	1%	72
Leptospermum polygalifolium subsp. *polygalifolium*	Tantoon	10	5	Tubestock	1%	72
Eucalyptus viminalis	Ribbon Gum	30	15	Tubestock	1%	72
Allocasuarina littoralis	Black She-oak	15	5	Tubestock	3%	217
Acacia floribunda	White Sally Wattle	6	2	Tubestock	2%	145
Acacia binervata	Two-veined Hickory	15	7	Tubestock	2%	145
Acacia melanoxylon	Blackwood	20	10	Tubestock	2%	145
Acacia mearnsii	Black Wattle	8	5	Tubestock	2%	145
Persoonia linearis	Narrow-leaved Geebung	5	4	Tubestock	2%	145
Hakea salicifolia	Finger Hakea	3	2	Tubestock	2%	145
Melaleuca styphelioides	Prickly-leaved Tea Tree	10	3	Tubestock	2%	145
Leptospermum trinervium	Flaky-barked Tea-tree	5	3	Tubestock	2%	145
Eucalyptus radiata	Narrow-leaved Peppermint	15	8	Tubestock	2%	145
Eucalyptus globoidea	Stringy Bark	40	15	Tubestock	2%	145
Eucalyptus mannifera	Brittle Gum	20	13	Tubestock	2%	145
Eucalyptus pauciflora	Snow Gum	12	6	Tubestock	3%	217
Eucalyptus amplifolia	Cabbage Gum	30	15	Tubestock	1%	72
Eucalyptus dive	Broad-leaved Peppermint	20	15	Tubestock	1%	72
Shrubs						
Ozothamnus diosmifolius	White Dogwood	5	1	Plug	2%	578
Hardenbergia violacea	Waraburra	3	2	Plug	2%	578
Olearia viscidula	Wallaby Weed	2.5	2.5	Plug	2%	578
Grasses						
Dianella caerulea	Paroo Lily	1	2	Plug	3%	4,337
Lepidosperma laterale	Sword-sedge	1	0.8	Plug	3%	4,337
Austrostipa rudis subsp. nervosa	Austrostipa rudis subsp. nervosa	0.3	0.2	Plug	3%	4,337
Carex longebrachiata	Drooping Sedge	0.8	0.5	Plug	3%	4,337
Lepidosperma urophorum	Sword-sedge	1.5	1	Plug	3%	4,337
Lomandra multiflora subsp. *multiflora*	Many-flowered mat-rush	1	0.5	Plug	3%	4,337
Lomandra longifolia	Spiny-headed Mat-rush	1	0.5	Plug	3%	4,337
Themeda triandra	Kangaroo Grass	1.5	0.5	Plug	3%	4,337
Austrostipa rudis	Austrostipa	1.2	0.5	Plug	3%	4,337
Microlaena stipoides	Weeping Grass	0.2	0.2	Plug	3%	4,337
Groundcovers						
Kennedia rubicunda	Dusky Coral-pea	-	-	Plug	3%	2,602
Glycine clandestina	Glycine	-	-	Plug	3%	2,602
Lobelia purpurascens	Whiteroot	0.3	1	Plug	3%	2,602
Hibbertia scandens	Climbing Guinea Flower	2	4	Plug	3%	2,602
Centella asiatica	Gotu Cola	0.2	5	Plug	3%	2,602
Hypericum gramineum	St Johns Wort	0.4	0.5	Plug	3%	2,602
Poranthera microphylla	Small Poranthera	0.15	0.5	Plug	3%	4,337
Gonocarpus tetragynus	Common Raspwort	0.3	0.2	Plug	3%	4,337
Veronica plebeia	Creeping Speedwell	1	0.5	Plug	3%	4,337
Viola hederacea	Native Violet	0.2	0.5	Plug	3%	4,337
Planting Type 3 - Planting on steep batters						
Shrubs						
Ozothamnus diosmifolius	White Dogwood	5	1	Plug	4%	73
Hardenbergia violacea	Waraburra	3	2	Plug	4%	73
Olearia viscidula	Wallaby Weed	2.5	2.5	Plug	4%	73
Leucopogon lanceolatus var. *lanceolatus*	Leucopogon lanceolatus var.	0.3	1	Plug	4%	73
Epacris microphylla	Coral Heath	1	0.4	Plug	4%	73
Leptospermum continentale	Prickly Tea-tree	2	2	Plug	4%	73
Leptospermum myrtifolium	Grey Tea-tree	3	2	Plug	4%	73
Leptospermum obovatum	Leptospermum obovatum	3	2	Plug	4%	73
Acacia longifolia subsp. *longifolia*	Sydney Golden Wattle	10	5	Plug	4%	73
Grasses						
Dianella caerulea	Paroo Lily	1	2	Plug	4%	365
Lepidosperma laterale	Sword-sedge	1	0.8	Plug	4%	365
Austrostipa rudis subsp. nervosa	*Austrostipa rudis subsp. nervosa*	0.3	0.2	Plug	4%	365
Lepidosperma urophorum	Sword-sedge	1.5	1	Plug	4%	365
Opercularia diphylla	stinkweed	0.3	0.2	Plug	4%	365
Lomandra multiflora subsp. *multiflora*	Many-flowered mat-rush	0.9	0.5	Plug	4%	365
Lomandra longifolia	Spiny-headed Mat-rush	1	0.5	Plug	3%	273
Themeda triandra	Kangaroo Grass	1.5	0.5	Plug	3%	273
Austrostipa rudis	Austrostipa	1.2	0.5	Plug	3%	273
Microlaena stipoides	Weeping Grass	0.2	0.2	Plug	3%	273
Gonocarpus tetragynus	Common Raspwort	0.3	0.2	Plug	3%	273
Veronica plebeia	Creeping Speedwell	1	0.5	Plug	3%	273
Groundcovers						
Glycine clandestina	Glycine	-	-	150mm	3%	164
Kennedia rubicunda	Dusky Coral-pea	-	-	150mm	3%	164
Lobelia purpurascens	Whiteroot	0.3	1	150mm	3%	164
Hibbertia scandens	Climbing Guinea Flower	2	4	150mm	3%	164
Hypericum gramineum	St Johns Wort	0.4	0.5	150mm	3%	164
Poranthera microphylla	Small Poranthera	0.15	0.5	150mm	3%	273
Viola hederacea	Native Violet	0.2	0.5	150mm	3%	273
Planting Type 4 - Groundcover planting						
Hardenbergia violacea	Purple Coral Pea	3	2	150mm	100%	2,313
Total Plant Count						**120,189**

Data source: Aerial imagery - nearmap 2021 (image date 24/04/2021, image extracted 30/06/2021) ; General topo - NSW LPI DTDB 2020, 2015. Created by: jrprice

Figure 16.37 **Concept landscape plan**

16.5 Mitigation and management measures

16.5.1 Construction

The measures listed in Table 16.17 would be implemented to manage landscape and visual impacts during construction.

Table 16.17 Landscape and visual mitigation measures – construction

Mitigation measure	Timing
'Early works' screening planting on the adjacent E4 portion of Lot 11 DP 1084421 (also owned by the proponent) would be implemented at the earliest opportunity, to reduce visual impacts from both the construction phase and operation phase	Pre-construction
Staging of works would be considered to undertake perimeter buffer planting in advance of construction works, particularly in locations where short-term visual mitigation would be beneficial. This would include larger-sized trees and shrub planting stock	Pre-construction
Seed collection of local provenance species would be undertaken for use in the revegetation	Pre-construction
All practical measures would be taken to ensure construction equipment, stockpiles, and other visible elements are located away from rural residential properties and sensitive views, as much as possible	Construction
Should any equipment or stockpiles be located in a visually prominent location for any reasonable period of time, screening measures such as hoarding and practices would be incorporated to ensure the site is kept tidy and visibility reduced.	Construction
No-go-zones would be implemented around drainage and water capture areas, and tree protection fencing would be implemented as needed, to support vegetation retention during construction.	Construction

16.5.2 Operation

The measures listed in Table 16.18 would be implemented to manage landscape and visual impacts during operation.

Table 16.18 Landscape and visual mitigation measures – operation

Mitigation measure	Timing
Design development As the design progresses, the proposal would continue to be refined to minimise the potential impacts on landscape character and views to the plastics recycling and reprocessing facility site. Design features that would be considered during detailed design include: – Layout: • working with the existing topography and land slope, to optimise the siting of buildings and external infrastructure components, in a way which minimises the visual and landscape impacts for surrounding uses • minimising (and avoiding where possible) potential impacts to existing drainage corridors and nearby waterways • appropriate setbacks from public and private viewpoints, and suitable space for perimeter planting • having regard to the surrounding vehicular, pedestrian and cycling networks • achieve a well-integrated solution which achieves seamless integration between internal pathways and these surrounding networks • examine and address key vantage points and views from more exposed sections along Collins Road – Alignment and design of new access road: • roadside planting and strategic use of lighting, to maintain the amenity of nearby rural residential properties • taller canopy trees and screening vegetation along the length of newly proposed access routes, leading to the plastics recycling and reprocessing facility, to make a positive contribution to the landscape setting in this location	Detailed design

Mitigation measure	Timing
• retention of the existing screening planting to help mitigate views towards the proposed access road, where possible (excluding the interface with Beaconsfield Road, where tree removal is necessary) • a planted entry statement with signage from the new entrance along Lackey Road consistent with the aesthetic and character seen within the broader Moss Vale township. Signage in accordance with and consistent with State Environmental Planning Policy 64 – Advertising and Signage (SEPP 64). – Buildings and structures: • built form design strategies to minimise the footprint, height and bulk of the building, by avoiding large blank facades without suitable articulation • building materials and finishes compatible with surrounding visual environment and colours and materials that are sensitive to the surrounding landscape: a. bright colours that would draw the eye and reflective surfaces would be avoided b. a palette of natural, earthy tones that do not detract from long range views of the surrounding rural landscape, would be adopted – Landscaping and setbacks: • planting in accordance with the Landscape Concept Plan provided in Figure 16.38 • a minimum 15-metre-wide landscaped area along lot frontages to internal access roads and along boundaries with rural zoned land outside the MVEC, and minimum 3-metre-wide landscaped area along the side and rear boundaries • plant selection within the plastics recycling and reprocessing facility site and along the new access road that reflect the palette of the area, and use compatible local native species selected from Council's native species list • more transparent, open-style perimeter fencing (rather than solid, impermeable structures, except if needed for retaining purposes) constructed of natural materials • where possible, retaining existing vegetation and where not possible, providing replacement vegetation to assist in screening the proposed built form from the surrounding roads, residential areas and scenic viewpoints – Lighting: • lighting provided in accordance with the Australian Standards for outdoor lighting, AS/NZS 4282:2019 *Control of the Obtrusive Effects of Outdoor Lighting*, to minimise lighting spill within the area • the use of eco lighting and, where appropriate, the use of directional luminaires, shields and baffles to minimise sky glow and light spill for surrounding rural residential properties	

17. Biodiversity

The chapter provides a summary of the potential biodiversity impacts of constructing and operating the plastics recycling and reprocessing facility. A full copy of the assessment results is provided in Technical Report 1 – Biodiversity Development Assessment Report.

17.1 Approach and method

17.1.1 Legislative and policy context to the assessment

The assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

– BC Act, EPBC Act and *Fisheries Management Act 1994* (FM Act)
– Biodiversity Conservation Regulations 2017
– Guidelines relevant to the assessment of impacts:
  - *Biodiversity Assessment Method* (BAM) (OEH 2017a)
  - *Biodiversity Assessment Method Calculator Users Guide* (OEH 2017b)
  - *NSW Groundwater Dependent Ecosystem (GDE) Policy* (DLWC 2002)

17.1.2 Method

Study area and locality

The study area for the biodiversity assessment was the area that was subject to field survey and assessed for direct or indirect impacts that may arise from the proposal.

The term 'locality' refers to the area within a 10 kilometre radius of the proposal site.

Key tasks

The biodiversity assessment generally involved:

– undertaking desktop literature and database review to describe the existing environment and landscape features of the study area and to:
  - identify the suite of threatened biota potentially affected by the proposal
  - identify potential presence of groundwater dependent ecosystems on or near the proposal site
– field surveys in accordance with the BAM to describe the biodiversity values of the proposal site and surrounding study area and determine the likelihood of threatened biota and their habitats occurring in the proposal site or being affected by the proposal
– determining reasonable actions to avoid and minimise impacts to biodiversity values
– completing calculations using the credit calculator version 1.3.0.00 to quantify the residual biodiversity impacts of the proposal and to determine the ecosystem and species credits that would be required to offset these impacts

Field surveys

Surveys of the proposal site were conducted in accordance with the BAM and with reference to appropriate threatened species survey guidelines for targeted species.

The survey effort undertaken for the assessment is summarised in Table 17.1. Further information is provided in section 2.2 of Technical Report 1 – Biodiversity Development Assessment Report.

Table 17.1 Summary of survey effort

Stage	Date	Survey technique
BAM assessment survey	2-3 March 2021	Mapping of vegetation zones Vegetation integrity plots Targeted threatened flora surveys Opportunistic fauna observations Fauna habitat assessment Targeted fauna survey, including: Spotlighting Call Playback Ultrasonic call recording using Anabats Active searches for nests, roosts, scats and other signs of fauna occupancy
Supplementary BAM assessment surveys	8 June 2021	Mapping of vegetation zones Vegetation integrity plots Targeted threatened flora surveys Opportunistic fauna observations Fauna habitat assessment
Supplementary BAM assessment surveys	29 July 2021	Mapping of vegetation zones Vegetation integrity plots Targeted threatened flora surveys Opportunistic fauna observations Fauna habitat assessment

Existing vegetation mapping of the site was ground-truthed in the field via systematic walked transects across the proposal site and by walking the boundary of vegetation units.

Plot surveys were conducted on site in accordance with the BAM to obtain vegetation integrity data for the calculation of biodiversity credits. The locations of all plots are shown on Figure 17.1.

Targeted surveys were undertaken for threatened flora species that were either predicted to occur at the proposal site by the BAM calculator or identified during the desktop review as having potential to occur within the study area given known distributions, previous records in the locality and habitat requirements for each species. Candidate threatened flora species that were targeted during these surveys and the appropriate survey period specified in the BAM calculator are listed in Table 17.2.

Table 17.2 Threatened flora species targeted during surveys

Scientific name	Common Name	Appropriate survey period	Month(s) surveyed
Eucalyptus macarthurii	Paddys River Box, Camden Woollybutt	All year	March, June and July
Lysimachia vulgaris var. *davurica*	Yellow Loosestrife	December - March	March

Targeted, seasonal surveys are required for species credit entities that could potentially occur at the proposal site based on the habitat resources present (referred to as 'candidate threatened species' under the BAM). Candidate threatened fauna species that were targeted during these surveys and the appropriate survey period as specified in the credit calculator are listed in Table 17.3.

Table 17.3 Threatened fauna species targeted during surveys

Species name	Common Name	Appropriate survey period	Survey Method/s utilised	Month(s) surveyed
Litoria aurea	Green and Golden Bell Frog	November - March	Diurnal surveys for basking frogs, nocturnal spotlight surveys, call detection, call playback and tadpole survey in accordance with DEWHA (2009)	March

Species name	Common Name	Appropriate survey period	Survey Method/s utilised	Month(s) surveyed
Myotis macropus	Southern Myotis	October to March	Performed as per the *Threatened Species Survey and Assessment Guidelines* (DEC 2004): two sound activated recording devices utilised for the entire night (a minimum of eight hours), starting at dusk, for two nights.	March

Fauna survey techniques and effort are summarised in Table 17.4.

Table 17.4 Fauna survey techniques and effort

Survey technique	Survey effort
Spotlighting	One night of spotlighting on the evening of 2 March, 2021. Included four person hours, conducted between 8 – 10pm. Survey effort included visually scanning all vegetation around the proposal site, the farm dams for frogs (in particular the Green and Golden Bell Frog), as well as publicly accessible planted roadside vegetation along the northern end of Beaconsfield Road. Total effort = four person hours.
Daytime traverses Active reptile/ amphibian searches Active searches for scats and signs	Targeted active searches of potential habitat throughout the study area targeting shelter dependent fauna such as small reptiles and frogs. Woody debris and other shelter substrate was lifted and inspected. Farm dams were surveyed for basing frogs. Dedicated searches for any signs of fauna occupation, including searching for evidence of feeding, foraging and signs of bird presence (such as pellets, whitewash, nests etc.) and signs of other biota (eg scats, scratchings, diggings, tracks etc.).
Ultrasonic call recording	Two Anabat units positioned at two locations within the proposal site over one night. The units were set to continuous recording and were placed on site at about 4pm and collected the next morning at about 9am. Total effort = 16 recording hours, of which about 11 were in darkness.

17.1.3 How potential impacts have been avoided

The proposal has aimed to avoid impacts on native vegetation and habitat values by focusing development in areas of exotic grassland where possible. Multiple iterations of the proposal boundary have been considered and the boundary adjusted to limit impacts on native vegetation within the remainder of the plastic recycling and reprocessing facility site. The plastic recycling and reprocessing facility site is highly modified and contains mostly exotic vegetation. The proposal would result in impacts to 0.32 ha of highly modified vegetation and planted trees.

Several options for the access road were considered with the aim of selecting an option with the least biodiversity values, as discussed further in section 4.3. The east-west access road (Option 2) was selected over the north-south option (Option 3) to avoid impacts on a local occurrence of *Southern Highlands Shale Woodlands of the Sydney Basin Bioregion* which is listed as an endangered ecological community under the BC Act, and as a critically endangered ecological community under the EPBC Act.

The patch of vegetation was sampled in Plot 6 and comprises nine Paddys River Box (*Eucalyptus macarthurii*) which is listed as an endangered species under the BC Act and EPBC Act. Comparatively, the east-west access road option (the chosen option) would require the removal of exotic grassland and a small patch of planted vegetation of low biodiversity value.

17.2 Existing environment

17.2.1 General ecological context

The proposal site has been cleared of all native vegetation and is dominated by exotic pasture. There are several planted windbreaks nearby or adjacent to the site which support the only midstorey or overstorey vegetation close to the proposal site. These windbreaks support a mixture of mature exotic species, as well as sub-mature, generally native species, however, do contain species that are not locally indigenous.

The proposal site does not contain any buildings, and the only structure on site is an old, decrepit cattle loader. Recent land uses have included grazing, and historical land uses appear to have included timber-getting and agriculture.

The proposal site occurs within the Moss Vale IBRA (Interim Biogeographic Regionalisation for Australia) subregion of the Sydney Basin IBRA bioregion. It is also mapped entirely within the 'Moss Vale Highlands' Mitchell Landscape (DECC 2008a).

Two ephemeral watercourses are present in the proposal site, one first order watercourse and one second order watercourse. There are four farm dams in the study area but no wetlands. The dams are associated with the two ephemeral watercourses on the proposal site and appear to have been excavated to capture local surface flow.

There is no intact native woodland or forest vegetation within the proposal site and the site is not connected to any patches of intact native vegetation. The two watercourses on-site provide limited aquatic habitat connectivity to the Wingecarribee River as the streams flow into a concrete channel and there is no riparian vegetation on the banks of the watercourses.

Non-native vegetation occurs as exotic grassland within the proposal site. Exotic grassland occupies 9.05 ha of the proposal site and extends over the whole site and surrounds the farm dams. Exotic grassland in the proposal site has been subject to grazing by livestock (approximately nine cows for the past five years on the plastics recycling and reprocessing facility site and three horses on the access road).

17.2.2 Native vegetation

Extent of native vegetation

There is 0.32 hectares of native vegetation in the proposal site associated with plant community type (PCT) 1256 Tableland swamp meadow on impeded drainage sites of the western Sydney Basin Bioregion and South Eastern Highlands Bioregion and PCT 944 Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion.

Flora species

A total of 73 flora species from 22 families were recorded within the study area, comprising 35 native and 38 exotic species. The Poaceae (grasses, seven native species and 17 exotic species) and Asteraceae (one native species and eight exotic species) were the most diverse families recorded.

A full list of flora species recorded is provided in Appendix B of Technical Report 1 – Biodiversity Development Assessment Report.

Plant community types

Field surveys confirmed the presence of two native PCTs within the proposal site as described in Table 17.5.

Mature trees are absent within the proposal site with the exception of a row of Radiata pine (*Pinus radiata*). There are no hollow-bearing trees on the proposal site, and no natural regeneration of any canopy species within the proposal site.

The native vegetation within the proposal site is in poor condition with many weeds present. There are dense patches of weedy grasses including Serrated Tussock (*Nassella trichotoma*), *Setaria parviflora* as well as infestations of the woody weed Blackberry (*Rubus fruticosus* spp. agg), throughout the plastics recycling and reprocessing facility site.

Groundwater dependent ecosystems

No native vegetation within the proposal site is mapped as a groundwater dependent ecosystem in the *Atlas of Groundwater Dependent Ecosystems*. The vegetation recorded in the proposal site would not be dependent on groundwater.

Table 17.5 Native vegetation zone within the proposal site

Vegetation zone	Plant community type (OEH 2021)	PCT ID	Condition	Area (ha)	Patch size (ha)	Vegetation integrity score	BC Act	EPBC Act
Farm dams	PCT 1256 Tableland swamp meadow on impeded drainage sites of the western Sydney Basin Bioregion and South Eastern Highlands Bioregion	1256	Poor	0.22	0.28 (< 5 ha)	42.9	Not a TEC	Not a TEC
Planted native and exotic vegetation	PCT 944 Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion	944	Poor	0.10	0.28 (< 5 ha)	34.2	Not a TEC	Not a TEC
Exotic grassland	N/A	N/A	Poor	9.05	N/A	1.5	Not a TEC	Not a TEC
Total area of native vegetation				**0.36**				
Total area				**9.65**				

Notes: TEC = Threatened ecological community

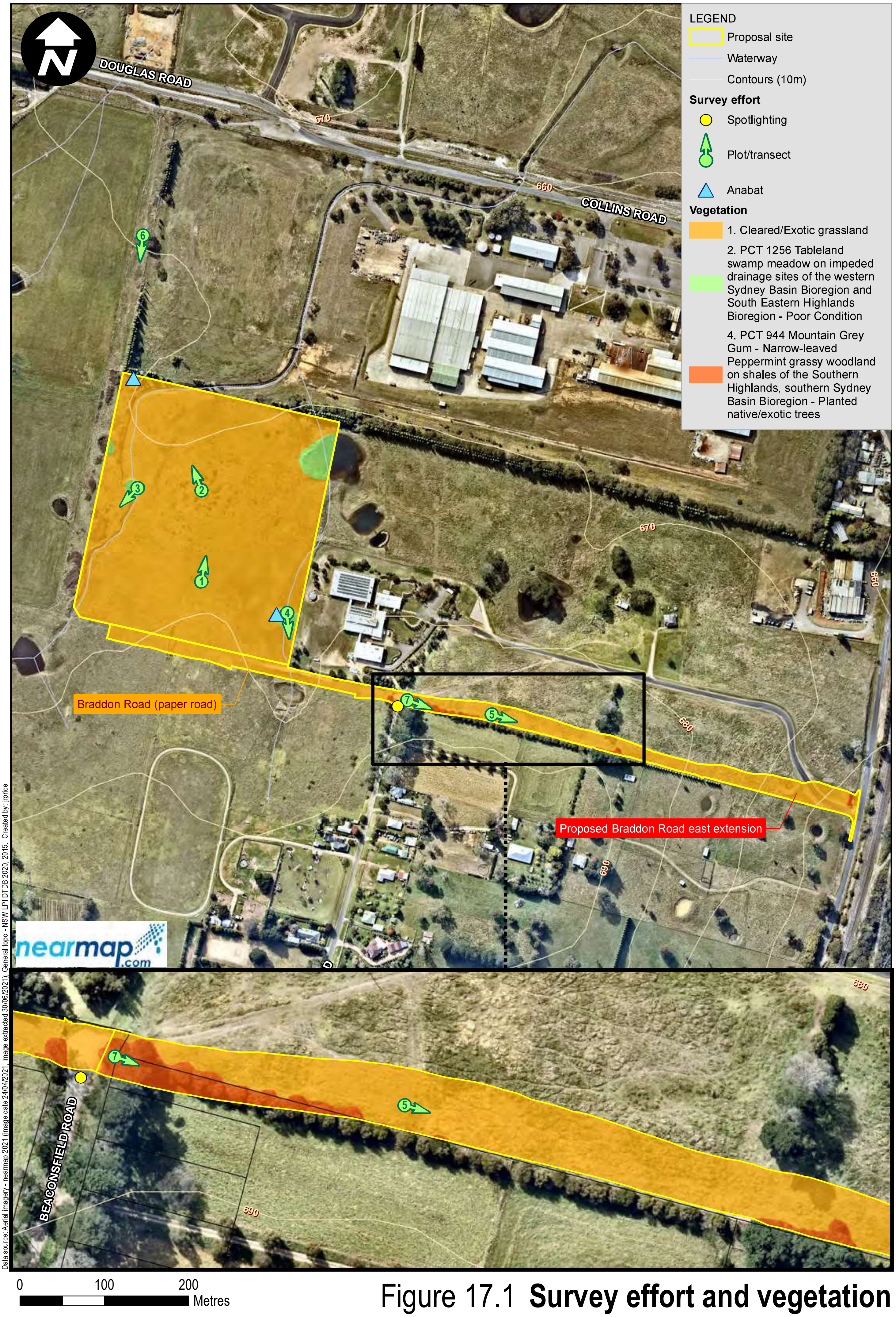


Figure 17.1 **Survey effort and vegetation**

17.2.3 Threatened biota

Threatened flora

No threatened flora species were identified within the proposal site during field surveys.

The desktop assessment and site survey confirmed that there is no suitable habitat for any threatened flora species in the study area. The highly modified nature of the study area, the history of disturbance, the lack of any intact native vegetation, the continued presence of grazing and the lack of connectivity with any areas of intact native vegetation mean the site does not comprise suitable habitat for any of the predicted threatened flora species.

A population of nine Paddys River Box (*Eucalyptus macarthurii*) were recorded outside the proposal site on an alternate access road option (Option 3 - North south connection with Douglas Road) that was previously considered. Paddys River Box (*Eucalyptus macarthurii*) is listed as an endangered species under the BC Act and EPBC Act.

Threatened fauna

Two threatened fauna species were possibly recorded within the proposal site during field surveys:

– Southern Myotis (*Myotis macropus*)
– Large Bent-winged Bat (*Miniopterus orianae oceanensis*)

A call from the Southern Myotis species group was recorded in the proposal site via anabat echolocation call recording. The Southern Myotis is listed as a vulnerable species under the BC Act. The call characteristics of *Nyctophilus* sp. and *the Southern Myotis* are very similar and can be easily confused particularly when call quality is less than optimal. It is likely that some calls attributed to the species group *Nyctophilus* sp./*Myotis macropus* are the Southern Myotis. A conservative approach was taken, and the species was assumed to be present.

A call from the Large Bent-winged Bat was recorded in the proposal site via anabat echolocation call recording. The Large Bent-winged Bat is listed as a vulnerable species under the BC Act. The Large Bent-winged Bat is a dual credit species meaning species credits are only calculated if suitable breeding habitat is located on the proposal site or within two kilometres of the proposal site. Breeding habitat for the Large Bent-winged Bat comprises caves, tunnels, mines, culverts or other structure known or suspected to be used for breeding.

As no breeding habitat occurs on the proposal site or within two kilometres of the proposal site, no species credits are required for this species. Offsets for removal of foraging habitat for the Large Bent-winged Bat are calculated via the ecosystem credits for the native vegetation on the proposal site.

Threatened ecological communities

No threatened ecological communities were recorded on the proposal site during field surveys.

The patch of planted trees in the proposed access road alignment was assigned to PCT 944 Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion. The vegetation does not strictly meet the definition of the PCT, as per the BioNet Vegetation Classification but was allocated to the PCT to which it most closely aligns, based on floristic composition, landscape position and geology.

PCT 944 is commensurate with *Southern Highlands Shale Woodlands of the Sydney Basin Bioregion* which is listed as an endangered ecological community under the BC Act, and as a critically endangered ecological community under the EPBC Act.

The patch of planted trees does not meet the floristic composition or the condition thresholds outlined in the Commonwealth Approved conservation listing for Southern Highlands Shale Forest and Woodland in the Sydney Basin Bioregion (DoE 2015) as the patch is smaller than 0.5 hectares and less than 30% of the perennial understorey vegetation cover is made up of native species.

17.3 Impact assessment – construction

Potential impacts on biodiversity during construction include:

– direct impacts as a result of vegetation clearing and disturbance in the proposal site
– indirect impacts on flora and fauna outside the proposal site as a result of activities within the site

A summary of the results of the impact assessment is provided in the following sections.

17.3.1 Direct impacts

Clearing of vegetation

The proposal would result in direct impacts on 0.32 hectares of native vegetation comprising:

– 0.22 hectares of emergent aquatic vegetation within the site itself that has been assigned to PCT 1256 Tableland swamp meadow on impeded drainage sites of the western Sydney Basin Bioregion and South Eastern Highlands Bioregion; and
– 0.1 hectares of planted native and exotic vegetation on the proposed east west access road that has been assigned to PCT 944 Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion

This vegetation is in poor condition with low species diversity. The impacts on this vegetation are associated with clearing for the plastics recycling and reprocessing facility and construction of associated infrastructure (roads, services etc.). The proposal would remove a very small proportion of individual plant species, PCTs and associated habitats comparative to that in the surrounding area.

In addition to the removal of this native vegetation, approximately 9.06 hectares of exotic grassland would be removed that does not require offset.

The impacts within the proposal site are summarised in Table 17.6 and shown on Figure 17.2.

Table 17.6 Direct impacts within the proposal site

Vegetation Community	PCT (OEH 2021)	Area within the proposal site (ha)
Tableland swamp meadow on impeded drainage sites of the western Sydney Basin Bioregion and South Eastern Highlands Bioregion	1256	0.22
Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion	944	0.10
Exotic grassland	N/A	9.06
Total		**9.37**

Removal of habitat and habitat resources

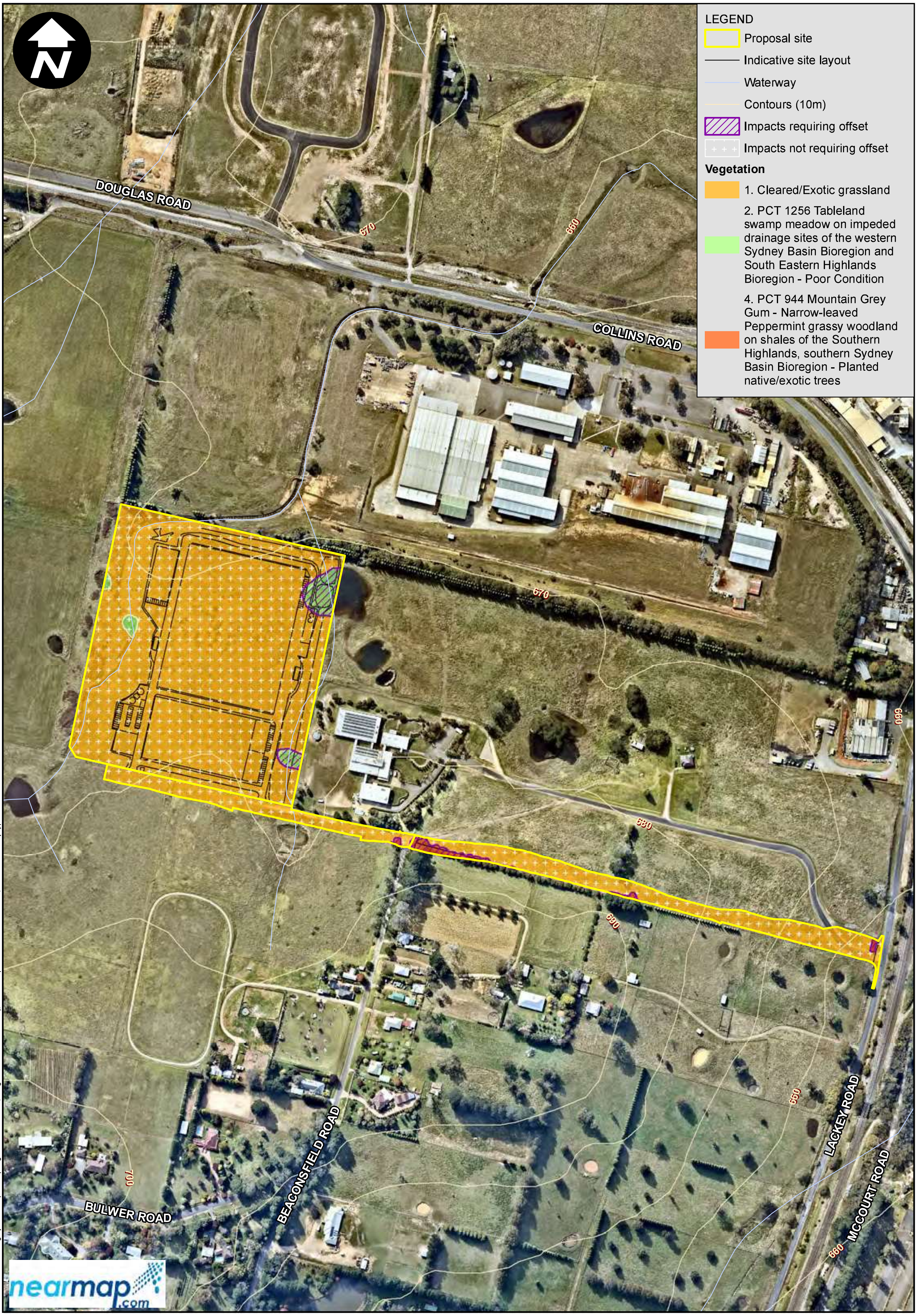
The farm dam that would be removed provides potential habitat resources for native fauna species, including the Southern Myotis. The proposal is therefore assumed to result in impacts on up to 0.32 ha of potential foraging habitat for this species credit entity.

The clearing of 0.32 ha of vegetation within the proposal site would not include the removal of any mature trees or important habitat for any threatened species.

Fauna injury and mortality

As described above, the proposal site provides limited habitat resources for native fauna species. Groundcover vegetation, leaf litter and woody debris would provide shelter and foraging substrate for reptiles, frogs and invertebrates. Construction is likely to result in the injury or mortality of some individuals of these less mobile fauna species and other small terrestrial fauna that may be sheltering in the exotic grassland within the proposal site during clearing activities. More mobile native fauna such as native birds, bats, terrestrial and arboreal mammals that may be sheltering in vegetation in the proposal site are likely to evade injury during construction activities.

Mitigation and management measures are proposed in section 17.5.1 to minimise the risk of vegetation clearing activities resulting in the injury or mortality of resident fauna.



0 100 200 Metres

Figure 17.2 **Biodiversity impact summary**

Fragmentation or isolation of habitat

Habitat fragmentation through the clearing of vegetation can increase the isolation of remnant vegetation and create barriers to the movements of small and sedentary fauna such as ground dwelling mammals, reptiles and amphibians. Furthermore, habitat fragmentation can create barriers to the movement of pollinator vectors, such as insects, and consequently affect the life cycle of both common and threatened flora.

The proposal would require the removal of a small amount of vegetation and habitat from within an already highly modified and fragmented landscape. Impacts resulting from the proposal would increase gaps in habitat within the landscape. Given the existing degree of fragmentation in the locality it is unlikely that the proposal would create any new barriers to the movement of pollinator and seed dispersal vectors, such as insects and birds.

The existing degree of fragmentation and isolation from large tracts of remnant, intact vegetation means the potential for connectivity improvement (even without the proposed development) is limited.

Aquatic habitats

Aquatic habitats in the proposal site are limited to small farm dams and drainage depressions. Aquatic habitats may provide limited breeding and shelter resources for common frog and reptile species as discussed above.

The drainage lines in the proposal site are highly modified, ephemeral drainage lines that are overrun with weeds and exotic grasses. None of the aquatic habitats in the proposal site or study area are classified as Key Fish Habitat and would not provide potential habitat for threatened fish. Currently the aquatic habitats provide little habitat connectivity as there is no native riparian vegetation corridor and limited connectivity in an aquatic sense due to dams and concrete channel in the north of the proposal site.

Habitat values are likely to be improved given proposed realignment and restoration of the eastern watercourse and revegetation of the riparian corridor along the western watercourse.

17.3.2 Indirect impacts

A summary of the potential indirect impacts associated with construction is provided in Table 17.7.

The potential for indirect impacts would be managed by implementing the mitigation measures provided in section 17.5.1 and the construction environmental management plan (see chapter 20). With the implementation of these measures, no significant indirect impacts on biodiversity are predicted.

Table 17.7 Indirect impacts on biodiversity

Impact	Description
Weed invasion	Vegetation within and adjoining the proposal site is in a highly modified condition with numerous weed species present. As such there is a low to moderate risk that construction activities would introduce and/or spread any new weeds into adjoining vegetation. Management measures including the development of a weed management sub-plan as part of the construction environmental management plan would be implemented to mitigate these potential impacts
Introduction and spread of weeds, pests and pathogens	Disturbance associated with vegetation clearing, vehicle traffic and general day to day operations of the proposal during construction increase the potential for the spread, introduction and establishment of weed and pest species, and diseases and pathogens. Weed species are effective competitors for food and habitat resources and have the potential to exclude native species and modify the composition and structure of vegetation communities. Construction activities within the proposal site also have the potential to introduce or spread pathogens such as Chytrid fungus (*Batrachochytrium dendrobatidis*) into adjacent native vegetation through vegetation disturbance and increased visitation. There is little available information about the distribution of these pathogens within the locality, and no evidence of these pathogens was observed during surveys. Chytrid fungus affects both tadpoles and adult frogs and can wipe out entire populations once introduced into an area. The potential for impacts associated with these pathogens is relatively low, given the fairly disturbed and modified nature of the proposal site. Diseases and pathogens can be introduced or spread to site via dirt or organic material attached to machinery, vehicles, equipment and employees.

Impact	Description
	To help mitigate the risk of pathogens being brought onto and/or spread through the site all machinery brought to site would be washed down and inspected to be free of soils, seeds and other organic material.
Aquatic disturbance and impacts on fish habitat	The introduction of pollutants from the proposal into the surrounding environment, if uncontrolled, could potentially impact on water quality further downstream. The potential for water quality impacts on Wingecarribee River (which is downstream from the drainage line that runs along the west boundary of the proposal site), are considered to be low to moderate given the existing disturbance within and around the proposal site. Potential water quality impacts would be managed through the implementation of mitigation measures, including the provision of sedimentation basins, silt fences and other structures to intercept runoff and sediment. No endangered aquatic communities, aquatic fauna or marine vegetation listed under the FM Act or EPBC Act occur in the proposal site and no significant impacts on riparian vegetation or habitats downstream of the proposal site are anticipated as a result of the proposal. There would be no impact on Key Fish Habitat as a result of the proposal.

17.3.3 Consideration of Matters of National Environmental Significance

The proposal would not result in impacts to any listed Matters of National Environmental Significance protected under the EPBC Act. An EPBC Act Referral is not required.

17.3.4 Offset requirements

Credit calculations have been performed in accordance with the BAM and using credit calculator version 1.3.0.00. The following credits are required to be retired to offset the impacts of the proposal:

- 5 ecosystem credits to offset impacts to 0.22 hectares of PCT 1256 Tableland swamp meadow on impeded drainage sites of the western Sydney Basin Bioregion and South Eastern Highlands Bioregion
- 2 ecosystem credits to offset impacts to 0.1 hectares of PCT 944 Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion
- 7 Southern Myotis species credits to offset the removal of habitat within a 0.32 hectare species polygon.

Other threatened species identified as potentially being impacted by the proposal are ecosystem credit species which would be offset through the retirement of the ecosystem credits listed above.

Impacts to 9.05 hectares of land in the proposal site would not require offsetting as this area is not native vegetation as defined in the BAM and comprises exotic vegetation.

The proposal would not result in impact to a Serious and Irreversible Impact entity, as the patch of PCT 944 does not meet the description of the threatened ecological community *Southern Highlands Shale Woodlands of the Sydney Basin Bioregion*.

17.4 Impact assessment – operation

Impacts on biodiversity values would be largely restricted to the construction phase of the proposal. Some beneficial impacts would occur as a result of the riparian vegetation management plan and the revegetation associated with the realignment of the western watercourse. A concept riparian vegetation management plan has been developed and is provided in Appendix A of Technical Report 10 – Soils and Water. A detailed riparian vegetation management plan would be developed before commencement of construction.

However, during operation there is potential for the proposal to impact surrounding vegetation and habitat values through:

- generation of additional light and noise
- erosion and sedimentation as a result of runoff from hard stand areas
- introduction of weed propagules by vehicle and/or residents/businesses

– fauna mortality as a result of collision with vehicles
– increased risk of fire
– rubbish dumping

Given current land uses at the proposal site and in adjacent areas the proposal would not result in a substantial increase in the operation of any of these potential impacts. Mitigation measures are also proposed to minimise the potential for these impacts (see section 17.5.2).

17.5 Mitigation and management measures

17.5.1 Construction

The measures listed in Table 17.8 would be incorporated into the construction environmental management plan or riparian vegetation management for the proposal to avoid and minimise biodiversity impacts associated with construction.

The preferred approach to offset the residual impacts of the proposal is to secure and retire appropriate credits from stewardship sites that fit within the trading rules of the NSW Biodiversity Offsets Scheme, in accordance with the 'like for like' report generated by the BAM calculator. If such credits are unavailable, credits would be sourced in accordance with the 'variation report' generated by the BAM calculator.

A payment to the Biodiversity Conservation Trust would be considered if a suitable number and type of biodiversity credits cannot be secured.

Table 17.8 Biodiversity mitigation measures – construction

Mitigation measure	Timing
General	
All workers would be provided with an environmental induction prior to starting work on-site. This would include information on the ecological values of the site, protection measures to be implemented to protect biodiversity and penalties for breaches.	Prior to clearing/ construction
Vegetation clearing	
Disturbance of vegetation would be limited to the minimum necessary to undertake the proposal.	Construction
Prior to the commencement of any work near the retained planted trees adjoining the proposal site, a survey would be carried out to mark the construction impact boundary. The perimeter of this area would be fenced using high visibility fencing and clearly marked as the limits of clearing. All vegetation outside this fence line would be clearly delineated as an exclusion zone to avoid unnecessary vegetation and habitat removal. Fencing and signage must be maintained for the duration of the construction period. Fencing would be designed to allow fauna to exit the site during clearing activities. Daily inspections of exclusion zones during works in area would be carried out.	Prior to clearing/ construction
Stockpiles of fill or vegetation would be placed within existing cleared areas (and not within areas of adjoining native vegetation).	Prior to clearing/ construction
Sediment fences would be installed to prevent transfer of sediments into adjacent vegetation.	Prior to clearing/ construction
Introduction of weeds and pathogens	
Weed and pest species management plan A weed and pest species management plan would be developed as part of the construction environmental management plan to manage weeds and pathogens during the construction and operational phase of the proposal.	Prior to clearing/ construction
The location and extent of any priority and/or high threat environmental weeds within the proposal site would be identified by a suitably qualified ecologist during pre-clearance surveys. The introduction and spread of weed species would be minimised by restricting access to areas of native vegetation and communicating the responsibilities of all proposal personnel at site inductions and during regular toolbox meetings. All priority weeds identified on-site would be controlled and removed in accordance with the requirements of the *Biosecurity Act 2016* and Council's relevant Weed Control Manuals. Appropriate	Prior to clearing/ construction

Mitigation measure	Timing
pesticides would be applied if required and a record of such application made in the pesticide application register. All noxious and environmental weeds would be cleared and stockpiled separately to all other vegetation, removed from site and disposed of at an appropriately licenced disposal facility. When transporting weed waste from the site to the waste facility, trucks would be covered to avoid the spread of weed-contaminated material. Disposal would be documented, and evidence of appropriate disposal would be kept.	
All machinery entering the proposal site would be appropriately washed down and disinfected prior to work on-site to prevent the potential spread of weeds, Cinnamon Fungus (*Phytophthora cinnamomi*) and Myrtle Rust (*Pucciniales fungi*) in accordance with the national best practice guidelines for Phytophthora (O'Gara *et al.* 2005) and the *Myrtle Rust factsheet* (DPI 2015b) for hygiene control.	Prior to any plant or machinery being brought onto the site
Control measures would be incorporated in the design of the proposal to limit the spread of weed propagules downstream of proposal site. Sediment control devices, such as silt fences, would assist in reducing the potential for spreading weeds.	Prior to clearing/ throughout construction
Removal of fauna habitat	
Protocols to prevent introduction or spread of chytrid fungus would be implemented in accordance with the *Hygiene protocol for the control of disease in frogs* (DECC 2008b).	Prior to clearing/ throughout construction
A trained ecologist would be present during the clearing of native vegetation or removal of potential fauna habitat to avoid impacts on resident fauna and to salvage habitat resources as far as is practicable.	Prior to and during clearing
Dam dewatering plan The dewatering of the dam would be done in accordance with a dam dewatering plan to be developed for the proposal in order to manage the environmental impacts that may arise from dewatering dams. The dewatering plan would include: – the quality and quantity of the water to be released – the fate of the water – any impacts to native, threatened or protected species – relocation of displaced native fauna – the spread of exotic flora and fauna species.	Prior to and during clearing
A suitably qualified and appropriately licenced ecologist would be present during the clearance of all native vegetation and/or fauna habitats. Animals that require handling must not be approached or handled until the ecologist is present, unless in an emergency (eg. when there are both no authorised persons present and where the failure to immediately intervene would place the animal at significant risk). In such an emergency, the site manager may obtain over the phone instructions from the project ecologist to ameliorate the situation. A wildlife rescue organisation (eg. WIRES or Sydney Wildlife) would be made aware of operations in case any injured fauna are found. All animals encountered would be treated humanely, ethically, and in accordance with relevant codes under the NSW *Prevention of Cruelty to Animals Act 1979*, including: – Australian code of practice for the care of animals for scientific purposes (NHMRC 2004) – Code of practice for the welfare of wildlife during rehabilitation (DPI 2001) – Animal ethics considerations and protocols outlined in this document If the project ecologist considers an animal is at risk of injury or undue stress, it would be gently directed into secure adjoining habitat. Where deemed necessary by the project ecologist, the animal may be required to be captured and released. Capture and release operations would proceed via the following protocols: – All construction activities that are considered by the project ecologist be likely to increase the risk of injury, mortality or stress to the animal would be halted until the animal has been removed, which would be enforced with the co-operation of the construction contractor. Construction activities that do not contribute to the risk of injury, mortality or stress to the animal can continue (as determined by the project ecologist). – Only qualified ecologists or wildlife carers would be authorised to handle animals. – Animals would be captured (if required) by the project ecologist using a safe and ethical technique, as is appropriate for the particular species (see below). Native animals that are unable to depart of their own accord would be captured and held in a receptacle appropriate for that species until release. All captive-held animals would be provided with food, water and warmth as is appropriate	During clearing

Mitigation measure	Timing
for the species. Each receptacle would only hold one animal at a time and would be cleaned and disinfected between use to avoid the spread of disease. – Details of any fauna relocated from trees, shrubs or other areas would be recorded on the register.	
The construction contractor would be required to contact the project ecologist for advice if any unexpected fauna are found during the construction period (ie. following clearing of native vegetation when the project ecologist is no longer on-site).	During clearing
A post-clearing report would be prepared documenting all animals that are handled, or otherwise managed, within the site. Data that would be recorded includes: – date and time of the sighting and details of the observer – species – number of individuals recorded – adult/juvenile – condition of the animal (living/dead/injured/sick) – management action undertaken (eg. captured, handled, taken to vet) – results of any management actions (eg. released, placed in a nest box, euthanised, placed with carer) – an inventory of hollows and fallen timber salvaged and relocated.	Post clearing

17.5.2 Operation

The mitigation measures that would be implemented to minimise potential operational impacts on biodiversity values are listed in Table 17.9.

Table 17.9 Biodiversity mitigation measures – operation

Mitigation measure	Timing
Appropriate speed limits would be signposted and enforced along internal roads to reduce the likelihood of vehicle strike and mortality of native fauna	Operation
Appropriate fencing would be erected at the interface between the proposal site boundary	Operation
Legal obligations to control priority weeds within proposal site to prevent the spread of propagules would be enforced	Operation
Street lighting would be designed to direct light away from rows of adjacent trees and to limit the impacts of light spill on native fauna habitats	Operation

18. Other issues

18.1 Greenhouse gas

The section provides a summary of the potential greenhouse gas emissions associated with constructing and operating the plastics recycling and reprocessing facility. A full copy of the assessment results is provided in Technical Report 9 – Greenhouse Gas.

18.1.1 Approach and method

Legislative and policy context to the assessment

The assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

- *National Greenhouse and Energy Reporting Act* 2007
- *National Greenhouse and Energy Reporting (NGER) (Measurement) Determination 2008* (as amended)
- National Greenhouse and Energy Reporting Regulations 2008
- *National Greenhouse Accounts (NGA) Factors* (Department of Industry, Science, Energy and Resources 2020)
- ISO 14064-2:2019 *Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements*

These guidelines are considered representative of good practice greenhouse gas accounting in Australia and are applicable to the proposal.

Method

Assessment boundary

The assessment considered the following sources of scope 1 and 2 emissions:

- Construction:
  - fuel consumption (including related infrastructure, administration building, internal road, and road for site access)
- Operation:
  - Stage 1 sorting and shredding fuel and electricity use
  - Stage 2 reprocessing fuel and electricity use
  - Employee commuting
  - Transport of plastics to site
  - Transport of product

Key tasks

The greenhouse gas assessment generally involved:

- developing a greenhouse gas inventory by:
  - identifying potential sources of emissions during the construction and operation phases of the proposal
  - estimating consumption data for emissions sources
  - applying emission factors from the *NGER (Measurement) Determination*
- calculating the estimated scope 1 and 2 greenhouse gas emissions
- assessing the estimated greenhouse gas emissions of the proposal against the national emissions

– identifying if the estimated emissions meet the reporting threshold under the National Greenhouse and Energy Reporting scheme

18.1.2 Impact assessment

Estimated greenhouse gas emissions

A summary of the estimated scope 1 and 2 greenhouse gas emissions occurring as a result of construction and operation activities for the proposal is provided in Table 18.1.

Table 18.1 Summary of greenhouse gas emissions – construction and operation phase

Activity	Activity data	Units	Total emissions (tCO_2-e)*		Total emissions
			Scope 1	Scope 2	
Construction					
Total diesel consumption	953	kL	2,583	0	2,583
Total construction emissions (tCO_2-e/ year)			**2,583**	0	**2,583**
Operations					
Electricity consumption (NSW) - Operations	87,430	MWh/year	0	70,818	78,818
Backup generator	10	kL	26	0	26
Employee commuting	697	kL	1,894	0	1,894
Transport of plastics to site	3,366	kL	9,147	0	9,147
Transport of product	3,366	kL	9,147	0	9,147
Total annual operational emissions (tCO_2-e/ year)			**20,215**	**70,818**	**91,033**

* Emissions are rounded up to the nearest whole tCO_2-e

It is noted that solar panels would be installed on the roof areas of the buildings. Estimates for how much power would be sourced from solar has not yet been made because the spacing and locations of the panels has not been determined at this stage in the design. This would be confirmed during the next stage of design, but is expected to be considerate given the large roof area available. The emissions estimates in Table 18.1 are therefore considered conservative.

Impact of emissions

Table 18.2 shows Australia's national greenhouse gas emissions, by sector, for the year to December 2020 and year 2019 and the contribution of the proposal as a percentage of each.

Table 18.2 National and NSW greenhouse gas emissions

	Australia Emissions Year to March 2021 ($MtCO_2$-e) [2]	2019 Australian emissions ($MtCO_2$-e) [2]	2019 NSW emissions ($MtCO_2$-e) [3]
Overall total	494	519	136.6
% contribution of the proposal operation	0.02%	0.02%	0.07%

Sources:

1. Quarterly Update of Australia's National Greenhouse Gas Inventory: September 2020 Incorporating emissions from the NEM up to December 2020, Australian Government Department of Industry, Science, Energy and Resources, March 2021
2. National Inventory Report 2019 Volume 1, Australian Government Department of Industry, Science, Energy and Resources, April 2021
3. State and territory greenhouse gas inventories: data tables and methodology - Table 3A: Sectoral breakdown of national, state, and territory greenhouse gas inventories and contribution to national emissions, 2019

Scope 1 and 2 emissions from construction of the proposal are estimated as 2,583 tCO_2-e, which is approximately 0.0019% of NSW's annual emissions and 0.0005% of Australia's annual emissions. Construction emissions is considered negligible compared to annual emissions in NSW and Australia.

Annual Scope 1 and 2 emissions during operations are estimated as 91,033 tCO_2-e, which is approximately 0.07% of NSW's annual emissions and 0.02% of Australia's annual emissions. Operational emissions are also considered negligible compared to annual emissions in NSW and Australia.

Operational emissions are higher than the facility reporting threshold of 25,000 tCO_2-e per annum, under the National Greenhouse and Energy Reporting scheme. Therefore, the plastics recycling and reprocessing facility would be required to monitor fuel and electricity use and report energy use and emissions annually under the NGER scheme.

18.1.3 Mitigation and management measures

Construction

The measures listed in Table 18.3 would be implemented during construction of the proposal to reduce and mitigate greenhouse gas emissions.

Table 18.3 Greenhouse gas mitigation measures – construction

Mitigation measure	Timing
Sustainable procurement practices would be adopted where feasible	Construction
Construction materials would be sourced locally where possible	Construction
Investigations into the feasibility of using biodiesel for trucks and equipment, electric vehicles and low carbon concrete would be undertaken would be undertaken	Construction
All plant and equipment used during construction would be regularly maintained to reduce emissions and comply with the relevant exhaust emission guidelines	Construction
All plant and equipment used during construction would be switched off when not in constant use and not left idling, as long as safe	Construction
Construction plant and equipment brought on-site would be regularly serviced and energy efficient vehicles or equipment would be selected where available	Construction

Operation

Table 18.4 lists the measures that would be implemented to reduce and mitigation emissions during operation.

Table 18.4 Greenhouse gas mitigation measures – Operation

Mitigation measure	Timing
More efficient equipment and lighting would be investigated during detailed design	Detailed design
Annual monitoring and reporting of greenhouse gas emissions required under the National Greenhouse and Energy Reporting scheme would be undertaken	Operation
Greenpower would be purchased for grid electricity during operation	Operation

18.2 Socio-economic

18.2.1 Approach and method

The basic assessment of the potential socio-economic impacts of the proposal included:

– **Social study area:** analysis of the site surrounds to determine the socio-economic study area. This analysis accounts for the communities that are considered to have the potential to experience changes to their social conditions due to direct impacts and benefits from the proposal. This is outlined in Table 18.5.

– **Description of socio-economic environment:** identification of the existing socio-economic environment of the social study area, including analysis of the demographic indicators relevant to the assessment.
– **Assessment of socio-economic impacts:** identification and assessment of the potential socio-economic impacts and benefits during construction and operation based on a review of the proposal description, an understanding of the socio-economic environment and review of the technical studies prepared for the EIS.

Table 18.5 Social study area

Area (Census area)	Definition
Moss Vale State Suburb (SSC)	The proposal site is located in Moss Vale state suburb. It is anticipated the community of Moss Vale are most likely to experience impacts and benefits from construction and operation of the proposal.
Wingecarribee LGA	The proposal site is located in the Wingecarribee LGA. Communities across the LGA may experience some regional impacts and benefits during construction and operation of the proposal.

18.2.2 Existing environment

Wingecarribee LGA is located about 140 kilometres from the Sydney central business district. It is more broadly located within the Sydney – Canberra – Melbourne transport corridor on the Southern railway line and Hume Highway (Wingecarribee Shire Council 2021). Wingecarribee LGA is predominately rural in character with agricultural land separating the towns and villages characterised by unique landscape and aesthetic appeal (Wingecarribee Shire Council 2021).

Wingecarribee LGA comprises of four main towns: Bowral, Moss Vale, Mittagong and Bundanoon, and many smaller villages. It is recognised for its impressive 19^{th} and 20^{th} century buildings and streetscapes, as well as for its natural and farming landscapes (Wingecarribee Shire Council 2021).

Wingecarribee LGA is bounded by Wollondilly Shire in the north, Wollongong City, Shellharbour City and the Municipality of Kiama in the east, Shoalhaven City and the Goulburn Mulwaree Council area in the south, and Upper Lachlan Shire in the west (profile id. n.d).

The urban structure and historic settlement pattern of the Wingecarribee LGA was heavily influenced by the arrival of the Main Southern Railway Line, which resulted in the rapid development of Mittagong, Bowral and Moss Vale in the 1860s. Today, the Main Southern Railway acts as a spine running north-south through the Wingecarribee LGA, with the towns and villages dispersed along the railway line (Wingecarribee Shire Council 2021).

Moss Vale is one of four main towns in the Wingecarribee LGA and has a mixed urban land use pattern ranging from detached housing to general industrial activities (Wingecarribee Shire Council n.d.). The town is located at a junction of important road and railway routes and is accessed via the Hume Highway and Moss Vale Road (Wingecarribee Shire Council n.d.).

The town is well serviced with a number of shops, a post office, medical centres, homeware shops, cafes, accommodation, community halls, a library, aquatic centre, showground and open spaces. There is also a number of primary and secondary schools and multiple churches. Southern Highlands Early Childhood Learning Centre and Lackey Park are located within proximity to the proposal site (975 metres and 1.4 kilometres south, respectively).

Table 18.6 provides a summary of relevant indicators for the socio-economic study area.

Table 18.6 Summary of relevant demographic indicators for the socio-economic study area

Indicator	Moss Vale SSC	Wingecarrbee LGA	NSW
Total population	8,579	47,882	7,480,228
Estimated resident population (ABS 2020)	N/A	51,134	8,089,817
Population projection (NSW Government 2019)	From 2016 to 2041, the population of Wingecarribee LGA is expected to increase by 2,5000 people, from 49,000 to 51,500. The movement of people around retirement age into Wingecarribee LGA will drive the area’s future population growth.		

Indicator	Moss Vale SSC		Wingecarrbee LGA		NSW	
	During this period, the working age population (aged 15-64), and number of children aged 14 and under is estimated to decrease. The number of people aged 65 and over is estimated to increase by 6,000 - from 12,200 in 2016 to 18,200 by 2041. Equivalent data is not available at the SSC level.					
Age						
Median age	43		47		38	
Under 18 years	23.6%		21.8%		22.1%	
Cultural diversity						
Indigenous population	222	2.6%	954	2.0%	216,176	2.9%
Born in Australia	3,442	40.1%	17,639	36.7%	2,425,532	32.4%
Language spoke at home other than English	7.4%		5.6%		25.2%	
Household characteristics						
Family households	67.8%		71.8%		72.0%	
Lone person households	29.5%		26.1%		23.8%	
Average household size	2.4		2.4		2.4	
Family characteristics						
Couple family with children	38.4%		38.2%		45.7%	
Couple family without children	43.4%		47.1%		36.6%	
One parent family	17.3%		13.8%		16.0%	
Other family	0.7%		0.9%		1.7%	
Dwelling characteristics and tenure type						
Owned (fully or with a mortgage	68.2%		76.5%		64.5%	
Rented (total)	27.8%		19.8%		31.8%	
Housing availability	As of 29 September 2021 (based on a realestate.com search), there were 10 available properties for rent in Moss Vale, and 33 properties for sale. The results of the search also indicated that between September 2020 and August 2021, the average demand for properties was lower in Moss Vale (974 visits per property advert) compared to the NSW average (1,677 visits per property advert).					
Housing affordability	It is generally accepted that if housing costs exceed 30 per cent of a low-income household's gross income, the household is experiencing housing stress (known as the '30/40 rule') (SGS Economics and Planning & National Shelter, Community Sector Banking & Brotherhood of Saint Lawrence 2019). SGS Planning, National Shelter, Community Sector Banking, and Brotherhood of St Laurence (2019) released a Rental Affordability Index that calculates rental affordability for groups identified as 'low income households'. The results of the 2020 quarter 1 index show that housing in Moss Vale was unaffordable or severely unaffordable for pensioner couples, and single part-time worker parent on benefits. Data was not available during this time period for single pensioners, single person on benefits and hospitality workers.					
Employment and income						
Median household income ($/week)	$1,228		$1,335		$1,486	
Median individual income ($/week)	$620		$645		$664	
Labour force participation	55.2%		54.3%		59.2%	
Unemployed persons	3.8%		3.8%		6.3%	

<table>
<tr><th>Indicator</th><th>Moss Vale SSC</th><th>Wingecarrbee LGA</th><th>NSW</th></tr>
<tr><td>Industry of employment</td><td colspan="3">
<table>
<tr><th>Industry</th><th>Moss Vale SSC</th><th>Wingecarribee LGA</th><th>NSW</th></tr>
<tr><td>Health Care and Social Assistance</td><td>11.5%</td><td>12.5%</td><td>12.5%</td></tr>
<tr><td>Accommodation and Food Services</td><td>10.4%</td><td>9.0%</td><td>7.1%</td></tr>
<tr><td>Construction</td><td>10.0%</td><td>10.0%</td><td>8.4%</td></tr>
<tr><td>Retail Trade</td><td>9.3%</td><td>9.7%</td><td>9.7%</td></tr>
<tr><td>Education and Training</td><td>9.2%</td><td>9.3%</td><td>8.4%</td></tr>
<tr><td>Manufacturing</td><td>8.4%</td><td>7.0%</td><td>5.8%</td></tr>
<tr><td>Professional, Scientific and Technical Services</td><td>5.1%</td><td>6.7%</td><td>8.1%</td></tr>
<tr><td>Public Administration and Safety</td><td>4.6%</td><td>4.3%</td><td>6.0%</td></tr>
<tr><td>Transport, Postal and Warehousing</td><td>4.5%</td><td>4.3%</td><td>4.7%</td></tr>
<tr><td>Other Services</td><td>4.5%</td><td>4.4%</td><td>3.7%</td></tr>
</table>
</td></tr>
<tr><td>Occupation</td><td colspan="3">
<table>
<tr><th>Occupation</th><th>Moss Vale SSC</th><th>Wingecarribee LGA</th><th>NSW</th></tr>
<tr><td>Technicians and trades</td><td>17.6%</td><td>16.0%</td><td>12.7%</td></tr>
<tr><td>Professionals</td><td>16.3%</td><td>20.2%</td><td>23.6%</td></tr>
<tr><td>Labourers</td><td>12.4%</td><td>10.2%</td><td>8.8%</td></tr>
<tr><td>Community and personal service</td><td>11.6%</td><td>10.8%</td><td>10.4%</td></tr>
<tr><td>Clerical and administrative</td><td>11.5%</td><td>11.3%</td><td>13.8%</td></tr>
<tr><td>Managers</td><td>10.9%</td><td>14.5%</td><td>13.5%</td></tr>
<tr><td>Sales</td><td>10.3%</td><td>9.7%</td><td>9.2%</td></tr>
<tr><td>Machinery operators and drivers</td><td>7.7%</td><td>5.8%</td><td>6.1%</td></tr>
<tr><td>Not Stated</td><td>1.7%</td><td>1.6%</td><td>1.8%</td></tr>
</table>
</td></tr>
<tr><td colspan="4">Education status</td></tr>
<tr><td>Completion of Year 12 (or equivalent)</td><td>43.5%</td><td>48.0%</td><td>53.9%</td></tr>
<tr><td colspan="4">Community vulnerability profile</td></tr>
<tr><td>Need for assistance</td><td>6.5%</td><td>5.6%</td><td>5.4%</td></tr>
<tr><td>Lived at same residence 1 year ago</td><td>76.4%</td><td>77.5%</td><td>77.4%</td></tr>
<tr><td>Lived at residence 5 years ago</td><td>15.9%</td><td>14.1%</td><td>14.5%</td></tr>
<tr><td>Socio-economic disadvantage</td><td colspan="3">The ABS produces four socio-economic indices for areas (SEIFA) based on Census data, which identify areas of relative advantage and disadvantage. The Index of Relative Socio-Economic Advantage/Disadvantage (IRSAD) was examined for the social locality.
The IRSAD divides a population into five equal groups, called a quintile. The lowest scoring of these groups are given a quintile number of 1, which indicates the highest level of disadvantage, and the highest scoring areas are given a quintile of 5, which indicates the highest level of advantage.
Within the social study area, the statistical areas are ranked within the state as follows:
– Moss Vale has an IRSAD quintile of 3
– Wingecarribee LGA had an IRSAD quintile of 5, meaning that compared to other areas in Australia, it experiences high levels of advantage.</td></tr>
</table>

NB: The number of persons in the labour force expressed as a percentage of persons aged 15 years and over.

Source: ABS 2016

Summary

Wingecarribee LGA is predominately rural in character with agricultural land separating the towns and villages characterised by unique landscape and aesthetic appeal. It comprises of four small towns and many smaller villages. Wingecarribee LGA is witnessing an increase in people aged 65 years and over, which is reflected in the median age of its residents.

Moss Vale is located at a junction of important road and railway routes and has consequently become one of the four main towns in the LGA. Moss Vale has a younger population compared to the LGA, however, there are more people who require assistance with daily activities in Moss Vale compared to both the LGA and NSW average. Moss Vale has a higher level of disadvantage compared to the LGA which experiences high levels of advantage compared to other areas in Australia.

Unemployment levels were equivalent in Moss Vale and the LGA, but they experience similar rates of labour force participation. Key industries of employment in Moss Vale include health care and social assistance, accommodation and food services, and construction.

18.2.3 EIS consultation which informed the socio-economic assessment

GHD has been undertaking a comprehensive engagement program with local residents, community members and project stakeholders throughout the planning and approvals process. Appendix G of the EIS describes these activites and the stakeholders that have been consulted, and provides a summary of the issues raised.

18.2.4 Impact assessment – construction

Construction

Socio-economics impacts related to the construction of the proposal would be temporary (about 12-15 months) and mostly localised to the construction area and nearby suburbs. The proposal would also have a number of beneficial and short-term adverse socio-economic impacts which are summarised in Table 18.7.

Table 18.7 Summary of social and economic impacts – construction

Impact	Description
Economic	
Employment	Construction of the proposal has the potential to generate employment for up to 200 staff across the duration of the construction program. The peak workforce (up to 30 people) is expected during major concrete pours. This would of particular benefit to the study areas, as technicians, trades and labourers are within the top three occupations in Moss Vale and the LGA.
Economic development	There is the potential for some nearby businesses to experience increased trade due to the presence of additional construction workers spending their wages, or to meet the demand for construction related goods arising from construction of the proposal.
Social	
Community perception	Local residents and businesses may have perceived concerns regarding increased vehicle movements on the local road network and amenity impacts associated with construction of the proposal. Consultation undertaken for the EIS indicated that local residents and community members have concerns about increased light and heavy vehicle traffic movements on the local road network. Construction traffic may also decrease perceptions of safety for some road users, and this was also raised as a concern by a community member. Construction of the proposal would not result in any significant impacts to traffic or amenity. Any construction-related impacts would be temporary in nature (about 12 to 15 months) and would be significantly reduced by the implementation of appropriate environmental management controls guided by the construction environmental management plan (see Chapter 20).
Traffic and transport	Access to and from the plastics recycling and reprocessing facility site during construction would be provided via Berrima Road, Lytton Road and Beaconsfield Road while the new access (Braddon Road and Braddon Road east extension) is under construction. Construction traffic would use new access road once it has been constructed. Construction vehicles would then access the plastics recycling and reprocessing facility site using the same haulage route proposed for operational access. The existing road network has sufficient capacity and would be readily able to cater for the expected construction traffic flows, with negligible impact to road operation or intersection performance. Additional information regarding the potential traffic, transport and access impacts associated with the proposal is provided in Chapter 11.
Noise and vibration	Construction activities have the potential to generate increased levels of noise and vibration at nearby sensitive receivers. Construction noise levels are predicted to be below the construction noise management level for the majority (151 out of 164) of the sensitive receivers in the study area. However, there is potential for construction noise to exceed the noise management level during worst-case construction conditions (when construction works are at the closest distance between source and receiver) at some of the closest receivers to the proposal site. The predicted noise levels are highly conservative and actual noise levels are likely to be lower than those modelled for the majority of the time.

Impact	Description
	These impacts are anticipated to be temporary in nature and would be managed through the mitigation measures presented in section 12.5. Vibration levels are not anticipated to exceed relevant criteria at surrounding residential and industrial receivers. Additional information regarding the potential noise and vibration impacts associated with the proposal is provided in Chapter 12.
Air quality	Low levels of dust would be generated during construction activities, but would be effectively managed through the mitigation measures proposed. Additional information regarding the potential air quality impacts associated with the proposal is provided in Chapter 13.
Visual amenity	During construction, there would be the potential for the construction compound for the storage of materials, staff offices and laydown areas to be visible from along Collins Road and nearby properties along Beaconsfield Road. Visual impacts related to construction equipment would be localised and temporary in nature and are not considered to be significant. Additional information regarding the potential visual impacts associated with the proposal is provided in Chapter 16.

18.2.5 Impact assessment – operation

Operation of the proposal has the potential to generate both beneficial and adverse socio-economic impacts. The long-term positive impacts are generally more likely to be experienced at a regional level, while the short-term impacts (both positive and negative) are likely to be more localised to the closest residences.

The potential socio-economic impacts related to the operation of the proposal are summarised in Table 18.8

Table 18.8 Summary of social and economic impacts – operation

Impact	Description
Economic	
Employment	Operation of the proposal would require the employment of up to 140 full time employees (with up to 40 employees onsite at any one time) over the long term. Consultation undertaken for the EIS indicated that local residents, community members and stakeholders would like to see an increase of local employment opportunities.
Low cost goods and materials	The proposal would result in an increased resource recovery opportunity, which would improve the supply of low cost recycled plastic goods to the community and the commercial sector.
Local and regional economic development	A range of direct and indirect business impacts associated with the proposal are anticipated. Direct impacts would include the provision of goods and services of nearby businesses to support the operation of the proposal, such as kitchen supplies and office goods. Indirect impacts would be associated with continued trade due to the continued presence of operational employees spending their wages, particularly for nearby commercial businesses.
Environmental sustainability	The proposal would result in an increased recovery rate of mixed plastics in NSW, and would reduce the use of landfills throughout the local and wider community, including the state of NSW.
Social	
Community perception	The public perception of the proposal may include uncertainty and concerns regarding the nature of the proposal and its potential impact. This may result in stress and anxiety towards the proposal. Consultation undertaken for the EIS indicated that the vast majority of local residents and community members support local plastics recycling, but were uncertain about the proposal's potential impacts and benefits as there are limited facilities with similar operations currently in Australia.
Improvement of waste services	The proposal would result in improved waste management services to the community and commercial sector. It would have the capacity to recycle and reprocess up to 120,000 tonnes per year of mixed plastics which would otherwise be landfilled and meet a key need within NSW.
Traffic and transport	During full scale operation, up to 100 heavy vehicle movements per day, and 280 light vehicle movements per day would be generated by the proposal. The existing road network has sufficient capacity to cater for the expected operational traffic flows and have negligible impact to road performance or intersection operation.

Impact	Description
	Consultation undertaken for the EIS indicated that traffic is a key concern amongst local residents and community members, with some nearby residents noting that it was their only concern related to the proposal. Additional information regarding the potential traffic, transport and access impacts associated with the proposal is provided in Chapter 11.
Noise and vibration	Long-term noise monitoring was undertaken at three locations within close proximity to the proposal site (see Figure 12.2) representative of the reasonably most affected residences within the noise catchment area. The noise environment was characterised with low background noise levels dominated by natural sounds (wind, trees, birds etc.) and the surrounding industry and noise from railway traffic. Consultation undertaken for the EIS indicated that the reversing beep noise from heavy vehicles and forklifts is a key concern amongst local residents. A number of local residents and community members also noted potential noise and vibration impacts to the daily operations of Australian BioResources as a concern. Noise impacts from the operation of the proposal are expected to be low, and within acceptable noise criteria throughout the operation of the proposal at all residential receivers. Further, adverse impacts are not anticipated to the mice housed at the Australian BioResources facility as predicted internal noise levels are below the hearing sensitivity for mice. Additional information regarding the potential noise and vibration impacts associated with the proposal is provided in Chapter 12.
Air quality	Potential air quality impacts from the operation of the proposal would be associated with emissions from activities within the main processing building (Building 1), the deep processing building (Building 2) and the wastewater treatment plant. Consultation undertaken for the EIS indicated that local residents and community members have concerns related to potential toxic fumes, and the environmental management measures which would be implemented to capture any potential air pollution. The air quality assessment included dispersion modelling of the emissions from the activities within Buildings 1 and 2 in accordance with the EPA's Approved Methods. The modelling predicted that ground level concentrations of both volatile organic compounds and particulates would be significantly below the assessment criteria at all sensitive receivers. The air quality assessment also qualitatively assessed emission generation potential and source to receptor pathway associated with operation of the wastewater treatment plant. The wastewater treatment plant would be fully enclosed, with air flow achieved through natural ventilation of the building. It would not generate significant amounts of odour. Given the low potential for emissions, and the distance to the nearest sensitive receiver, the risk of air quality impacts from the wastewater treatment plant is considered to be low. Additional information regarding the potential air quality impacts associated with the proposal is provided in Chapter 13.
Visual amenity	During operation, the proposal would introduce new features into the landscape which would be localised and would not affect the overall character of the locality. The proposal would also be located on land zoned IN1 General Industrial within the MVEC which is expected to undergo significant development and a change in character in the future. Additional information regarding the potential visual impacts associated with the proposal is provided in Chapter 16 and Technical Report 7.

18.2.6 Changes made to the proposal in response to feedback received

During development of the environmental assessment process, the design of the facility and its access point was iterative and dependent on rigorous engineering and ongoing community and stakeholder engagement. Where possible, Plasrefine Recycling has sought to incorporate community and stakeholder feedback directly into the design process. Section 6.3.2 and Appendix G of the EIS describes the changes made.

18.2.7 Mitigation and management measures

Mitigation measures have been identified throughout chapters 9 to 18 to avoid, minimise and mitigate potential environmental impacts that may result from the construction and operational of the proposal, and inherently, the associated socio-economic impacts that may result. A compilation of mitigation measures is provided in chapter 20.

Table 18.9 provides a summary of the proposed measures to manage socio-economic impacts.

Table 18.9 Socio-economic management measures

Management measure	Timing
A community information and awareness strategy would be included in the construction environmental management plan and would outline measures to maintain communication with the community and all relevant stakeholders throughout construction of the proposal.	Construction
The operational environmental management plan would include measures to engage with stakeholders and to manage and respond to feedback received during the operation.	Operation
A contact log would be maintained to log public comments and complaints.	Construction Operation
A community consultative committee would be established to ensure the community and stakeholder groups are: – kept informed of the status of the project, any new initiatives, and the performance of the proponent – consulted on the development of the project, management plans and proposed changes to the approved project – able to provide feedback on key issues that may arise during the development or implementation of the project	Construction Operation

18.3 Non-Aboriginal cultural heritage

18.3.1 Approach and method

Legislative and policy context to the assessment

The assessment was undertaken in accordance with the SEARs and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

– the EP&A Act, *Heritage Act 1977* (NSW) (Heritage Act) and EPBC Act
– *NSW Heritage Manual* (HO and DUAP 1996)

Study area

The study area for the assessment included the proposal site and a 200 metre buffer around the proposal site.

Key tasks

The assessment involved:

– searching statutory and other heritage lists and databases (see below) to identify whether any listed heritage items are located within or in the vicinity of the proposal site
– reviewing the proposal description and plans
– assessing the potential impacts of the proposal on listed and potential heritage items in accordance with the guidelines listed above

Heritage lists and databases

The following heritage lists and databases were searched in September 2021:

– World Heritage List
– Australian heritage lists (under the EPBC Act):
  - National Heritage List
  - Commonwealth Heritage List
– Register of the National Estate (it is noted that this is an archival list and is not a statutory heritage register)

– NSW heritage lists (under the Heritage Act):
  - NSW State Heritage Register
  - Section 170 NSW Government agency heritage and conservation registers
– local heritage lists under the Wingecarribee Local Environmental Plan 2010

18.3.2 Existing environment

Historical context

The Southern Highlands has a rich history which began with the traditional owners of the land, the Gundungurra and D'harawal people, and later European settlers who first explored the area in 1798. Aboriginal heritage is discussed in chapter 15.

Council (WSC no date) identifies that European settlement commenced in the Southern Highlands around 1820. The first settlement, Bong Bong settlement, located on the Moss Vale Road between Moss Vale and Burradoo adjoining the Wingecarribee River, is marked by an obelisk and sits within the greenbelt between Moss Vale and Burradoo as part of the Burradoo Landscape Conservation Area. The 1860s saw rapid development in the region through the advent of the Main Southern Railway Line.

Heritage-listed items and sites

There are four sites listed on the State Heritage Register and 66 locally listed sites/items within the suburb of Moss Vale. However, there are no sites/items located within the proposal site or within the study area for the assessment.

The closest site of local heritage significance is located about 970 metres to the east of the plastics recycling and reprocessing facility site and about 280 metres east of the access road corridor (where it meets Lackey Road). This site is Austermere, (former SCEGGS School) house and ground – listing No. I398, located at Suttor Road, Moss Vale.

The closest site of state heritage significance is the Christ Church, Churchyard and Cemetery (listing No. 01383) which located about two kilometres to the southeast of the plastics recycling and reprocessing facility site.

18.3.3 Impact assessment – construction

As no heritage-listed items or site are located on or within 200 metres of the proposal site, no direct impacts on items or sites of local, state or national heritage significance are anticipated.

The potential for vibration impacts on structures was assessed by the noise and vibration assessment, and the results are provided in section 12.3.5. The assessment concluded that construction vibration was not likely to cause structural damage beyond 22 metres from vibration-intensive activities (such as rollers). There are no heritage-listed structures within this distance.

No other direct or visual impacts during construction are expected.

18.3.4 Impact assessment – operation

No direct or visual impacts during operation are expected.

18.3.5 Mitigation and management measures

As no impacts to heritage-listed items or sites are expected during construction or operation, no mitigation or management measures are required.

18.4 Cumulative impacts

This chapter provides an assessment of the potential cumulative impacts of the proposal taking into account other projects in the study area.

18.4.1 Approach and method

For an EIS, cumulative impacts can be defined as the successive, incremental, and combined effect of multiple impacts, which may in themselves be minor, but could become significant when considered together.

Study area

The study area for the consideration of potential cumulative impacts varies according to the nature of the key matters being considered and area of influence, as listed in Table 18.10.

Table 18.10 Cumulative assessment – study area extents

Key matter	Study area extent for cumulative impacts
Noise and vibration	1.6 kilometres surrounding the plastics recycling and reprocessing facility site and access road corridor
Traffic and transport	The road network in the vicinity of the proposal site including Berrima Road, Douglas and Collins Road, Lackey Road, Bulwer Road, Lytton Road, Beaconsfield Road as well as the proposed road access corridor
Air quality and odour	1.2 kilometres surrounding the plastics recycling and reprocessing facility site
Landscape and visual	2 kilometres surrounding the plastics recycling and reprocessing facility site
Aboriginal cultural heritage	10 kilometres surrounding the plastics recycling and reprocessing facility site
Biodiversity	10 kilometre radius of the proposal site

Key tasks

The assessment of potential cumulative impacts has been undertaken in accordance with the SEARs and considers the potential for impacts taking into account other projects in the study area.

The following tasks were undertaken to assess the potential for cumulative impacts:

- identifying potentially relevant projects in the study area (either proposed or approved) based on information available in the public domain
- screening identified projects for their potential to interact with the proposal
- identifying and assessing (quantitatively or qualitatively) the significance of potential cumulative impacts.

Potentially relevant projects in the study area were identified based on a site visit undertaken by GHD in November 2020 and search of the following data sources in September 2021:

- NSW Major Projects Planning Portal
- Wingecarribee Shire Council DA tracking database

18.4.2 Potentially relevant future projects in the study area

Two State significant development projects within or near Moss Vale which have been recently approved or are being proposed. In addition, the site visit undertaken by GHD in November 2020 identified parcels of land from an 18 lot industrial subdivision for sale on land to the north of the plastics recycling and reprocessing facility site.

Details of these projects and consideration of the relevance of the projects to potential cumulative impacts with the proposal are provided in Table 18.11.

Table 18.11 Cumulative assessment – potentially relevant future projects

Project	Location and description	Assessment of relevance
Southern Waste Management Facility (SSD-10356)	*15 Carribee Road, Moss Vale* A waste management facility with a maximum throughput of up to 200,000	Status: currently at the 'Prepare EIS' stage. Potential for interaction with the proposal: – located about 1.1 km north west of the plastics recycling and processing facility site.

Project	Location and description	Assessment of relevance
	tpa of hydro-excavation and drilling muds, VENM and stormwater	
New Berrima Brickworks facility (SSD-10422)	*416 and 524 Berrima Road, Moss Vale* A 50 million brick per annum brickworks plant with 24/7 operations, to replace and update the existing Bowral plant	Status: approved in May 2021 Potential for interaction with the proposal: – located about 2.5 km northwest of the plastics recycling and processing facility site. – Due to the distance the project is unlikely to have cumulative impacts related to noise and vibration, air quality, and landscape and visual impacts.
18 Lot Subdivision	*Douglas Road, Moss Vale* An 18 Lot industrial subdivision ranging in size from 3,000 m^2 to 11,545 m^2.	Status: Subdivision approved in 2009. During the GHD site visit, the subdivision works appeared to be mostly complete and the land was advertised for sale. Potential for interaction with the proposal: – Located about 350 north of the plastics recycling and processing facility site on land zoned IN1 General Industrial. – The exact final future land uses are currently not known.

There are no other known State significant development and State significant infrastructure projects, designated development projects or other major greenfield and urban renewal developments scheduled for the area.

Development application documents were not publicly available for the 18 Lot Subdivision and therefore there was insufficient information available to quantify or assess potential future impacts associated with projects associated with the subdivision, other than to note that they may have potential impacts that will be relevant.

18.4.3 Cumulative impacts with other projects

Biodiversity

Development application documents were not publicly available for the 18 Lot Subdivision.

A request to waive the requirement for a Biodiversity Development Assessment Report for the Southern Waste Management Facility was submitted to the Department of Planning and Environment (Prime Environmental Consulting 2019a). The request included a biodiversity assessment which identified that 2.2 hectares of exotic grassland would be removed or modified but noted that no threatened biota were considered likely to be impacted by the project. A waiver was subsequently granted by the Office of Environment and Heritage in 2019.

The EIS for the New Berrima Brickworks facility (WillowTree Planning 2020) identified that the project would require the removal of 2.06 ha of vegetation, comprising two hectares of PCT 944 (Mountain Grey Gum - Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion) and 0.06 ha of PCT 731 (Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion). This would include 24 individual *Eucalyptus macarthurii* (Camden Woollybutt) trees. The EIS concluded that the project would not result in significant biodiversity impacts, and due to the small scale of predicted impacts, did not propose biodiversity credits to mitigate or offset impacts.

The cumulative impacts of the proposal with the above projects would therefore include the removal of 2.38 hectares native vegetation. There would be cumulative impacts to 2.1 hectares of PCT 944 (comprising 0.1 hectares from the proposal and 2.0 hectares from the New Berrima Brickworks facility).

The cumulative loss of native vegetation and associated habitats is not considered to be significant and impacts of the proposal would be mitigated by providing offsets.

The proposal and other projects identified would involve minimal disturbance to aquatic habitats. Therefore, the potential cumulative impacts on aquatic ecological communities and sensitive receiving environments would be minimal.

Aboriginal cultural heritage

The scoping assessment (Prime Environmental Consulting 2019b) for the Southern Waste Management Facility included an Aboriginal cultural heritage due diligence assessment. The assessment identified 59 Aboriginal archaeological sites recorded on the AHIMS. However, the proposed disturbance area was absent of any recorded archaeological sites.

The assessment noted that:

– the proposed disturbance area
  - contained steeply to moderately inclined hillslopes and a heavily disturbed rounded crest
  - contained no reliable sources of water and the survey did not identify any Aboriginal heritage sites
  - was assessed as having low archaeological potential due to the distance to a reliable water source, erosion prone soil characteristics and the results of the survey

– the high level of existing site disturbance also indicate that in-situ subsurface deposits are unlikely to be present across the proposed disturbance area.

The assessment concluded that the proposed disturbance area has low archaeological potential and no further Aboriginal cultural heritage assessment is proposed as part of the EIS.

The EIS for the New Berrima Brickworks facility (WillowTree Planning 2020) identified 134 recorded Aboriginal sites within the study area for the project and 13 sites that would be impacted by the project. One site was assessed as having high significance that would be subject to partial harm. One site was assessed as having moderate significant that would be subject to partial harm. The remaining sites were assessed as having low cultural significance and total harm.

The cumulative impacts of the proposal with the above projects would therefore include harm to:

– one site assessed as having high significance
– one site assessed as having moderate significance
– three isolated finds assessed as having high cultural values but low scientific values

The remaining sites that would be impacted by the proposal or the above projects were assessed as having low significance or value.

Mitigation measures include preparation of Aboriginal cultural heritage management plans and these plans would include measures, where appropriate through consultation with RAPs, to locate and salvage artefacts.

Traffic and transport

The scoping assessment (Prime Environmental Consulting 2019b) for the Southern Waste Management Facility identifies that potential traffic and transport impacts would be associated with an increase in the number of vehicles that would travel along Berrima Road (a sub-arterial road) and ultimately Douglas Road (a local collector road), principally between the site and the major industrial hubs of Sydney, Wollongong and Canberra. The scoping assessment does not quantify the expected light or heavy vehicle trips the project is likely to be generated. However, vehicles associated with the project are not expected to use Collins Road, Lackey Road or other local roads that form part of the traffic and transport assessment study area for the proposal.

The EIS for the New Berrima Brickworks facility (WillowTree Planning 2020) identifies that the facility would have frontages to Berrima Road to the west and New Berrima Clay/Shale Quarry to the north. It also identifies that:

– the project would generate up to 115 trucks (230 movements) per day
– the project would have a total of 36 employees (with associated light vehicles) during a shift at any one time
– trucks would travel to the facility via Taylor Avenue and Berrima Road.

Therefore, traffic to and from the New Berrima Brickworks facility would likely use Berrima Road but would not use Douglas Road, Collins Road, Lackey Road or other local roads that form part of the traffic and transport assessment study area.

The EIS for the New Berrima Brickworks facility (WillowTree Planning 2020) determined that Berrima Road would continue to operate at a very good level of service (being Level of Service A).

Therefore, the potential cumulative traffic and transport impacts of the proposal and the above projects would be minimal.

Noise and vibration

The scoping assessment (Prime Environmental Consulting 2019b) for the Southern Waste Management Facility does not quantify the potential noise and vibration impacts but it does identify that potential noise and vibration impacts would be primarily managed through the full enclosure of the facility. Insufficient information is currently available to quantify potential cumulative noise and vibration impacts with the proposal. However, the enclosure of the facility is likely to result in minimal potential for cumulative noise and vibration impacts.

Due to the distance the New Berrima Brickworks facility is unlikely to have cumulative impacts with the proposal related to noise and vibration.

Air quality

Similar to noise and vibration, the scoping assessment (Prime Environmental Consulting 2019b) for the Southern Waste Management Facility identifies that potential air quality impacts would also be primarily managed through the full enclosure of the facility. Insufficient information is currently available to quantify potential cumulative air quality impacts of this project with the proposal.

Due to the distance the New Berrima Brickworks facility is unlikely to have cumulative impacts with the proposal related to air quality.

Potential cumulative air quality impacts of the proposal with other *existing* industrial facilities are considered in section 13.4.4.

Landscape and visual

The scoping assessment (Prime Environmental Consulting 2019b) for the Southern Waste Management Facility does not consider potential landscape and visual impacts.

Due to the distance, the New Berrima Brickworks facility is unlikely to have cumulative impacts with the proposal related to landscape and visual amenity.

19. Local and regional infrastructure

19.1 Off-site infrastructure required

Infrastructure required on the plastics recycling and reprocessing facility site is described in chapter 7. Other infrastructure required off-site includes:

- New public access road (Braddon Road and Braddon Road east extension) – which is also part of the proposal site
- Water and sewer connections
- Power connection
- Telecommunications (NBN) connection

19.1.1 New access road

Access would be provided to / from the plastics recycling and reprocessing facility site to Lackey Road in the east via a new public road constructed within the existing “paper road” west of Beaconsfield Road and extension of the new public road along the southern boundary of the Australian BioResources site (Braddon Road east extension), as shown in Figure 4.2. This option is aligned with the location of a new future east-west road corridor as part of the MVEC. Consultation with Council (as outlined in chapter 6) confirms support for this public road.

As part of the land on which the new public road is proposed is privately owned, it requires acquisition (or lease agreement) of a portion of the following parcel of land for the construction and operation of the road:

- Lot 10 DP 1084421 (9-11 Lackey Road, Moss Vale) – the Australian BioResources site

To minimise the number of land owners directly impacted by the proposed new public road, the proposed road corridor to Lackey Road as shown in Figure 2 (Option 2a) is not directly in line with Braddon Road. If a straighter alignment is preferred by the Council than shown in this figure, the following parcel of land would also be affected:

- Lot 1 DP 26490 (77 Beaconsfield Road, Moss Vale)

This alternative alignment (Option 2b) is shown in Figure 4.3.

For Option 2a, landowner’s consent would be required for the new access road for part Lot 10 DP 1084421.

The proposed road is included within this EIS and would be assessed and approved as part of this State Significant project.

19.1.2 Water and sewerage

Council is responsible for providing water and sewerage services throughout the Wingecarribee local government area.

GHD has liaised with Council’s Water, Sewage and Drainage officers and has undertaken water and sewer modelling requested by Council, which is contained in Technical Report 11 – Water and Wastewater Modelling. This identifies an existing water main available in Braddon Road to provide a water service.

The report also identifies a need for a new gravity sewer from the plastics recycling and reprocessing facility site in a northerly direction to the nearest manhole which is located on Douglas Road.

19.1.3 Power

The plastics recycling and reprocessing facility would require an electricity supply to operate the facilities, which would necessitate a new electricity connection. Initial investigations by GHD indicated that a zone substation is located on Douglas Road, to the north-west of the plastics recycling and reprocessing facility site.

This would require a new powerline from the plastics recycling and reprocessing facility site to the zone substation. It is likely that this powerline would go along the existing paper road on the western side of the proposal site, and that this would be on overhead lines until it reached the railway line, then pass under the line, before emerging on Douglas Road and heading west on overhead lines to the substation.

19.1.4 Telecommunications

The plastics recycling and reprocessing facility would need to be connected to the NBN. It is understood that the NBN is available nearby. GHD consulted with NBN Co by sending a letter in August 2020, which was not responded to.

19.1.5 Natural gas

At this stage, it is not anticipated that a natural gas connection would be required. However this may change based on final selection of equipment.

19.2 Infrastructure delivery and staging

19.2.1 Access road

Council has requested that Plasrefine Recycling negotiate with the landowner of Lot 10 DP 1084421 and build the new access road as part of the proposal. The public road would then be dedicated to Council, with the works able to be considered as works in kind and able to offset any required developer contributions.

Council has advised Plasrefine Recycling that if agreement on purchasing the land cannot be achieved, that it could potentially use its powers of compulsory acquisition. Council is yet to respond to correspondence sent in October 2021 on this matter. The approvals required to build this road are sought through this EIS.

19.2.2 Water and sewerage

The modelling undertaken by GHD at Council's request assessed the ability of the water system to provide sufficient water for operations, and the sewerage network and sewage treatment facilities to accommodate the flows from the facilities. The results of modelling have indicated that the sewerage system has capacity, provided that discharges to the sewer system occur at night, when domestic flows are very low.

As mentioned above, there is a need for a new gravity sewer from the plastics recycling and reprocessing facility site in a northerly direction to the nearest manhole which is located on Douglas Road.

Plasrefine Recycling will continue to engage with Council (as operator of the local water and sewer network) to provide this connection. As Council is the owner of the existing sewer infrastructure, it is expected that Council would be responsible for obtaining the approval required under Part 5 of the EP&A Act for the new section of sewer main, from the proposal site to the existing manhole in Douglas Road. There would likely be sufficient capacity in the new sewer main to service other future developments in the vicinity of the plastics recycling and reprocessing facility site.

As mentioned above, an existing water main is available in the yet to be constructed Braddon Road, and it is anticipated that Plasrefine Recycling would connect directly to this main to provide a water service. If any approvals would be required for Plasrefine Recycling to connect to the existing water main, these would be obtained by Council (as the service provider) under Part 5 of the EP&A Act.

19.2.3 Power

GHD consulted with Endeavour Energy and the proponent has submitted an application for a power connection to Endeavour Energy to service the project.

As Endeavour Energy is the service provider, it is expected that it would be responsible for obtaining the approvals required for a public utility under Part 5 of the EP&A Act for the new power connection.

19.2.4 Telecommunications

GHD consulted with NBN Co by sending a letter in August 2020, but no response was received. Discussions with NBN are expected to take place once the EIS is on exhibition. It is expected that NBN would be available in the local area and could be extended to the site as part of construction of the new road. If any approvals would be required for Plasrefine Recycling to connect to the NBN, these would be obtained by the NBN service provider under Part 5 of the EP&A Act.

19.2.5 Natural gas

If any approvals were required in future for Plasrefine Recycling to connect to existing natural gas infrastructure, these would be obtained by the service provider under Part 5 of the EP&A Act.

19.3 Planning agreement

A Voluntary Planning Agreement (VPA) between Plasrefine Recycling, Australian Bioresources and Council is expected to be required to facilitate the new public road. VPA discussions commenced with Council in late 2021.

19.4 Development contributions

The proponent is expected to be liable for Section 94 and 64 developer contributions. The cost of purchasing land and constructing the public road, as well as building of the new sewer is expected to be able to be offset against these contributions through a Works in Kind application to be submitted to Council for its assessment and determination

19.5 Infrastructure delivery and staging plan

The arrangements to ensure the required servicing upgrades (in particular sewerage and electricity) will be implemented in a timely manner are summarised below.

Table 19.1 Infrastructure delivery plan

Servicing	Current status	Proposed next actions	Timing
Sewerage	Modelling completed by GHD at Council request and letter of offer submitted to Council for sewerage connection	Council to confirm arrangements for sewer connection, including permission for proponent to access sewer manhole via new sewerage main along paper road	February 2022
Electricity	Application submitted to Endeavour Energy for electricity connection and fee paid by proponent for technical study by Endeavour Energy	Endeavour Energy to conduct study and confirm ability to connect, costs and timing of such a connection	March 2022
Water	Modelling completed by GHD at Council request and letter of offer submitted to Council for water connection	Council to confirm arrangements for water connection	February 2022

An electricity connection will not be required until late 2023/early 2024, so there is sufficient time to plan, obtain approved and build the connection. Similarly, sewer and water connections will not be required until this time.

20. Environmental management

20.1 Environmental management framework

20.1.1 Compilation of impacts

The key potential impacts during construction and operation that require mitigation and management are summarised in Table 20.1 and Table 20.2 respectively. Further information is provided in the relevant chapters.

The identified impacts would be mitigated by implementing the environmental management procedures and plans described in sections 20.1.2 through 20.1.4 and the mitigation measures compiled in Appendix D.

Table 20.1 Summary of key potential construction impacts

Issue	Key potential construction impacts
Waste	Generation of waste during construction, which would require appropriate storage, segregation, handling and reuse, recycling or disposal
Soils and water	Erosion and generation of sediment due to a relatively large area of disturbance during construction Impacts on downstream water quality if management measures and not implemented, monitored and maintained
Traffic and transport	Temporary increases in heavy vehicle and light vehicle traffic movements on the local road network
Noise and vibration	Potential for construction noise to exceed the noise management level during worst-case construction conditions (when construction works are at the closest distance between source and receiver) at some of the closest receivers to the proposal site
Air quality	Low levels of dust generation during earthworks, access road and main facility construction activities and well as track-out across all stages of construction
Aboriginal cultural heritage	Harm to three isolated finds (MVRec IF1, BR IF1, and BR IF2) assessed as having high cultural values but low scientific values and three sites (Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3) assessed as no longer having cultural heritage value
Landscape and visual	Temporary landscape character changes and visual impacts due to visibility of construction compound and activities, and increase in construction traffic
Biodiversity	Clearing of 0.32 hectares of native vegetation Removal of the existing farm dam which provides potential foraging habitat for native fauna species, including the Southern Myotis Possible injury or mortality of some individuals of less mobile fauna species during clearing activities Indirect impacts such as weed invasion, introduction of pests and pathogens and aquatic disturbance as a result of erosion and sedimentation

Table 20.2 Summary of key potential operation impacts

Issue	Key potential operation impacts
Waste	Generation of some waste during operation from both the recycling and reprocessing activities as well as from staff/offices, which would require appropriate storage, segregation, handling and reuse, recycling or disposal
Soils and water	The realignment of the existing eastern watercourse and changes to surface water flows as a result of the proposal infrastructure Riparian vegetation restoration of both the realigned eastern watercourse and existing western watercourse Demand for potable water and wastewater (sewage) capacity
Traffic and transport	Increases in heavy vehicle and light vehicle traffic movements on the local road network

Issue	Key potential operation impacts
Noise	Noise from plant and equipment and recycling/reprocessing activities within the buildings that would require appropriate acoustic considerations in the building design
Air quality	Low levels of particulates and volatile organic compound emissions from granulation and injection and extrusion moulding Low level of particulates emissions from milling or profiling activities in Building 2
Hazards and fire risks	Risks from operational hazards such as vehicle interaction, natural hazards, fire, entanglement, falls from heights, flying/falling objects, manual handling, slips, trips, falls, collisions, contact with chemicals Fire risks from potentially combustible internal waste stockpiles
Landscape and visual	Moderately significant potential impact to the landscape character zone LCZ1 (pastoral open undulating land) as a result of the high sensitivity and susceptibility to change (albeit low magnitude of change) of the zone High potential visual impact to viewpoints 1 (view from Beaconsfield Road looking north-west), and 2 (view from 250 metres north of Bulwer Road, looking north-east towards the plastics recycling and reprocessing facility site) as a result of high sensitivity to change and substantial and obvious changes to the existing view Moderate potential visual impact to viewpoint 5 (view from Collins Road, looking south) as a result of substantial and obvious changes (albeit low sensitivity to change) to the existing view
Biodiversity	Beneficial impacts as a result of the riparian vegetation management plan and the revegetation associated with the realignment of the western watercourse Potential for impacts to surrounding vegetation and habitat values through: – generation of additional light and noise – erosion and sedimentation as a result of runoff from hard stand areas – introduction of weed propagules by vehicle and/or residents/businesses – fauna mortality as a result of collision with vehicles – increased risk of fire – litter
Greenhouse gas	Greenhouse gas emissions of about 91,000 tCO_2-e. While negligible compared to the annual emissions in NSW and Australia, it would potentially be above the reporting threshold of the National Greenhouse and Energy Reporting scheme

20.1.2 Approach to environmental management

The approach to environmental mitigation and management for the proposal involves:

- Proposal design – as described in chapter 7, the proposal incorporates measures to avoid and minimise impacts.
- Mitigation measures – mitigation measures provided in chapters 9 through 18 are identified as an outcome of the environmental impact assessment and are consolidated in section 20.2.
- Plasrefine Recycling's environmental management system – would be used to manage the construction and operation of the proposal. The management system would provide the framework for implementing the construction and operation environmental management plans described below, and any conditions of other approvals, licences, or permits.
- Proposal-specific construction environmental management plan and an operational environmental management framework – prepared to guide the approach to environmental management during construction and operation, as described in sections 20.1.3 and 20.1.4. The construction environmental management plan and an operational environmental management framework would:
  - outline the environmental management practices and procedures to be followed
  - document processes for demonstrating compliance with the commitments made in this EIS, the submissions report (to be prepared), and relevant approval conditions
  - be prepared generally in accordance with the *Environmental Management Plan Guideline for Infrastructure Projects* (DPIE 2020).

20.1.3 Construction environmental management plan

The management of environmental impacts during construction would be documented in the construction environmental management plan, to be prepared by the construction contractor(s). The construction environmental management plan would provide a centralised mechanism through which all potential construction-related environmental impacts will be managed. It would also provide the overall framework for the system and procedures to ensure that environmental impacts are minimised, and that legislative and approval requirements are fulfilled.

The construction environmental management plan would define how specific environmental issues are to be managed during construction in accordance with the mitigation measures provided in the EIS and the conditions of approval. It would be prepared generally in accordance with the *Environmental Management Plan Guideline for Infrastructure Projects* (DPIE 2020c). The construction environmental management plan would include:

- Plasrefine Recycling's environmental policy, objectives, and performance targets for construction
- reference to all relevant statutory and other obligations, including consents, licenses, approvals, and voluntary agreements required
- management policies, procedures, and review processes to assess the implementation of environmental management practices and the environmental performance of the proposal against the objective and targets
- requirements and guidelines for management in accordance with:
  - the conditions of approval for the proposal
  - the mitigation measures specified in this EIS
  - relevant construction management guidelines
  - requirements in relation to incorporating environmental protection measures and instructions in all relevant standard operating procedures and emergency response procedures
  - roles and responsibilities of all personnel and contractors to be employed on-site
  - incident and contingency management procedures
  - processes for demonstrating compliance with the commitments made in this EIS, the submissions report (to be prepared), and relevant approval conditions
  - procedures for complaints handling and ongoing communication with the community
  - a monitoring and auditing program, as defined by this EIS and the conditions of the approval.

The construction environmental management plan would comprise a main document, issue-specific sub-plans, activity-specific procedures and strategies, and site-based control maps. The construction environmental management plan issue-specific sub plans proposed to manage the impacts identified in the EIS (in accordance with the mitigation measures) include:

- construction waste management plan
- detailed soil and water management plan (including erosion and sediment control plans)
- unexpected finds procedure
- riparian vegetation management plan
- construction traffic management plan
- construction noise and vibration management plan
- construction dust management plan
- Aboriginal cultural heritage management plan
- weed and pest species management plan
- dam dewatering plan
- community information and awareness strategy

20.1.4 Operational environmental management plan

The operational environmental management plan would:

- describe desired outcomes and processes for the prevention and management of environmental impacts resulting from the operation the proposal
- set out the responsibilities and accountabilities within Plasrefine Recycling and others in this regard
- identify key management systems that support the delivery of environmental compliance.

The environmental management plan would include:

- a description of activities to be undertaken during operation
- an environmental risk analysis to identify the key environmental performance issues associated with the operation phase
- statutory and other obligations that the proponent is required to fulfil during operation, including approvals, consultations and agreements required from authorities and other stakeholders under key legislation and policies
- a description of the links with Plasrefine Recycling's Environmental Management System, and the environment protection licence for the proposal
- overall environmental policies, guidelines and principles to be applied to operation
- roles and responsibilities for relevant employees involved in operation, including relevant environmental training and induction requirements
- incident and contingency management procedures
- details of how environmental performance would be managed and monitored to meet acceptable outcomes, including what actions would be taken to address identified potential adverse environmental impacts.

Specific plans to manage issue-specific impacts identified in the EIS (in accordance with the mitigation measures) would include:

- operational waste management plan
- operational water management plan
- green travel plan
- operational noise management plan
- operations plan for stockpile management
- incident response management plan
- emergency services information package

20.2 Mitigation and management measures

Appendix D provides a compilation of the measures proposed to mitigate and manage the potential impacts of the proposal, as detailed in chapters 9 through 18.

The measures listed may be revised in response to submissions raised during public exhibition of the EIS and/or any design changes made following exhibition. The final list of mitigation measures would be provided in the submissions report. If the proposal is approved, the conditions of approval, which would include reference to the finalised mitigation measures, would guide subsequent phases of the proposal. The works would be undertaken in accordance with the conditions of approval and the final list of mitigation measures.

21. Justification and conclusions

21.1 Justification for undertaking the proposal

21.1.1 Environmental considerations

Approach

Detailed environmental investigations have been carried out as described in chapter 8 and chapters 9 to 18 to:

- understand the existing environment of the proposal site and surrounds
- inform access road option selection
- inform development of the concept layout design and preliminary construction planning
- undertake the environmental impact assessment and prepare the EIS.

To provide a high level of certainty in understanding the environment and identifying potential impacts, all investigations were undertaken by technical specialists experienced in impact assessment using best practice methodologies in accordance with relevant requirement statutory requirements and guidelines. A summary of the investigations undertaken, methodologies applied, and results achieved, are described in chapters 9 to 18. Further detailed information is provided in the technical reports.

The first step of the impact assessment process involved identifying key potential environmental issues, impacts and risks that would be subject to detailed assessment as part of the EIS. Investigations were informed by the impact scoping exercise and environmental risk assessment, as described in chapter 8, and were undertaken in accordance with the SEARs. The results of environmental investigations and consideration of the environmental risk assessment were used to ensure that potential impacts are avoided as far as possible.

Ways to further reduce and minimise unavoidable potential impacts on the environment have also been considered. Mitigation and management measures to minimise any outstanding impacts are identified in this document. These measures, and the proposed approach to environmental management during construction and operation, are provided in chapter 20.

Avoiding and minimising impacts through design

The approach to design development has included a focus on avoiding and/or minimising the potential for impacts during all key phases of the design process. In this regard, a feedback process has enabled findings from stakeholder engagement and the various technical specialist studies to be captured and shared, allowing a collective understanding of the receiving environment to be built up, and leading to elements of the design being refined or changed to respond to these findings.

Various detailed investigations and assessments have been undertaken, including site visits and modelling. These investigations included a broad study area to identify key constraints early in the design process and assist with avoiding and minimising impacts as far as reasonably practicable.

The overall approach to the design development included the following key steps:

- location screening
- social, environmental and economic constraints assessment to identify and assess potential sites
- technology selection
- preparation of initial concept design and concept site layout
- stakeholder engagement
- refinement to the design and concept site layout
- detailed investigations and assessments
- further refinement of the design/technology and concept site layout.

Key features that have now been incorporated in the design of the proposal to avoid and minimise impacts include:

- enclosure of all plastic waste receival, recycling, reprocessing and storage within buildings with automatic fast opening doors to minimise the potential for noise impacts and prevent waste materials from entering the environment
- design of the concept site layout to enable the main doors where waste delivery trucks would enter and exit to be placed on the western side of the building, facing away from the nearest sensitive receivers
- careful selection of plant, equipment and building materials to reduce noise emissions and vibration and enable the proposal to meet strict operational noise criteria defined by the *Noise Policy for Industry* (NSW EPA 2017)
- installation of air pollution control devices on all crushing, granulation and injection or extrusion moulding production lines to treat air emissions at source and therefore minimise air emissions
- design of the concept site layout and access road to minimise (and avoid where possible) potential impacts to riparian vegetation and native vegetation
- design of the concept site layout to enable all waste delivery trucks to queue entirely within the site (avoid any queuing on Braddon Road)
- provision of an on-site wastewater treatment plant to recycle water used in the plastic cleaning processes in order to maximise water re-use and reduce demand on potable water
- enclosure of the wastewater treatment plant and placement on the site to minimise potential for noise or odour
- installation of rainwater tanks to capture roof water and further reduce potable water demand
- incorporating a water quality treatment train including gross pollutant traps for primary treatment of runoff from impervious ground surfaces, lined storage basins for rainwater tank overflow and gross pollutant trap outflow and a bioretention filter basin and swale immediately downstream of storage basins to ensure all water discharged off-site would have a neutral or beneficial effect on water quality
- design of the internal building layout to ensure internal plastic waste stockpile dimensions and volumes would comply with the *Fire safety guideline - Fire safety in waste facilities* (FRNSW 2020)

21.1.2 Social and economic considerations

Potential positive and negative socio-economic impacts have been considered in section 18.2.

During construction there is potential for actual or perceived amenity impacts associated with increased vehicle movements on the local road network, noise, vibration, dust and views to the proposal site. Any potential actual or perceived construction-related amenity impacts would be temporary in nature (about 12 to 15 months).

During operation there is also potential for actual or perceived amenity impacts associated with increased vehicle movements on the local road network, noise, air emissions and changes to landscape character and views to the proposal site.

Ways to reduce and minimise unavoidable potential amenity and socio-economic impacts have been considered during design development to date and as a result of the environmental investigations. Chapter 20 provides details of these proposed mitigation and management measures.

The proposal also has a number of significant benefits which must also be considered when determining if the proposal is in the public and community's interest overall. The benefits of the proposal are summarised below.

Public interest and community benefits

The proposal would help deliver key national and state priorities for waste management and resource recovery infrastructure and policy. The proposal would provide significant local plastics recycling and reprocessing capacity to divert waste otherwise destined for landfill, increase plastic recycling and keep existing plastics in use in the economy.

The key overall benefits are:

- **Diversion of waste from landfill:** the proposal would divert significant quantities of plastics waste from landfill, which in turn would reduce demand for new landfills

- **Improved sustainability:** every tonne of mixed plastics that can be recycled is estimated to lead to a net avoidance of 320 tonnes of CO_2 equivalent greenhouse gas emissions, 1.2 kilograms of non-methane volatile organic compounds (ie. smog) and 26 kilolitres of water (Carre et al 2015)
- **Increased resource efficiency:** the proposal would not only recycle mixed plastics, but it would also reprocess the plastics into advanced products, which is consistent with a move towards a circular economy
- **Job creation:** the proposal is expected to create new up to 30 jobs at the peak of construction and up to 140 new long-term jobs in the resource recovery sector once at full scale operation
- **Stimulate the local economy:** the proposal would increase economic activity in the Southern Highlands region with potential increases in trade at local businesses and increased demand for construction related goods and services
- **Drive innovation:** the proposal includes advanced automated sorting and processing technologies but also includes a products manufacturing lab to conduct recycling research and product development to further drive innovation in plastics recycling
- **Provide education:** the proposal would include facilities to enable educational activities for school groups and other interested parties to be carried out (and learn about plastic waste, plastic recycling and turning wastes into valuable resources)

The plastics recycling and reprocessing facility layout and design has also been developed with due consideration of the sensitivity of the surrounding environment.

Therefore, the project is considered to be in the public and community's interest.

21.1.3 Consistency with the strategic direction for waste management in NSW

As described in Appendix E, the proposal is consistent with key national and NSW waste management plans and policies, and other relevant plans and strategies. In summary:

- The proposal is consistent with the *National Waste Policy* (Australian Government 2018) and *National Waste Policy Action Plan* (Australia Government et al 2019) as it would transform plastic waste into high value materials, create jobs and contribute towards meeting Australia's resource recovery target.
- The proposal is consistent with the *National Plastics Plan 2021* (DAWE 2021) as it would increase Australia's recycling capacity and contribute towards the packaging and plastics targets.
- Consistent with the NSW Waste Strategy (DPIE 2021a), the proposal would contribute necessary infrastructure to improve NSW's capacity to increase resource recovery and lift both the plastics recycling rate and the overall average recovery rate.
- The proposal is consistent with the *NSW Circular Economy Policy Statement: Too Good to Waste* (NSW EPA 2019) as it would reduce demand for new landfills, provide innovative technologies that increases resource efficiency and create jobs in the resource recovery sector.

21.1.4 Suitability of the site

The plastics recycling and reprocessing site is considered suitable for the proposal for the following reasons:

- the proposal site is within the Moss Vale Enterprise Corridor (MVEC), a significant area of land (greater than 1,000 hectares) between Moss Vale and New Berrima, set aside for industrial and employment generating development under the Wingecarribee LEP.
- the use (plastics recycling and reprocessing) is consistent with Council's desired future character and use of land within the MVEC and Southern Highlands Innovation Park, which is land specifically designated by Council for employment generating development, large scale industrial development and sustainable and innovative businesses
- the use is permissible with consent in the IN1 General Industrial zone and is consistent with the objectives of this zone under the provisions of the Wingecarribee Shire LEP
- it is located close to major transport routes to Sydney, Canberra and Wollongong and along the main route to Melbourne (ie. near the Hume Highway, with good connections to the M7, M5 and M4 motorways)

- the preliminary site investigation demonstrated its suitability for its intended future use from a contamination risk perspective under SEPP 55
- the preliminary risk screening, conducted in accordance with the requirements of SEPP 33, confirmed that its intended use would not be an offensive or hazardous industry
- the soils and water assessment, conducted in accordance with the requirements of the Sydney Drinking Water Catchment SEPP, demonstrated its intended use would result in a neutral or beneficial effect on water quality
- the proposal site is not mapped as Biophysical Strategic Agricultural Land (BSAL) and agricultural use of the proposal site is not permitted in the IN1 General Industrial zone
- the location is more than 1 km to the north and west (on the other side of the rail line) of Moss Vale's main tourist attractions (on the other side of the rail line) and more than 4 km from Berrima's main tourist attractions. Heavy vehicle access to the site uses TfNSW's approved routes for use by heavy vehicles and does not detract from these attractions
- the EIS technical studies have demonstrated that its intended use would not result in significant impacts to nearby sensitive receivers and with the implementation of the proposed mitigation and management measures outlined in this EIS, the potential environmental impacts of the proposal would be adequately managed.

The proposed new access road corridor is considered suitable for the proposal as it aligned with the future east-west road corridor as part of the MVEC and removes the need for operational traffic to use Beaconsfield Road. The *Moss Vale Enterprise Corridor Development Control Plan* (WSC 2012) designates the new access road corridor as a future collector road.

21.1.5 Ecologically sustainable development

The EP&A Act adopts the definition of ecologically sustainable development contained in the *Protection of the Environment Administration Act 1991*. The following sections provide reasons justifying the proposal having regard to the principles of ecologically sustainable development defined by clause 7(4) of Schedule 2 of the EP&A Regulation.

Precautionary principle

The precautionary principle is defined as '…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'.

A range of environmental investigations have been undertaken during the development of the proposal and the environmental assessment process, to ensure that potential impacts are understood with a high degree of certainty. The assessment of the potential impacts of the proposal is considered to be consistent with the precautionary principle. The assessments undertaken are consistent with accepted scientific and assessment methodologies and have taken into account relevant statutory and agency requirements. The assessments have applied a conservative approach with regard to construction and operational arrangements, and the modelling used.

The proposal design has evolved to avoid impacts where possible and to reflect the findings of the studies undertaken. For example, the new access road for the proposal has been selected to minimise the potential environmental impacts, particularly the extent of biodiversity impacts and with consideration of safety. The facility layout and design has also been developed with due consideration of the sensitivity of the surrounding environment and of nearby land uses.

Mitigation and management measures have been proposed to minimise potential impacts, which would be implemented during construction and operation.

A conservative approach has been adopted in relation to potential impacts. For example, where potential suitable habitat for species credit species is present, the species are assumed present and appropriate offsets have been calculated. No threat of serious or irreversible damage to the environment arising from the proposal has been identified.

Principle of inter-generational equity

The principle of inter-generational equity is defined as '…the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.'

Construction of a facility and new access road such as the proposal has the potential for some degree of environmental and social disturbance. These disturbances include the clearing of vegetation; realignment of one of the existing waterways, some disturbance to private properties for the new access road; and localised impacts. However, the potential for environmental and social disturbance as a result of construction has to be balanced against the long-term benefits of the plastics recycling and reprocessing facility overall.

The proposal would facilitate improved diversion of plastic waste from landfill into uses with higher resource value (value adding). This would be achieved through a combination of advanced sorting, separating and cleaning technologies to separate mixed plastics. The technology has been specifically selected and designed to recover valuable materials which would once have either been exported overseas or otherwise have been landfilled. This would help conserve raw material resources and fossil fuels (used for the production of plastics). This is a direct benefit to future generations.

Recycling of plastics and reprocessing captures the embodied energy contained within the waste – significantly reducing energy and water demand that would be required to manufacture using virgin materials.

In addition, the proposal would improve local employment potential and contribute to economic growth in the local area.

Conservation of biological diversity and ecological integrity

The principle of conservation of biological diversity and ecological integrity is defined as '…conservation of biological diversity and ecological integrity should be a fundamental consideration.'

Ecological studies have been undertaken to identify potential adverse impacts on biodiversity. Where potential impacts cannot be avoided, mitigation measures would be implemented to reduce the impact as far as possible.

Multiple iterations of the proposal boundary have been considered and the boundary adjusted to limit impacts on native vegetation within the remainder of the plastic recycling and reprocessing facility site.

The proposed new access road was selected to avoid impacts on a local occurrence of *Southern Highlands Shale Woodlands of the Sydney Basin Bioregion* on one of the access road alignment options, which is listed as an endangered ecological community under the BC Act, and as a critically endangered ecological community under the EPBC Act. This compares to the selected road option, which would require the removal of exotic grassland and a small patch of planted vegetation of low biodiversity value.

A biodiversity assessment was undertaken in accordance with the *Biodiversity Assessment Method* (OEH 2017) to identify potential adverse impacts on biodiversity. Mitigation measures are proposed to minimise and manage the significance of the impact on native vegetation and flora and fauna. Biodiversity offsets would be implemented to address the impacts that cannot be avoided.

Improved valuation and pricing of environmental resources

The principle of improved valuation and pricing of environmental resources is defined as '…that environmental factors should be included in the valuation of assets and services.'

The assessment has identified the environmental and other consequences of the proposal and identified mitigation measures where appropriate to manage potential impacts. If approved, the construction and operation of the proposal would be in accordance with relevant legislation, the conditions of approval, and the construction and operation environmental management plans. These requirements would result in an economic cost to the proponent. The implementation of mitigation measures would increase both the capital and operating costs of the proposal. This signifies that environmental resources have been given appropriate valuation.

The value of environmental resources is also inherently considered in the development of a design that avoids and minimises impacts.

The concept design for the proposal has been developed with an objective of minimising potential impacts on the surrounding environment. The extra cost of road access options assessment, designs, proposal elements, management measures and impact offset or mitigation packages, are selected to avoid and minimise environmental and/or social impacts, are included in the total estimated proposal cost.

21.2 Conclusion

The proposal responds to a strong need to develop additional plastic recycling and reprocessing infrastructure in order to provide the capacity and technology to divert plastic waste from landfill, increase plastics recycling and keep existing plastics in use in the economy.

The proposal is consistent with the Wingecarribee LEP and in particular, the objectives of the IN1 General Industrial zone. It is also consistent with Council's desired future character and use of land within the MVEC and Southern Highlands Innovation Park, which is land specifically designated by Council for employment generating development, large scale industrial development and sustainable and innovative businesses. The proposal has addressed and is consistent with the relevant objects (Section 1.3) of the EP&A Act in particular:

> b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment
>
> c) to promote the orderly and economic use and development of land,
>
> e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,
>
> g) to promote good design and amenity of the built environment.

As described in chapters 7 and 20, the proposal would incorporate environmental management and design features to ensure that potential impacts are managed and mitigated as far as practicable. The majority of the potential construction related impacts would be effectively mitigated by the implementation of best practice construction management, including the implementation of the environmental management approaches described in section 20.1 and the mitigation measures compiled in section 20.2.

The preferred approach to offset the residual impacts of the proposal on biodiversity values is to secure and retire appropriate credits from stewardship sites that fit within the trading rules of the NSW Biodiversity Offsets Scheme in accordance with the 'like for like' report generated by the BAM calculator. If such credits are unavailable, credits would be sourced in accordance with the 'variation report' generated by the BAM calculator.

The detailed design for the proposal would be developed with the objective of minimising potential impacts on the local and regional environment, and the local community. The design and construction methodology would continue to be developed with this overriding objective in mind, taking into account the input of stakeholders.

To manage the potential impacts identified by the EIS, and in some cases remove them completely, the assessment chapters outline a range of mitigation measures that would be implemented during construction and operation of the proposal. Chapter 20 summarises the mitigation measures that would be implemented. The environmental performance of the proposal would be managed by the implementation of the construction environmental management and operational environmental management framework. The plans and framework would also ensure compliance with relevant legislation and any conditions of approval.

With the implementation of the proposed mitigation and management measures the potential environmental impacts of the proposal would be adequately managed.

Development consent should be granted for the proposal because it:

- is permissible with consent and consistent with the objects of the IN1 General Industrial zone
- is located in the Southern Highlands Innovation Precinct (SHIP), a strategically designated employment generating area where various industrial uses and high technology industries can be accommodated
- is consistent with the strategic planning directions of State and local planning policies
- will contribute to the State's waste recovery performance in meeting waste reduction targets and is consistent with the orderly and economic use and development of land
- would generate social and economic benefits including the provision of 140 operational jobs for the local area and a direct capital investment value of $88 million

- the impacts of the development can be mitigated and managed to ensure an acceptable level of environmental performance
- involves the staged construction of the public access road prior to construction of the recycling and reprocessing facility onsite and performance verification prior to commencement of operational stages as additional safeguards in mitigating environmental impacts and
- is in accordance with the Objectives of the *Environmental Planning and Assessment Act 1979* and is consistent with the Ecologically Sustainable Development Principles, because it would achieve an appropriate balance between the relevant environmental, economic and social considerations.

Whilst the proposal has the potential to result in minor increases in traffic, noise, air quality and amenity impacts, it is a suitable development for the site, sited within the broader MVEC and Southern Highlands Innovation Park, and will deliver local and regional economic benefits. As such, it is in the public interest.

22. References

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