Modification for the upgrade of the Chester Hill Resource Recovery Facility (MP_0052)

Prepared for Builders Recycling Operations Pty Ltd

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SG HADDAD ADVISORY

Strategic Planning Services

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Abbreviations

CBCC	Canterbury-Bankstown City Council
EPL	Environmental Protection License
Facility	Chester Hill Resource Recovery Facility
DPE	NSW Department of Planning and Environment
EPA	NSW Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
POEO Act	Protection of the Environment Operations Act
BRO	Builders Recycling Operations Pty Ltd
tpa	Tonnes per annum

Executive Summary

Introduction

Building Recycling Operations (BRO) Pty Ltd has operated the Chester Hill Resource Recycling Facility (The Facility) since 2015. The Facility is located in the Chester Hill Industrial Precinct which is within the local government area of Canterbury - Bankstown. The facility has approval under the State's former Major Projects legislation (Part 3A) to process up to 100,000 tonnes per annum (tpa) of building and construction waste including concrete, solid waste, topsoil, and timber in addition to non-ferrous and ferrous metal. The Facility commenced operations in 2008 under separate ownership and operators.

Since 2010, the Facility has been the subject of ongoing regulatory non-compliance matters. In 2017 the Department of Planning and Environmental (DPE) issued an order under the *Environmental Planning and Assessment Act, 1979* requiring a number of inherited matters to be addressed including stormwater management, stockpile layout and height, inappropriate use of containers on site, and the need to seal roads.

In the same year, the EPA issued a 'show cause' letter identifying a number of matters considered inconsistent with the applicable Environment Protection License (EPL) issued under the *Protection of the Environment Operations Act*, *1997.* These matters included exceedances of waste limits and waste stockpile heights and inadequate dust management. Importantly, both agencies identified the need to address the legacy waste and operational stockpiles particularly in relation to potential contaminates such as asbestos.

BRO, as the new operator of the Facility, is fully committed to resolving these issues and is currently working through a comprehensive program to ensure compliance. Measures adopted as part of the compliance program include the cessation of all deliveries and the processing of waste on-site, the reduction of the height of stockpiles, improved stormwater and dust management measures, the sampling of potentially contaminated material, and inspections by the EPA to confirm the triage process, the quarantine area, the non-asbestos contaminated area and Asbestos Containing Material (ACM) contaminated area, and the subsequent removal of contaminated material.

BRO submits however, that the only appropriate way to permanently address the non-compliance issues is to develop, implement and invest in a long-term strategy involving the development of a $20m contemporary, state of the art resource recovery facility which includes amongst other things the construction of an enclosure on hardstand areas with appropriate environmental management. BRO considers that with a strong commitment to environmental performance, the construction of the upgraded facility will deliver a sustainable waste recycling facility in line with regulatory and community expectations. Hence the need to apply for a formal modification to its planning approvals to enable BRO to progress the necessary upgrades consistent with good environmental practices.

The Proposed Modification

The modification seeks the:

- Upgrade of the site including the:
  - reconfiguration of the layout including waste stockpiles;
  - erection of an enclosure for the sorting and recycling of waste and the progressive development of hardstand areas for the operational areas of the facility; and
  - improvements to stormwater and wastewater management to ensure required water quality standards.

- Establishment of a daily processing limit of approximately 910 tonnes and the increase in the annual processing limit from 100,000 tpa of building and construction waste (including metal) to 250,000 tpa.

Once the upgrade is complete, the Facility would be capable of processing up to 250,000 tpa of construction and building waste at a recovery rate of greater than 75%. The additional capacity has a number of important benefits. It would:

- transform the site from its current state into a contemporary resource recovery facility with significantly improved environmental and regulatory performance;
- maximise resource recovery and minimise waste to landfill consistent with Federal, State and local government strategic policies;
- contribute positively to the needs of the construction industry; and
- inject capital into local and regional economies including securing 13 full time positions.

Following consultation with the Department of Planning and Environment (DPE) and the Environment Protection Authority (EPA), the scope of the modification application has been clarified and a key design change made to address outstanding environmental and amenity concerns.

Interrelationship between proposed modification and existing legacy and operational stockpiles

The modification application does not seek approval to manage and remove the current legacy and operational stockpiles from the site. BRO continues to engage with the EPA to work towards a mutually acceptable outcome for the existing legacy and operational stockpiles under its existing EPL. Consequently, the modification application should be assessed on the basis that they are no longer on the site.

Amended design to fully enclose site processing activities

The original design for the enclosure as originally submitted with the draft EA and S75W application comprised a shed which was closed on the eastern, southern and western sides yet open on the northern side to assist operations. While the impact analysis found that the processing activities associated with this design would meet key environmental and amenity criteria, especially in relation to air and noise, the EPA maintained concerns that future operations would not consistently meet the relevant standards. Consequently, BRO has amended the initial design to fully enclose the processing activities. This will ensure acceptable and sustained environmental and amenity performance.

Justification for the modification

The NSW Waste Avoidance and Resource Recovery Strategy 2014–21 provides a clear framework for waste management over the next five years. The Strategy aims to increase recycling rates to 80% for construction and demolition (C&D) waste and 70% for commercial and industrial (C&I) waste in 2021. The modification will contribute positively to the implementation of the goals in the NSW Waste Avoidance and Resource Recovery Strategy by diverting up to 187,500 tpa of building and construction waste from landfill. It will also considerably improve the environmental and amenity performance of the facility and its long term sustainability as a waste management asset for the wider NSW community.

A comprehensive environmental impact assessment has been carried out in support of the modification. Key findings are summarised below.

Environmental Impact assessment

Specialist reports were undertaken for waste management, traffic, air, noise, hydrology, visual, and fire safety. Studies undertaken in 2007, 2015 and 2017 were relied upon to determine soil and water impacts. The results of all specialist studies and the assessment in general are summarised below.

Traffic Impact Assessment

The traffic impact analysis found that the upgrade of the facility is expected to generate an additional 22 truck movements per hour and 40 passenger vehicle movements per hour during the morning and evening peak periods which is similar to the anticipated level of development traffic assessed for the original approved development.

An analysis of key intersections using the SIDRA model concludes that there is sufficient capacity to accommodate the expected additional traffic generated by the proposed upgrade of the Facility. The identified intersections would continue to operate satisfactorily with similar performance to that found under existing and future base case conditions which includes growth of background traffic to the year 2027. It was also found that the existing access and parking arrangements were adequate and that while the proposal would result in some queuing, it would be contained well within the site.

Noise and Vibration

The noise emissions associated with the daily operations are predicted to have a minor to moderate impact on receivers on Waldron Road. The noise impact assessment recommended 2 options to ensure compliance with the trigger levels at the Waldron Road properties:

- Option 1: increase the height of the north eastern boundary wall to a height of 8 metres; or
- Option 2: increase the height of the north eastern boundary wall to a height of 6 metres and further enclose the north eastern end of the shed.

However, given BRO has now amended the design of the shed to fully enclose processing activities, mitigation which goes beyond both Options 1 and 2, qualitatively the proposal is expected to easily meet noise goals at sensitive receivers at all times of the day. It should be noted that given the decision to fully enclose processing activities, the EPA advised that it was not necessary to revisit the noise and air quality modelling undertaken for the initial design.

The increase in road traffic noise is predicted to comply with the relevant noise criteria.

Noise Management levels were established for the construction of the site. Minor exceedances of the noise management levels by up to 6dBA could potentially be experienced during a worst-case scenario, albeit the impact would be of short duration. Noise levels will be managed using all feasible and reasonable measures as per the EPA's Interim Construction Noise Guideline.

Vibration criteria were established for both construction and operation of the site. No vibration impact from either construction or operation is expected.

Air Quality

A quantitative air quality assessment was conducted for the site which included dispersion modelling using AERMOD. Taking into consideration the proposed air quality management strategies to be employed on site and the nature of the proposed development, the assessment concluded that the risk of air quality impacts is low. The decision by BRO to now fully enclose all processing activities further reduces this risk ensuring that the facility will comfortably meet air quality goals.

A dust management plan will be established for the site. The objectives of the dust management plan would be to minimise the impact of dust at nearby neighbours by ensuring there is no significant visible dust leaving the site.

A review of proposed site activities did not identify any activities with the potential to generate odours. Materials dumped onto the tipping floor of the processing building would be inspected. In the unlikely event that loads contain prohibited materials, such as putrescible waste, they would either not be permitted to unload or they would be immediately loaded back onto the delivering vehicle and rejected from the site.

The GHG assessment considered Scope 2 – Indirect Emissions for energy used to run the plant and equipment on site which would include conveyors, screens and windsifters, dust extraction plant etc. The expected electricity energy usage was as estimated to be 500kwh. The relevant emission factors applicable to the plant were derived from the National Greenhouse Accounts Factors July 2017. The emission factor for indirect emissions for electricity used is 0.83kg $CO_{2\text{-}e}$/kWh.

Equivalent $CO_{2\text{-}e}$ emissions have been estimated to be 7.8 tonnes $CO_{2\text{-}e}$ per year. Australia's total greenhouse gas emission in 2017 amounted to 533.7 million tonnes of carbon dioxide equivalent ($MtCO_{2\text{-}e}$) whilst in NSW, in 2012, accounted for 131.6 $MtCO_{2\text{-}e}$ of the total. Therefore the plant will account for less than 0.006% of NSW emissions.

Soil and Water

The site was remediated in 2002 and deemed suitable for industrial purposes. In recommending approval for the project in early 2007, the Department of Planning was satisfied that potentially contaminated soils had been adequately addressed. The soils assessment supporting the Part 3A application confirmed that the site was suitable for commercial and industrial uses. However, it did identify a number of potentially contaminated areas within the site which would require careful management during construction. These areas were to remain in situ and were to be sealed as part of the development proposal. Construction management measures have been identified in the environmental assessment to ensure contaminants are dealt with appropriately including overlay of design, due diligence and protocols for dealing with suspect material.

Since this time there have been two assessments that support the earlier findings, one in 2007 and the other in 2015. Both assessments found that the existing subgrade should not be excavated without due consideration of contaminated materials. While these reports support the continued use of the site for commercial and industrial uses, they reiterate the need for care during construction to ensure that contaminants are managed properly for both environmental and work, health and safety reasons. Known contamination has been identified in the environmental assessment and management measures for unexpected finds outlined.

Given that unsealed surfaces will be sealed with concrete to form a continuous hardstand area and the existing stormwater management infrastructure upgraded to include new pipes, construction of a stormwater detention system and installation of water quality treatment devices, the modification would have a positive impact in terms of contamination. In terms of surface and ground water, assessments concluded that the development would result in a significant improvement in stormwater and pollutant discharges from the site particularly given the potential for infiltration of contaminates into the groundwater as a result of this development is negligible given the:

- Majority of the site would be impermeable (with the exception of the small landscaping/grass areas particularly to the south);
- Processing of all wastes would occur within a full enclosure;
- Site's stormwater will improve as a result of the proposed project; and
- There is a range of mitigation and management measures available to ensure acceptable performance during both construction and operation.

Hydrology

A hydrological impact assessment was conducted for the site taking into consideration the modifications which concluded that:

- beneficial soil and water improvement impacts are predicted as a result of the modifications with unobstructed overland flow paths maintained consistent with the natural fall of the existing topography;
- stormwater flows across the site will be managed with a new onsite detention storage system which will include gross pollutant and sediment traps;
- modelling of stormwater quality demonstrates an overall reduction in pollution percentages;
- the provision of rainwater tanks will capture a large quantity of rainfall for non-potable irrigation and dust suppression uses reducing the need for potable main water supply and that harvested water would be available for 89% of the time; and
- there will not be an unacceptable offsite flood risk associated with the modifications particularly given onsite detention and rainwater harvesting.

Visual Impact

The layout and design of the proposed development provides for the efficient use of the site. The proposed modification including the enclosure, hardstand, internal vehicular driveway and landscaping have been located to ensure a functional site layout that achieves the operational objectives of the proposal. The proposed building will sit within an existing industrial area with existing Industrial precinct dominated by industrial uses and associated buildings.

The design of the proposed enclosure encapsulates high commercial and industrial standards by virtue of configurations and colour which respond to the industrial character of the precinct. The application of appropriate tones would alleviate the bulk and scale of the built form to the streetscape. Landscaping within the setbacks and across the site will soften the appearance of built form and hardstand and reduce the perceived bulk and scale of the development.

The Visual Impact Assessment found that views from the surrounding residential areas would have negligible to moderate/low impacts due to the screening afforded by the existing industrial uses, existing established trees and distance to the proposed development. Views from residential flat buildings to the north (Viewpoint G) of the site are the most significantly affected but the majority of the rooms appear to be bathrooms and bedrooms. Furthermore, current views from this point include views of the existing heavy rail corridor and industrial precinct. Furthermore, the site is currently characterised by open earth mounds, waste processing equipment and shipping containers.

On balance, the construction of a 'state of the art' resource recovery facility that will significantly improve onsite environmental performance, positively contribute to State waste recycling targets and the construction industry and inject capital into the local and regional economy outweighs the negligible to moderate/low visual impacts associated with the new enclosure.

Land Use Risk (Hazards)

In accordance with SEPP 33 an assessment was undertaken which considered the:

- small amount of dangerous goods stored in the dedicated dangerous goods storage room being a maximum of 5 x 200L barrels of oil and up to 6 x 18-20kg gas bottles (LPG);
- onsite storage of up to 15,000 litres of diesel in a self bunded smart tank; and
- distance of the storage room from nearest residential receivers.

The assessment concluded that the proposed development cannot be classed as potentially hazardous and that the preparation of a PHA was not required.

Fire and Incident Management

A preliminary Fire Hazard Analysis was conducted for the proposed facility that identifies the likely fire safety systems and measures that will be required to address the hazards and risks associated with its use for the storage of large quantities of combustible materials. The objective of the study was to ensure that the proposed fire prevention, detection, protection and fire-fighting measures are appropriate for the specific fire hazard and adequate to meet the extent of potential fire risk for the proposed development.

Having regard to the BCA and the requirements of Fire and Rescue NSW (FRNSW), the analysis found that the fire safety systems and measures identified are considered appropriate for the specific fire hazard and are expected to adequately address the extent of potential fire risk associated with the proposed development for use as a Waste Management Facility. Having regard to the BCA, these include:

- Perimeter vehicle access for emergency vehicles;
- Fire hydrants;
- Fire hose reels;
- Fire sprinklers, including occupant earning;
- Portable fire extinguishers;
- Fire control centre;
- Automatic smoke exhaust; and
- Emergency lighting and exit signs.

It is noted that a more detailed Fire Safety Study will be required during the detailed design stage of the project to ensure all fire safety objectives are identified and addressed to the satisfaction of all stakeholders. This will include an updated Fire Hazard Analysis that will involve further consultation with FRNSW.

Other Environmental issues

BRO also considered other relevant potential environmental impacts associated with the proposed modification including, biodiversity, aboriginal and non-aboriginal heritage, and socio-economic impacts. Given the negligible impacts expected and the ability of these issues if applicable to be effectively managed under existing conditions of approval and relevant updated environmental management plans, further detailed analysis was not considered necessary.

Mitigation measures

As a result of consultation with both the DPE and EPA, BRO has made a number of key design changes to the development including the full enclosure of all processing activities to address concerns raised by the EPA in relation to the Facilities' ability to sustain environmental performance in the long term, and a

considerable reduction in the height of the enclosure to address visual impacts. These changes will ensure that the proposal meets key environmental and amenity criteria in the short and long term, particularly in relation to visual impacts and air and noise emissions.

The assessment also identified a range of recommended management and mitigation measures to avoid and mitigate impacts. BRO is committed to implementing these measures as appropriate and it is expected that the draft mitigation measures would be revised in response to regulatory and community submissions and more detailed design work, and a CEMP and OEMP prepared accordingly. These are summarised below:

Traffic and transport – as part of the updated CEMP traffic management measures will be adopted including onsite speed limits and pedestrian routes around and through the site. As part of the OEMP a Driver Code of Conduct will be prepared to ensure that deliveries associated with the Facility adhere to accepted industry standards for the transport of waste.

Noise – *the adoption of a range of* construction noise management and mitigation strategies including: strategically positioned plant to limit emissions; limiting the use of acoustically significant plant; regular maintenance of machinery; consultation with neighbours; noise monitoring during activities predicted to generate maximum impacts; and awareness training for all staff and contractors. BRO will maintain a community complaints line that will be available throughout the construction activities. Records of all community complaints will be maintained on an up-to-date complaints register including what action was taken to rectify the cause.

Air – A range of design outcomes will be implemented to minimise the generation of dust including hard standing the site; enclosing all processing activities to reduce the dispersion of dust; use of mist sprays; a dust extraction system; and use of hoppers and bays to store materials. In addition, dust management strategies will be implemented which include the temporary covering or spraying of stockpiles, ensuring the hardstand area is free of visible dust, the use of water to control dust from screens and the conveyor circuit and where necessary, the spraying of the unloading/loading of trucks.

Soil and water – *A* contamination management plan (CMP) will be prepared and submitted to DPE and EPA in conjunction with the updated CEMP and OEMP. The purpose of the CMP is to establish a set of best practice procedures for the identification and management of contaminated soil/water if encountered during construction or operations. The key objective of the CMP is to ensure that impacts from the disturbance of contaminated soils/water are minimised through appropriate management. The CMP will be complemented by an unexpected finds protocol.

A range of standard construction and operational measures would also be implemented to further ensure the protection of soil and water resources. Included in the CEMP and OEMP these would include an incident response plan; sediment and erosion controls; limitation of exposed soil and areas to be stabilised as soon as practicable; acid sulphate soil identification protocols; a refueling procedure; measures to ensure leachate generated within the sheds is conveyed to closed collection pits/sumps; maintenance procedures to ensure the integrity of the detention basins and rainwater tanks and associated pipes; and an ongoing surface water monitoring program.

Hydrology – During construction works a range of mitigation measures will be adopted including sediment fencing; a gravel layer at the construction vehicle access point in the works area; regular monitoring of soil movement characteristics and cleaning of sediment deposits; regular dewatering of low points in the excavation works; and security fencing around the area of constructions works.

Proposed stormwater quality improvement measures include: 4 x 10m3 rainwater tanks to collect roof water for non-potable demand; Ecosol litter baskets to collect gross pollutants; and a Ecosol Storm Pit Class 2_20L filtration device.

Visual impacts – appropriate colours and finishes for the proposed built form to minimise the prominence of the structure and ensure it blends in with the landscape. Extensive vegetative screening will be implemented along the southern and eastern elevations where deep root planting can be accommodated. This will be complemented by residual landscaping elsewhere on the site where practical.

Hazards and fire safety - A range of measures will be implemented to ensure hazard and fire safety including: the provision of a dedicated dangerous goods storage facility; a fully bunded 15,000 litre diesel smart tank; continuous perimeter access around the enclosure for emergency vehicles; the provision of external fire hydrants; a fire hose reel system to serve the building; a fire sprinkler system throughout the building; a fire sprinkler system that automatically activates a building occupant warning system; portable fire extinguishers; a fire control centre; an automatic smoke exhaust system; a minimum 3m exclusion zone around the operational stockpile; appropriate concrete separation of the individual storage bays; and the retention of contaminated water run-off. It should be noted that a more detailed Fire Safety Study will be completed during the detailed design stage.

Conclusion

The modification including the increase in waste throughput will facilitate a significant improvement in environmental performance by allowing BRO to construct a hardstand area and purpose built enclosure with inbuilt contemporary environmental and amenity management controls. Coupled with improved environmental management practices, the upgrade will help address legacy non compliance waste issues and enable sustainable regulatory compliance.

The environmental assessment has addressed the Secretary's Environmental Assessment Requirements in full. Potential impacts associated with the modification including traffic, noise, air quality, contamination, hazards, hydrology and visual impacts have been carefully considered. The environmental assessment demonstrates that the cleanup the construction and operation of the upgraded facility will vastly improve environmental outcomes with the operation predicted to meet key environmental, land use safety and amenity criteria subject to the implementation of mitigation measures.

In addition to improved environmental performance, the operation of the upgraded facility would result in several other positive outcomes including:

- a resource recovery rate of greater than 75% consistent with the NSW Government's recycling goals;
- a positive contribution to the construction industry by providing an efficient strategically located resource recovery facility capable of diverting up to 187,500 tpa of waste from landfill; and
- ongoing economic stimulation of the local and regional economies through $20 million in capital investment and full-time employment for approximately 13 persons.

Consequently, the amendment it is considered to be in the public interest and should be approved.

1 Introduction

1.1 The Chester Hill Resource Recovery Facility

The Chester Hill Resource Recovery Facility (The Facility) was approved on 27 February 2007 by the then Minister for Planning under Part 3A of the *Environmental planning and Assessment Act, 1979*. The approval enabled the processing of 100,000 tpa of ferrous and non-ferrous metals at the site.

On 2 June 2009, the Department of Planning, under delegation from the Minister for Planning approved a modification application to allow for a wider range of waste to be processed at the site. The modified approval retained the 100,000 tpa throughput but enabled the processing of building and construction waste including concrete, solid waste, topsoil, timber and green waste, in addition to the previously approved non-ferrous and ferrous metal.

The Facility commenced operations in 2008.

In 2014, the site (as identified by the red outline in Figure 1) containing the processing facility (as identified in Figure 2) was leased to BRO. While current processing activities have ceased given the need to address onsite non compliance legacy issues (refer to Section 1.3), normal operating conditions for the Facility as approved would be as follows:

- The recycling of up to 100,000 tpa of building and construction waste;
- Approximately 40-50 inbound truck deliveries per day made up of predominantly single axle skip trucks via Wallgrove Road, Christina Road and Miller Road or Hume Highway and then Miller Road;
- The sorting and crushing of materials including:
  - The crushing of concrete and brick products into aggregate ranging from 30mm to 40mm in size and DGB road base;
  - The mulching of timber for use in gardening and landscaping;
  - The extraction of steel for delivery to separate steel recyclers;
  - The collection and screening of residual dirt leftover from the recycling process; and
  - The extraction of residual waste for disposal to landfill.
- Approximately 25 outbound truck deliveries per day comprising predominantly large rigid and semi-trailers via Wallgrove Road, Christina Road and Miller Road or Hume Highway and then Miller Road.

The approximate proportion of material that would otherwise normally be processed on site would be up to:

- 20,000 tpa of concrete
- 20,000 tpa of metals
- 30,000 tpa of inert and general solid waste
- 10,000 tpa of topsoil
- 10,000 tpa of timber
- 10,000 tpa of residual waste

Machinery normally used in the recovery and processing of waste includes:

- 2 X excavators
- 2 X front end loaders
- Crusher
- Screener
- Trommel

Under both the planning approval and the EPL applicable to the site and operator, the Facility is able to operate as follows:

- Monday to Friday 7:00am to 6:00pm
- Saturday 8:00am to 1:00pm
- Sunday & Public Holidays: Nil

The operation of heavy machinery is only able to occur between 7am-5pm Monday to Friday. This modification request does not seek any changes to the approved hours of operation.

1.2 Site location, local context including surrounding land uses

The land is owned by Tong Hong Chung and Tung Hui Chung as tenants in common and is legally described as Lot 8, DP 1039882. The site is leased to separate businesses, GQM Logistics (which operates a container hire, storage and sales facility on the northern portion of the site) and BRO, which is licensed to operate the subject Facility on the southern portion of the site. The modification proposal only relates to that land tenanted by BRO as identified in Figure 2.

The site is approximately 6.5 hectares in area and located in the Chester Hill Industrial Precinct (refer to Figure 1) within the local government area of Canterbury – Bankstown.

The main Southern Rail Line is located immediately to the north of the site, which, along with the operation of the container hire activities, separates the site from residential areas. A residential area is located to the east of the site with the nearest residential dwelling approximately 150 metres from processing activities. Land uses to the south and west predominantly comprise industrial uses including food packaging, cement manufacturing, storage facilities, refrigeration manufacturing and container transporting.

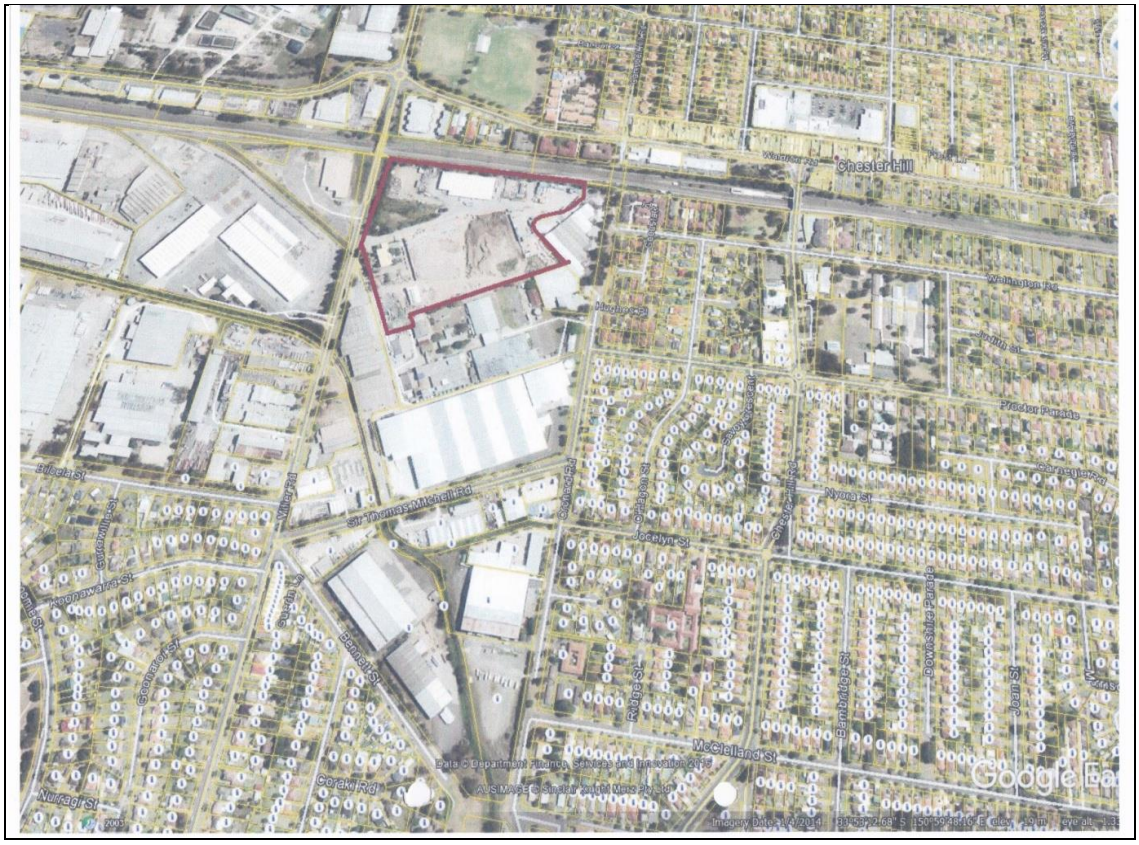
The site is zoned 4(a) General Industrial under Bankstown LEP 2015 and the current and as proposed operations are permissible with consent.

The site can be accessed from the Hume Highway, a major arterial road, via Miller Road as well as Christina Street/Waldron Road via Miller Street. The two existing tenants share the access off Miller Road. The access comprises a 10m wide ingress driveway and an 8m wide egress driveway, separated by a raised concrete island. Immediately entering the site there is an existing two storey office building currently used by BRO for administration and amenities. Immediately adjacent the administration building is a sealed car park providing 74 car spaces (refer to Plates 1 & 2). There is also a 19m long semi-trailer turning template to enable heavy vehicles to access the parking and loading/unloading area, and then exit the site in a forward direction (refer to Figure 2). However, the template is currently partially covered by containers and waste stockpiles.

Within the site an internal roadway circulates around the administration building and links the passenger and heavy vehicle parking areas. The internal roadway has a width of 7m.
There are no other substantial structures on the site apart from containers utilised for waste segregation and acoustic purposes. The remainder of the site is generally compacted fill and characterised by processing activities including materials stockpiles (refer to Plates 2 & 4), open storage areas and utility services.

The site is reasonably level (refer Survey Plan in Appendix M) draining from the north to the south west towards Miller Road with a fall of about 4m from north to south along the western boundary, although it is noted that ground levels are variable due to the movement of waste stockpiles on site.

Figure 1: Site location



The EA submitted in support of the original Part 3A application, found that subsurface conditions (i.e. below concrete, asphalt and compacted fill surfaces), comprise fill material generally well compacted and varying in depth from 0.6m to 2.1m but mostly around a 1.5m depth. Under the fill materials is stiff to very stiff natural clay to depths of 1.5m to 2m, followed by weathered rock. Bringelly shale is expected to underlay fill, clay and weathered rock materials.

The EA also found that the existing subgrade should not be excavated due to the presence of contaminated materials (refer to Section 4.4). The contamination reports prepared for the subject site (refer to Appendices G, H & I) confirmed this and found that while the site was fit for the intended use, care would need to be taken when undertaking any excavation on site. While this modification seeks to construct hardstand across the site, build an enclosure and improve stormwater and environmental performance in general, appropriate techniques will need to be adopted when constructing the proposed enclosure to ensure contaminants are handled correctly. Construction management measures have been identified in the environmental assessment to ensure contaminants are dealt with appropriately including overlay of design, due diligence and protocols for dealing with suspect material.

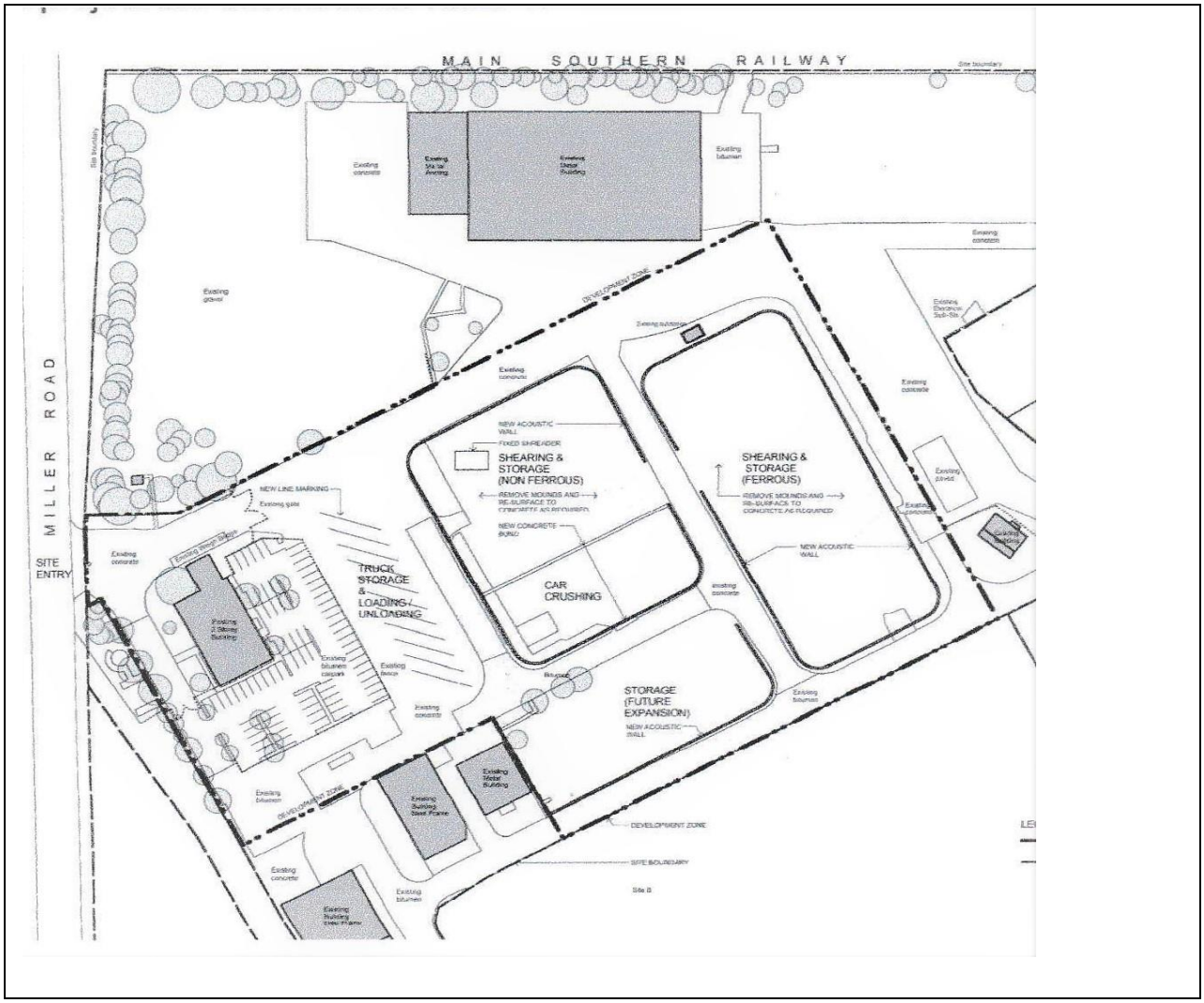
The site contains a number of mature trees and shrubs, primarily around the site perimeter. Due to the cleared nature of the development zone, no existing vegetation will be affected by the project.

1.3 Site history and legacy non compliance issues

Legacy Compliance Issues

The site of the Chester Hill Resource Recovery Facility has been the subject of ongoing regulatory compliance matters since 2010. The original approval included the requirement to erect barriers around the perimeter of the site to attenuate noise, and barriers within the site to separate waste. However, instead of erecting barriers, the then operator placed shipping containers both within the site and on the perimeter.

Figure 2: Approved and licensed area for the Facility



In 2010 the DPE issued an order under S121B of the EPA Act requiring the proponent to install acoustic barriers consistent with the approval. Following further advice from the DPE relating to the inconsistency of the containers with the approval, the then site operator sought to modify the approval to regularise the placement of the containers. The DPE refused the modification request on the basis that the containers did not provide adequate noise attenuation, did not provide for the necessary degree of material segregation, and would have unacceptable visual impacts on the locality.

Between 2010 and 2014, the Department and EPA issued several letters to the former operators of the Facility in relation to the outstanding matters with little resolution, leading to the former operator having its EPL revoked in early 2014. In 2014 the Chester Hill Resource Recovery Facility was leased to

BRO for ongoing operation despite continued non compliances with the Project Approval as amended. In early 2017, the Department and EPA conducted a number of inspections identifying several non-compliances with the planning approval, and potential breaches of the EPL.

Plate 1 – Existing administration block which is to be retained

Plate 2 Existing car parking with partial truck parking template to the right

Plate 3 – Containers used to separate waste from internal roadway and administration area

Plate 4 – Containers used to attenuate noise emissions from processing activities

Plates 5 & 6 – Processing activities including screening, crushing and stockpiling

The identified non-compliances with the planning approval and subsequent required actions are summarised below:

- inadequate storm water control requiring a revised storm water management plan;
- non compliant site layout including inconsistent placement of stockpiles requiring works to be undertaken in accordance with approved plans;
- inappropriate use of containers for noise attenuation requiring their removal, the erection of permanent barriers, and a revised noise management plan;
- unsealed roads and working areas requiring sealing and cleaning as prescribed in the approval and statement of commitments; and
- excessive height of a stockpiles requiring removal of all unprocessed or baled material from the site in excess of 3m in height.

In relation to the potential breaches of BRO's EPL, the EPA issued a Show Cause letter in August 2017 and in April 2018. Issues identified in the letter were as follows:

- failure to notify a fire in a waste stockpile in August 2017;
- exceedences of the authorised amount of waste on site at any one time (30,000 tonnes);
- unauthorized storage of waste outside premise boundary;
- exceedences of 3m maximum stockpile height; and
- failure to manage dust in accordance with the *"Air Pollution Control Management Plan"*, specifically relating to the need to install additional water pumping capacity and additional mist sprays at material transfer points and around the perimeter.

Both DPE and EPA also identified the need to address the onsite legacy waste and current operational stockpiles particularly relating to the potential for asbestos in the stockpiles.

The Way Forward

Despite continued efforts by BRO, it became clear that a piecemeal approach to compliance would not meet the needs of DPE, EPA or indeed BRO itself. BRO submits that the most appropriate way to address the compliance issues in the long term is to develop a contemporary and sustainable resource recovery facility as described in this modification proposal. Together with a strong commitment to environmental performance, the construction of a 'state of the art' fully enclosed facility on hardstand areas with appropriate water management would resolve residual on-site and off-site environmental and amenity impact issues, whilst contributing to the social and economic benefit of waste recycling.

Until such time as the works associated with the proposed modifications are approved and operational, BRO has implemented a number of interim measures to address regulatory concerns. These include the following:

- the cessation of deliveries and the processing of waste on-site pending the determination of this modification application and the cleanup of the site consistent with the provisions of the Order;
- the creation of a perimeter around the operational stockpile and contaminated area consistent with a *"Stockpile Segregation Plan"* approved by the EPA;
- the placement of aggregate materials along internal roadways to form a continuous" all weather pad" for trucks removing waste from the stockpiles;
- the storage of all fuel and oil containers in the south western corner of the site; and
- the height reduction of existing stockpiles below 3 metres consistent with the "*Operational Stockpile Segregation and Removal Plan".*

In addition, BRO will continue to engage the EPA to find a mutually agreeable solution for the legacy and operational stockpiles.

Plate 7 - Legacy waste stockpile

1.4 Need for the subject modification and project justification

Strategic context

The NSW Waste Avoidance and Resource Recovery Strategy 2014-21 establishes goals for:

- Avoiding and reducing waste generation;
- Increasing recycling – with target recycling rates by 2021-22 of 80 per cent for construction and demolition (C&D) waste and 70 per cent for commercial and industrial (C&I) waste; and
- Diverting additional waste from landfill for alternative uses, such as recycling.

The upgraded Facility would positively contribute to the goals and aims of the WARR Strategy as it would directly result in a recovery rate of greater than 75% diverting up to 187,000 tpa of waste from landfill. This is especially important given that:

- C&D waste generated in Sydney continues to grow predominantly on the back of a robust housing sector and significant infrastructure projects, and
- existing landfill capacity in the Sydney region is diminishing with limited opportunities for additional capacity.

Plate 8 – Operational waste stockpile

Improved Environmental Performance

As identified above, BRO submits that the most appropriate way to address the compliance issues in the long term is to construct a new, state of the art, purpose built facility that would enclose key impact activities. The enclosure would include contemporary environmental management controls such as mist sprays and a dust extraction system.

BRO would also implement a superior screening process within the new enclosure to enable more recycling and diversion of waste from landfill within an environmentally controlled manner. The recovered materials would then be either baled or stockpiled for eventual transportation to end markets. Refer to Section 2 for a full description of the screening and recovery process.

As demonstrated in Section 4, the construction and operation of the upgraded Facility at full capacity (250,000 tpa) is predicted to meet all applicable environmental, amenity and land use safety criteria subject to the implementation of a range of mitigation measures.

License alignment

The modification also seeks to align the current planning approval with the operational requirements of BRO's Environmental Protection License (EPL). Under its current EPL, BRO is able to store up to 30,000 tonnes of material per day. While BRO is not seeking any change to this limit, the modification seeks to establish in the planning approval a daily average processing limit of 910 tonnes which would better align with the EPL. Greater alignment of the two key approvals would facilitate operational efficiencies and assist with ongoing compliance efforts.

Capacity

The modification application seeks approval for the new enclosure including plant and equipment capable of processing up to 250,000 tpa of construction and building waste at a recovery rate of greater than 75%. The additional capacity has a number of important benefits including:

- providing BRO the financial incentive and means to address the onsite legacy waste issues and transform the site from its current state into a contemporary resource recovery facility with significantly improved environmental and regulatory performance;
- maximising resource recovery and minimising waste to landfill consistent with Federal, State and local government strategic policies;
- contributing positively to the needs of the construction industry; and
- injecting capital into local and regional economies including securing 13 full time positions

1.5 The modification proposal, and amendments to conditions of approval and statement of commitments

This document supports the application by BRO Pty Ltd to modify MP 06_0052 relating to the operation of the Chester Hill Recycling Facility. The modification seeks the:

- Upgrade of the site including the:
  - reconfiguration of the layout including waste stockpiles;
  - erection of an enclosure for the sorting and recycling of waste and the development of hardstand areas for the operational areas of the facility; and
  - improvements to stormwater and wastewater management to ensure required water quality standards.
- Establishment of a daily average processing limit of approximately 910 tonnes and the increase in the annual processing limit from 100,000 tpa of building and construction waste (including metal) to 250,000 tpa.

The modification proposal has reconsidered the need for a Statement of Commitments (SOC) and considers that a Statement of Commitments is no longer justified given that:

- The SOC by and large duplicates the approval;
- There is the potential for inconsistency between the two documents; and
- SOC's are unique to Part 3A which has now been repealed.

Subsequently, as part of the modification proposal, the SOC has been reviewed and any provisions relevant to the ongoing operation of the Facility should be incorporated into any modified approval as identified below. The now redundant SOC is attached as Appendix B.

Conditions of Approval

Key conditions requiring amendment within the approval are as follows:

Schedule 1

- Insert 2018;
- Replace the Proponent with Building Recycling Operations (BRO) Pty Ltd;
- Insert Mod 3; and
- Update definitions.

Schedule 2 (Terms of Approval)

- Condition 2 - will need to be amended to reflect the documents submitted in support of the modification application such as this EA;
- Condition 4 will need to be amended to include the new annual throughput of 250,000 tpa;
- Condition 5 added imposing a daily processing limit of 910 tonnes;
- Condition 8 added to ensure a construction certificate is obtained prior to construction;
- Condition 9 to be amended to incorporate additional public infrastructure protection measures; and
- Conditions 11, 12, 13, 14 & 15 incorporated relating to vehicle access, car parking and services.

Schedule 3 (Specific Environmental Conditions)

- Conditions 2, 3,4 & 5 incorporated relating to the adoption of specific noise mitigation measures;
- Condition 6 – amended to reflect need to submit a revised Noise Management Plan;
- Condition 7 – amend to reflect need to submit a revised Traffic Noise Management Strategy (TNMS);
- Condition 8 – amended to include the requirement for a revised Noise Audit;
- Condition 10 – amended to incorporate the need for stormwater quality improvement measures;
- Condition 13 – amended to reflect the need to submit a revised Stormwater Management Plan;
- Condition 14 – amended to reflect the provision of a specific dangerous goods storage facility within the enclosure;
- Condition 15 – amended to reflect need to submit a revised Fire Safety Study;
- Condition 16 – amended to reflect the need to submit a revised Emergency Plan and revised Safety Management System;
- Condition 18 - amended to reflect need to submit a revised Waste Management Plan
- Condition 22 – new condition requiring the implementation of Dust Management Plan incorporating mitigation measures identified in Wilkinson Murray air quality assessment;
- Condition 23 – new condition requiring a new containment report outlining measures to be adopted to ensure contaminants remain insitu during both construction and operation
- Condition 24 – new condition requiring the submission of a design and landscaping report outlining measures to be adopted to minimise visual impacts
- Condition 28 – new condition requiring heavy vehicle compliance with existing RTA heavy vehicle road restrictions

Schedule 4 - Environmental Management and Monitoring

- Condition 1 - amended to reflect need to submit a revised environmental management plan (EMP);
- Condition 2 – new condition requiring certification prior to both construction and operation that the proponent has complied with all relevant conditions of the approval;
- Condition 3 – new condition requiring an independent environmental audit within 12 months of operation and every 3 years thereafter; and
- Conditions 6 & 7 – new conditions relating stakeholder communications and complaints line.

There are also a number of administrative amendments required such as replacing the Director -General with the Secretary and DEC with EPA.

1.6 Environmental Assessment Requirements

BRO received the Secretary's Environmental Assessment Requirements for this modification on the on 20 December 2017. The requirements were prepared in consultation with the Environment Protection Authority (EPA), Roads and Maritime Services (RMS), Department of Primary Industry (DPI), and City of Canterbury Bankstown (Council). The issues raised and where they are addressed within the EA are identified in Table 1.

Consistent with the SEARs, detailed assessment supported by specialist evidence based studies have been undertaken for key issues including traffic, noise, air quality including greenhouse gases, contamination, hazards and fire safety, hydrology and visual impacts (Section 4). The assessment has found that the construction and operation of the proposed upgraded facility, subject to mitigation measures, will meet applicable environmental, amenity and land use criteria at the maximum throughput of 250,000 tpa.

BRO also considered other relevant potential environmental impacts associated with the proposed modification including, biodiversity, aboriginal and non-aboriginal heritage, and socio-economic impacts. Given the non applicability or negligible impacts expected and the ability of these issues to be effectively managed under existing conditions of approval and relevant updated environmental management plans, further detailed analysis was not considered necessary.

Table 1: Summary of Secretary's Environmental Assessment Requirements and where addressed in the EA

Requirement	Where addressed
Department of Planning and Environment	
Description of the proposal including the need and justification for the modification, strategic context and other approvals.	Sections 1 & 2
Suitability of the site including: • Details of all approvals and approved plans for the existing Facility • Results of any recent independent audits • Detailed justification that the site can accommodate the proposed increase in processing capacity.	Sections 2&3 and Appendices A, B & C Key impact assessments relating to traffic, noise, air, hydrology, soil and water, hazards and fire safety, hydrology and visual impacts are provided in Section 4. Detailed assessments can be found in Appendices C-F Section 4 - The assessments demonstrate that the modified facility will have acceptable construction and operational impacts and will meet applicable environmental and amenity standards subject to the implementation of mitigation measures.
Details of the existing operations including: • A summary of existing statutory approvals • A summary of existing conditions relevant to the modification	Sections 1, 2 & 3

Requirement	Where addressed
• A summary of existing environmental management and monitoring • Detailed plans of the existing and proposed layout • Details of all structures to be retained modified or constructed.	
Description of the modification including: • Changes to the operation of the site and staging • Details of any workshop or garaging of vehicles • Justification and need • Details of any changes to conditions • An assessment of environmental impacts and measures to mitigate	Sections 2, 3 & 4
Waste Management including: • waste management during construction and relocation of waste; • program for the removal of all waste on site including asbestos; • likely waste stream and volumes including daily, weekly and annual throughput including maximum waste to be stored on site at any one time; • details on waste processing including technology to be used, outputs and destination and quality control; • details of storage, handling and transportation; • details of measures to identify and address non-conforming waste; • measures to ensure consistency with NSW WARR Strategy	Section 2
Noise and vibration • A quantitative assessment of the construction, operation and transportation noise and vibration on all affected receivers, prepared in accordance with EPA guidelines	Section 4.2 and Appendix E
Air quality and odour • A quantitative assessment of the potential air quality, dust and odour impacts for all phases of the proposal in accordance with EPA guidelines	Section 4.3 and Appendix F
Traffic and transportation • Traffic impact assessment for all phases of the modification which considers traffic types and volumes likely to be generated, impacts on road safety the capacity of the road network including the intersections of the Hume Highway and Christina Road with Miller Road; • Site access arrangements, internal road network and parking arrangements.	Section 4.1 and Appendix D

Requirement	Where addressed
Hydrology • Potential impacts to soil and water resources, topography, hydrology, drainage lines and watercourses near the site; • Details of stormwater/wastewater/leachate management systems and measures to treat/reuse or dispose of water; • Surface water quality at discharge points and relevant water quality criteria and mitigation measures; • A revised water balance and a detailed description of measures to minimise water use at the site; • Flooding impacts including changes to flood behaviour.	Section 4.5 and Appendix J
Fire and Incident Management • Identification of aggregate and stockpiled quantities of combustible waste products • Identification of foreseeable on and offsite fire risks; • Details of environmental protection equipment to be installed on the premises	Section 2 and Section 4.7 and Appendix L
Safety & Hazards • A preliminary risk screening undertaken in accordance with SEPP 33 with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the development: and • If necessary a Preliminary Hazard Analysis.	Section 3 and Section 4.7
Soil and Water • Detailed assessment of the extent and nature of any contamination of the soil and groundwater; • An assessment of potential risks to human health and environmental receptors • Mitigation and management measures; and • Consideration of the site's suitability for the development	Section 4.4 and Appendices G,H & I
Visual impact • details of building design and potential visual impact of the proposed buildings and associated structures; • details of measures to minimise visual impacts such as landscaping	Section 4.6
Consultation • details of consultation with relevant local, State and Commonwealth government authorities	Section 2

2 Proposed modification

2.1 Key elements of the modification

The modification seeks approval for the:

- Upgrade of the site including the:
  - reconfiguration of the layout including waste stockpiles;
  - erection of an enclosure for the sorting and recycling of waste and the progressive development of hardstand areas for the operational areas of the facility; and
  - improvements to stormwater and wastewater management to ensure required water quality standards.
- Establishment of an average daily processing limit of approximately 910 tonnes and the increase in the annual processing limit from 100,000 tpa of building and construction waste (including metal) to 250,000 tpa.

Key Elements of the proposal include the creation of continuous hardstand areas and the construction of a fully enclosed industrial building (refer to Figures 3-6). The enclosure will be 187.5 metres long by 125 metres wide equating to 23,437.5 square metres of floor space. At its highest, the enclosure will be 17.5 metres high falling to 13 metres at the eastern and western elevations. There will be a 15 metre setback on the southern and eastern boundaries which will accommodate deep soil landscaping, fire fighting access, stormwater flow and stormwater tanks.

As identified in Figure 3, trucks would enter the site and make their way to the shed entrance in the north eastern corner, access the new weighbridge before making their way to 1 of 3 unloading docks. All operations, including stockpiling, screening, picking, pre-sorting, sorting and dumping will occur within the enclosure. Trucks would then exit the shed through a door in the north western corner, access the existing weighbridge before exiting the site. The proposed upgraded Facility is expected to employ a total of 13 staff at full capacity comprising three administrative staff and 10 processing staff.

Construction

Site cleanup (not part of this application)

It is envisaged that a mutually agreeable outcome for addressing the legacy and operational stockpiles could be completed within 12 months.

Construction

Construction is expected to take up to 12 months and involves site establishment works for the development including the construction of the concrete slab and the enclosure starting at the eastern end of the site (i.e. being the closest processing activities to residences). The key activities include:

- Removal of the onsite shipping containers;
- Establishing the construction area of the site including perimeter fencing and site access;
- Pouring the concrete slab and driveways;
- Erecting the full enclosure and establishing the internal layout of the newly constructed facility;
- Relocating all machinery into their new position (where applicable); and
- Installation of new machinery.

Prior to the concrete slab being poured, an expert will be commissioned to determine the most appropriate location and method of piering noting identified hotspots.

Figure 3: Proposed layout of upgrade facility (refer to Appendix O for detailed illustration of waste process/storage)

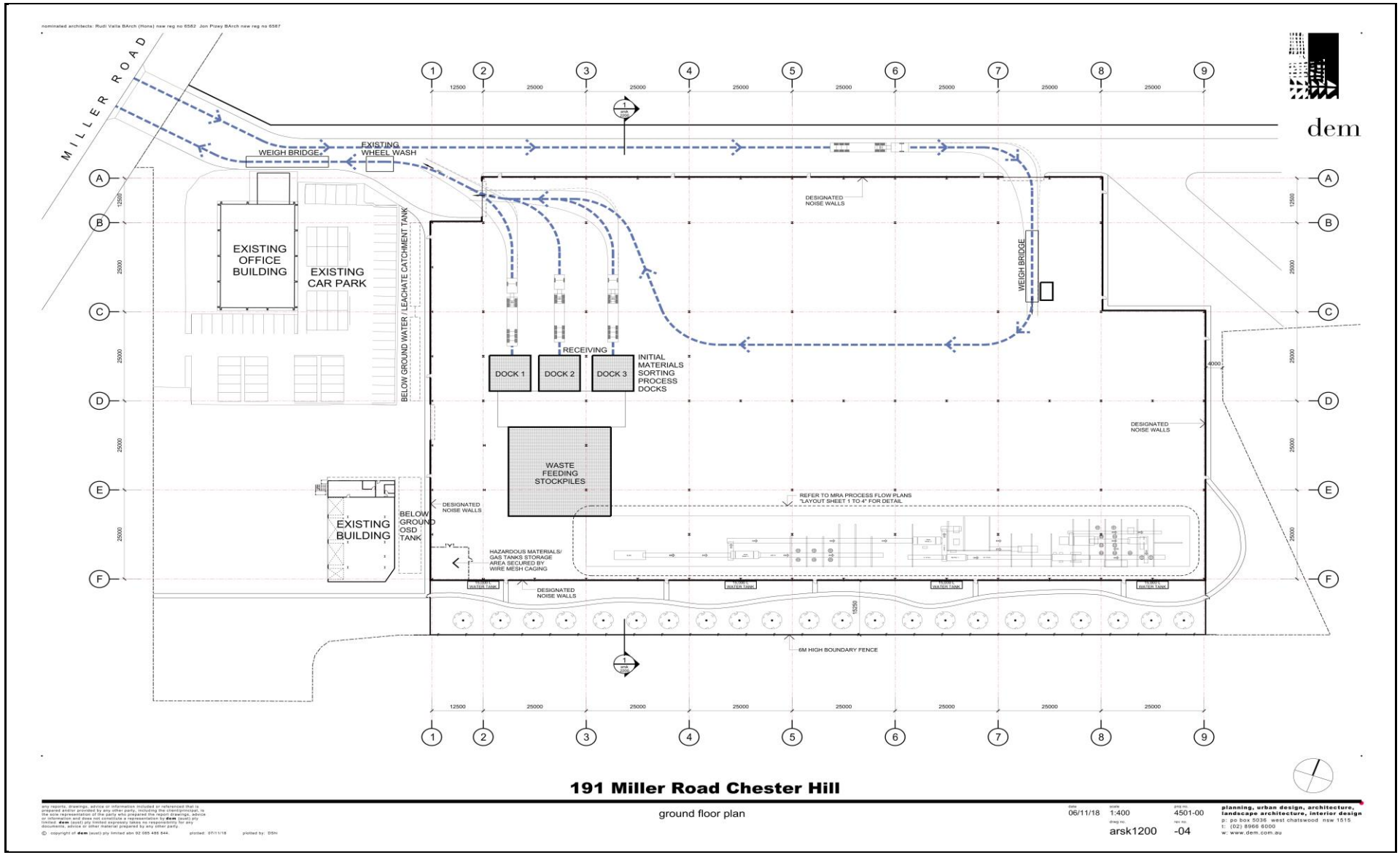


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Figure 4: Perspectives of the proposed facility looking approximately north east

Figure 5: Roof Plan

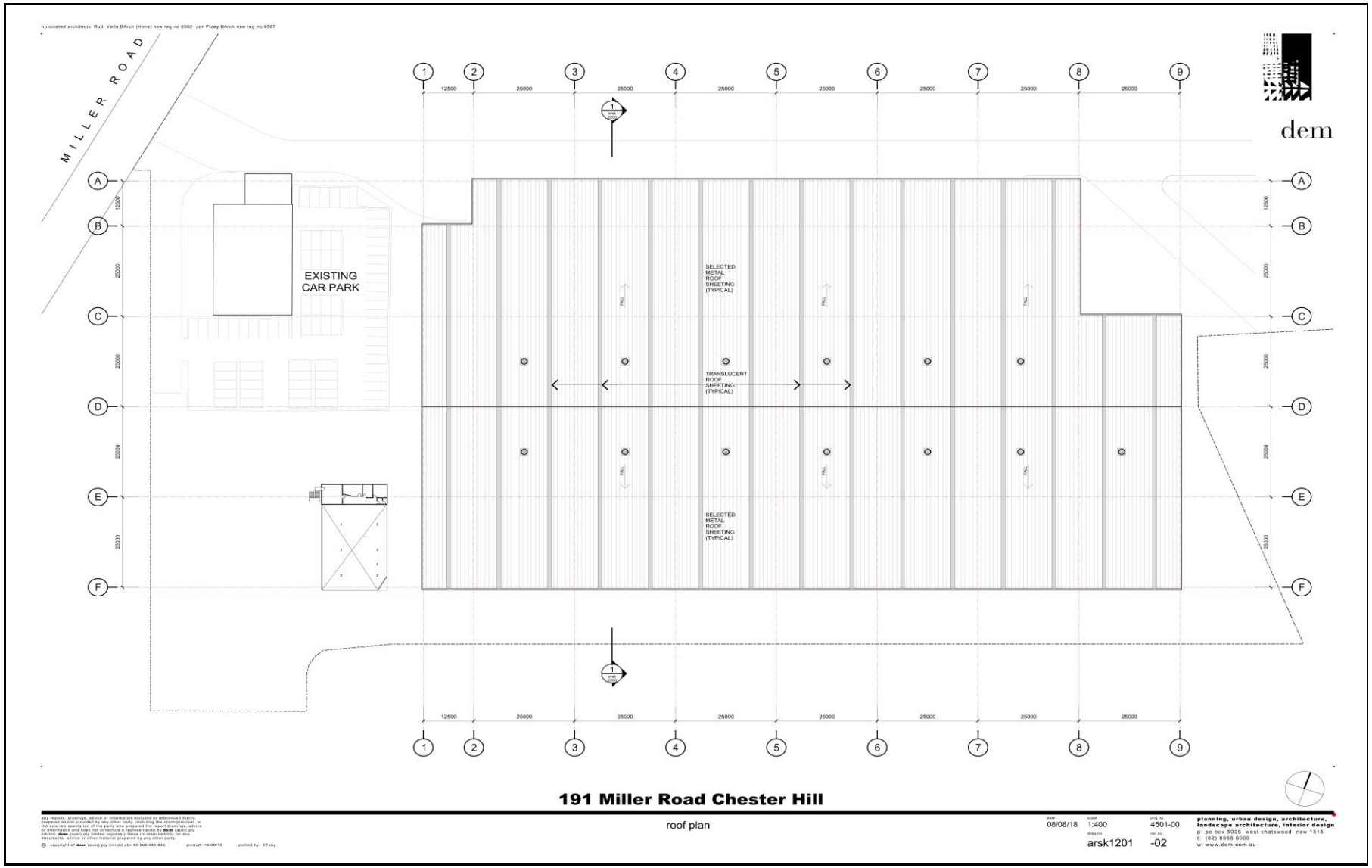

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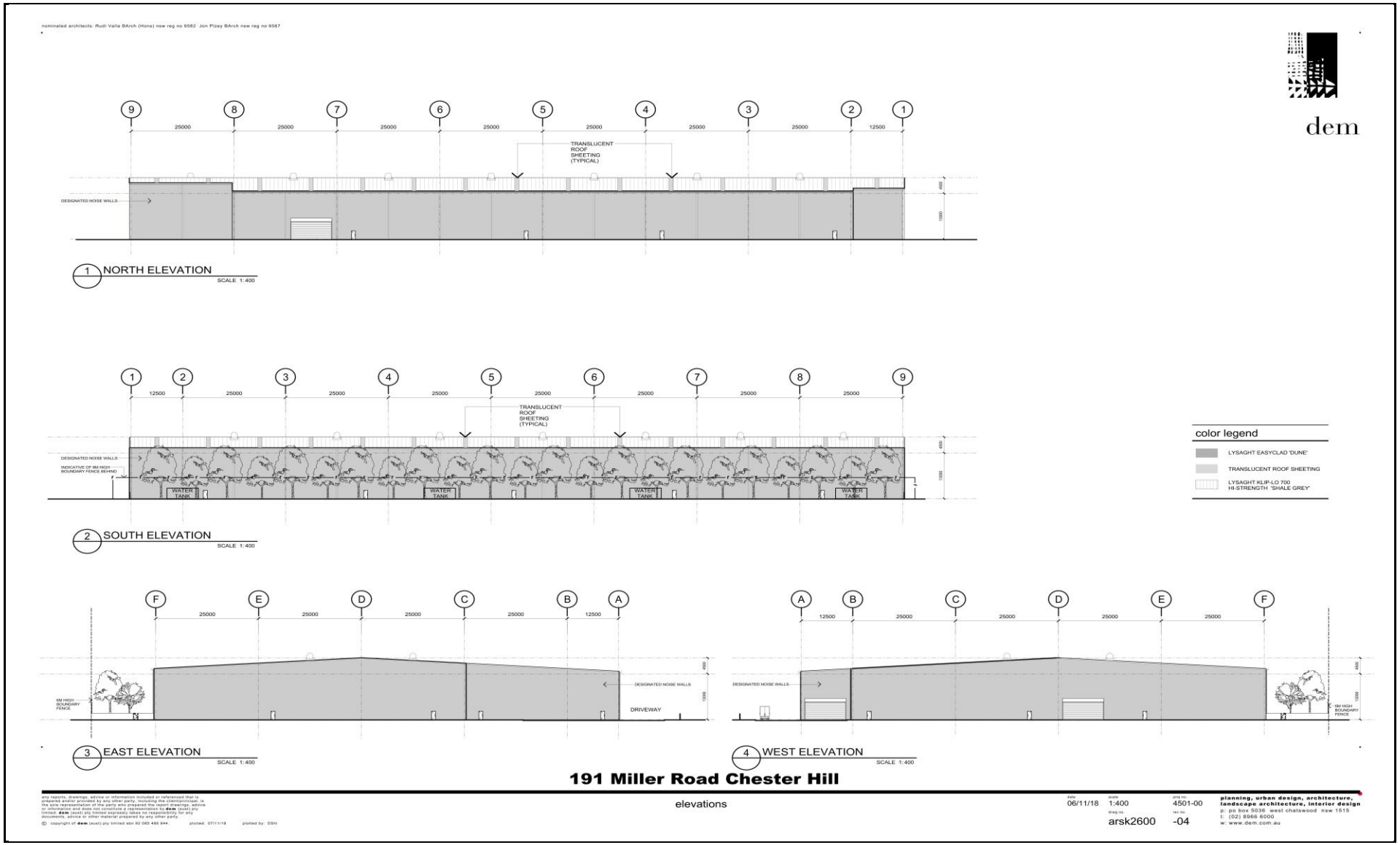
Figure 6: Cross Sections



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Processing Shed

The enclosure will be 187.5 metres long by 125 metres wide equating to 23,437.5 square metres of floor space. At its highest, the enclosure will be 17.5 metres high falling to 13 metres at the eastern and western elevations. There will be a 15 metre setback on the southern and eastern boundaries which will accommodate deep soil landscaping, fire fighting access, stormwater flow and stormwater tanks.

As identified in Figure 3, trucks would enter the site and make their way to the shed entrance in the north eastern corner, access the new weighbridge before making their way to 1 of 3 unloading docks. All operations, including stockpiling, screening, picking, pre-sorting, sorting and dumping will occur within the enclosure. Trucks would then exit the shed through a door in the north western corner, access the existing weighbridge before exiting the site. More detailed illustrations of the processing floor can be found in Appendix O including individual storage bays by material.

Project Duration

BRO intends commencing work on the upgrade as soon the legacy waste issues have been addressed which is expected to take 12 months. It is expected that construction of the hardstand and enclosure will take up to 12 months.

Operational Hours

In accordance the current approval, the working hours for the site will remain as follows:

- Monday to Friday: 7:00AM – 5:00PM
- Saturday: 8:00AM - 1:00PM
- Sunday & Public Holidays – No work

2.2 Waste process

Information & Assumptions

The Facility will process construction and demolition waste (C&D) and skip-bin waste with an annual maximum target capacity of 250,000 tonnes/yr assuming the following:

- 700 kg/m3 Operating Hours (per year):
- (8×5 + 5×1) × 52 = 2,340 hours/year Uptime:
- 90% Effective Operating Hours (per year):
- 2,106 hours/year Processing Throughput Capacity (mass):
- 118 t/hour Processing Throughput Capacity (volume): and
- 170 m3/hour

Process Flow Description

Figure 6 illustrates diagrammatically the proposed recovery process using estimated mass and volume flows. The process can be described generally as follows:

1. Unloading and Inspection - All incoming waste trucks to be inspected and waste materials unloaded into designated areas. Trained staff will conduct a preliminary inspection for contaminants (e.g. asbestos). If contaminants are identified, the material is to be reloaded onto trucks and removed from site. This will be undertaken within the designated area indicated in Figure 3. In the event that asbestos is identified within in coming loads, protocols consistent with the EPA's Draft Protocol for Managing Asbestos during Resource Recovery of Construction and Demolition Waste will be implemented (refer to Appendix P).

2. Transfer of Material to Pre Sort – All inspected and cleared material is then moved to the pre-sort and feeding area using two excavators.

3. Pre –sort and feeding - The pre-sort removes large recyclables and material that are incompatible with the processing plant such as:
   - tyres;
   - wooden pallets and other large timber products;
   - large ferrous, steel products and white goods;
   - oversize waste products; and
   - large cardboard products.

   The pre-sorted material that is considered suitable for the processing plant is then fed into the feeding and dosing bunker. The dosing bunker regulates the flow of material into the processing plant.

4. Primary Screen and Sort - The primary screen (Waste Screen 1) separates the incoming material into two size fractions:
   - The 1. 0 to 220mm fraction; and
   - The > 220mm fraction.

   The > 220mm fraction feeds directly to a manual picking station. The manual picking station allows for the sorting and recovery of recyclables and the separation of concrete and stone products from the remaining waste material, either for recovery or disposal. Products recovered at the Primary Sort stage are:
   - steel;
   - aluminium;
   - timber;
   - cardboard;
   - plastic films; and
   - concrete and aggregate.

   The '0 to 220mm' fraction is then directed to the second screen.

5. Separation of Ferrous Materials - The 0 to 220mm fraction is then conveyed under a magnetic separator that sorts and recovers ferrous metals.

6. Secondary Screening - The secondary screening section consists of 3 screens designed specifically for construction and demolition waste comprising: waste screen 2, flip flow screen 1 and flip flow screen 2. These screens separate the 0 to 220mm fraction into the following sizes:
   - waste screen 2 - 0 to 70mm o 70 to 220mm;
   - flip flow screen 1 - 0 to 20mm and 20 to 70mm; and
   - flip flow screen 2 - 0 to 10mm and 10 to 20mm

7. The Recovery of Fines - The 0 to 10mm fraction (fines) consists of clean sand material with minimal contamination and does not require any further processing and is accordingly recovered.

8. Separation of Ferrous Metals - The 10 to 20mm fraction is conveyed under a magnetic separator that sorts and recovers ferrous metals.

9. Aggregate Decontamination – 10 to 20 - The 10 to 20mm fraction can contain small pieces of contamination (i.e. non-aggregate materials) such as plastics and timber. Cleaning is undertaken via a 3-step process as follows:

- A rotary screen is first used to remove long, oversized materials that have passed through the flip flow screens;
- A zigzag wind sifter then removes residual light-weight materials (such as plastics, paper and plastic films). The material is fed via a rotary valve into a controlled vertical zigzag channel, where it is exposed to jets of pressurised air. The light materials are pushed off and transported into a cyclone separator. The heavy materials remain on the belt. The light material and the heavy materials exit the machine through two separate rotary valves; and
- A (laser) optical sorter is then used to detect and separate glass. Material is fed onto a short acceleration conveyor for laser scanning. The glass is then ejected using a range of pressurised-air-nozzles positioned at the end of the conveyor, isolating the ejected materials from the aggregate. This technology can also be equipped with near infrared (NIR) and metal detection to detect hard plastics and any remaining metals and recover these from the material stream.

10. Aggregate Decontamination – 20 to 70mm - The 20 to 70mm fraction usually contains contamination in the form of plastics, paper, wood chips and small metal fragments. Decontamination is a two-stage process:
    - An over-belt magnet is used to sort and recover any ferrous metals;
    - Following this, the light materials and the majority of the timber pieces are cleaned out by means of a 2-way windsifter drum. The material is fed onto a short acceleration conveyor. At the end of the belt the material is struck with an air jet. At the same time, the material enters a large rotating, separating drum. Hard and heavy materials drop and bounce back against the air flow. Light and flexible materials are assisted over the drum. As a consequence, the dropped fraction is predominantly heavy aggregate, and the light fraction is predominantly plastics, textiles, light timbers and is a residual waste, or could potentially be used for energy recovery.

11. Sorting and Decontamination – 70 to 220mm - The 70 to 220mm fraction usually consists of concrete, aggregate, rocks, bricks, timber, plastics, card and paper, textiles, metal and other non-recyclable contamination. The sorting and decontamination process for this fraction is aimed at recovering the following streams:
    - clean aggregate;
    - clean timber primary fraction;
    - timber-rich secondary fraction;
    - ferrous metals; and
    - other recyclables (if available).

    The sorting and decontamination is a six-stage process:
    - an over-belt magnet is used to attract and separate any ferrous metal;
    - the material enters a 3-Way windsifter which separates the material into a heavy fraction, a medium fraction and a light fraction. The material is fed onto a short acceleration conveyor. At the end of the belt the material is struck with an air jet. At the same time, the material enters a large rotating, separating drum. Hard and heavy materials drop and bounce back against the air flow. Light and flexible materials are assisted over the drum. The dropped fraction is predominantly heavy aggregate. The light fraction then enters an expansion chamber with a shuttling conveyor to allow a medium fraction to drop out. The medium fraction is typically rich in timbers and hard plastics. The light fraction is predominantly plastics, textiles, light timbers and is a residual waste, or could potential be used for energy recovery;

- the heavy fraction enters a manual sorting and quality control station where the contaminants (non-aggregate) and timber materials are removed manually;
- the medium fraction passes by an optical sorter, which detects and separates recoverable timber materials. This is achieved by means of an acceleration conveyor, which spreads the material to present it to the optical scanner. The near infrared (NIR) scanner detects the timber material facing the scanner and ejects the material at the end of the belt using pressurised air nozzles;
- the ejected medium fraction (post-optical sorter) also passes a quality control station to remove any false carry overs, engineered timbers and other composites were not detected; and
- the dropped fraction from the optical sorter also passes a picking station that can manually sort timber and other residual recoverable materials.

12. Storage and Sales - All products and residual materials are then transported to bunkers from where they can be loaded onto trucks for sales and (in the case of the residual material), disposal. The final recovered product categories are:
    - concrete, bricks, rocks and masonry;
    - non-ferrous metals;
    - ferrous metals;
    - cardboard, paper and plastics;
    - clean timber;
    - timber-rich materials;
    - 0 to 10mm fines;
    - 10 to 20mm aggregate;
    - 20 to 70mm aggregate; and
    - Pre-sorted materials

Importantly, the enclosure will be equipped with dust extraction points for the manual sorting stations and transition points of materials that generate excessive dust. Additionally, all windsifting exhaust air is ducted into a baghouse filter. The baghouse filter separates the residual airborne dust and ensures that only clean exhaust air is released to the atmosphere. Furthermore, there will be a dust suppression misting system in use at various points along the process flow and the entry and exit points of the building to minimise the dust emissions of the site.

2.3 Traffic and transportation

Recyclable waste materials from construction sites around Sydney would be delivered to the facility for processing and sorting generally using 12.5 tonnes trucks. These trucks would arrive at the facility fully laden and depart empty. These trucks would arrive at the facility throughout the day. The processed materials from the facility would be delivered to various locations throughout Sydney using trucks up to 42 tonnes. These trucks would arrive at the facility empty and depart the facility fully laden. The Australian Standard (AS2890.2:2002 Part 2 Off-street Commercial Vehicle Facilities) indicates that a 12.5 tonne truck would be equivalent to a 12.5m long heavy rigid vehicle. Similarly, the National Heavy Vehicle Regulator (NHVR) indicates a 42 tonne truck would be equivalent to 19m semi-trailer and/or truck and dog trailer.

The proposed modification does not include any alteration of existing access arrangements to the site. It will continue to operate as an uncontrolled intersection with separated ingress and egress driveways as per existing geometric configuration and will continue to be shared with the adjoining site. It is

proposed to retain the existing administration building (including the nearby car parking spaces) located near the access to the site. The proposed enclosure would be constructed over land to the east of the existing administration building. Staff traffic upon entering the site would veer to the south to gain access to the car parking spaces. Trucks would continue down the shared access road to gain entry into the proposed enclosure at the north eastern end of the shared access road.

Upon entering the shed, trucks would be weighed before proceeding to the relevant internal areas within the enclosure depending on whether the truck is to drop off the materials for processing or to be loaded with processed recycled materials. Trucks would then proceed to exit the shed via the wheel wash area and then to the second weigh bridge before exiting the site (refer to Figure 3). The existing site layout includes 74 car parking spaces located adjacent to the existing administration building. This will continue to be available for the parking of staff vehicles. The proposed modification is not expected to generate any additional parking demand. The relevant development control plan does not include a specific use similar to that being proposed on the subject site. The proposed facility is expected to employ up to 13 staff. Therefore, the proposed parking retention of the existing 74 car parking spaces would be more than adequate.

Trucks are not expected to remain on the site for any extended period of time as the trucks would be processed as they come in. Therefore, parking for trucks would not be required. Furthermore, the site layout has been designed using *AustRoads Design Vehicles and Turning Path Templates* and to accommodate worst case queuing of trucks entering the site with the weighbridge set back some 240 metres from site egress.

2.4 Hydrology

Site drainage currently comprises a network of underground pipes and pits which are relatively small in diameter (up to 375mm). There are no existing detention tanks to reduce the peak flow of stormwater leaving the site. Beyond the site there is a number of existing kerb entry pits located along Miller Road which generally drain in a southerly direction. The upgraded facility will include a number of new water quality controls including new drainage lines, new pits and pipes discharging to an existing easement, a new on-site detention storage system with provision for the capture of gross pollutants and sediment to improve the quality of discharge from the premises. Rainwater tanks are also proposed to harvest a large quantity of rainwater falling on the enclosures rook and hardstand area. This will reduce the demand for potable mains water and will be used for irrigation.

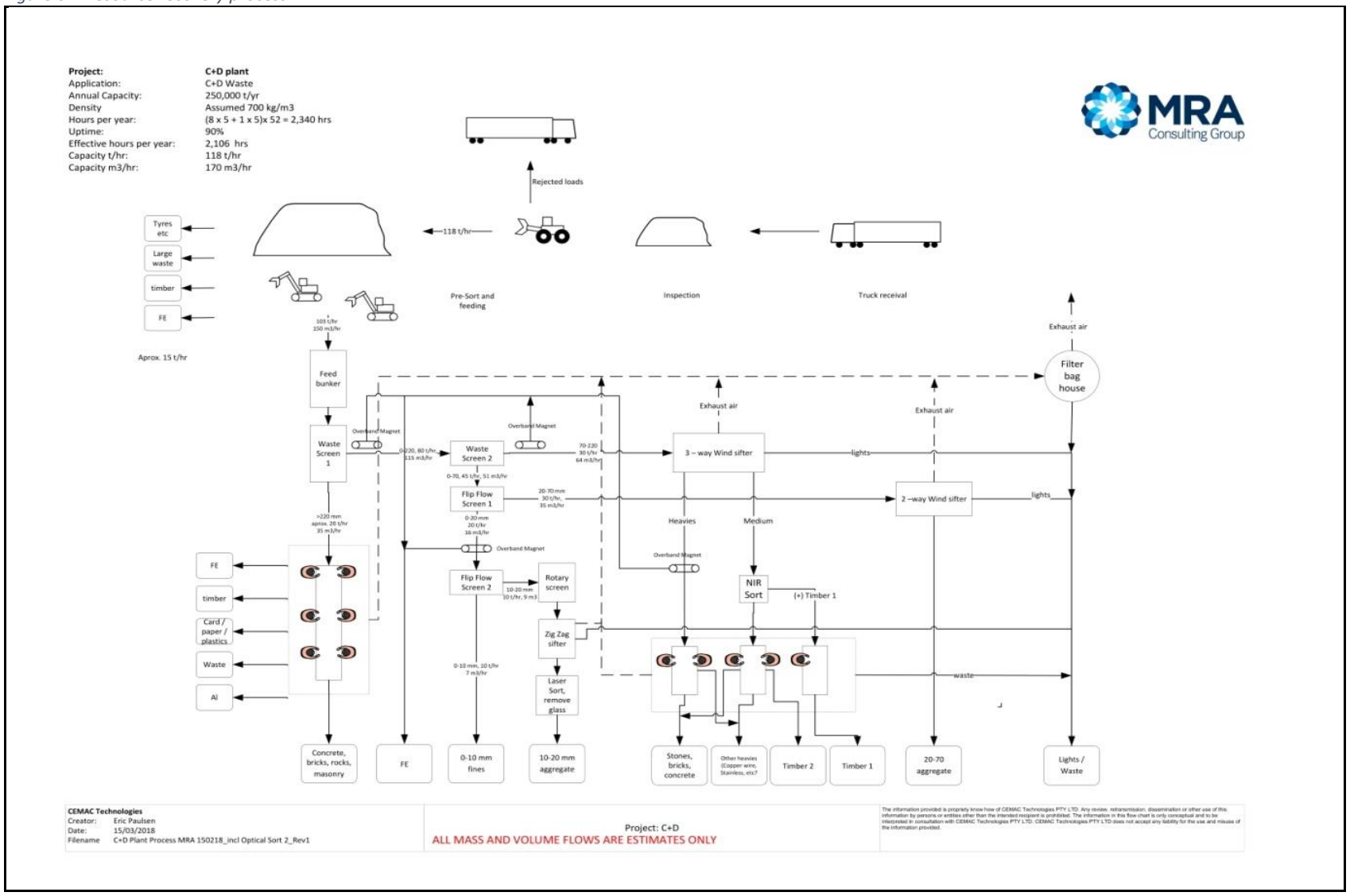
The development would result in a significant improvement in stormwater and pollutant discharges from the site particularly given the potential for infiltration of contaminates into the groundwater as a result of the development would be negligible given the:

- Majority of the site would be impermeable (with the exception of the small landscaping/grass areas particularly to the south);
- Processing of all wastes would occur within a full enclosure;
- Site's stormwater will improve as a result of the proposed project; and
- There is a range of mitigation and management measures available to ensure acceptable performance during both construction and operation.

2.5 Urban Design and Landscaping

The enclosure would be of high design quality with colours and finishes generally compatible with the surrounding land uses. To minimise visual impacts the enclosure will be painted a contemporary Shale Grey colour.

Figure 6 – Resource recovery process



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The enclosure is likely to comprise colourbond cladding. External finishes will be applied that will reduce glare and minimise visual intrusiveness.

Landscaping would be undertaken around the site as part of the modification to further soften the visual impacts associated with the erection of the enclosure. Deep soil zones are provided on both the southern and eastern setbacks which are generous at 15 metres. The landscaping would include a mix of mature trees, shrubs and grasses with a particular emphasis on screen planting along the southern and eastern boundaries. A landscape plan will be prepared and submitted to DPE prior to construction commencing.

2.6 Fire and Incident Management

A preliminary Fire Hazard Analysis (refer to Section 4.7 and Appendix J) was conducted for the proposed facility that identifies the likely fire safety systems and measures that will be required to address the hazards and risks associated with its use for the storage of large quantities of combustible materials. The objective of the study was to ensure that the proposed fire prevention, detection, protection and fire-fighting measures are appropriate for the specific fire hazard and adequate to meet the extent of potential fire risk for the proposed development.

Having regard to the BCA and the requirements of Fire and Rescue NSW (FRNSW), the analysis found that the fire safety systems and measures identified were considered appropriate for the specific fire hazard and are expected to adequately address the extent of potential fire risk associated with the proposed development for use as a Waste Management Facility. It should be noted that the operational stockpile located immediately behind the unloading bay was considered to present the major fire related risk within the building as it has the potential to contain large quantities of combustible materials.

The fire safety systems to be provided include:

- Perimeter vehicle access for emergency vehicles;
- Fire hydrants;
- Fire hose reels;
- Fire sprinklers, including occupant earning;
- Portable fire extinguishers;
- Fire control centre;
- Automatic smoke exhaust; and
- Emergency lighting and exit signs.

It is noted that a detailed Fire Safety Study will be required during the detailed design stage of the project to ensure all fire safety objectives are identified and addressed to the satisfaction of all stakeholders. This will include an updated Fire Hazard Analysis that will involve further consultation with FRNSW.

The Facility also has a current Emergency Response Plan which provides a planned and coordinated strategy for site personnel in the event of an emergency situation. The strategy includes requirements for both Occupational Health & Safety and Environmental Management matters. This plan will also be updated to incorporate the detailed findings of the Fire Hazard Analysis.

2.7 Alternatives

BRO considers that alternative options are limited given the regulatory compliance circumstances affecting the site. However, two alternatives to the modification were considered, the 'Do Nothing' option and the option of surrendering its operational license.

The 'Do Nothing' scenario - Should the modification proposal not proceed then current operations would continue to be constrained due to inherited non-compliances, site layout and storage area capacity which would limit the volume of waste able to be received. This in turn would compromise and severely limit BRO's ability to improve environmental performance and provide a long term sustainable regulatory compliance outcome for the site.

Surrendering the license to operate - Given the extent of work required to enable processing activities to recommence onsite, specifically the need to remove containers, and address the legacy and processing stockpiles, the option of cleaning the site and surrendering the license was considered. However, this option ignores a significant opportunity to develop a 'state of the art' resource recovery facility that would maximise operational throughput to meet growing demand for C&D recycling facilities in metropolitan Sydney, and to meet State strategic resource recovery targets.

Accordingly, the modification proposal would significantly improve operational efficiency and environmental performance, as well as contributing to the objectives of maximising waste recycling opportunities. It is considered the preferred option.

3 Strategic and Statutory Framework

3.1 Strategic Context

NSW Waste Avoidance and Resource Recovery Strategy 2014-21

The WARR Act establishes the mechanisms to prioritise avoidance, recycling and final disposal of waste. The NSW WARR Strategy establishes the following goals:

- Avoiding and reducing waste generation;
- Increasing recycling with target recycling rates by 2021-22 of 80 % for construction and demolition (C&D) waste and 70% for commercial and industrial (C&I) waste; and
- Diverting additional waste from landfill to alternative uses, such as recycling and energy recovery.

The modification proposal supports the objectives of the WARR Strategy. The Proposal would directly result in an increased recycling rate of greater than 75% and increased diversion of waste from landfill.

National Waste Policy: Less Waste, More Resources

The National Waste Policy which was released in 2009 outlines the Commonwealth government's direction for waste management in Australia through to 2020. Objectives of the Policy are for the nation to:

- manage waste in an environmentally safe, scientific and sound manner, and reducing the amount of waste disposed;
- routinely manage waste streams as a resource to achieve better environmental, social and economic outcomes; and
- increase the amount of products, goods and materials that can be readily and safely used for other purposes at end of life.

The modification proposal supports the objectives of the National Waste Policy. The Proposal would utilise best practice resource recovery and environmental controls whilst at the same time maximising resource recovery and minimizing waste to landfill.

Greater Sydney Region Plan (Region Plan) and South City District Plan (District Plan)

A key objective of both the Region and District Plans is to facilitate greater reuse and recycling of waste particularly as Sydney grows requiring additional waste management services and disposal options. The Greater Sydney Region Plan highlights that:

- existing waste management facilities do not have the capacity to accommodate projected growth;
- many contractors rely on waste facilities outside the local area due to limited waste infrastructure in Greater Sydney;
- it is important to have recycling and waste management facilities distributed throughout the urban area to facilitate increased recycling and efficiencies in transportation; and
- industrial and urban services land such as the Chester Hill Industrial Precinct provides an appropriate location for a waste management facility and the recycling of municipal, commercial and industrial waste.

The modification proposal supports the objectives of both the Region and District Plans. The modified proposal would increase capacity for the recycling of construction materials whilst at the same time reducing the amount of waste requiring disposal to landfill. The Facility is located within industrial and urban services land which is located centrally within the urban context of metropolitan Sydney.

3.2 Existing approval

Major Project Approval

The Facility was originally approved on 27 February 2007 under Part 3A of the *Environmental Planning and Assessment Act, 1979*. The approval enabled the processing of 100,000 tonnes of ferrous and non-ferrous metals per annum at the site. In 2009, the approval was modified to allow for a wider range of waste to be processed at the site. In addition to the non-ferrous and ferrous metal, the modification enabled the processing of building and construction waste including concrete, solid waste, topsoil, and timber (refer to Appendix A).

The Proposal is also considered to be integrated development under Section 4.46 of the EP&A Act as the Facility is a scheduled premises under the *Protection of the Environment Operations Act 1997 (POEO Act)* and is subject to an EPL that will require amendment (Appendix C).

Despite the 2009 modification, the former site operator did not construct the site in accordance with that approval.

No other approvals, permits or licenses are required for the modification.

Proposed modification

The modification seeks the:

- Upgrade of the site including the:
  - reconfiguration of the layout including waste stockpiles;
  - erection of an enclosure for the sorting and recycling of waste and the progressive development of hardstand areas for the operational areas of the facility; and
  - improvements to stormwater and wastewater management to ensure required water quality standards.
- Establishment of an average daily processing limit of approximately 910 tonnes and the increase in the annual processing limit from 100,000 tpa of building and construction waste (including metal) to 250,000 tpa.

3.3 Modification of approval

For the purposes of S75W of the EPA Act, approval of the Facility was originally designated as a transitional Part 3A project and therefore any modifications could be applied for under S75W. However, on 1 March 2018 changes were made to the EPA Act including the repeal of S75W. The changes to the Act were supported by amended EPA Regulations which include transitional provisions relevant to resolving outstanding S75 W applications. The implications of the Regulations for the current application are as follows:

- the approved project can be modified under section 75W given the request to modify was made before 1 March 2018; and
- Determination of the modification must be made before 1 September 2018 or if not, the Secretary must be satisfied that the application is supported by sufficient information for a determination to be made.

The Department has advised that given the imminent lodgment of the modification application that the application will continue to be considered under the provisions of S75W apply to this modification request.

Section 75W requires the Minister to be satisfied that the proposed modification is consistent with the approved project and does not constitute a new project in its own right. BRO submits that the proposed modification is consistent with the existing Facility. The modification would not change the intent or purpose of the approved project given:

- It would remain a resource recovery facility;
- It would retain essentially the same development approval; and
- The environmental consequences of the modification would be vastly improved to those resulting from the current approved operations at the site.

In addition, the proposal would divert from landfill 187,500 tpa of waste.

3.4 Objectives and justification

The key objectives of the modification are to:

- Provide BRO the means to address the onsite legacy waste issues and transform the site from its current state into a contemporary resource recovery facility with significantly improved environmental and regulatory performance;
- Maximise resource recovery and minimise waste to landfill consistent with Federal, State and local government strategic policies;
- Contribute positively to the needs of the construction industry; and
- Inject capital into local and regional economies including 50 construction and 13 operational positions.

As outlined in Section 2, the cleanup of the site consistent with the existing Orders is expected to take 12 months. It is then expected to take an additional 12 months to construct the hardstand and enclosure and commence operations.

Justification

The NSW Waste Avoidance and Resource Recovery Strategy 2014–21 provides a clear framework for waste management over the next five years. The modification will contribute positively to the implementation of the goals in the NSW Waste Avoidance and Resource Recovery Strategy by diverting up to 187,500 tpa of waste from landfill. It will also considerably improve the environmental performance of the facility and its long term sustainability as a waste management asset for the wider NSW community.

The environmental assessment has been prepared in accordance with EP&A Regulations and consistent with the Secretary's Environmental Assessment Requirements (SEARs) as outlined in Section 2.

Section 4.15 Consideration

Section 4.15 of the Environmental Planning and Assessment Act 1979 lists the matters that a consent authority is required to take into consideration in determining an application (so far as relevant). These include:

- any environmental planning instrument
- any draft environmental planning instrument that is or has been placed on public exhibition and details of which have been notified to the consent authority
- any development control plan
- the regulations that apply to the land to which the development application relates
- 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 suitability of the site for development
- any submissions made in accordance with the Act or the Regulations
- the public interest

The assessment of this modification request has had due regard to the matters outlined in Section 4.15. All relevant environmental planning instruments have been considered and the proposal is generally consistent with the aims and objectives of these instruments. The modification application has been prepared and submitted consistent with the EPA Regulations. A comprehensive impact assessment has been undertaken consistent with the SEARs which has found the following:

- the construction and operation of the upgraded facility will vastly improve environmental outcomes with the operation predicted to comfortably meet key environmental, land use safety and amenity criteria subject to mitigation;
- the upgrade will result in a resource recovery rate of greater than 75% consistent with the EPAs recycling goals of the NSW Waste and Resource Recovery Strategy 2014-2021; and
- the upgrade will stimulate the local economy through $20 million in capital investment and full-time employment for approximately 13 positions once the capital works are complete.

Consequently, it is considered to be in the public interest and should be approved.

3.5 Local Environmental Plan (LEP) and Development Control Plan

Bankstown Local Environmental Plan (LEP) 2015

Bankstown LEP 2015 is Council's principal planning document to regulate effective and orderly development in the City of Bankstown. The LEP provides objectives, zones and development standards such as lot sizes and floor space ratios.

The site of the Facility is located on land zoned IN1 General Industrial under Bankstown LEP 2015 and the current and proposed operations are permissible with consent. The aims of the 4(a) General Industrial zone is as follows:

a) to manage growth in a way that contributes to the sustainability of Bankstown, and recognises the needs and aspirations of the community,
b) to protect and enhance the landform and vegetation, especially foreshores and bushland, in a way that maintains the biodiversity values and landscape amenity of Bankstown,
c) to protect the natural, cultural and built heritage of Bankstown,
d) to provide development opportunities that are compatible with the prevailing suburban character and amenity of residential areas of Bankstown,
e) to minimise risk to the community in areas subject to environmental hazards by restricting development in sensitive areas,
f) to provide a range of housing opportunities to cater for changing demographics and population needs,
g) to provide a range of business and industrial opportunities to encourage local employment and economic growth,
h) to provide a range of recreational and community service opportunities to meet the needs of residents of and visitors to Bankstown,
i) to achieve good urban design in terms of site layouts, building form, streetscape, architectural roof features and public and private safety,
j) to concentrate intensive trip-generating activities in locations most accessible to rail transport to reduce car dependence and to limit the potential for additional traffic on the road network,

k) to consider the cumulative impact of development on the natural environment and waterways and on the capacity of infrastructure and the road network,
l) to enhance the quality of life and the social well-being and amenity of the community.

The modification proposal is consistent with the aims of the LEP. The modified Facility will incorporate best practice environmental performance and mitigation measures that will help to protect the natural environment resulting in significant environmental improvements in both the short and long term. Coupled with improved onsite management, these improvements will help ensure ongoing regulatory compliance.

The modification would minimise the risk of environmental hazards with the implementation of best practice mitigation measures. It will be designed to ensure that it achieves good urban design outcomes in terms of its industrial context and neighbouring residential areas, particularly in relation to building form and visual amenity. The design of the building will be complemented by deep root zones to facilitate appropriate landscaping which will soften the overall impacts of the enclosure.

The Facility aims for a resource recovery rate of >75% which will divert up to 187,500 tpa of waste from landfill and contribute positively to the needs of the construction industry. The ongoing use of the site as a resource recovery facility is consistent with Council's land use policies and will ensure orderly development of the subject land. The modification proposal will contribute positively to the local and regional economies through short and long term employment and capital injection.

The objectives of the 4(a) General Industrial zone is as follows:
a) To provide a wide range of industrial and warehouse land uses.
b) To encourage employment opportunities.
c) To minimise any adverse effect of industry on other land uses.
d) To support and protect industrial land for industrial uses

The modification proposal is consistent with the objectives of the zone. The site would continue to be used for resource recovery purposes and is appropriately located within an existing industrial precinct. A fundamental aim of the modification is to improve environmental performance by minimizing impacts on surrounding land uses in particular nearby residential uses. Further, it will support the on-going economic viability of the precinct providing 13 full-time operational positions and 20 contractors. It would also provide approximately 50 jobs during the construction of the modification proposal.

Bankstown Development Control Plan (DCP) 2015
Bankstown Development Control Plan 2015 supplements the LEP by providing additional objectives and development controls to enhance the function, appearance and amenity of development in the City of Bankstown. The development controls include storey limits, setbacks, building design, landscaping and access. The section of the DCP relevant to the modification proposal is *Part B3 – Industrial Precincts.* Part B3 generally applies to land zoned IN1 General Industrial and IN2 Light Industrial.

Given the modification application relates to a Major Project approval issued under the former Part 3A of the *EPA Act,* development control plans are not applicable and do not govern the merit assessment of the application. Notwithstanding, the assessment has fully considered the heads of consideration within the DCP in characterizing the development and the overall design of the modified Facility to ensure consistency with Council's overarching aims and objectives for the site and the surrounding area.

The desired character objectives of the DCP are as follows:

(a) To have general industrial precincts in the City of Bankstown that accommodate a wide range of contemporary industries, warehouses and other compatible land uses within a generous landscape setting, and protects the industrial land for industrial uses; and

(b) To have light industrial precincts in the City of Bankstown that accommodate a range of contemporary light industries and warehouses within a landscaped setting, and will not cause nuisance or adversely affect the surrounding amenity for example by way of noise or emissions.

The provisions relevant to the modification proposal and how they have been addressed are identified in Table 2.

Table 2 – Consistency of modification with relevant provision of Bankstown DCP 2015

Provision	Summary of requirement	Comment
Building Controls	Site coverage 1. sum of site coverage not to exceed 70% Setbacks 2. minimum setback for development to primary road frontage is 10 metres 3. setbacks to side and rear boundaries must maintain solar access or visual privacy, avoid easements, and provide adequate buffer between residential areas.	• The total site area is 6.5 Ha while the gross floor area of the enclosure is 2.35 Ha. • The enclosure therefore covers approximately 36% of the site and is therefore consistent with the DCP requirement. • Setbacks along the southern and eastern boundaries are 15 metres with deep soil zones. There are minimal impacts in terms of solar access and visual privacy.
Development adjacent to residential zones	• must be compatible with height, scale, siting and character of existing residential development • goods, plant, equipment and other material must be stored and screened from residential areas • noise generated from fixed sources or motor vehicles should be effectively insulated and /or minimised • must not cause nuisance to residents through operation, traffic movement, parking, headlight glare, security lighting, fumes, gases, smoke, dust or odours	• A visual impact assessment has concluded that the enclosure will not result in unacceptable visual impacts on residential areas. • One of the key objectives of the modifications is to locate all key impact activities inside the enclosure to reduce offsite amenity issues especially offsite noise and dust impacts. • A noise impact assessment was conducted consistent with the RNP which found that with mitigation, the modification would meet relevant noise goals at sensitive land uses. • The increase in road traffic noise is predicted to comply with the relevant noise criteria. • An air quality assessment was undertaken which concluded that the risk of air quality impacts was low.
Building Design & materials	• development must articulate the facades to achieve a unique and contemporary architectural appearance • development on a corner allotment must incorporate architectural corner features to add visual interest	• The design of the proposed enclosure encapsulates high commercial and industrial standards by virtue of configurations and colours which respond to the industrial character of the precinct.

	• quality materials must be used such as brick, glass, and steel to construct the facades of a development • development must incorporate innovative roof design that achieves a contemporary architectural appearance combined with high quality materials and finishes	• The application of appropriate tones would alleviate the bulk and scale of the built form to the streetscape and the residential areas to the north, east and to a lesser degree the south.
Safety and Security	• administration must be located at the front of buildings • development must provide lighting to external paths, common lobbies. Driveways and car parks should be appropriately illuminated.	• the existing administration building is strategically located at the entrance to the site • all lighting will be provided consistent with Australian Standards
General	• adequate off-street parking relative to demand • suitable landscaping particularly between any buildings and the street alignment • no uncontrolled traffic through residential streets • there must no detraction from residential amenity • energy efficient and resource conservation measures should be adopted relevant to the design, construction and operation	• the existing parking arrangements (74 spaces) are more than adequate and the proposal would not generate unacceptable truck queues • access to the site is via Miller Road which functions as a collector road to and from the Hume Highway. Increased traffic associated with the modification meets applicable noise criteria • extensive landscaping is planned around the southern and eastern boundaries to soften the impact of the enclosure from residential areas and where practicable across the remainder of the site.
Acoustic privacy	• must consider the INP and acoustic amenity of adjoining residential zoned land • adoption where necessary of soundproofing for machinery or activities	• the modification proposal is expected to comfortably meet noise goals at all sensitive land uses
Pollution Control	• must control fumes, odour emissions, and potential water pollutants in accordance with requirements of relevant public authority	• a quantitative air quality assessment found that the risk of air quality impacts was low given the proposed air quality management strategies employed on site and the nature of the proposed development • site activities do not include any activities with the potential to generate odours • the plant will account for less than 0.006% of NSW greenhouse emissions.
Open Space	• development must provide a landscaped area along primary and secondary road frontages of an allotment which is greater than 4,000m2 - minimum width for landscaped area to primary road 10 metres - minimum width for landscaped area to secondary road frontage 3 metres	• Landscaping within the setbacks will soften the appearance of built form and hardstand and reduce the perceived bulk and scale of the development. • In general, the landscaping will be provided to enhance the existing

	• employee amenities should utilise or has access to landscaped areas • the landscaped area should include trees at a rate of 1 canopy tree per 30m2 of landscaped area	streetscape and promote scale and density of planting to soften the visual impact of the proposed enclosure. • A detailed landscaping plan will be submitted prior to construction commencing
Business and building identification signs	• Signage will be the subject of a separate development application	N/A
Storage areas	• The storage and use of hazardous must comply with the requirements of WorkCover NSW and other relevant public authorities • The storage and use of dangerous goods must comply with the Dangerous Goods Act and relevant regulations	• The onsite storage of a maximum of 5 x 200L barrels of diesel and up to 6 x 18-20kg gas bottles (LPG) in a designated storage facility does not trigger any of the SEPP 33 screening thresholds. The preparation of a PHA is not required.
Infrastructure	• Telecommunications etc must be integrated into architectural features of the building and be sufficiently screened when viewed from residential areas • External lighting must give consideration to the impact of glare on the amenity of adjoining residents	• There will be no change to current telecommunications onsite • Exterior light lighting will be installed consistent with relevant standards and where practical installed in such a way that directs light downwards to further minimise impacts on adjacent land uses

3.6 State Environmental Planning Policies

State Environmental Planning Policy No. 33 – Hazardous & Offensive Development

SEPP 33 requires consent authorities, in assessing applications for industrial development, to consider the potential risk and offensiveness of the proposal in terms of impacts on human health, property and the biophysical environment.

Potentially Hazardous Industry.

SEPP 33 defines a potentially hazardous industry as development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:

- (a) to human health, life or property, or
- (b) to the biophysical environment.

If a development is potentially hazardous, a Preliminary Hazard Analysis (PHA) must be prepared to demonstrate that safeguards are in place that will prevent such harm occurring. The guideline Applying SEPP 33 provides screening tests that can be used to determine whether the quantity and location of dangerous goods within the proposed development site are such as to cause a potential hazard.

BRO has advised that approximately 5 x 200L barrels of oil and up to 6 x 18-20kg gas bottles (LPG) would be stored in the onsite dangerous goods storage room identified in Figure 3. Although not identified as a dangerous good, 4 x 50L Argon and Cargon welding gas bottles would also be stored in this area. The proposed storage room would be similar to the existing storage room identified in Plate 9.

Separate to the dangerous goods storage facility a 15,000 litre self bunded smart tank for dispensing diesel is currently located in the centre of the site. The tank would be relocated to an appropriate location when construction commences. Both the storage room and the diesel dispenser are located well away from the site boundary and sensitive receptors (>250 metres from the nearest residence).

Plate 9 – Existing onsite dangerous goods storage facility

Application of SEPP 33 Screening Tests

SEPP 33 gives general screening threshold quantities below which various dangerous goods are not considered to represent a potential hazard. The storage of a maximum of 5 x 200L barrels of oil and up to 6 x 18-20kg gas bottles (LPG) does not trigger any of the SEPP 33 screening thresholds. Similarly, the storage of up to 15,000 litres of diesel in an appropriately bunded dispenser does not trigger any of the thresholds neither individually nor when considered along with the others goods stored onsite.

Accordingly, the application of the screening methodology set out in *Applying SEPP 33* leads to the conclusion that the proposed development cannot be classed as potentially hazardous. Under these circumstances, the preparation of a PHA is not required.

Potentially offensive industry

An air quality assessment was undertaken to determine the potential for air quality impacts to be generated offsite. The proposed development would process building and demolition waste as well as ferrous and non-ferrous materials. The facility would process inert matter, such as metals, concrete, bricks, tiles rubber and wood with an expected throughput of 250,000 tonnes per annum. It is not expected that the site would generate any odours given the inert nature of the material.

However, there is the potential for dust to be generated and impact offsite. A quantitative assessment was undertaken (refer to Section 4.3) which included dispersion modelling using AERMOD. It concluded

that the risk of air quality impacts would be relatively low considering the proposed air quality management strategies employed on site and the nature of the proposed development.

While it is now intended to fully enclose all processing activities, the assessment concluded that a Dust Management Plan (DMP) should be prepared for the site. The aim of the plan is to minimise dust to nearby neighbours by ensuring there is no significant visible dust leaving the site. The specific measures to be included in DMP are detailed in Sections 4.3 and 4.9 and include the creation of continuous hardstand to reduce uncovered areas and emissions from vehicle movements; the construction of a full enclosure to minimise wind erosion and dispersion of emitted dust; mist sprays; a dust extraction system; the use of hoppers and bays to store materials; the covering and spraying of stockpiles, the hardstand area being kept free of visible dust by sweeping; the use of water to control dust from screens and conveyor circuit and where necessary, water spraying will be conducted during the unloading/loading of trucks, particularly if visual dust is generated.

State Environmental Planning Policy No. 55 – Remediation of Land

The objective of SEPP 55 is to provide for a coordinated state-wide planning approach for the remediation of contaminated land. SEPP 55 aims to promote the remediation of contaminated land with the objective of reducing the risk of harm to human health or other aspects of the environment.

Clause 7 of SEPP 55 requires the approval authority to have regard to certain matters before granting approval. These matters include:

- Whether the land is contaminated;
- Whether the land is, or would be, suitable for the purpose for which development is to be carried out;
- If remediation is required for the land to be suitable for the proposed purpose, whether the land will be remediated before the land is used for that purpose.

EPP 55 also imposes obligations to carry out any remediation work in accordance with relevant guidelines, developed under the CLM Act and to notify the relevant council of certain matters in relation to any remediation work. Site contamination is considered in Section 4.4. The assessment notes that the site was remediated in the early 2000s and found suitable for use as a resource recovery facility then and in subsequent assessments. The assessment also found that the continuous hard standing of the site would be the most appropriate response to address the existing subsurface contaminants provided appropriate measures are adopted during construction, particularly to ensure contaminants in the topsoil are not released into the environment.

BRO is committed to undertaking testing in the preliminary stages of construction to determine the most appropriate form of structural support for the enclosure and the need to ensure asbestos fines are dealt with appropriately.

3.7 Other NSW legislation

Protection of the Environment Operations Act 1997

The Facility has an existing license under the POEO Act (EPL 20421). An amendment to the current EPL will be required.

3.8 Commonwealth legislation

Environment Protection and Biodiversity Conservation Act 1999

An approval under the *Environment Protection and Biodiversity Conservation Act* (EPBC Act) is required for any action that is likely to have a significant impact on Matters of National Environmental

Significance (MNES). Nine MNES are listed under Part 3 of the EPBC Act. None are relevant to the site. Subsequently, BRO submits that there will be no significant impact on MNES and a referral to the Federal Department of the Environment and Energy is not required.

3.9 Consultation

BRO has been corresponding with both the NSW Department of Planning and Environment and the NSW Environment Protection Authority for some time in relation to the regulatory compliance issues identified in Section 1. BRO has also had regular meetings with both agencies regarding the operation of the facility in general and its desire to provide a long term solution to these issues and to develop a viable and sustainable resource recovery facility. Consultation undertaken by BRO in relation to this modification application is summarized in Table 3.

As already identified, consultation with DPE, EPA and CBCC resulted in a number of key design changes to the proposal that will result in better and sustained environmental performance. These changes included fully enclosing all processing activities and significantly reducing the height of the facility. Consultation with NSW Fire Brigades resulted in a Preliminary Fire Safety Study being conducted which addressed worst case fire risk and fire management responses noting that a more detailed Study will be finalised during the detailed design process.

Table 3: Summary of Stakeholder Consultation

Stakeholder	Form of Consultation	Issues raised
NSW Environment Protection Authority	Met with representatives of DPE and EPA on 30 July 2018	Key issues raised included height, legacy stockpiles and need to fully enclose all processing activities.
Canterbury Bankstown City Council	Met with representatives of CBCC on 29 August 2018	Issues raised related to legacy waste issues. Indicative plans were provided as requested.
NSW Fire Brigades	Met with representatives of the FRNSW on 22 September 2018	Issues raised included identification of worst case fire risk and fire management responses
The surrounding businesses and residents	Refer below	Refer below

Community and business consultation

Community consultation was undertaken with site neighbours consistent with the SEARs. On Thursday 20 September 2018, CDL Planning door knocked over 90 private and commercial premises within 100 metres of the above site. Over two thirds of the premises door knocked had someone available to seek comment. A map is provided at Figure 7 illustrating the properties door knocked. The commercial premises were primarily located on Miller Road, Sir Thomas Mitchell Road, Orchard Road and Waldron Road, Chester Hill. The private residences were primarily located on Waldron Road, Orchard Road, Hughes Place, Wellington Road, Goodstate Place and Proctor Parade, Chester Hill. At each premises community members were provided the opportunity to look at the proposed development layout plan, visual analysis and 3D model of the proposal and feedback sought. The feedback received from each person, including surrounding businesses, was positive.

A high number of people door knocked were aware of the site and raised the past fire on site or previous dust issues as a problem, however, the feedback about the new proposal was overwhelmingly positive, particularly given it is to be fully enclosed and will significantly reduce dust emissions. No other issues or concerns were raised about the proposal, nor was any feedback or comments negative or

against the proposal. In addition, those door knocked were advised that upon application, feedback would be sought from the Department of Planning and Environment should they wish to make any comment in a formal capacity.

Figure 7 – Extent of local consultation including map

BUILDERS RECYCLING OPERATIONS
191 MILLER ROAD CHESTER HILL
COMMUNITY CONSULTATION MAP SEPTEMBER 2018

Name and number of Streets canvased		
Street Name	**From Number**	**To Number**
Waldron Road	137	165
Miller Road	197	203
Sir Thomas Mitchel Road	1	11
Orchard Road	96	128
Wellington Road	253	259
	70	90
Proctor Parade	108	116
	165	171

SUBJECT SITE:  **AREA CANVASED:**

SG HADDAD ADVISORY

Strategic Planning Services

4 Environmental Impact Assessment

4.1 Traffic Impact Assessment

The Transport Planning Partnership (TTPP) was engaged to undertake a traffic and transport assessment for the Proposal. The complete Transport Impact Assessment is included at Appendix D to this report. This section summarises the assessment undertaken by TTPP and identifies the key issues relating to traffic and transport, during both construction and operation as well as mitigation management strategies.

Road Network

Hume Highway - The Hume Highway is a classified State Road and forms part of the National Highway connecting Sydney to Melbourne. Near the subject site, the highway operates two-way with six lanes, and has a posted speed limit of 70km/h. Miller Road connects to Hume Highway at a trafficked T-intersection, less than 1.6km from the site.

Miller Road - Running in a north-south direction along the western boundary of the site, Miller Road functions as a two-way collector road providing connectivity to and from the Hume Highway. In the vicinity the site, the road consists of four lanes with unrestricted kerbside parking in the outer lanes and has a posted speed limit of 60km/h. In the northern corner of the site, Miller Road narrows to become two separated lanes over a railway overbridge. Two roundabouts control the intersections with Christina Road/Waldron Road and Sir Thomas Mitchel Road to the north and south of the site respectively. Vehicle access to the subject site is located on Miller Road.

Waldron Road/Christina Road - Waldron Road and Christina Road intersect Miller Road at a roundabout to the north of the site. Waldron Road is a four-lane, two-way road, aligned in the east-west direction with a posted speed limit of 60km/h. Signage at the roundabout restricts heavy vehicles three tonnes and over access onto Waldron road except for deliveries. Therefore, trucks three tonnes and over approaching from the southern direction on Miller road, will be directed onto Christina Road. Vehicles turning into Christina Road from Miller Road will be required to form one lane and adhere to a speed limit of 60km/h.

The existing access from the recycling facility lies on Miller Road at an uncontrolled intersection, approximately 300m south of the intersection with Christina/Waldron Road. The access is divided by a concrete island creating separate ingress and egress driveways measuring approximately 9m each and is shared with an adjoining site operating as a sorting/logistics facility.

Existing traffic

Intersection turning movement counts at nearby intersections were conducted on Wednesday 1st of November 2017 from 8:00am to 9:00am and from 4:00pm to 5:00pm. The following intersections were surveyed:

- Miller Road – Hume Highway
- Miller Road – Christina Road
- Miller Road – Recycling Centre Access.

Surveyed peak hour intersection movement volumes are presented in Appendix D.

Based on the Facility's maximum tonnages proposed under the modification, it is expected to generate 148 movements per day (74 arrivals and 74 departures) generated by 12.5 tonne waste delivery trucks

and 52 movements per day (26 arrivals and 26 departures) from 42 tonne processed waste removal trucks.

Average hourly flows have been calculated from the generated daily trips, assuming 10 working hours (7:00am – 5:00pm) per day. The hourly traffic generated is broken down as follow:

- approximately 16 movements (8 arrivals and 8 departures) per hour from 12.5 tonne (12.5m) waste delivery trucks; and
- approximately 6 trips per hour (3 arrivals and 3 departures) from 42 tonne (19m) processed waste removal trucks in each direction

In addition, the Facility is expected to employ 13 staff. However, to be consistent with the previous traffic assessment which was accepted by DPE when recommending that the 2009 modification proposal be approved, the assessment has conservatively adopted additional traffic generation relating to 40 staff. In relation to staff traffic generation, the following assumptions are made:

- each staff member would drive themselves to and from the facility;
- all staff arrive at the site during the morning peak hour to report for work; and
- all staff depart from the site during the evening peak hour.

The assumptions relating to staff traffic generation are the same as that adopted in the previous assessment. On this basis, staff traffic would result in additional 40 inbound trips during the morning peak hour and 40 outbound trips during the evening peak hour.

In summary, the expected traffic generation during the peak periods is as follow:

- 16 heavy rigid vehicle movements per hour;
- 6 articulated vehicle movements per hour; and
- 40 passenger vehicle movements per hour.

The above expected traffic generation is generally consistent with that assumed in the previous traffic assessments which anticipated the proposed facility would generate 18 truck movements per hour and 40 passenger vehicle movements per hour. On this basis, the proposed development would generate 4 additional truck movements per hour above the approved development.

Background traffic growth

Roads and Maritime Services (RMS) maintains and operates a strategic traffic forecasting model. Plots showing traffic growth from the 2016 and 2026 models have been obtained.

The 2016 to 2026 growth factors identified in Appendix C show typical growth factors between one to two per cent per annum. Accordingly, these have been applied to 2017 surveyed traffic volumes to provide 2027 future base case volumes for assessment of the future cases.

Traffic distribution

Traffic distribution ratios to and from the site have been adopted based on the previous traffic assessment which was accepted by the DPE. These are as follow:

- 25% inbound - access the site from the north via Christina Rd and Miller Road;
- 25% inbound – access the site from the north via Gurney Rd and Miller Road
- 50% inbound – access the site from the south via Miller Road 25 per cent outbound – travel to the north via Miller Road and Christina Road;
- 25% outbound – travel to the north via Miller Road and Gurney Road; and
- 50 per cent outbound – travel to the south via Miller Road and Hume Highway.

Intersection analysis

The existing operation of the nearby intersections to the site have been assessed using SIDRA which calculates intersection performance measures such as 'average delay' that vehicles encounter and the level of service (LoS). RMS uses level of service as a measure to indicate the operating efficiency of a given intersection. The level of service (LoS) ranges from A to F. Levels of service between A and D indicate the intersection is operating within capacity with LoS A providing exceptionally good performance to LoS D indicating satisfactory performance. LoS E and F indicate the intersection is operating at or near capacity and would require intersection improvement works to maintain reasonable performance. LoS D is the long term desirable level of service for most intersections in Sydney.

Level of service is also directly related to the average delay experienced by vehicles travelling through the intersection. At signalised intersections, the average delay is the volume weighted average of all movements. For roundabouts and priority controlled intersections (give way and stop sign), the average delay relates to the worst movement.

SIDRA intersection modelling has been carried out for three nearby intersections. The following three scenarios have been assessed in this regard:

- Scenario 1: existing conditions using 2017 survey data and observed traffic patterns;
- Scenario 2: 2027 future base case with Scenario 1 traffic with growth of the background traffic to 2027 using RMS provided growth factors, and
- Scenario 3: 2027 post development condition with Scenario 2 plus the additional development traffic estimated as part of this proposal.

The results for the different scenarios are detailed in Appendix D. In summary the results are as follows:

- Scenario 1: - the intersections are performing well under existing traffic conditions with acceptable delays and overall a LoS of B or better in both peak periods;
- Scenario 2: the intersections are performing satisfactorily in the future base case scenario with an overall LoS of C or better in both peak periods. This performance is generally similar with those found in the existing conditions, albeit some intersections would experience slightly longer delays; and
- Scenario 3: With the additional traffic generated by the proposed development, the intersections would continue to operate satisfactorily as represented in Table 4 below. All the assessed intersections would continue to have a LoS of C or better in both peak periods. With the additional traffic from the proposed development, the assessed intersections would have similar performance to 2027 future base case conditions.

Queue Analysis

- The proposed facility includes two weigh bridges to record the tonnage of vehicles entering and leaving the facility. The weigh bridges will have the potential to generate vehicle queues. The extent of queuing will depend on the arrival rate of vehicles and the service rate or the processing time of the weigh bridges. The proposed Facility is expected to generate a total of 11 trucks per hour in each direction comprising 8 x 12.5m long rigid trucks per hour, and 3 x 19m semi-trailers per hour. It is noted that only trucks will be required to be weighed. Staff vehicles will not be required to use the weigh bridges. As such, only trucks would contribute to the queues at the weigh bridges.

Table 4 – Post development intersection development

Intersection	Morning Peak		Evening Peak	
	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service
Miller Rd-Hume Hwy	23	B	33	C
Miller Rd – Site access	12	A	23	B
Miller Rd – Christina Rd	29	C	40	C

The analysis detailed in Appendix D was undertaken consistent with industry standards. It found that the processing time for arriving trucks at the weigh bridge varied from half a minute to no more than four minutes which equate to service rates ranging from 15 vehicles per hour (vph) to 120 vph. Subsequently, based on a worst case scenario (with a processing time of four minutes) the 95th percentile queue length would be approximately 138m. This is based on the site layout noting that the incoming weighbridge is located 240m from Miller Road providing ample queue storage within the site. The worst case queuing scenario (138m) is significantly less than the available queue storage (240m). On this basis it is highly unlikely that the operation of the facility at maximum production would generate vehicle queues that would extend into Miller Road.

Separately, it is noted that the shared access road has sufficient width to accommodate queued trucks while still enable other vehicles to access the other sites on either side of the queued trucks.

Conclusion

The traffic impact analysis concluded that the:

- Upgrade of the facility is expected to generate an additional 22 truck movements per hour and 40 passenger vehicle movements per hour during the morning and evening peak periods which is similar to the anticipated level of development traffic assessed for the original approved development;
- Intersection analysis of relevant intersections using SIDRA indicates that there is sufficient capacity to accommodate the expected additional traffic generated by the proposed upgrade of the facility. The identified intersections would continue to operate satisfactorily with similar performance to that found under existing and future base case conditions;
- Assessment of the identified intersections includes growth of background traffic to the year 2027 using growth factors obtained from RMS;
- Proposed development can continue to use the existing access arrangements without the need for any modifications;
- Proposed development does require any changes to existing parking arrangements; and
- Proposed development would generate some vehicle queues, but this is expected to be contained well within the site.

On this basis, it is concluded that the overall traffic impacts of the proposed upgrade of the facility are satisfactory and predicted not to create any adverse impacts to the surrounding road network.

Mitigation and Management

It is considered that no additional mitigation or management measures are required given there is:

- Sufficient parking;

- Site access arrangements are adequate for the proposed modification noting that the site layout has been designed to accommodate queuing; and
- The local road network can readily absorb the additional predicted traffic.

Notwithstanding, the CEMP will include a Driver Code of Conduct to ensure that deliveries associated with the Facility adhere to accepted industry standards for the transport of waste including the covering of loads.

4.2 Noise and Vibration Impact Assessment

Existing Environment and Proposed Modification.

A Noise Impact Assessment (NIA) was conducted by Wilkinson Murray (refer to Appendix E) to assess the potential noise impacts arising from the proposed modification. Wilkinson Murray assessed the potential noise impacts from day to day operations as well as the impacts from generated traffic and construction noise.

The land use surrounding the site is predominantly industrial, with the nearest and most sensitive residences located approximately:

- 120m to the north of the site, across the train line on Waldron Road;
- 150m to the east on Orchard Road; and
- 380m southwest at the intersection of Miller Road and Bilolea Street.

Industrial receivers include the KU Chester Hill Children's Centre, the Industrial Estate located at 173 Orchard Road, Integrated Packaging, and Display and Rack Australia. In addition, the northern part of the subject site is tenanted by GQM Logistics, a container hire, storage and sales firm.

It should be noted that the original design of the enclosure involved a shed with three walls but was open to the north for operational reasons. This included a 3m wall/fence around the entire building footprint and also a 8m high enclosed section covering approximately half the building footprint. All operations, including stockpiling, screening and dumping would to occur behind the wall. Screening, picking and pre-sorting and sorting will occur under the covered section along the southern wall of the development. Truck deliveries and excess stockpiling will occur in the uncovered section on the northern side of the development.

However, following discussions with the EPA on 30 July 2018, BRO has amended the proposal and now intends to construct a fully enclosed shed within which all processing and loading and unloading would occur. While the assessment has been undertaken on the original design, the EPA has advised that it is not necessary to revisit the modelling given that operations under the original design were predicted to meet applicable noise goals and that full enclosure of all processing activities would provide additional mitigation.

Noise and Vibration Assessment Criteria

Operational Noise criteria

The site currently operates under EPL 20421, issued by the NSW EPA. The EPL establishes noise limits for the operation of the facility. These limits were adopted for the assessment to ensure that future operations comply with BRO's license obligations. The limits are shown below in Table 5.

Table 5 EPL 20421 Noise Limits

Location	Day (Leq 15 min)
Residences in Waldron Road	47
Residences in Goodstate Street/Orchard Road	50
Any other affected residence	50

The license does not currently specify limits at the neighbouring industrial receivers. The NSW EPA's Noise Policy for Industry sets an amenity trigger level for industrial receivers of 70dBA. This has been adopted for all industrial receivers surrounding the site given that the proposal does not involve any change to operating hours.

Traffic Noise Criteria

The EPA's NSW Road Noise Policy (RNP) provides criteria for managing noise levels associated with traffic generating developments. Traffic associated with the modification is detailed in Section 4.1 and includes 12.5 tonne trucks delivering waste to the facility and up to 42 tonne trucks removing waste from the facility. On site movements are considered under the operational noise assessment.

Access to the premises is via the existing driveway located on Miller Road. Based on the RNP definition of Sub-arterial roads and local roads Miller Road could be classified as a Sub-Arterial road due to its connection to the Hume Highway and its traffic flows during peak hour. However due to the distance of the site from the Hume Highway and the surrounding area Miller Road has been conservatively designated a local road for the purpose of this assessment. The RNP assessment criteria are reproduced in Table 4.3 of Appendix E. Based on the existing traffic levels on Miller road, traffic noise levels at the assessed receivers already exceeds 55 dBA LAeq, 1hour during the daytime. Therefore, in accordance with the RNP, any increases in road noise levels at sensitive receivers along Miller Road should be less than 2 dB.

Construction Noise Management levels

The NSW EPA's Interim Construction Noise Guideline (ICNG) recommends noise management levels (NML) for construction activities to control the impact on the surrounding community. The ICNG noise management levels are presented in Table 4.4 of Appendix E. The noise affected level represents the point above which there may be some community reaction to noise. The highly noise affected level represents the point above which there may be strong community reaction to noise.

The construction Noise Management Levels (NMLS) for the development are presented in Table 4.5 of Appendix E. The NML are based on the RBL's used to establish the EPA license noise limits. It is expected that construction will only occur during standard daytime construction hours.

Construction and Operational Vibration Criteria

Human exposure to vibration – Assessing Vibration: A Technical Guideline (ATG) published by the EPA provides guidance for assessing human exposure to vibration. Consideration of the guideline confirms that the proposed vibration intensive activities should be considered as intermittent vibration. Table 5.4 in Appendix D adopts the relevant daytime Vibration Dose Value (VDV) established in the ATG given the proposed works will only occur during the day period.

Potential for building damage from vibration – There are currently no Australian Standards applicable, however it is accepted practice to establish goals using overseas standards. British Standard BS 7385:1993 is the most commonly used Standard in Australia and considered by Wilkinson Murray to be the most appropriate for this project. The vibration guide values for cosmetic damage established by BS7385-2 are reproduced in Table 4.7 of Appendix E.

Operational Noise Assessment

Noise levels due to the proposed operation of the Project at the identified noise sensitive receiver locations have been predicted using a model created with the Cadna-A acoustic noise prediction software (Version 4.6) as recognised by the EPA. Factors addressed in the noise modelling include

equipment noise level emissions and location; screening from structures; receiver locations (the closest residential boundaries were considered to represent the residential receivers); ground topography; noise attenuation due to geometric spreading; ground absorption; and atmospheric absorption.

The typical worst case acoustic scenario was considered to be when construction of the proposal is complete and the site is operating at its full capacity of 250,000 tonnes per annum. Noise source levels for the plant were based on site measurements conducted by Wilkinson Murray (29th November 2017) and Wilkinson Murray's existing database of noise levels. A worst case 15 minute scenario was developed using a range of noise sources which are reproduced in Table 4-8 of Appendix D. The walls of the structure were treated as barriers and an overhang was included to cover the enclosed portion. It was assumed there was minimal absorption in the shed and the noise sources were treated as free field.

The predicted operational noise levels are reproduced in Table 6 below. Notably a 4-6 dBA exceedance is predicted at the multi-storey receivers on Waldron Road. This exceedance is considered to be a moderate to significant impact and therefore requires mitigation.

Table 6 Predicted Operational Noise Levels

Receiver	Trigger Level dBA LAeq 15min	Predicted level dBA LAeq 15min	Exceedance	Complies?
R1	47	52	5	-
R2	47	51	4	-
R3	47	53	6	-
R4	50	33	-	Yes
R5	50	39	-	Yes
R6	50	39	-	Yes
R7	50	40	-	Yes
R8	50	40	-	Yes
R9	50	41	-	Yes
R10	50	41	-	Yes
R11	50	33	-	Yes
R12	70	48	-	Yes
R13	70	56	-	Yes
R14	70	42	-	Yes
R15	70	47	-	Yes
R16	70	48	-	Yes

In order to reduce the noise levels at receivers on Waldron Road to the appropriate criteria under the original design, mitigation would be required. Due to the large footprint of the operations and elevated height of the affected receiver's, mitigation options were limited. Two potential options are presented below, namely:

- Option 1: Increase the height of the wall to shield the receivers on Waldron Road. A 8m high perimeter wall along North Eastern corner of site would reduce predicted levels to meet the required trigger levels; or
- Option 2: Increase the height of the North Eastern section of wall to 6m AND add a partial enclosed section to covered portion of the facility.

The adoption of either option was expected to result in the future operation of the facility meeting the noise goals in the EPL. This is represented in Tables 4.1 and 4.2 of Appendix E and is spatially represented in the Figures 9 and 10 below. However, given that BRO has made the decision to locate

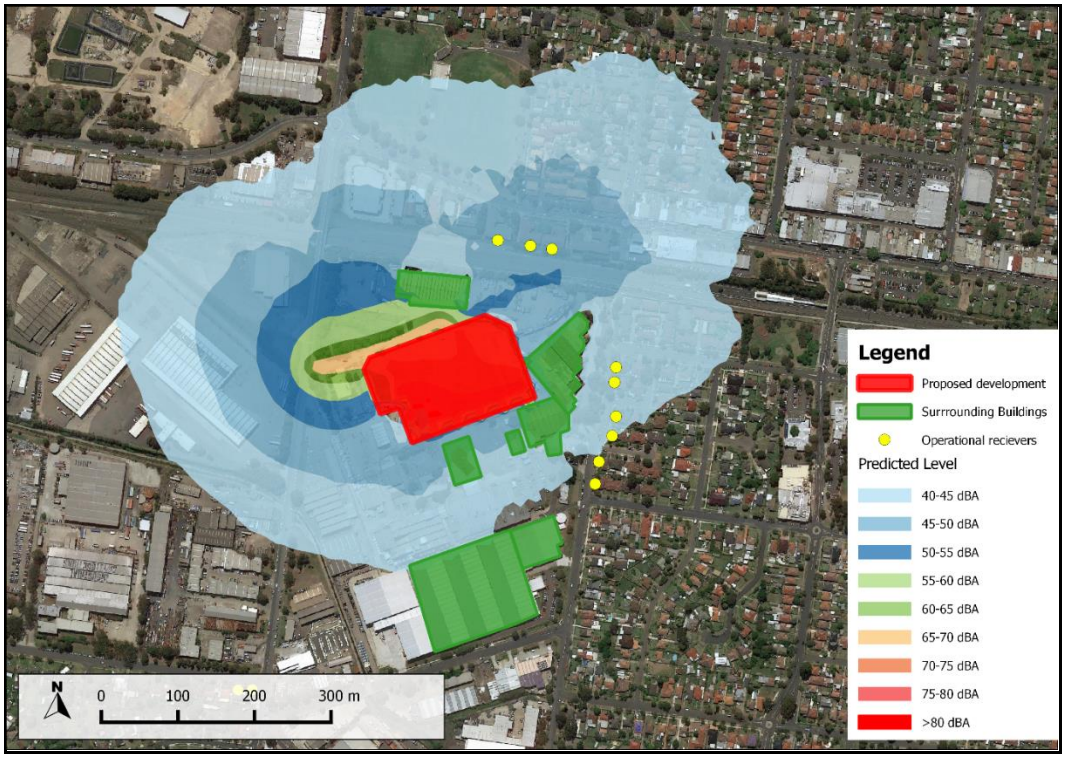
all processing activities within a fully enclosed shed, it can be assumed that operations will meet all noise goals at all time at all locations.

Traffic Noise Assessment

Traffic noise levels have been predicted using the Calculation of Road Traffic Noise (CoRTN) model developed by the Welsh Office of the UK Department of Transport, 1988. The CoRTN method calculates the LA10, 18hr noise level and takes into account the following factors:

- Traffic flow volumes;
- Average vehicle speed;
- Percentage of heavy vehicles;
- Gradient of road;
- Type of road pavement;
- Distance from receiver location to road;
- Shielding from barriers / building and intervening topography;
- Angle of view;
- Building facade reflection correction; and
- Ground absorption.

Figure 9 Noise Contours with mitigation option 1, $L_{Aeq\ 15min}$

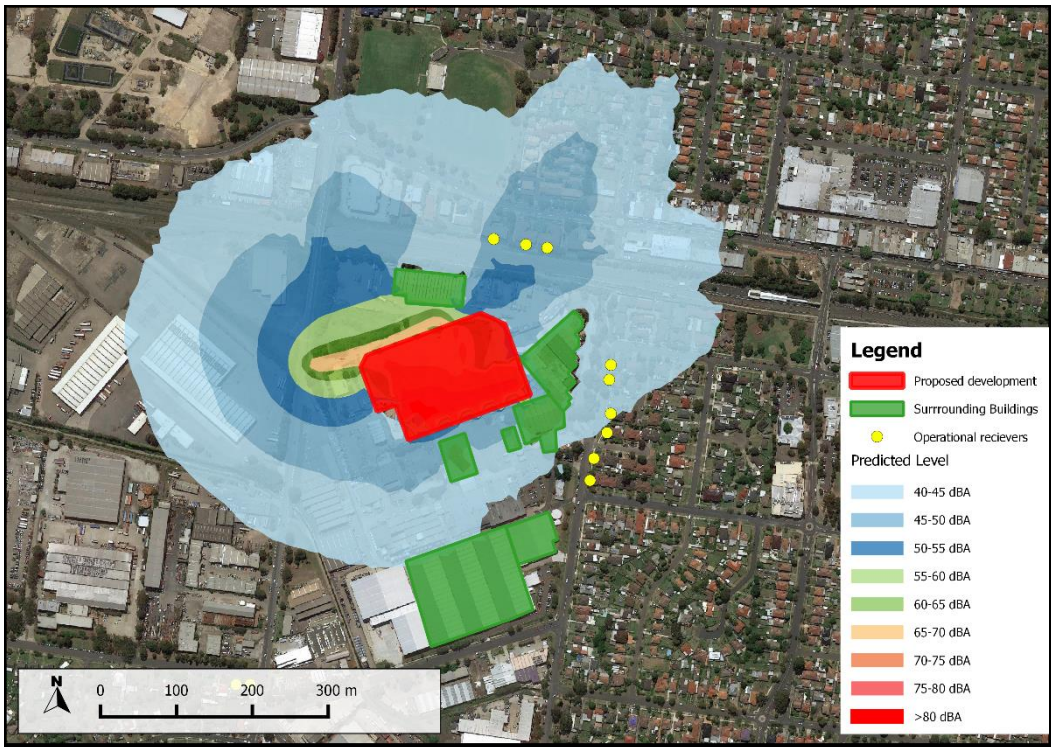


The assessment considered both existing and additional peak traffic flows for Miller Road North and South (Figure 4.13 of Appendix D) found that the additional 22 truck movements and 40 light vehicles per hour results in an increase in the LAeq,1hr of 0.5dB (Figure 4.13 of Appendix E). This is below the 2dB criterion limit established in the RNP for existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments. In accordance with the RNP, no mitigation of traffic noise levels, due to the operation of the Proposal, is warranted.

Construction Noise Assessment

Noise from the construction of the facility has the potential to impact on nearby receivers. Noise source levels for the plant were based on measurements conducted by Wilkinson Murray and Wilkinson Murray's database of noise levels. A worst case 15 minute scenario was developed using a range of noise sources. The majority of the construction work will occur either at a distance from the worst affected receivers or behind the existing shipping container that currently act as noise barriers. However there will be some periods where the containers will provide no shielding due either to location or them having been removed as required for construction.

Figure 10 Noise contours with mitigation option 2, $L_{Aeq\ 15min}$



As with the operational noise, the apartments on Waldron Road are the most likely affected receivers. A worst-case construction noise scenario was developed based on the following assumptions: no shielding from barriers; hand tools used at a height; telehandler located on site; mobile Crane located in driveway; concrete truck and concrete pump located on site; and noise source located at northern end of site, closest to receivers on Waldron Road. The predicted noise from the worst-case construction scenario were calculated using Cadna-A and are reproduced in Table 7 below.

Noise will need to be managed on a stage by stage basis. The use of the proposed equipment without mitigation measures has the potential to exceed the noise management level. Mitigation measures should be used to manage exceedances of the noise management levels in accordance with the ICNG. Under this worst case scenario, exceedances of the 'Noise Affected' Level of up to 6dBA are expected at the residences located on Waldron Road. This indicates that the there may be some community reaction to noise and therefore construction noise needs to be managed using a construction noise management plan. The impact however is short in duration.

Operational and Construction Vibration

None of the operations conducted on the site are not expected to cause any significant vibration. Plant likely to be used during construction which could typically be expected to induce minor vibration

includes: truck movements; excavator movements; piling rig; and vibratory roller. The nearest potentially affected commercial receivers are 15m away and are of heavy concrete construction. The nearest residential receivers are 100m away and are conservatively classified as typical lightweight construction. Vibration goals, typical vibration intensive plant and indicative working distances are identified in Appendix E. As a guide, indicative working distances are quoted for both "structural" damage and human comfort.

The minimum distance from any residence to the location of construction plant operation exceeds that required for the human comfort criteria to be achieved although vibration levels at industrial neigbours may possibly be felt. The distances to residential receivers (and to surrounding industrial premises) exceed those applicable to safe working distances for building damage. Vibration levels due to construction works are not predicted to result in damage to buildings. The vibration caused by any equipment either in construction or in operation of the facility is expected to be well below the recommended levels for cosmetic damage and human comfort.

Table 7 - Predicted Construction Noise Levels

Receiver	NML	Predicted level $L_{Aeq\ 15min}$	Exceedance
R1	52	58	6 dBA
R2	52	57	5 dBA
R3	52	54	2 dBA
R4	55	46	-
R5	55	41	-
R6	55	42	-
R7	55	42	-
R8	55	41	-
R9	55	42	-
R10	55	42	-
R11	55	46	-
R12	75	50	-
R13	75	67	-
R14	75	63	-
R15	75	65	-
R16	75	60	-

Mitigation measures

During construction activities, the following construction noise management and mitigation strategies should be adopted where feasible:

- plant, where possible, to be strategically positioned to provide shielding where noise generation at a site is predicted to be above criteria at surrounding receptors;
- limitation of use of acoustically significant plant (reticulation pumps) to minimise exposure to nearby residences (where possible);
- undertake regular maintenance of machinery to minimise noise emissions.
- consultation with residences immediately adjacent to proposed works will include letter box drops and verbal communication prior to works;
- noise monitoring during activities predicted to generate maximum impacts; and
- all contractors and staff will undergo noise awareness training.

BRO will maintain a community complaints line that will be available throughout the construction activities. Records of all community complaints will be maintained on an up-to-date complaints register. The records will include:

- date and time of the complaint;
- the means by which the complaint was made (telephone, mail or email);
- any personal details of the complainant that were provided, or if no details are provided, a note to that effect;
- the nature of the complaint;
- any actions taken by the construction contractor in relation to the complaint, including any follow up contact with the complainant and the timing for implementing action; and
- if no action was taken by the construction contractor in relation to the complaint, the reason why no action was taken.

Maintenance will be confined to standard daytime construction hours and where possible, away from noise sensitive receivers.

Conclusion

The noise emissions associated with the daily operation were predicted to have a minor to moderate impact on receivers on Waldron Road. To mitigate this impact BRO originally proposed to increase the height of the north eastern boundary wall to 6 metres and further enclose the north eastern end of the shed which will ensure compliance with noise goals. However, BRO now intends to fully enclose all processing activities within an enclosure which will ensure that site operations will meet all relevant noise goals at sensitive receivers at all times.

The increase in road traffic noise is predicted to comply with the relevant noise criteria.

Noise Management levels were established for the construction of the site. Minor exceedances of the noise management levels of up to 6dBA could potentially be experiences during a worst-case scenario. Noise levels will be managed using all feasible and reasonable measures as per the Interim Construction Noise Guideline.

Vibration criteria were established for both construction and operation of the site. No vibration impact from either construction or operation is expected.

4.3 Air Quality Impact Assessment

An Air Quality Impact Assessment (AQIA) was conducted by Wilkinson Murray to assess the potential air quality impacts arising from the proposed modification (refer to Appendix F).

Dust Monitoring

The site currently operates under EPL 20421 issued by the NSW EPA. In accordance with the EPL, four dust deposition gauges are used to monitor dust emissions from the site located at the common boundary between the premises and unit 8, 191 Miller Road, at the south eastern corner of KU Chester Hill Children's Centre at 157-159 Waldron Road, the north western corner of the warehouse at 149 Orchard Road, and at the common boundary between the premises and 195 Miller Road. These locations are prescribed in the EPL. The EPL also identifies measures required to control dust including:

- All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises;
- All areas must be maintained, at all times, in a condition which effectively minimises the emission of wind-blown or traffic-generated dust;
- The licensee must ensure that no material, including sediment or oil, is tracked from the premises;
- Trucks entering and leaving the premises that are carrying loads must be covered at all times except during loading and unloading;

- The licensee must maintain a weather station to monitor onsite weather conditions including but not limited to rainfall and wind strength and direction. Weather information is to be used to inform reactive dust management;
- The licensee must manage dust in accordance with the "Air Pollution Control Management Plan", prepared by Pollution Control Consultancy and Design and dated April 2017;
- A copy of all records required by the Air Pollution Control Management Plan must be produced to any authorised officer of the EPA who asks to see them; and
- A copy of the Air Pollution Control Management Plan must be kept at the Premises at all times. It must be available for inspection by any employee or agent of the licensee working at the Premises.

Qualitative Risk Assessment

The proposed development would process building and demolition waste as well as ferrous and non-ferrous materials. The facility would process inert matter, such as metals, concrete, bricks, tiles rubber and wood with an expected throughput of 250,000 tonnes per annum.

There is the potential for air quality impacts especially dust on the neighbouring premises as a result of the proposed operation. Site operations which have the potential to generate dust include vehicles entering and leaving the site; vehicles, including trucks and heavy machinery moving around the site on paved surfaces; trucks dumping waste material; excavators and loaders dumping material into trucks; waste material on conveyors; screens operating; loading dumping material into screen and conveyor system hopper; shredder operating; and wind erosion off hardstand areas and/or stockpiles.

The building waste to be accepted typically contains a high percentage of dusty materials. Visible dust that is generated should be controlled using attended water sprays. A review of the proposed site activities has not identified any activities with the potential to generate odours. Materials dumped onto the tipping floor of the processing building would be inspected. If any loads are found to contain any prohibited materials, such as putrescible waste, it would immediately loaded back into the delivering vehicle and rejected from the site.

Air quality Assessment Criteria

The EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (January, 2017)* sets out applicable impact assessment criteria for a number of air pollutants which aim to protect the general health and amenity of the community in relation to air quality.

Key pollutants of interest associated with the Project comprise dust and particulate matter as follows:

- Total Suspended Particulates (TSP);
- Particulate Matter (PM10 and PM2.5); and
- Deposited Dust.

The EPA Approved Methods specifies air quality assessment criteria for assessing impacts from dust generating activities. These criteria are consistent with the National Environment Protection Measures for Ambient Air Quality (NEPC, 1998). These criteria which are identified in Table 8 below, relate to the total concentrations of dust and particulate matter in the air and not just that from the project. Therefore, some consideration of background levels needs to be made when using these goals to assess impacts.

Table 8 - Impact assessment criteria – dust and particulate matter

Pollutant	Averaging period	Impact	Criteria
Total suspended particulates (TSP)	Annual	Total	90 µg/m³
Particulate matter ≤2.5 µm ($PM_{2.5}$)	Annual	Total	8 µg/m³
	24-hour	Total	25 µg/m³
Particulate matter ≤10 µm (PM_{10})	Annual	Total	30 µg/m³
	24-hour	Total	50 µg/m³
Deposited dust (DD)	Annual	Total	4 g/m²/month
	Annual	Incremental	2 g/m²/month

Dust deposition recorded at the two locations within the site boundary has an average dust deposition of 3.9 and 4.1 g/m^2/month. Locations 1,3 and 4 have exceeded 4.1 g/m^2/month in at least one individual month. The dust deposition data indicates the site currently generates significant dust.

Existing Meteorology

The assessment considers temperature, humidity and rainfall. Temperature data indicates that January is the hottest month of the year, with a mean daily maximum temperature of 23.2 degrees Celsius. July is the coolest month with a mean daily minimum temperature of 6.1 degree Celsius. March is the wettest month with an average rainfall of 98 mm of rain.

Local Ambient Air Quality

Air Quality monitoring data from the Office of Environment and Heritage (OEH) air quality monitoring site at Chullora has been used to characterise the ambient air quality in the area surrounding the project site. The Chullora site is located approximately 4.7 kilometres east of the project site.

Ambient concentrations of PM_{10} as measured at the OEH monitoring station in Chullora between 2012 and 2016 are identified in Table 5.5 of Appendix F. The data show that no exceedances of the 24-hour average goals for PM_{10} were measured during 2014. However during 2012, 2013, 2015 and 2016, a number of exceedances of the 24-hour average goals for PM_{10} were recorded. All annual average concentrations of PM_{10} were below the goal.

Ambient concentrations of $PM_{2.5}$ as measured at the OEH monitoring station in Chullora between 2012 and 2016 are identified in Table 5.6 of Appendix F. The data shows that no exceedances of the 24-hour average goals for $PM_{2.5}$ were measured during 2012 or 2014. During 2013, 2015 and 2016, a number of exceedances of the 24-hour average goals for $PM_{2.5}$ were recorded. Annual average concentrations of $PM_{2.5}$ were below the advisory goal during 2012 but on or above the goal for all other years.

The majority of exceedances of the 24-hour average goals for PM10 and PM2.5 during 2016 were caused by bushfire reduction burning in the Greater Sydney Metropolitan Region during May. The highest 24-hour average concentrations of PM10 and PM2.5 during 2012 that were considered to not be affected by reduction burning, were 36.5 µg/m3 and 20 µg/m3, respectively. These values are considered to be more representative of the existing ambient air quality in the area, and have been used further in the assessment as typical ambient levels.

The dust deposition data available for the site was deemed not to be representative of an ambient level due to existing impact from the site, additionally there is no readily available site-specific TSP data. The Chullora monitoring site does not measure these components, however estimates of the background levels for the site are required to assess the impacts per the relevant criteria.

Estimates of the annual average background TSP concentrations can be determined from a relationship between measured PM10 concentrations. This relationship assumes that 40% of the TSP is PM10 and was established as part of a review of ambient monitoring data collected by co-located TSP and PM10 monitors operated for reasonably long periods of time in the Hunter Valley (NSW Minerals Council, 2000). Applying this relationship with the 2016 annual average PM10 concentration of 18.1 µg/m3 at the Chullora monitoring station estimates an annual average TSP concentration of 45.3 µg/m3.

To estimate annual average dust deposition levels, a similar process to the method used to estimate TSP concentrations is applied. This approach assumes that a TSP concentration of 90µg/m3 will have an equivalent dust deposition value of 4 g/m2/month; and indicates a background annual average dust deposition of 2.0 g/m2/month for the area surrounding the project.

A summary of the assumed background particulate levels are as follows:

- TSP - 45.3 µg/m3 annual average;
- PM10 - 18.1 µg/m3 annual average;
- PM10 - 36.5 µg/m3 (24 hour);
- PM10 - 20 µg/m3 (24 hour); and
- Dust deposition - 2.0 g/m2/month.

Dispersion Modelling

Dispersion modelling was conducted using regulatory approved meteorological and dispersion modelling tools. Given there is no meteorological observation data of the required quality available for the site, data was used from Bankstown Airport AWS located approximately 3.7 kilometres south west of the Project site. Site-specific meteorological data was generated using 'The Air Pollution Model' (TAPM). The TAPM model included assimilation of data collected at the Bankstown Airport AWS during the year 2016. The TAPM results, including predictions of wind speed, wind direction, temperature, humidity, cloud cover, solar radiation and rainfall, were used as inputs to AERMET – AERMOD's meteorological pre-processor. AERMET uses the TAPM data, along with land use data, to calculate mixing heights and velocity scaling parameters.

The dispersion model AERMOD was chosen for the assessment, a steady state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts. It includes treatment of both surface and elevated sources, and both simple and complex terrain.

The potential air pollutants associated with the Project are dust and particulate matter. Potential sources of dust generation are:

- Vehicles entering and leaving the site;
- Vehicles, including trucks and heavy machinery moving around the site on paved surfaces;
- Trucks dumping waste material;
- Excavators and loaders dumping material into trucks;
- Waste material on conveyors;
- Screens operating;
- Loading dumping material into screen and conveyor system hopper;
- Shredder operating; and
- Wind erosion off hardstand areas and/or stockpiles.

Taking into account control measures including dust extraction, misting sprays and watering where necessary, the total estimated emissions from the site are 3924kg/annum. However, to estimate the emissions of the specific pollutants identified for the assessment, information regarding the speciation of the dust is required. The distribution of particle size within the Total Suspended Particulates (TSP) is:

- PM2.5 is 5.0% of TSP;
- PM2.5-10 is 24.8% of TSP; and,
- PM10-30 is 70.1% of TSP.

Based on the particle size distribution and the total emitted mass of dust, the daily estimated emission rates for the pollutants of interest are presented in Table 9 below with a full inventory provided in Appendix D.

Table 9 Dust and Particulate Emissions

Source	Emissions (kg/day)		
	TSP	PM_{10}	$PM_{2.5}$
Entire Site	6.55	3.70	0.51

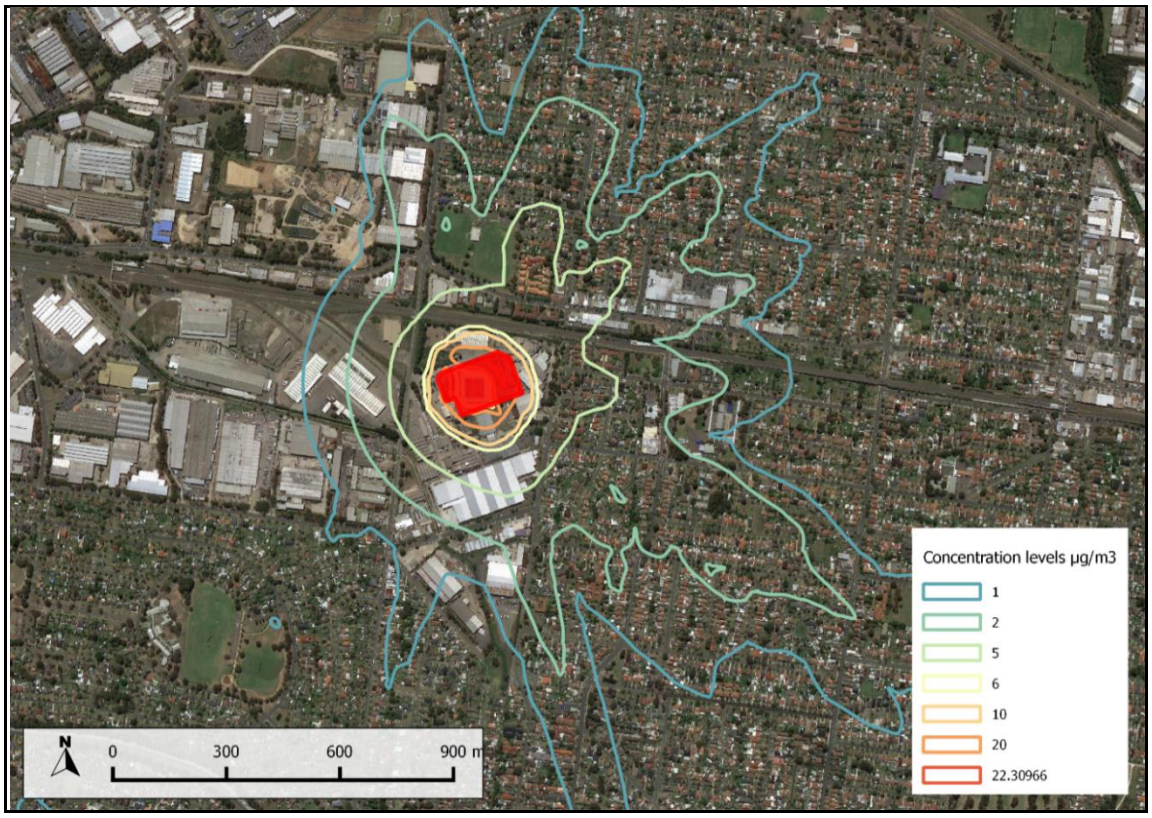
Due to the semi enclosed nature of the dust generating activities, the source has been modelled as a single volume source, the size of the shed. The large volume source is centred over the shed. This approach is considered to be conservative. The predicted incremental ground level concentrations of the identified air pollutants at sensitive receptors, due to the operation of the Project, are presented in Tables 10 below. Also presented are the total ground level concentrations of pollutants, based upon the existing ambient air quality. The predicted incremental and total ground level concentrations of dust and particulate matter are also presented. The results are also spatially represented in Figures 11 and 12 below.

Table 10 Predicted Dust and Particulate Matter Impacts at Receptors

Receptor	TSP		PM_{10}				Dust Deposition	
	Annual Average		24-hour Average		Annual Average		Annual Average	
	Increment	Total*	Increment	Total*	Increment	Total*	Increment	Total*
Criteria	90 µg/m³		50 µg/m³		25 µg/m³		2 g/m²/month	4 g/m²/month
R1	12.0	57.3	4.5	41.0	0.5	18.6	0.2	2.2
R2	10.1	55.4	3.8	40.3	0.5	18.6	0.2	2.2
R3	8.3	53.6	3.1	39.6	0.5	18.6	0.2	2.2
R4	1.4	46.7	0.6	37.1	0.1	18.2	0.0	2.0
R5	6.8	52.1	2.8	39.3	0.5	18.6	0.2	2.2
R6	7.0	52.3	2.8	39.3	0.5	18.6	0.2	2.2
R7	7.4	52.7	2.9	39.4	0.5	18.6	0.2	2.2
R8	7.4	52.7	2.8	39.3	0.5	18.6	0.2	2.2
R9	6.8	52.1	2.8	39.3	0.5	18.6	0.2	2.2
R10	6.7	52.0	2.6	39.1	0.5	18.6	0.2	2.2
R11	1.4	46.7	0.6	37.1	0.1	18.2	0.0	2.0
R12	10.6	55.9	4.1	40.6	0.5	18.6	0.2	2.2
R13	28.5	73.8	10.6	47.1	2.5	20.6	1.0	3.0
R14	10.5	55.8	4.2	40.7	0.7	18.8	0.3	2.3
R15	20.8	66.1	7.8	44.3	1.8	19.9	0.7	2.7
R16	37.4	82.7	13.4	49.9	2.6	20.7	1.0	3.0

* Total impacts include background concentrations.

Figure 11 - Ground Level Concentration Contours – 24 hour average PM10



Modelling results

The assessment indicates that the total impact on 24-hour average PM10 concentrations, calculated conservatively in accordance with the Approved Methods, comply with the impact assessment criterion of 50 µg/m3 at all sensitive receivers. The predicted incremental and total levels of TSP and deposited dust comply with the impact assessment criteria at all sensitive receivers. The dispersion modelling results for PM2.5 at discrete receptors indicates that the Project is unlikely to generate additional exceedances of the 24-hour average goal for PM2.5 at any sensitive residential receptors.

The predicted levels show that the annual average will be exceeded despite only a minor contribution from the project. The worst case $PM_{2.5}$ annual average concentration at surrounding receptors due to the project was 0.63µg/m^3. This represents approximately 8% of the $PM_{2.5}$ criteria and is considered an acceptable contribution to the airshed.

It should be noted that since undertaking the modelling BRO has decided to fully enclose all processing activities to ensure sustained environmental outcomes. Given the modelling for the original design concluded that 24-hour average PM10 concentrations would comply with the impact assessment criterion at all sensitive receivers, the full enclosure would be expected to further reduce these levels at these receivers and further reduce the predicted contribution of the facility to $PM_{2.5}$ annual average concentrations.

Mitigation and Management

Dust Mitigation

The following dust controls will be implemented to significantly improve dust emissions compared to the current site:

- creation of continuous hardstands to reduce uncover areas and emissions from vehicle movements;
- construction of a full enclosure to reduce wind erosion and reduce dispersion of emitted dust;

Figure 12 - Ground Level Incremental Dust Deposition - g/m2/month Annual Average

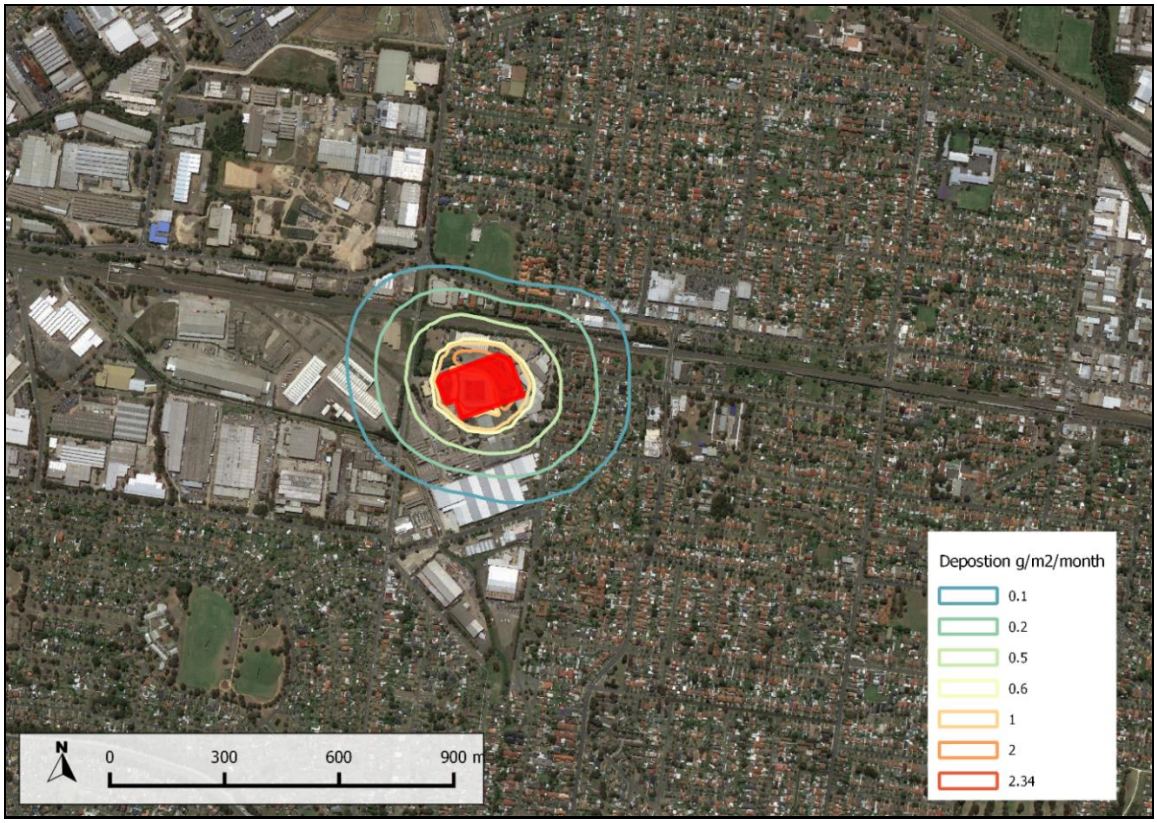


Table 11 Predicted $PM_{2.5}$ Impacts at Discrete Receptors

Receptor	PM2.5			
	24-hour Average		Annual Average	
	Increment	Total*	Increment	Total*
Goal	**25 µg/m3**		**8 µg/m3**	
R1	0.7	20.7	0.1	8.1
R2	0.7	20.7	0.1	8.1
R3	0.6	20.6	0.1	8.1
R4	0.1	20.1	0.0	8.0
R5	0.7	20.7	0.0	8.0
R6	0.7	20.7	0.1	8.1
R7	0.6	20.6	0.1	8.1
R8	0.6	20.6	0.1	8.1
R9	0.6	20.6	0.1	8.1
R10	0.6	20.6	0.1	8.1
R11	0.1	20.1	0.0	8.0
R12	0.8	20.8	0.1	8.1
R13	2.5	22.5	0.6	8.6
R14	0.8	20.8	0.1	8.1
R15	2.0	22.0	0.5	8.5
R16	2.8	22.8	0.5	8.5

* Total impacts include background concentrations.

- mist sprays;
- dust extraction system; and
- use of hoppers and bays to materials;

The following dust management strategies will be implemented to further minimise dust:

- where applicable, stockpiles are to be temporarily covered or sprayed with water to keep dust to a minimum;
- hardstand area to be kept free of visible dust by sweeping;
- water should be used to control dust from screens and conveyor circuit where there is visible dust;
- If visual dust is generated, water spraying will be conducted during the unloading/loading of trucks.

If mitigation methods are not effective, the following additional actions will be employed:

- increase water sprays;
- stop activity;
- secure with a cover;
- clearing of hardstand/road surface; and
- reduce or modify activities.

If visual monitoring indicates that the air quality objectives are being exceeded:

- identify the activities that were occurring at the time of the exceedances;
- determine the activities that were most likely contributing to the exceedances;
- review site works and environmental controls in place for this activity; and
- implement an agreed alternative to more adequately control dust generation.

Complaints

The Site Manager will maintain a complaint register. Any complaints will be investigated. Complaints will receive a verbal response as soon as possible.

Monitoring

All staff will conduct constant visual monitoring. The Site Manager will note non-conformances as they occur. All plant operated by the site operator will be well maintained and comply with the EPA emission standards. Dust deposition monitoring will continue to be conducted as per the existing license.

Roles & Responsibilities

The Site Manager will ensure the following equipment and controls are in place:

- dust mitigation equipment is available and operating at the frequency, times and location specified;
- provide direction to equipment operators concerning speed of operation(s) and duration of watering;
- staff and sub-contractors to be inducted and made aware of the air quality / dust suppression techniques used on site; and
- follow up on all dust complaints.

Summary

A quantitative air quality assessment has been conducted for the site including dispersion modelling using AERMOD. It concludes that the risk of air quality impacts are low considering the proposed air quality management strategies employed on site and the nature of the proposed development.

It is recommended that a dust management plan be prepared for the site to minimise dust to nearby neighbours by ensuring there is no significant visible dust leaving the site.

Greenhouse Gas Assessment

An assessment has been carried out to identify and quantify sources of greenhouse gas (GHG) emissions for the proposed Facility. The assessment of Greenhouse Gas emissions directly relates to the energy consumption and the associated impact on the environment. The following greenhouse gases have been identified as significant contributors to global warming:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Nitrous oxide (N_2O);
- Synthetic gases; and
- Hydro fluorocarbons HFCs, SF_6, CF_4, C_2F_6.

HFCs and synthetic gases are not relevant to the proposed development. National Greenhouse Accounts Factors (July 2016) has been used to provide consistent set of emissions factors, which are suitable for reporting Greenhouse Gas Emissions. Under the Department of Climate Change and Energy Efficiency protocol, GHG emissions are categorised as Scope 1, Scope 2 and Scope 3 emissions, being;

- Scope 1 – Direct (or point-source) emission factors emissions, are direct emissions from sources owned or operated by the facility. These may be calculated using 'Point Source Emissions Factors' as defined in the AGO Factors and Methods Workbook;
- Scope 2 – Indirect emission factors – emissions are GHGs released as a result of the generation of electricity, or the production of heat, cooling or steam purchased by the reporting company.
- Scope 3 – Various emission factors – emissions are all other GHG emissions that are not covered under Scope1 or Scope 2. Scope 3 emissions can include activities such as employees commuting to work; extraction, production and transport of fuels, materials and other goods; and use of products manufactured and sold.

The GHG assessment considers Scope 2 – Indirect Emissions for energy used to run the plant and equipment on site which would include conveyors, screens and windsifters, dust extraction plant etc. The expected electricity energy usage has been estimated to be 500kwh.

Inventories of greenhouse gas emissions can be calculated using published emission factors. Different gases have different greenhouse warming effects and emission factors take into account the global warming potentials of the gases created during combustion. The estimated emissions are referred to in terms of CO_2-equivalent emission by applying a global warming potential of one for CO_2. The relevant emission factors applicable to the Facility have been derived from the National Greenhouse Accounts Factors July 2017. The emission factor for indirect emissions for electricity used is 0.83kg $CO_{2\text{-}e}$/kWh.

Equivalent $CO_{2\text{-}e}$ emissions have been estimated to be 7.8 tonnes $CO_{2\text{-}e}$ per year. Australia's total greenhouse gas emission in 2017 amounted to 533.7 million tonnes of carbon dioxide equivalent ($MtCO_{2\text{-}e}$) whilst in NSW, in 2012, accounted for 131.6 $MtCO_{2\text{-}e}$ of the total. Therefore the plant will account for less than 0.006% of NSW emissions.

4.4 Soil and Water

Site History

Up until 2000, the subject site was used to manufacture explosives, acids and fertilizers. In 2002 a number of buildings onsite were demolished and the site remediated consistent with the requirements

of the *Contaminated Land Management Act (CLM) Act.* A Site Audit Statement prepared by CH2M verified the site was suitable for continued commercial/industrial use.

The 2006 environmental assessment supporting the Part 3A application confirmed that the site validation process had identified that on-site sources of groundwater contamination had been removed and that previously identified contaminants within the site were undergoing natural attenuation. On this basis the existing groundwater contamination did not pose any constraint on the use of the site for ongoing commercial or industrial uses.

While the EA again confirmed that the site was suitable for commercial and industrial uses, it did identify a number of potentially contaminated areas within the site which would require careful management during construction. These areas were not to be disturbed and were to be sealed as part of the development proposal. In recommending approval for the development DPE was satisfied that potentially contaminated soils had been appropriately addressed.

Since 2008 the site has been used as a resource recovery facility initially recovering only non-ferrous and ferrous metal. In 2009 the previous operator of the facility gained approval to allow for a wider range of waste to be processed at the site including concrete, solid waste, topsoil, timber and green waste, in addition to non-ferrous and ferrous metal. In 2014 BRO leased the site and commenced operations.

However, as detailed in Section 1.3, site operations have been the subject of ongoing regulatory compliance matters since 2010. In 2017 BRO ceased operations until such time as these matters had been resolved. While key compliance matters relate to visual impact, noise and air quality, both DPE and EPA identified the onsite legacy waste and current operational stockpiles as a primary concern, particularly relating to potential asbestos contamination in the stockpiles.

The modification application does not seek approval to manage and remove the current legacy and operational stockpiles from the site. BRO will rely on the Orders issued by DPE and EPA and the management measures associated with these Orders to manage and remove the stockpiles in a safe manner. Consequently, the assessment of onsite contamination has been conducted on the basis that the stockpiles have been appropriately investigated and treated or removed as relevant.

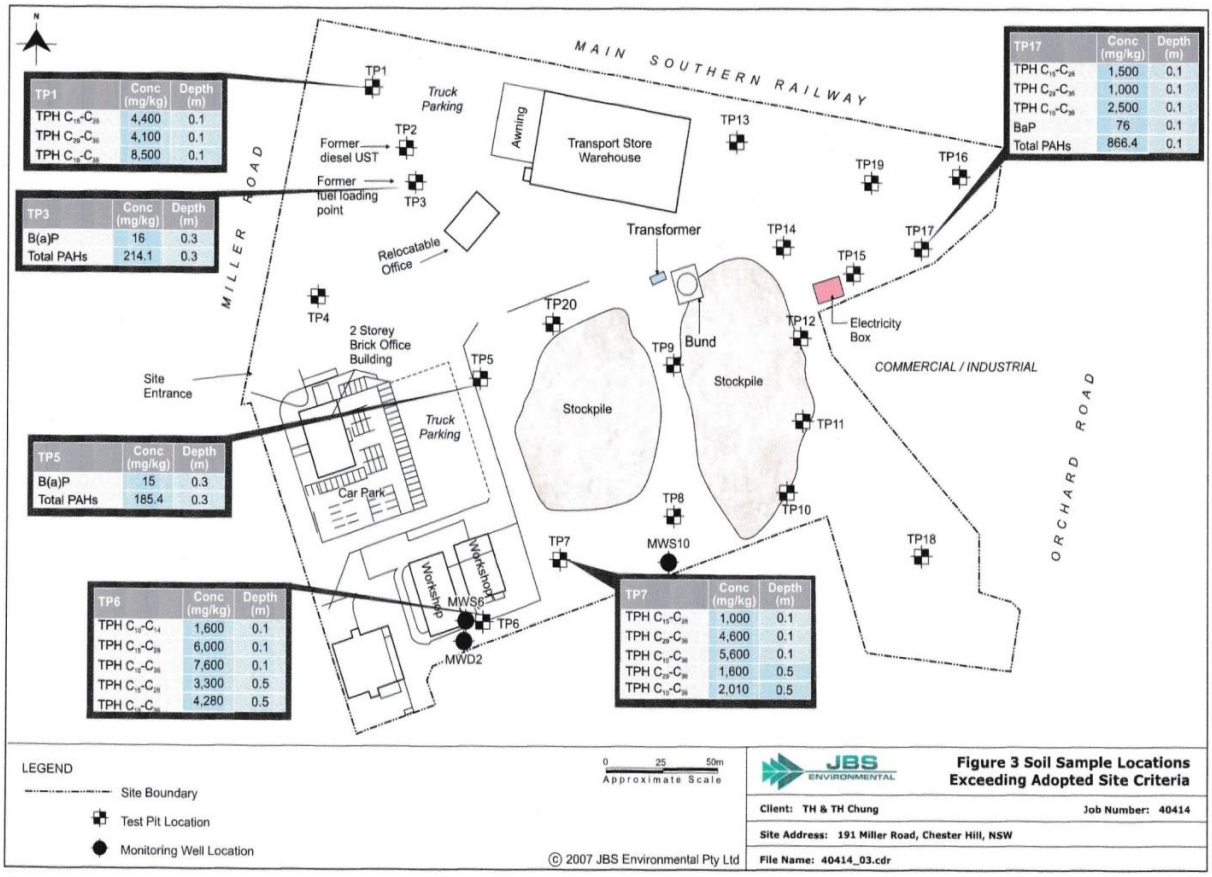
2007 Contamination Assessment.

In 2007 (refer to Appendix G) JBS Environmental carried out a contamination assessment to confirm that the site was suitable for ongoing commercial and industrial uses. The assessment found that (refer to Figure 13):

- Localised hydrocarbons were identified above the adopted site criterion in surface fill material at a number of sample locations but were generally confined to the upper 0.5m layer;
- Similarly benzo(a)pyrene and total PAHs were reported above the adopted site criterion in surface fill material at a number of locations but were generally confined to the upper 0.5m layer;
- Heavy metals, BTEX, VOCs, phenols, OCP and PCBs were not reported above the adopted assessment criteria in any soil sample collected from the site;
- Asbestos fragments were not identified at the site, and asbestos fibres were not reported in any soil sample submitted for analysis; and
- Levels of contaminants in groundwater were found to be below the adopted groundwater assessment criteria apart from slightly elevated concentrations of dissolved zinc and 1,2-dichloroethane. These however, were not considered to pose an unacceptable risk to human health or the environment.

Given the above, the assessment concluded that the site was suitable for continued commercial/industrial use. The report included figures identifying the site layout and soil and groundwater sampling locations, soil sample locations exceeding site criteria, and groundwater sample locations exceeding site criteria. These have been reproduced in Figures 13 & 14 below.

Figure 13 - 2007 soil sample locations exceeding adopted site criteria



2015 Contamination Assessment.

In 2015 JBS was again commissioned to undertake a *Contamination Assessment* to characterize site surface soil contamination conditions at the commencement of a new lease (for BRO to operate the Facility). The assessment, which is provided in full in Appendix H, included a review of the site history; 16 test pits; analysis of selected soil samples by a NATA accredited laboratory; comparison of collected data against relevant endorsed criteria; and the preparation of a baseline report.

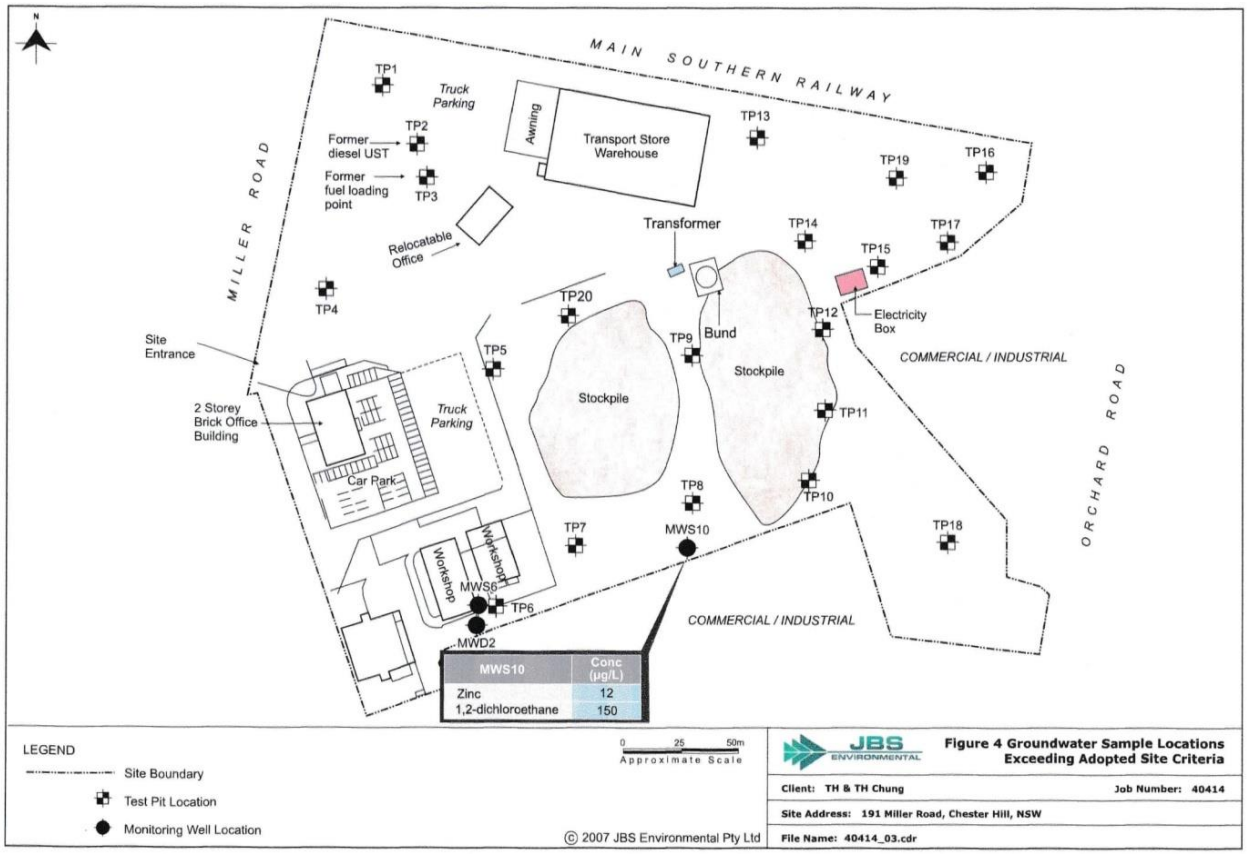
The key objective of the assessment was to determine whether levels of potential contaminants at the site had been appropriately characterized and recorded and also, to determine what levels of potential contaminants were present in the surface and near surface soil at the site.

The assessment included the following parameters:

- The comparison of soil data against relevant criteria to determine contamination status of surface and near surface soils;
- The adoption of NSW EPA criteria and the relevant National Environment Protection (Assessment of Site Contamination) Measure;
- The assessment of data against pre determined data quality objectives for precision; and

- Given the site was to continue as a materials handling facility the adoption of a commercial/industrial land use criteria scenario in developing a health based screening criteria.

Figure 14 - 2007 groundwater sample locations exceeding adopted site criteria



The assessment concluded that:

- Surface soils comprised brown silty fill material overlain by 20 centimeters of sandy fill or road base;
- Fill material generally extended to the depth of 1 metre below ground level;
- Observed anthropogenic materials included brick, concrete, plastic, timber and steel;
- No soil staining, unusual discolourisation or odours were noted in fill material or natural soil except for suspected sulfur odours at one test pit;
- PID readings used to detect volatile organic compounds and other gases were detected at all 16 locations, with a maximum concentration of 0.4 ppm;
- Concentrations of Contaminants of Potential Concern (CoPC) in all analysed samples were below the adopted criteria, with the exception of asbestos fines;
- No suspected asbestos containing materials (ACM) were identified at any of the test pits; and
- Asbestos fines were detected in soil samples collected at several pits at concentrations that were greater than the criteria (refer to Figure 15). Asbestos fines were also detected in a number of other soil samples but below the laboratory limit of reporting.

Water

In 2017 an assessment of potential impacts of groundwater and stormwater discharge from the subject site was undertaken by JBS on behalf of BRO. The assessment which is provided at Appendix I comprised of:

- Surface water and groundwater sampling for the waste management facility;

- The assessment of quality assurance / quality control undertaken with regards to the generation of environmental data for the assessment. Environmental data was found to be sufficiently reliable for the objectives of the assessment; and
- Groundwater monitoring wells installed at nine locations across the site.

Figure 15 2015 asbestos in soil

Based on the surveyed groundwater levels, it was found that the:

- Inferred direction of groundwater is to the south-west, consistent with the surrounding topography;
- Concentrations of COPCs were below the adopted screening criteria for fresh water ecosystems with the exception of a range of heavy metals and trichloroethlene (TCE);
- Concentrations of heavy metals within the extent and down gradient boundary of the waste handling operation were considered to be representative of urban geological conditions;
- There were no evidence of chlorinated solvents use or storage on site;
- It is unlikely that the current site activities are causing heavy metal and TCE impact to groundwater;
- COPCs were found to be below the adopted screening criteria for fresh water ecosystems with the principal exception of TSS and heavy metals;
- Reported levels of zinc, chromium and copper were reported to exceed the screening criteria in Pit 7 by a factor of 1.7, 1.2 and 3.4 respectively although concentrations were below typical values found for industrial land uses. In other words they were within the expected concentration range for typical urban water runoff for industrial land use; and

- Impacts at a catchment level were found to be below the adopted trigger values taking into consideration the dilution attenuation factor (DAF) and the estimated concentration attributable to the site.

Conclusion

The findings of both the 2007 and 2015 soil assessments and the 2017 surface and ground water assessment support the findings of investigations undertaken in support of the original application in 2006 which found that the continued use of the site for commercial and industrial uses was appropriate provided care is taken during construction to ensure that onsite contaminants are appropriately managed.

In relation to potential surface and groundwater contamination, the potential for infiltration of contaminates into the groundwater as a result of this development is negligible given the:

- Majority of the site would be impermeable (with the exception of the small landscaping/grass areas particularly to the south);
- Processing of all wastes would occur within a full enclosure;
- Site's stormwater will improve as a result of the proposed project; and
- There is a range of mitigation and management measures available to ensure acceptable performance during both construction and operation.

The water quality assessments referred to in this section and Section 4.5 confirm that the proposal would result in an improvement in TSS, TP and TN pollutant concentrations being discharged to Canterbury-Bankstown's downstream stormwater system. Overall, the development would result in a significant improvement in stormwater and pollutant discharges from the site. Notwithstanding, a number of controls will be implemented to ensure acceptable long term environmental performance during both construction and operation. These are outlined below.

Mitigation Measures

Contamination Management Plan (CMP)

To support the preparation of both the construction and operational environmental management plans (as outlined below) and the management of onsite contamination in general during both construction and operation, a contamination management plan (CMP) will be prepared and submitted to DPE and EPA in conjunction with both the CEMP and OEMP.

The purpose of the CMP is to establish a set of best practice procedures for the identification and management of contaminated soil/water if encountered during construction or operations. The key objective of the CMP is to ensure that impacts from the disturbance of contaminated soils/water are minimised through appropriate management.

A number of key principles will be implemented via the plan including the need to:

- Avoid and minimise the environmental and human health risks associated with disturbance of contaminated land encountered during construction;
- Identify relevant statutory requirements for managing and transporting contaminated soil;
- Ensure no degradation of the environment as a result of contaminated soil; and
- Ensure that spillages do not result in contamination of soil, air or water.

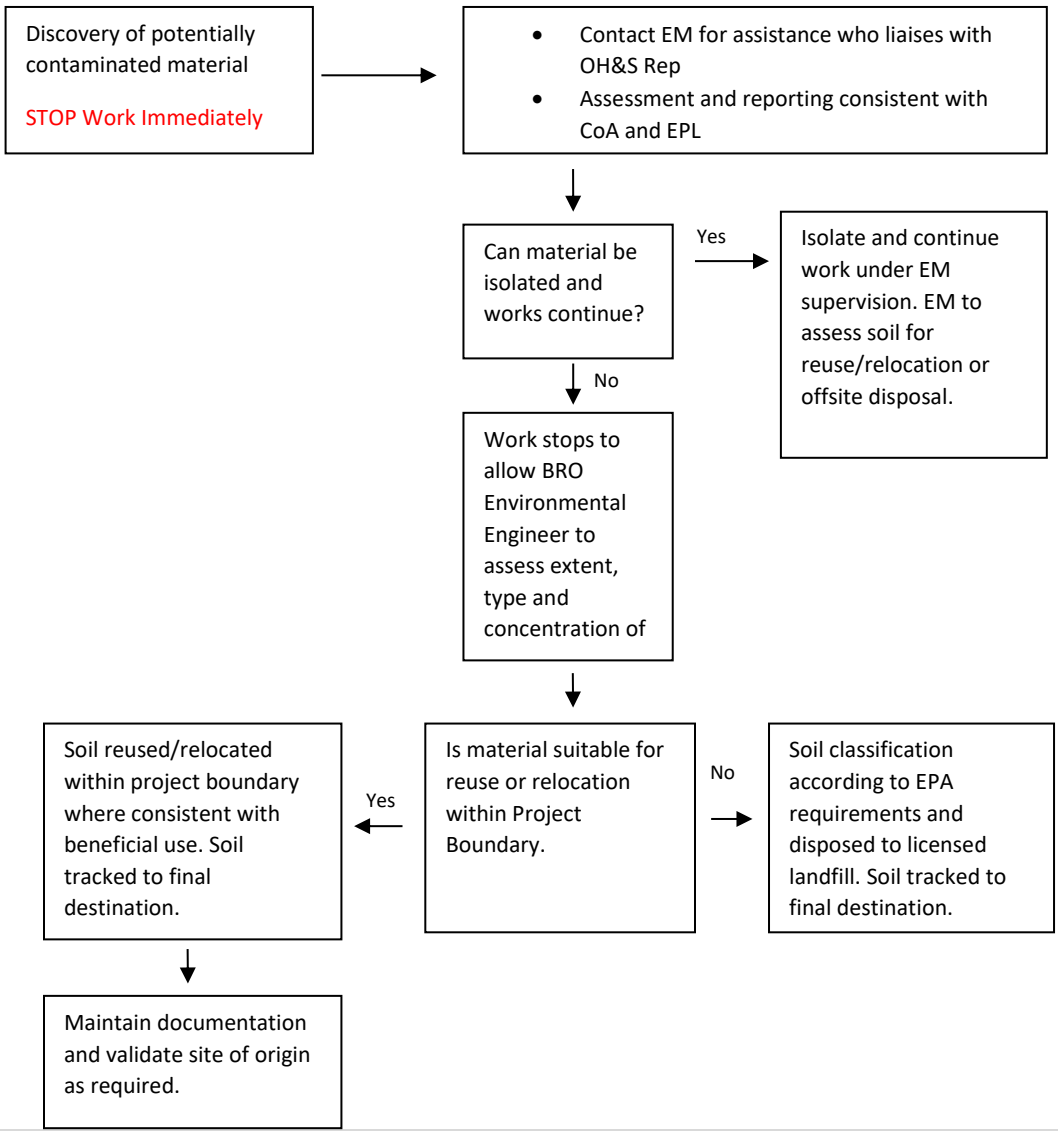
The CMP will include a consolidated map identifying existing areas of known contaminants that require avoiding or additional mitigation measures particularly during construction and establishment of

landscaping. Construction safeguards to ensure all contamination is handled appropriately would include but not be limited to the following:

- Pre construction testing to determine the most appropriate form of structural support for the enclosure and handling requirements;
- Following the completion of Footing & Services design it will be over layed with the Hotspot Plan and incorporated into Construction Drawings;
- Subcontractors will be accordingly made aware of the potential for ACM (or other hotspot) in the area;
- Appropriate Safe Work Method Statements (SWMS) would be prepared and signed off the Builder; and
- Should any ACM or Hotspot be evident, the suspect material would be cordoned off and tested and depending on the results, the material appropriately dealt with.

The CMP will also supplement this map with an unexpected finds protocol as generally illustrated below in Figure 16. Adherence to the CMP and unexpected finds protocol will help ensure full compliance with the relevant legislative requirements, conditions of approval and EPA requirements, and enable focused personnel training on contaminated land management for the site.

Figure 16 – Unexpected finds protocol



Construction

A CEMP to be finalised and submitted to the satisfaction of DPE to include but limited to:

- An incident response plan to be followed in the event of a spill, including the notification requirements and the use of absorbent material to contain the spill;
- Sediment and erosion controls and other management procedures to minimise contaminants in site surface water discharge including the management and removal of gross pollutants;
- Limitation of exposed soil to those areas being worked on and disturbed areas to be stabilised as soon as practicable;
- Acid sulphate soil identification protocols;
- An ongoing surface water monitoring program to measure the success of pollution mitigation measures to be implemented; and
- Provision for the Environmental Engineer to be contacted upon the encounter of any unexpected finds with work to cease immediately within the area until such time that the Environmental Engineer determines its safe.

Operation

A OEMP to be finalised and submitted to the satisfaction of DPE to include but not be limited to:

- An incident response plan to be followed in the event of a spill, including the notification requirements and the use of absorbent material to contain the spill;
- A refueling procedure that will be implemented for all refueling activities undertaken on site
- Measures to ensure that any leachate generated within the sheds will be conveyed to closed collection pits/sumps which are to be isolated and pumped out by an authorised liquid waste disposer if required;
- Protocols for inspection of detention basins following heavy rainfall events and the where necessary the subsequent removal of litter and sediment;
- Maintenance measures aimed at ensuring the integrity of the rainwater tanks and associated pipe work through regular inspection and repairs where necessary including the inspection of tank inlets, insect proofing and leaf filters;
- Regular inspection and cleaning of gutters and internal inspections of rainwater tanks undertaken to check for evidence of access by animals, birds or insects;
- The regular sweeping of hardstand areas. Where wash down of the hardstand areas is required, the sediment laden water would be prevented from entering stormwater pits so that sediment can be captured above ground and managed accordingly;
- An ongoing surface water monitoring program to measure the success of pollution mitigation measures to be implemented; and
- Provision for the Environmental Engineer to be contacted upon the encounter of any unexpected finds with work to cease immediately within the area until such time that the Environmental Engineer determines its safe.

4.5 Hydrology

Impact assessment

The proposed modification has the potential to cause both onsite and offsite water related impacts. A hydrological assessment was undertaken consistent with the SEARs and Council's requirements to address stormwater-related matters associated with movement of soil and water across the site (refer to Appendix J). The assessment included hydrological analysis using local rainfall data in conjunction with catchment and contributing sub catchment areas within the site boundary noting that the

upgraded facility will include new drainage lines, new pits and pipes discharging to an existing easement, a new on-site detention storage system with provision for the capture of gross pollutants and sediment to improve the quality of discharge from the premises. Rainwater tanks are also proposed to harvest a large quantity of rainwater falling on the enclosures roof.

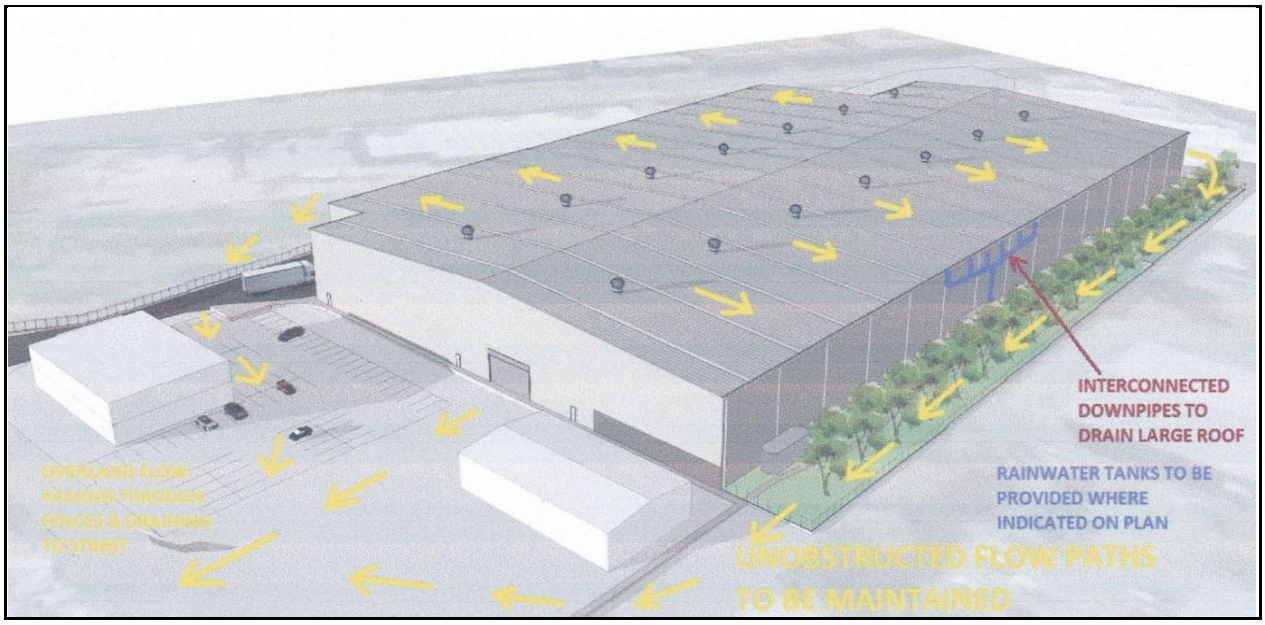
The assessment considered overland flows, flooding effects, detention storage, rainwater storage and ongoing mitigation measures.

Site conditions and existing flows

A detailed survey plan is attached at Appendix M. The general direction of the natural surface fall is approximately from the northeast sloping down towards the western side of the property. A number of kerb entry pits are located along Miller Road and generally drain in a southerly direction towards an open stormwater channel approximately 200 metres from the front of the site. An existing drainage easement contains a 825mm pipe which passes through the western neighbour at 195 Miller Road.

On site the highly variable shapes of the existing stockpile areas are to be replaced and managed in a more efficient manner with all processing activities being fully enclosed. The enclosure will cover an area of approximately 2.35 Ha. The site will also be fully covered by impervious slab paving which will reduce existing infiltration and leaching from waste materials into the underlying soil. Associated beneficial impacts would include a reduction of random uncontrolled soil erosion behavior and the undesirable accumulation of sediment deposits on the lower sides of the former stockpiles.

Figure 17 – Expected stormwater flows



The existing network of underground pipes and pits has been found to comprise relatively small diameter pipes (up to 375mm diameter) in relation to the site catchment, and no existing detention tanks are present to reduce the peak flow of stormwater leaving the site. As a result, new drainage lines are proposed to be installed in conjunction with the upgraded recycling facility, with existing drainage connections to be maintained as appropriate, where they are not being disturbed by the new development works.

There is an existing earth channel located along the southern boundary. This open channel provides significant flow width for the conveyance of overland flows, and it is intended that this area will be landscaped with stable vegetation at the rear of the new building structure, whilst maintaining its function as an overland flow route (refer to Figure 17). The existing temporary straw bales in the channel will no longer be considered necessary when the loose earth is replaced by landscaping.

Consistent with CBCC's engineering standards relating to unobstructed overland flow paths, proposed boundary fencing will permit the passage of surface flows by providing a gap of at least 500mm height above ground level.

Flooding effects

The flooding assessment referenced CBCC's Stormwater System Report for 191 Miller Road, Chester Hill which found that the stormwater system comprised of a variable width drainage easement located along the western site boundary of the site and an overland flowpath (floodway) for excess stormater runoff from the upstream catchment as identified above. Council's report concluded that the site would be subject to stormwater inundation from the overland flowpath during large storm events and that provision should be made on site, and at boundary fences, for this stormwater runoff to pass unobstructed over the site.

The Council's report concluded that a study to determine the 100 year ARI water surface level would not be required for development on the site provided the development complies with the controls in CBCC *DCP 2015 – Catchments Affected by Stormwater Flooding*. The flood map at Figure 18 identifies the 100 year Average Recurrence Interval (ARI) flood depths for the site and beyond. The pink surface contours and blue water surface contours indicate that the main western area of flooding occurs below RL21.00, up to and anticipated ponding level of approximately RL20.90. Ponding in localized depressions around the existing stockpile mounds will be removed following construction of the new enclosure. Council's applicable flood-related requirements as relevant to the proposal e include the following:

Floor level – The floor level must be:

- Non habitable floor levels must be no lower than 20-year flood unless justified by a specific assessment;
- The level of the habitable floor area must be equal to or greater than the 100-year flood level plus 500mm freeboard; and
- A restriction on the use of the land is to be registered on Title where the lowest floor level is elevated more than 1.5 metres above finished ground level.

Building components

- All structures must have flood compatible building components below the 100-year flood level plus 500 mm freeboard.

Structural soundness

- The structure must withstand the forces of flood-water, debris, and buoyancy up to and including 100-year flood plus 500 mm freeboard, or up to probable maximum flood level plus 500mm freeboard.

Flood effects

- The development must not increase flooding effects elsewhere having regard to: loss of flood storage; changes in flood levels, flows and velocities; and the cumulative impacts of multiple developments in the vicinity. Also need to identify any major overland flow path; and

- An easement may be required or a restriction on Title where there is a major overland flow of significant backwater flooding.

Parking and driveway access

- The minimum surface level of open car parking spaces or carports shall be as high as practical and not below
  - the 20 year flood level; or
  - the level of the crest of the road at the location where the site has access.
- Enclosed car parking must be protected from inundation;
- The level of driveway providing access between the road and parking spaces must be as high as practical, and not lower than 0.3 metres below the 100-year flood level;
- Enclosed car parking areas capable of accommodating more than 3 vehicles or more than 0.8 metres below the 100 year level shall have adequate warning signs, signage and exits; and
- Restraints or vehicle barriers are to be provided to prevent floating vehicles leaving the site in a 100-year event.

Evacuation

- Reliable access for pedestrians or vehicles is required. Where feasible, an area of refuge within the building or development site that is above the PMF, and which is equal to 20% of the gross floor area of the development, or such other area capable of accommodating the number of people likely to require evacuation.

Management and design

- A Site Emergency Response Flood Plan is required where floor levels are below the prescribed floor level;
- The development proposal must demonstrate that there is an available are above the 100-year flood level to store goods; and
- There must be no storage of materials below the prescribed floor level which may cause pollution or be potentially hazardous during floods.

The Facility has been designed consistent with the above requirements of the DCP. Detailed drawings are provided in Appendix N. It is noted that Council's site specific Stormwater System Report takes precedence over the general Council guidelines, and that no additional flood study is required.

Detention Storage

Canterbury Bankstown Council's engineering standards for detention systems (Section 10) identify that flood affected areas can be excluded from detention calculations. This is usually because submerged detention storages tend to offer limited performance benefits to the reduction of peak flows. However, locating a new detention tank in a more elevated position within the proposed works area is considered to provide desirable functional performance if the outlet pipe is set higher than the downstream flood level, thereby reducing submergence effects. A DRAINS software model was prepared for the assessment of detention storage performance. The model was analysed for the year, 20 year and 100 year ARI storm events using a range of various storm durations (5min, 10min, 15min, 20min, 30min, 45min, 1hr, 1.5hr & 2hr). The following characteristic values were used for the model:

1. Paved area depression storage 1mm
2. Grassed area depression storage 5mm
3. Soil type 3 (for slow infiltration rates)
4. Antecedent Moisture Content (AMC) 3 (wet soil at the start of a storm)

Surface flow travel times were calculated with inputs including flow path length, sub catchment slope, impervious and pervious percentage and roughness to determine the flow time and associated runoff for each subcatchment. An indicative node diagram was developed for DRAINS on-site detention modelling purposes (refer to Figure 19).

Figure 18 – 100 yr ARI Flood Depth (m) and Flood Contour levels (mAHD) for 191 Miller Road, Chester Hill

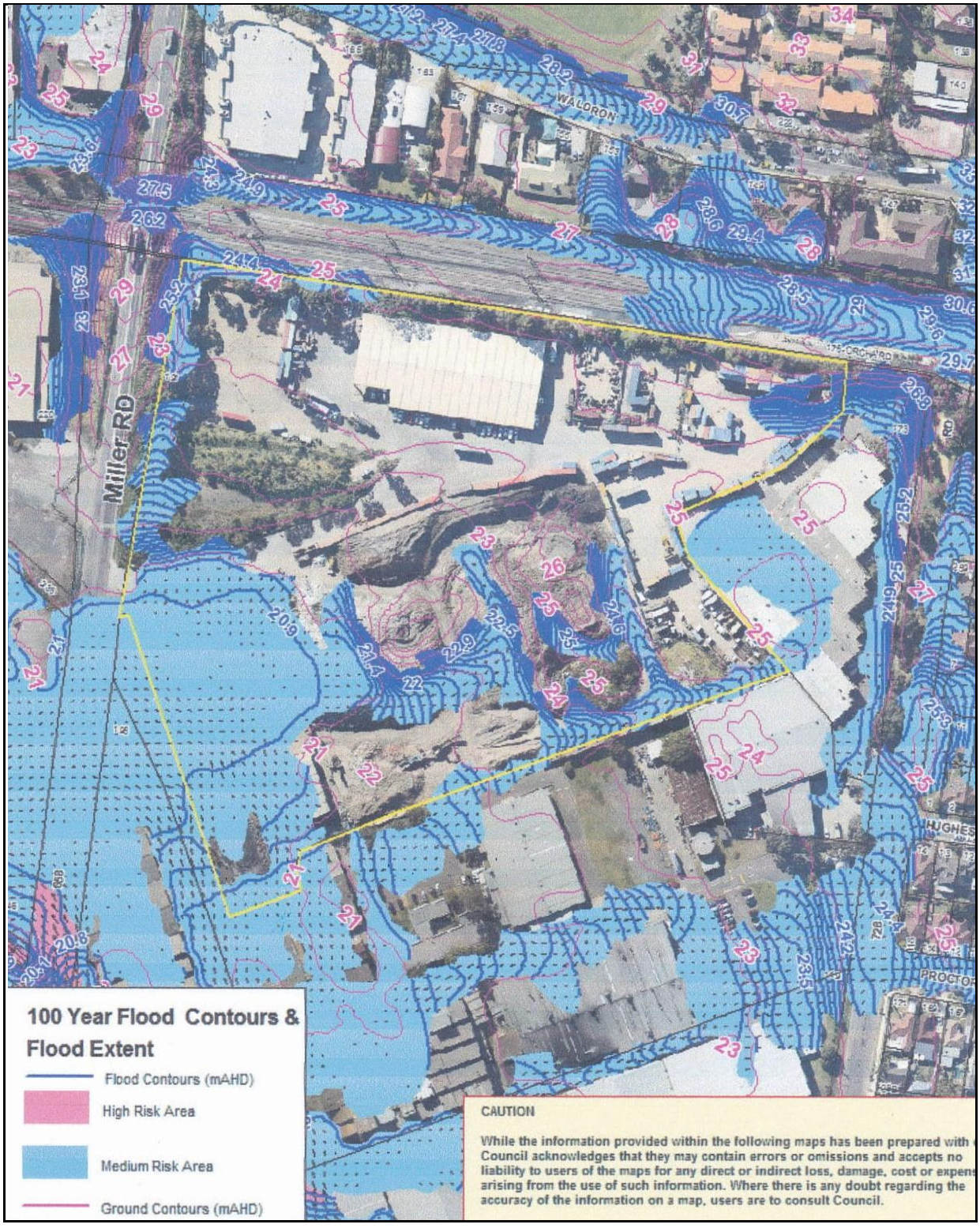


Figure 19 – Node diagram developed for DRAINS on-site detention modelling

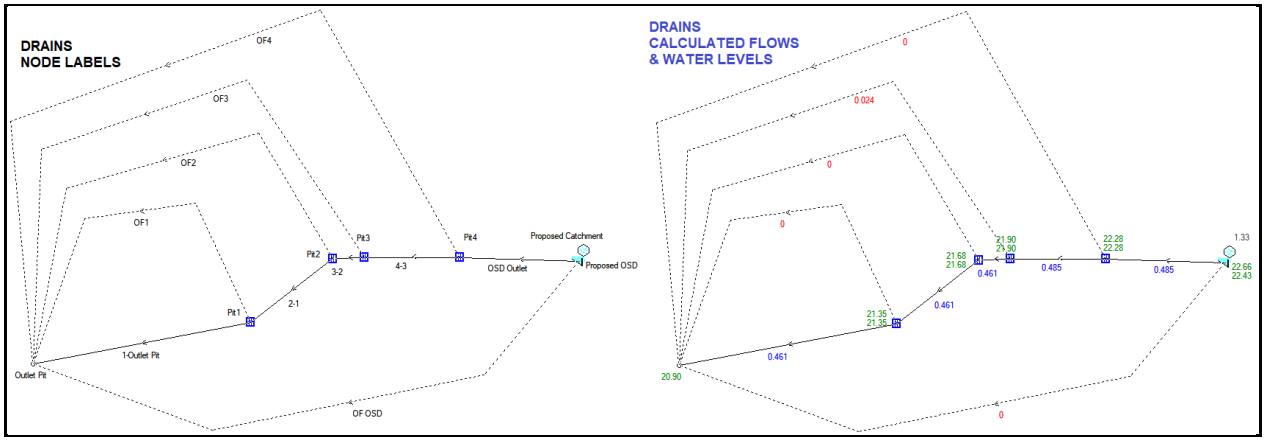
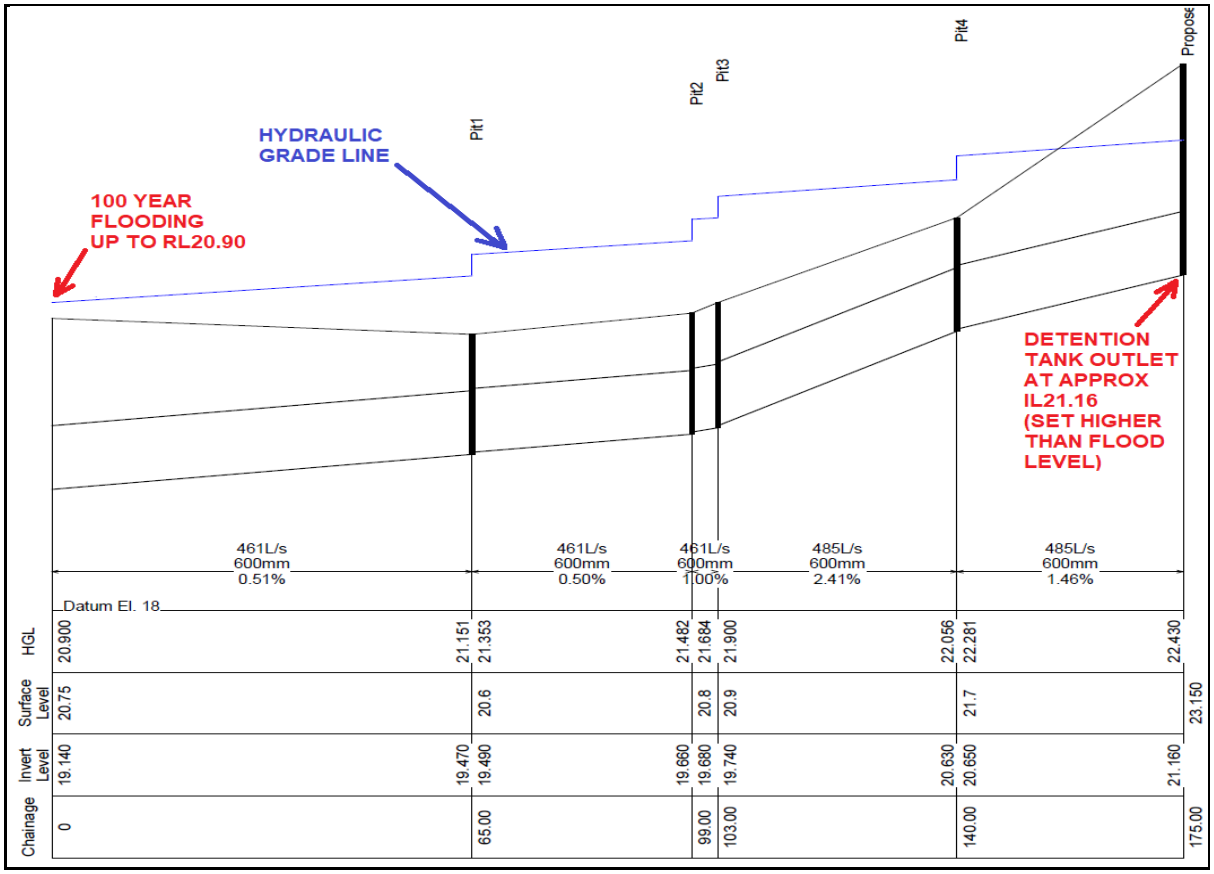


Figure 20 – Longitudinal section of main pipeline



A longitudinal section of the main pipeline (refer to Figure 20) accommodates opposing flow from downstream flooding effects and reduces the impact of submergence by raising the detention tank outlet higher than the flood level of RL20.90.

The assessment predicted that the proposed flows for various storm durations do not exceed existing flow conditions. Table 12 identifies flows for various storm durations. The storm durations shown in the light green columns do not exceed existing flows for the corresponding durations which are shown in

the yellow columns. The assessment indicates that a 600mm pipe would adequately restrict flows from a 513 cubic metre detention tank for the equivalent catchment associated with the proposed works.

Rainwater Storage

Rainwater storage requirements are often imposed on new residential developments to satisfy State Environmental Policy Building Sustainability Index (BASIX) assessment requirements. However, commercial and industrial developments generally do not have the same requirement, although Councils generally encourage rainwater reuse when the roof catchment and non-potable demand is available to make efficient use of the system.

Relatively clean runoff from the roof drainage system is normally collected for reuse purposes and remains separate from the more contaminated runoff collected from surface drainage which may accumulate leaves, sediment and other debris. Non-potable water demand includes the supply to hose taps, landscape irrigation and toilet flushing.

The following considerations can influence the decision to install a rainwater tank:

- A large roof area can collect and direct a significant amount of water, but if non-potable demand is small, much of that water will tend to remain unused while it is being stored in a tank;
- A small non-residential site population does not generate a large demand for toilet flushing purposes;
- A large impervious site often has relatively small landscaped areas which do not require a large volume for irrigation purposes;
- Delivering water at a suitable pressure and flowrate typically requires a pump system and associated electricity costs; and
- Ideally, an efficient rainwater tank system will not remain full of water and will not remain empty, but operate with a “healthy” water balance of rising and falling water levels during periods of wet weather and dry weather.

Table 12 - Stormwater detention summary

STORMWATER DETENTION CALCULATION SUMMARY

Project: 2016-0932 191 Miller Rd Chester Hill

Effective detention storage up to RL 23.00 (lowest connected grate)

	5 YEAR ARI					20 YEAR ARI					100 YEAR ARI				
Storm Duration	Existing Runoff L/s	Detained Flow L/s	Overflow L/s	Total Outflow L/s	Max Water RL m	Existing Runoff L/s	Detained Flow L/s	Overflow L/s	Total Outflow L/s	Max Water RL m	Existing Runoff L/s	Detained Flow L/s	Overflow L/s	Total Outflow L/s	Max Water RL m
5min	302	288		288	21.81	557	364		364	21.93	944	390		390	22.11
10min	423	359		359	21.91	620	386		386	22.08	876	427		427	22.34
15min	493	371		371	21.99	807	404		404	22.19	1040	446		446	22.47
20min	515	380		380	22.05	756	420		420	22.29	1010	465		465	22.59
25min	603	388		388	22.09	822	427		427	22.34	1000	467		467	22.60
30min	544	380		380	22.05	750	419		419	22.29	936	457		457	22.55
45min	435	371		371	21.99	626	408		408	22.22	825	454		454	22.53
1.0hr	464	380		380	22.05	664	423		423	22.31	859	478		478	22.63
1.5hr	487	382		382	22.05	685	424		424	22.33	876	485		485	22.66
2.0hr	496	378		378	22.03	691	421		421	22.31	883	474		474	22.62

RESTRICTIVE PIPE OUTLET DIAMETER =	600	mm
MINIMUM INTERNAL TANK AREA =	430.5	m2
REQUIRED STORAGE VOLUME =	513	m3
DEVELOPMENT WORKS AREA =	20944	m2
EXISTING IMPERVIOUS PROPORTION =	11	%
PROPOSED IMPERVIOUS PROPORTION =	100	%
DOWNSTREAM FLOOD LEVEL RL =	20.90	

For stormwater concept design purposes a rainwater storage volume of 4 x minimum 10,000L tanks = 40m3 is proposed to collect a roof catchment of 6200m2 from the eastern side of the new structure.

Larger tank sizes may be adopted, but manufacturers will often limit the size of the overflow pipe to maintain structural integrity. Based on water balance calculations as summarized in Table 13, this volume would be anticipated to be adequate for non-potable demand for 89% of the time.

For calculation purposes assumed irrigation demand is based on 30mm per week watering in Summer and Spring months, and 15mm per week in Winter and Autumn months, with a landscaped area allowance of 1000m2 on the south side of the new structure. Non-potable demand for toilet flushing is based on an average of six 3L flushes or 18L per person per day for 15 site personnel: 15 people x 0.018m3/day per person = 0.27m3/day. Each minimum 10,000L rainwater tank is intended to collect water via a series of interconnected downpipes from the eaves gutter above and drain to the detention tank via a 300mm overflow pipe. Sample images of a prefabricated rainwater tank are included in Appendix J.

It should also be noted that leaf guards will be provided on lengths of roof guttering to reduce the pollutants which may find their way into a rainwater storage tank and cause discoloration of the non-potable water supply. A rainwater pump is to be provided to pressurise the rainwater service and maintain minimum flow performance requirements at the relevant fixtures and taps. A backup mains supply will need to be fitted with an appropriate backflow prevention device to ensure that contaminants in the rainwater tank will not pollute the water system and that taps will still function during a power failure.

Table 13 – Site water balance

WATER REUSE TANK CALCULATION (based on Bureau of Meteorology rainfall records over 20 years = 7305 days from 1983 - 2002)

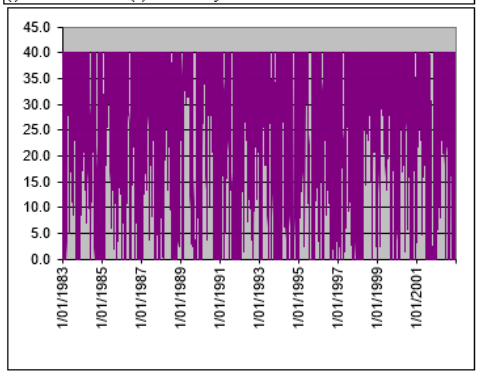
Proportion of TOTAL rainfall runoff volume drained :
83 % of drained runoff overflows from tank
17 % of drained runoff captured for reuse

20yr Runoff Coefficient = **0.945** based on **100** % impervious proportion of drained area
Area drained to tank = **6200** m2 (= 31 % of **20200** m2 site)
Irrigation demand = **4.30** mm/day = 30.10 mm/week for summer/spring (Sep-Feb)
2.15 mm/day = 15.05 mm/week for winter/autumn (Mar-Aug)
Irrigation area = **1000** m2 (= 5 % of 20200 m2 site)
Any additional demand = **0.27** m3/day (e.g. laundry, toilets, car washing for NON-POTABLE USE ONLY)
Tank Storage = **40** m3 (Initial storage taken as **0** m3 at start of year)
Non-potable water demand = 25471.8 m3 over 7305 days
Water from main needed for 835 days out of 7305 days = 11 % of the time (water is drawn from the mains supply)
Water drawn from main = 3294.8 m3 or kL Rate of water reuse = 89 % of the time (the rainwater tank has sufficient water for reuse)
Water reused from tank = 22177.1 m3 over 7305 days
Rate of water reuse = 87 % of non-potable demand supplied by tank storage
Runoff from all storms = 129054.4 m3 (Non-potable demand is 20 % of this volume)

Max overflow volume in a day = 1262.1 m3
Storms usually peak between 2pm & 6pm due to daily heating of the earth's surface by the sun, which is a maximum during the afternoon (see www.bom.gov.au/weather/nsw/sewwx/about.shtml)
Mean overflow rate for a 4 hour duration = 88 L/s

CALCULATION NOTES
(A) = date
(B) = rainfall
(C) = runoff coeff * (B) / 1000 * area drained to tank
(D) = seasonal irrigation demand / 1000 * irrigation area + any additional non-potable demand
(E) = (C) - (D)
(F) = tank capacity if ["previous (F)" storage + (E) change in storage] exceeds capacity
(F) = 0 empty tank if ["previous (F)" storage + (E) change in storage] < 0
(F) = ["previous (F)" storage + (E) change in storage] if capacity is sufficient to store
(G) = overflow difference if ["previous (F)" storage + (E) change in storage] exceeds capacity
(G) = 0 overflow if ["previous (F)" storage + (E) change in storage] is within capacity
(H) = 1 if (F) = 0 no water stored in tank
(I) = positive (E) change in storage if (H) > 1
(I) = 0 no mains drawoff if (H) = 0 tank storage sufficient

(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Date	Sydney Airport Rainfall mm	Runoff to tank m3	Water Demand m3	Change in storage m3	Residual Tank Storage m3	Overflow from Tank m3	Days to fill from main	Water from main m3
					0.0			
1-Jan-83	1.8	10.5	4.6	6.0	6.0	0.0	0	0.0
2-Jan-83	0	0.0	4.6	-4.6	1.4	0.0	0	0.0
3-Jan-83	19.3	113.1	4.6	108.5	40.0	69.9	0	0.0
4-Jan-83	0.2	1.2	4.6	-3.4	36.6	0.0	0	0.0
5-Jan-83	0	0.0	4.6	-4.6	32.0	0.0	0	0.0
6-Jan-83	0	0.0	4.6	-4.6	27.5	0.0	0	0.0
7-Jan-83	0	0.0	4.6	-4.6	22.9	0.0	0	0.0
8-Jan-83	0	0.0	4.6	-4.6	18.3	0.0	0	0.0
9-Jan-83	0	0.0	4.6	-4.6	13.8	0.0	0	0.0
10-Jan-83	0	0.0	4.6	-4.6	9.2	0.0	0	0.0
11-Jan-83	0	0.0	4.6	-4.6	4.6	0.0	0	0.0
12-Jan-83	0	0.0	4.6	-4.6	0.0	0.0	0	0.0
13-Jan-83	0	0.0	4.6	-4.6	0.0	0.0	1	4.6
14-Jan-83	0	0.0	4.6	-4.6	0.0	0.0	1	4.6
15-Jan-83	0	0.0	4.6	-4.6	0.0	0.0	1	4.6
16-Jan-83	0	0.0	4.6	-4.6	0.0	0.0	1	4.6
17-Jan-83	0	0.0	4.6	-4.6	0.0	0.0	1	4.6
18-Jan-83	0	0.0	4.6	-4.6	0.0	0.0	1	4.6
19-Jan-83	0	0.0	4.6	-4.6	0.0	0.0	1	4.6
20-Jan-83	0	0.0	4.6	-4.6	0.0	0.0	1	4.6
21-Jan-83	0	0.0	4.6	-4.6	0.0	0.0	1	4.6
22-Jan-83	2.8	16.4	4.6	11.8	11.8	0.0	0	0.0
23-Jan-83	0	0.0	4.6	-4.6	7.3	0.0	0	0.0



Stormwater Quality Improvement Measures

Stormwater quality improvement devices are typically selected to satisfy the relevant pollutant target performance criteria as demonstrated by a software package known as MUSIC (Model for Urban Stormwater Improvement Conceptualisation). Although the site is predominantly covered by roofing, it has been conservatively assumed that about half of the covered area could contain surface contaminants being conveyed at ground level and be considered as paved runoff rather than "clean" roof runoff. Most of the actual stormwater runoff would be collected from the new roof and remain unpolluted. To achieve beneficial environmental effects the proposal includes the following measures:

- A 40m3 rainwater tank storage collecting roof water runoff for non-potable demand;
- Ecosol litter baskets to collect gross pollutants; and
- an Ecosol Storm Pit Class 2_20L filtration device.

Images of these devices are included in Appendix J.

Following the implementation of the above devices the MUSIC modelling predicted that there would be an improved pollutant load with total suspended solids, total phosphorous, total nitrogen and gross pollutants all significantly reduced (refer to Table 13).

Table 13 – Treatment Train Effectiveness

	Sources	Residual Load	% Reduction
Flow (ML/yr	23.8	23.8	0
Total Suspended Solids (kg/yr)	2390	830	65.3
Total Phosphorus (kg/yr)	4.91	2.41	50.9
Total Nitrogen (kg/yr)	52.4	36.1	31.1
Gross Pollutants (kg/yr)	577	16.9	97.1

Mitigation and management

Construction related erosion and sediment control measures

During construction works the following measures will be adopted:

- Sediment fencing on the low side of earthmoving operations;
- A gravel layer at the construction vehicle access point in the works area;
- Regular monitoring of soil movement characteristics and cleaning of sediment deposits;
- Regular dewatering of low points in the excavation works; and
- Security fencing around the area of constructions works.

Stormwater quality improvement measures

Proposed stormwater quality improvement measures include:

- 4 x 10m3 rainwater tanks to collect roof water for non-potable demand;
- Ecosol litter baskets to collect gross pollutants; and
- Ecosol Storm Pit Class 2_20L filtration device.

Conclusion

In summary, the assessment concluded:

- Beneficial impacts to soil and water movement are anticipated as a result of the proposed facility upgrade, with unobstructed overland flow paths generally maintained in the natural direction of fall dictated by the existing surface topography. The existing southern earth channel is to planted with landscaping, improving the stability of the surface which formerly experienced the movement of loose earth material. Existing underground drainage routes are to be preserved, with additional new pits and pipes discharging to the existing drainage easement passing through the western neighbour at 195 Miller Road;
- Stormwater flows across the proposed works area are to be managed with a new on-site detention storage system, including provision for the capture of gross pollutants and sediment to improve the quality of discharge from the premises. Extensive impervious concrete slab paving will also reduce existing infiltration and leaching from waste materials into the underlying soil;
- Modelling of stormwater quality improvement has been undertaken with MUSIC software to demonstrate associated pollutant reduction percentages;
- Rainwater tanks are proposed to capture a large quantity of rainfall collected on the new roof surface and reduce draw off from the public potable main water supply by addressing non-potable irrigation and toilet flushing demand with the stored rainwater supply. Based on the estimated demand, water balancing calculations indicate adequate rainwater storage would be available for 89% of the time; and
- Flooding impacts have been addressed with consideration for stormwater system report information provided by Canterbury Bankstown Council, and a detention tank design that reduces submergence effects by positioning the tank so that its discharge outlet is higher than the downstream flood level.

4.6 Visual Impact

Key site elements

Key Elements of the proposal include the creation of continuous hardstand areas and the construction of a fully enclosed industrial building (refer to Figures 3-6). The enclosure will be 187.5 metres long by 125 metres wide equating to 23,437.5 square metres of floor space. At its highest, the enclosure will be 17.5 metres high falling to 13 metres at the eastern and western elevations. There will be a 15 metre setback on the southern and eastern boundaries which will accommodate deep soil landscaping, fire fighting access, stormwater flow and stormwater tanks. All processing activities will be moved inside the new enclosure including loading and unloading, stockpiling, sorting and processing.

Landscape and Visual Amenity Analysis

The new enclosure has the potential for visual impacts especially on adjoining residential areas. A landscape and visual amenity assessment has been undertaken to determine the visibility of the proposal from surrounding areas and the potential visual impact (refer to Appendix K). The analysis also identifies building design and landscape mitigation measures to reduce any adverse visual impacts and ensure the proposal complements the visual character of its setting.

Assessment methodology

The visual amenity assessment is based on the methodology outlined in Guidelines for Landscape and Visual Impact Assessment second edition prepared by the Landscape Institute (UK) and the Institute of Environmental Management and Assessment, published by Spon Press and the Environmental Impact Assessment Practice Note - Guideline for Landscape Character and Visual Impact Assessment prepared

by the RMS, 2013. The assessment evaluates the landscape character of the site, the current visual amenity from selected viewpoints and the significance of change to the views based on the degree to which the view is changing and its visual sensitivity.

Landscape Character Impact Assessment
Landscape character refers to the built, natural and cultural aspects of an area. Impact assessment is made by addressing the sensitivity of character zones within the study area and the magnitude of landscape effects.

Sensitivity of the Character Zone
The degree to which a particular landscape type or area can accommodate change without detrimental effect on its character. Sensitivity varies with landuse, topography, vegetation, spatial qualities and scope for mitigation.

Magnitude of Landscape Effects
This involves the nature and scale of changes to elements within the landscape and the consequential effect on landscape character.

The landscape character assessment below is based on the site analysis.

Table 14 – Visual site analysis

Landuse	The site is zoned IN1 – General Industrial
Topography	Generally flat with gentle falls from north east to the south west
Drainage	Follows general falls from north east to the south west
Vegetation	Some established trees around the boundaries and weeds
Spatial qualities	The site lies within an industrial precinct
Built form environment	Two existing 2 storey buildings are located on site

Table 15 – Landscape character impact grading matrix

		Magnitude			
Sensitivity		High	Moderate	Low	Negligible
	High	High impact	High-moderate	Moderate	Negligible
	Moderate	High-moderate	Moderate	Moderate-low	Negligible
	Low	Moderate	Moderate-low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Visual Impact Assessment
The character of the existing site which is dominated by large areas of compacted earth, pavement and stockpiles would be the subject of significant change with the introduction of a large industrial shed as

described above. The assessment of visual impacts is based on visual sensitivity and the magnitude of visual effects as described below and detailed in Appendix X:

1. Identify areas from which the proposal is visible
2. Describe the existing view from each key viewpoint;
3. Determine the sensitivity of the view;
4. Determine how much the view is changing;
5. Evaluate the significance of the change
6. Identify measures to reduce visual impacts or enhance visual quality.

Zone of Visual Influence and Key Viewpoints

The Zone of Visual Influence encompasses the areas from which the site is clearly visible and from where the proposal may have an effect on visual amenity. The proposed building will be visible from:

- Residential areas and the public realm to the north – which lies across the rail corridor and includes the Terry Lamb Complex, Waldron Road, Banool Street and the rear of the Houses on Virgil Ave;
- A small portion of residential area to the south West in Biloela Street; and
- Residential areas to the east and south east in Orchard Road and Wellington Road.

The proposal may be visible from additional areas however the effect on visual amenity would be low due to the distance from the site, reduced visibility due to the location of existing buildings and / or vegetation screening, and the small number of visual receptors. The Zone of Visual Influence is constrained by existing buildings, vegetation and distance from the site as seen from viewpoints A to G shown below in Figure 21 below. The impact of the proposal on views from key viewpoints A to G within the Zone of Visual Influence is described in the following pages.

Figure 21 – Zone of Visual Influence

Viewpoint A (refer to Figure 22)

Visual amenity – The view is from the bridge which is elevated over the rail bridge and is screened partially by large eucalypts. Existing sheds and warehouses on and around the site are evident.

Visual sensitivity – Views of the proposed building within its industrial context would be screened by existing vegetation. The existing buildings within the industrial area currently lie below the tree line. The view would be intermittent for passing motorists. Receptor sensitivity is considered to be low.

Magnitude of Visual Effects – The new structure would be a new addition to the view and would add greater bulk and scale in the foreground. It would a large industrial use to what is an industrial context. The magnitude of change is considered to be low.

Visual Impact – The change to the view would be **low** given the existing vegetation, the industrial context of the enclosure. Landscaping and appropriate finishes and colours would further ensure acceptable visual outcomes.

Viewpoint B (refer to Figure 23)

- *Visual amenity* – The view is to an existing brick and tile 2 storey warehouse which is partly screened by established trees.
- *Visual sensitivity* – The existing view is from the side of the residential properties in Wellington Road. A large warehouse dominates the end of the cul-de-sac. The views are partly screened by existing vegetation. The new structure would remain well below the tree line.
- *Magnitude of Visual Effects* – The change would be negligible given the existing building and the screening provided by the existing trees.
- *Visual Impact* – The significance of the change would be moderate to low as the proposed building would be for the most part screened by existing trees although it would be close to the viewing point. Landscaping and appropriate finishes and colours would further ensure acceptable visual outcomes.

Figure 22 – Viewpoint A

Viewpoint C (refer to Figure 24)

- *Visual amenity* – This view is to the entry of warehouses and industrial buildings associated with Integrated Packaging. The view is from the sides of homes in the residential area off Orchard Street. Security fencing and gate is visually prominent in the foreground. There are some established trees which soften the current view.
- *Visual sensitivity* – The view is from the western side of the existing homes. A 1.8m high fence is located on the boundary which is also screened. There are minimal windows (viewing opportunities) located along the sides of these properties.
- *Magnitude of Visual Effects* – The change would involve the addition of a bulky building in the background protruding above the roof line of existing structures. The building will sit in the background and be largely hidden from view by existing structures and established trees.
    - *Visual Impact* – The impact is considered to be **moderate to low**. There are limited viewing opportunities from existing residences and the existing view is to an established industrial area which contains established trees. The new structure will be located in the background of the existing view behind established structures and trees. Landscaping and appropriate finishes and colours would further ensure acceptable visual outcomes.

Figure 23 – Viewpoint B

Viewpoint D (refer to Figure 25)

- *Visual amenity* – This viewpoint is from the existing residential area, north west of the proposed site. The view is largely made up of an existing warehouse in the foreground. There are a number of established trees that soften the current view.
- *Visual sensitivity* – The view is made up of industrial buildings, 2 storey in the foreground and 3-4 storey in the background. The view is from the front living areas of the existing residential dwellings.
- *Magnitude of Visual Effects* – The magnitude of the change would be minimal as the proposed enclosure would be hidden from view to a large extent by the existing warehouses and industrial buildings already in the area.
- *Visual Impact* – The view is largely industrial with some established trees. The proposed building is approximately 390 metres away and has minimal inclusion at the view point. The impact is **negligible.**

Viewpoint E (refer to Figure 26)

- *Visual amenity* – Views from residential dwellings towards existing industrial area including factories and warehouses and associated industrial activities. Building heights are relatively low at approximately 2-3 storeys surrounded by security fencing. There are small established trees interspersed throughout the industrial area.
- *Visual sensitivity* – The view is made up of industrial buildings, 2 storey in the foreground and 3-4 storey in the background. The view is from the front living areas of the existing residential dwellings.
- *Magnitude of Visual Effects* – Views from the existing residential area are directly into the existing industrial area. The view to the new warehouse would be an angle view from the front of the dwellings and there less obvious and direct. The building would sit in the background and amongst the existing industrial buildings and would not create a significant change to the view.

- *Visual Impact* – The view is predominantly industrial with scattered established trees in the foreground. The proposed building is 365m away and is only just protruding above the existing building line. Scattered established retained trees help to soften this protrusion. The impact is **negligible.**

Figure 24 – Viewpoint C

Viewpoint F (refer to Figure 27)

- *Visual amenity* – Views from the rear of the residential dwellings of Virgil Avenue across the ovals at the Terry Lamb Complex. The view consists of scattered established trees, single storey community buildings to the right and 3 storey apartment buildings. The industrial buildings lie in the background beyond these buildings and view.
- *Visual sensitivity* – Residences look directly at the proposed site from the rear yards and rear living spaces, through open space. Screening is afforded by street trees, park trees, apartment buildings in the middle ground. General land slope is down towards the industrial area which is 10m below view point. This will reduce the proposed height of buildings.
- *Magnitude of Visual Effects* – The proposed building form will have a large bulk and scale but due to the middle ground screening of apartments and street trees will have minimal impact on the view from these houses. Existing industrial uses are already partly visible and the new building will be an addition to this land use type.
- *Visual Impact* – The view point is 380m from the proposed building. Even through the receptor is residential and is viewing the proposed site from their living spaces, the existing buildings and established trees largely screen the proposed development. The building also sits lower down by about 10m. The significance of change to the views would be **negligible** as a result.

Figure 25 – Viewpoint D

Viewpoint G (refer to Figure 28)

- *Visual amenity* – Views across the existing rail and freight line corridor and existing industrial area. Existing warehouses and industrial buildings are visible in the background. Established Eucalypts soften the view. Photo is from the lower oval but imitating the view from the bedrooms and living spaces of the south facing apartments.
- *Visual sensitivity* – Apartment dwellings look directly at the proposed site from south facing bedrooms, bathrooms and possible living spaces. The existing site is industrial with a mix of 1-3 storey warehouses, shipping containers, earth mounds and buildings. There is a variety of materials and uses and established tree planting which breaks the scale of the site down. The industrial area also sits approximately 5m lower than the view point.
- *Magnitude of Visual Effects* – The enclosure will have a large bulk and scale but due to the middle ground screening of apartments and street trees will have minimal impact on the view from these dwellings. Existing industrial uses are already partly visible and the new building will be an addition to this land use type.
- *Visual Impact* – The significance of change to the views would be **High - Moderate**. The proposed building would possibly improve the visually outlook of the industrial area from the apartments by reducing the 'untidy' layout that is currently in place. The view is an established industrial area and the proposed building is modernising and cleaning up the current activities on site. However more distance views will be impacted. These visual impacts must however be balanced against the significant noise and air quality improvements that will be achieved by fully enclosing processing activities.

Figure 26 – Viewpoint E

Mitigation measures

The following mitigation measures will be adopted to reduce the visual impact of the enclosure:

- Colours would be chosen to minimise the visual impact of the shed. For example, it is expected that a medium blue/grey colour such as Colorbond's Shale Grey would be used for the proposed built form to minimise the prominence of the structure and ensure it blends in with the landscape. This is illustrated in Figure 29 below which shows the change in view impacts at Viewpoint D when applicable colours are applied;
- Proposed landscaping will mitigate and soften visual impacts and improve the amenity of the site, both for users and those viewing the site locally. Extensive screening will be implemented along the southern and eastern elevations where deep root planting can be accommodated; and
- Exterior light fittings will be installed consistent with Australian Standards and where practicable in such a way that directs light downwards to minimise impacts on adjacent land uses.

Figure 27 – Viewpoint F

Conclusion

The area is zoned IN1 General Industrial and is currently dominated by industrial uses. The project consists of a new large warehouse facility for recycling and waste processing with an area of approximately 23,000sqm. The existing brick building and car parking will be retained as part of the development. Existing vegetation is located along the rail corridor, Miller Road and scattered through the Industrial area.

The proposed building will sit in amongst within an existing industrial area with existing Industrial uses and buildings. The area is a mix of small and large scale warehouses and a mix of other assorted buildings. Due to the industrial uses minimal tree planting is located in the area and generally only around the roads / boundary lines. Views from the surrounding residential areas would have negligible to moderate low impact due to the screening afforded by the existing industrial uses, existing established trees and distance to the proposed development.

The layout and design of the proposed development provides for the efficient use of the site. The proposed modification including the enclosure, loading docks, hardstand, and internal vehicular driveway have been located to ensure a functional site layout that achieves the operational objectives of the proposal.

The design of the proposed enclosure encapsulates high commercial and industrial standards by virtue of configurations and colour which respond to the industrial character of the precinct. The application of appropriate tones would alleviate the bulk and scale of the built form to the to the streetscape.

Figure 28 – Viewpoint G

Landscaping within the setbacks and across the site will soften the appearance of built form and hardstand and reduce the perceived bulk and scale of the development. In general, the proposed landscaping will be provided to enhance the existing streetscape and promote scale and density of planting to soften the visual impact of the proposed enclosure.

View Point G will be the most significantly impacted by the proposed development but the majority of the rooms appear to be bathrooms and bedrooms. View Point G is of existing heavy rail corridor, Industrial area and the site is currently used for open earth mounds, waste processing equipment and shipping containers, therefore the proposed development might be viewed as a positive addition to this view. Importantly, these visual impacts should be balanced against the significant noise and air quality improvements that will be achieved by fully enclosing processing activities.
Furthermore, the development will diminish distance views from this view point but could be mitigated with further tree planting to complement existing established trees already along the rail corridor.

On balance, the construction of a 'state of the art' resource recovery facility that will significantly improve onsite environmental performance, positively contribute to State waste recycling targets and the construction industry and inject capital into the local and regional economy outweighs the negligible to moderate/low visual impacts associated with the new enclosure.

Figure 29 - View D with mitigation

4.7 Land Use Risk and Fire and Incident Management

Potentially hazardous industry.

SEPP 33 defines a potentially hazardous industry as development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality:

- (a) to human health, life or property, or
- (b) to the biophysical environment.

If a development is potentially hazardous, a Preliminary Hazard Analysis (PHA) must be prepared to demonstrate that safeguards are in place that will prevent such harm occurring. The guideline Applying SEPP 33 provides screening tests that can be used to determine whether the quantity and location of dangerous goods within the proposed development site are such as to cause a potential hazard.

BRO has advised that approximately 5 x 200L barrels of oil and up to 6 x 18-20kg gas bottles (LPG) would be stored in the onsite dangerous goods storage room identified in Figure 3. Although not identified as a dangerous good, 4 x 50L Argon and Cargon welding gas bottles would also be stored in this area. The proposed storage room would be similar to the existing storage room identified in Plate 9.

Separate to the dangerous goods storage facility a 15,000 litre self bunded smart tank for dispensing diesel is currently located in the centre of the site. The tank would be relocated to an appropriate location when construction commences.

Both the storage room and the diesel dispenser are located well away from the site boundary and sensitive receptors (>250 metres from the nearest residence).

Fire and Incident management

A preliminary Fire Safety Study has been prepared and is located at Appendix L. As described in Section 2 the proposal comprises a large single storey building. The building will exceed the maximum permissible fire compartment size permitted within the Building Code of Australia (BCA), and will therefore be assessed as a Large Isolated Building pursuant to Clause C2.3 of the BCA.

Trucks will enter the building and deposit their waste into an 'operational stockpile' that will not exceed approximately 500 tonnes of waste at any given time. Once the material is taken from the operational stockpile and processed, it is separated into individual bays that will contain different waste product including:

- Concrete
- Bricks and tiles
- Timber
- Sand
- Soils
- Plastics
- Paper and cardboard
- Glass
- Metals

Vehicle access to the site is at a single point from Miller Road to the north east corner of the allotment. The site is bounded by existing allotments to all sides.

Required fire safety systems and measures

With reference to the Deemed to Satisfy (DtS) provisions of the Building Code of Australia 2016, Amendment 1 (BCA), the following fire safety systems and measures are applicable for the proposed development:

- Perimeter vehicle access for emergency vehicles;
- Fire hydrants;
- Fire hose reels;
- Fire sprinklers, including occupant earning;
- Portable fire extinguishers;
- Fire control centre;
- Automatic smoke exhaust; and
- Emergency lighting and exit signs.

Perimeter access will be provided around the building for emergency vehicles. The requirements for vehicle access are summarised as follows:

- Must be capable of providing continuous access for emergency vehicles to enable travel in a forward direction from a public road around the entire building; and
- Must have a minimum unobstructed width of 6m with no part of its furthest boundary more than 18m from the building and in no part of the 6m width be built upon or used for any purpose other than vehicular or pedestrian movement; and
- Must provide reasonable pedestrian access from the vehicular access to the building; and ▪ must have a load bearing capacity and unobstructed height to permit the operation and passage of fire brigade vehicles; and

- Must be wholly within the allotment except that a public road may serve as the vehicular access or part thereof.

Where the provisions for vehicle access vary from the above, consultation will be required with Fire & Rescue NSW (FRNSW) to ensure suitable provisions are provided to facilitate fire brigade intervention activities.

Fire Hydrants
A fire hydrant system shall be provided to serve the building in accordance with the relevant provisions of BCA Clause E1.3 and AS 2419.1-2005.

It is noted that preliminary discussions with FRNSW have revealed that they will require the hydrant system to be designed to provide 50 L/s of flow at the required operating pressures. Where the existing street mains are not capable of delivering the required water supply, dedicated onsite fire water tanks and associated pumps will be required.

All fire hydrants are to be located external to the building in accordance with the relevant provisions of AS 2419.1.

Fire Hose Reels
A fire hose reel system will be provided to serve the building in accordance with the relevant provisions of BCA Clause E1.4 and AS 2441-2005.

Fire Sprinklers
A fire sprinkler system shall be provided throughout the building in accordance with the relevant provisions of BCA Specification E1.5 and AS 2118.1-1999. The hazard classification for the building is considered to be High Hazard – for process / storage risks. Where the existing street mains are not capable of delivering the required water supply, dedicated onsite fire water tanks and associated pumps will be required.

The fire sprinkler system is also required to automatically activate a building occupant warning system to ensure occupants are provided with an automatic warning in the event of sprinkler activation. The building occupant warning system is to comply with the relevant provisions of AS 1670.1-2005.

Portable Fire Extinguishers
Portable fire extinguishers will be provided to serve the building in accordance with the relevant provisions of BCA Clause E1.6 and AS 2444-2006.

Fire Control Centre
A fire control centre shall be provided for the building in accordance with the relevant provisions of BCA Specification E1.8 to coordinate fire-fighting operations.

Automatic Smoke Exhaust
An automatic smoke exhaust system shall be provided to serve the building in accordance with the relevant provisions of BCA Specification E2.2b and AS/NZS 1668.1-2015. Further, smoke reservoirs may be required at roof level to contain smoke at designated internals, including above the operational stockpile.

The design of the smoke exhaust system, including the size and capacity of smoke exhaust fans and the requirements for smoke reservoirs, is subject to a more detailed Fire Safety Study that is to be completed during the design stage.

Emergency Lighting and Exits

A system of emergency lighting and exit signs will be provided throughout the building in accordance with the relevant provisions of BCA Part E4 and AS 2293.1-2005.

Operational Stockpile and Storage Bays

The operational stockpile is considered to present the key risk within the subject building as it can potential contain large quantities of combustible materials. A minimum 3m exclusion zone shall be provided around the perimeter of the stockpile.

The individual storage bays that contain the different waste product (as identified above) shall be separated by concrete construction. The storage bays containing the combustible materials (i.e. timber, plastics, and paper / cardboard) shall not be located next to each other.

Containment of Contaminated Water

Suitable provision shall be made for the retention of contaminated water run-off.

As a Guide, the minimum containment capacity should be calculated on the basis of two (2) hydrants operating simultaneously at 10 L/s each (a total of 20 L/s), plus the calculated maximum sprinkler design output, operating for a period of 90 minutes.

Other

The external areas of the site should be level, clear of all rubbish and combustible materials, and enclosed by fences or walls constructed of non-combustible construction.

The fences or walls should be of sufficient height to prohibit unauthorised persons from entering.

Table 16 – Relevant BCA assessment data.

BCA Reference	BCA Assessment
Building Classification and Use	Class 7 or 8 (storage / process)
Rise in Storeys	1
Number of Levels Contained	1
Minimum Type of Construction Required	Type c
Effective Height	13 – 17.5 metres
Maximum Size of Fire Compartments	Large Isolated Building: ▪ Area ~ 20,100m2 ▪ Volume ~ 302,000m3

Conclusion

The fire safety systems and measures identified above are considered appropriate for the specific fire hazard and are expected to adequately address the extent of potential fire risk associated with the proposed development for use as a Waste Management Facility.

It is noted that a more detailed Fire Safety Study will be required during the detailed design stage of the project to ensure all fire safety objectives are identified and addressed to the satisfaction of all stakeholders. This will include an updated Fire Hazard Analysis that will involve consultation with Fire & Rescue NSW (FRNSW).

4.8 Other Environmental Issues

BRO also considered other relevant potential environmental impacts associated with the proposed modification including, biodiversity, aboriginal and non-aboriginal heritage, and socio-economic impacts. Given the negligible impacts expected and the ability of these issues if applicable to be

effectively managed under existing conditions of approval and relevant updated environmental management plans, further detailed analysis was not considered necessary.

4.9 Summary of Mitigation Measures

The assessment has identified a range of environmental impacts and recommended management and mitigation measures to avoid and mitigate these impacts. This compilation of mitigation measures has been provided to satisfy the SEARs and presents a summary of the measures which the proponent is committed to implementing either prior to construction, during construction or during operation.

These draft mitigation measures may be revised in response to public submissions or through design changes. As already discussed in the EA, during the assessment process BRO decided to fully enclose all processing activities to address concerns raised by the EPA in relation to the Facilities' ability to sustain environmental performance in the long term.

It is envisaged that all mitigation measures will form the basis for the any approval. Existing management plans including the CEMP and OEMP will be reviewed and updated following approval and prior to construction and operation respectively. The mitigation measures are represented by issue and for both construction and operational mitigation where applicable.

Traffic

Construction traffic - as part of the updated CEMP traffic management measures will be adopted including onsite speed limits and pedestrian routes around and through the site.

Operational traffic - the OEMP will be updated to include a Driver Code of Conduct to ensure that deliveries associated with the Facility adhere to accepted industry standards for the transport of waste including the covering of all loads.

Noise and Vibration

Construction noise mitigation - the following construction noise management and mitigation strategies should be adopted where feasible:

- plant to be strategically positioned to provide shielding where noise generation at a site is predicted to be above criteria at surrounding receptors;
- limitation of use of acoustically significant plant (reticulation pumps) to minimise exposure to nearby residences (where possible);
- regular maintenance of machinery to minimise noise emissions;
- consultation with residences immediately adjacent to proposed works including letter box drops and verbal communication prior to works;
- noise monitoring during activities predicted to generate maximum impacts; and
- all contractors and staff to undergo noise awareness training.

BRO will maintain a community complaints line that will be available throughout the construction activities. Records of all community complaints will be maintained on an up-to-date complaints register and will include:

- date and time of the complaint;
- the means by which the complaint was made (telephone, mail or email);
- any personal details of the complainant that were provided, or if no details are provided, a note to that effect;
- the nature of the complaint;
- any actions taken by the construction contractor in relation to the complaint, including any follow up contact with the complainant and the timing for implementing action; and

- if no action was taken by the construction contractor in relation to the complaint, the reason why no action was taken.

Maintenance will be confined to standard daytime construction hours and where possible, away from noise sensitive receivers.

Operation noise mitigation - in order to reduce the noise levels at receivers on Waldron Road to the appropriate criteria BRO has decided to fully enclose all processing activities.

Air Quality

Dust Mitigation

The following dust controls will be implemented:

- hard standing the majority of the site to reduce uncovered areas and emissions from vehicle movements;
- construction of a full enclosure to reduce wind erosion and reduce dispersion of emitted dust;
- mist sprays;
- dust extraction system; and
- use of hoppers and bays to store materials.

The following dust management strategies will be implemented to further minimise dust:

- where applicable, stockpiles to be temporarily covered or sprayed with water to keep dust to a minimum;
- the hardstand area will be kept free of visible dust by sweeping;
- water will be used to control dust from screens and the conveyor circuit where there is visible dust; and
- water spraying will be conducted during the unloading/loading of trucks, if visual dust is generated.

The following additional actions will be employed if the above measures are not effective:

- increased water sprays;
- securing with a cover;
- clearing of hardstand/road surface.

If visual monitoring indicates that the air quality objectives are being exceeded then BRO would need to:

- identify the activities that were occurring at the time of the exceedances;
- determine the activities that were most likely contributing to the exceedances;
- review site works and environmental controls in place for this activity; and
- implement an agreed alternative to more adequately control dust generation.

Complaints

The Site Manager will maintain a complaint register. Any complaints will be investigated. Complaints will receive a verbal response as soon as possible.

Monitoring

All staff will conduct constant visual monitoring. The Site Manager will note non-conformances as they occur. All plant operated by the site operator will be well maintained and comply with the EPA emission standards. Dust deposition monitoring will continue to be conducted as per the existing license.

Roles & Responsibilities

The Site Manager will ensure the following equipment and controls are in place:

- dust mitigation equipment is available and operating at the frequency, times and location specified;
- provide direction to equipment operators concerning speed of operation(s) and duration of watering;
- staff and sub-contractors to be inducted and made aware of the air quality / dust suppression techniques used on site; and
- follow up on all dust complaints.

Soil and Water

Contamination Management Plan (CMP)

To support the preparation of both the construction and operational environmental management plans and the management of onsite contamination in general during construction and operation, a contamination management plan (CMP) will be prepared and submitted to DPE and EPA in conjunction with the updated CEMP and OEMP.

The purpose of the CMP is to establish a set of best practice procedures for the identification and management of contaminated soil/water if encountered during construction or operations. The key objective of the CMP is to ensure that impacts from the disturbance of contaminated soils/water are minimised through appropriate management.

The CMP will include a consolidated map identifying existing areas of known contaminants that require avoiding or additional mitigation measures particularly during construction and establishment of landscaping. This would include pre construction testing to determine the most appropriate form of structural support for the enclosure and handling requirements.

The CMP will also supplement this map with an unexpected finds protocol. Adherence to the CMP and the unexpected finds protocol will help ensure full compliance with the relevant legislative requirements, conditions of approval and EPA requirements, and enable focused personnel training on contaminated land management for the site.

Construction

The CEMP to be finalised and submitted to the satisfaction of DPE to include but not limited to:

- An incident response plan to be followed in the event of a spill, including the notification requirements and the use of absorbent material to contain the spill;
- Sediment and erosion controls and other management procedures to minimise contaminants in site surface water discharge including the management and removal of gross pollutants;
- Limitation of exposed soil to those areas being worked on and disturbed areas to be stabilised as soon as practicable;
- Acid sulphate soil identification protocols;
- An ongoing surface water monitoring program to measure the success of pollution mitigation measures to be implemented; and
- Provision for the Environmental Engineer to be contacted upon the encounter of any unexpected finds with work to cease immediately within the area until such time that the Environmental Engineer determines its safe.

Operation

A OEMP to be finalised and submitted to the satisfaction of DPE to include but not be limited to:

- An incident response plan to be followed in the event of a spill, including the notification requirements and the use of absorbent material to contain the spill;
- A refueling procedure that will be implemented for all refueling activities undertaken on site
- Measures to ensure that any leachate generated within the sheds will be conveyed to closed collection pits/sumps which are to be isolated and pumped out by an authorised liquid waste disposer if required;
- Protocols for inspection of detention basins following heavy rainfall events and the where necessary the subsequent removal of litter and sediment;
- Maintenance measures aimed at ensuring the integrity of the rainwater tanks and associated pipe work through regular inspection and repairs where necessary including the inspection of tank inlets, insect proofing and leaf filters;
- Regular inspection and cleaning of gutters and internal inspections of rainwater tanks undertaken to check for evidence of access by animals, birds or insects;
- The regular sweeping of hardstand areas. Where wash down of the hardstand areas is required, the sediment laden water would be prevented from entering stormwater pits so that sediment can be captured above ground and managed accordingly;
- An ongoing surface water monitoring program to measure the success of pollution mitigation measures to be implemented; and
- Provision for the Environmental Engineer to be contacted upon the encounter of any unexpected finds with work to cease immediately within the area until such time that the Environmental Engineer determines its safe.

Hydrology

Construction related erosion and sediment control measures

During construction works the following measures will be adopted:

- Sediment fencing on the low side of earthmoving operations;
- A gravel layer at the construction vehicle access point in the works area;
- Regular monitoring of soil movement characteristics and cleaning of sediment deposits;
- Regular dewatering of low points in the excavation works; and
- Security fencing around the area of constructions works.

Stormwater quality improvement measures

Proposed stormwater quality improvement measures include:

- 4 x 10m3 rainwater tanks to collect roof water for non-potable demand;
- Ecosol litter baskets to collect gross pollutants; and
- Ecosol Storm Pit Class 2_20L filtration device.

Visual

The following mitigation measures will be adopted to reduce the visual impact of the enclosure:

- Colours will be chosen to minimise the visual impact of the shed. For example, it is expected that a medium blue/grey colour would be used for the proposed built form to minimise the prominence of the structure and ensure it blends in with the landscape. This is illustrated in Figure 29 below which shows the change in view impacts at Viewpoint D when applicable colours are applied;
- Proposed landscaping will mitigate and soften visual impacts and improve the amenity of the site, both for users and those viewing the site locally. Extensive screening will be implemented along the southern and eastern elevations where deep root planting can be accommodated; and

- Exterior light fittings will be installed consistent with Australian Standards and where practicable in such a way that directs light downwards to minimise impacts on adjacent land uses

Hazards and Fire Safety

- The provision of a dedicated dangerous goods storage facility;
- A fully bunded 15,000 litre diesel smart tank;
- Continuous perimeter access around the enclosure for emergency vehicles;
- The provision of external fire hydrants consistent with the relevant provisions of BCA Clause E1.3 and AS 2419.1-2005 and designed to provide 50 L/s of flow at the required operating pressures;
- A fire hose reel system to serve the building in accordance with the relevant provisions of BCA Clause E1.4 and AS 2441-2005;
- A fire sprinkler system throughout the building in accordance with the relevant provisions of BCA Specification E1.5 and AS 2118.1-1999;
- A fire sprinkler system that automatically activates a building occupant warning system:
- Portable fire extinguishers;
- A fire control centre;
- An automatic smoke exhaust system;
- A minimum 3m exclusion zone around the operational stockpile;
- Appropriate concrete separation of the individual storage bays that contain the different waste products;
- The retention of contaminated water run-off; and
- Ensuring all external areas of the site should be level, clear of all rubbish and combustible materials, and enclosed by fences or walls constructed of non-combustible construction; and
- A more detailed Fire Safety Study that is to be completed during the design stage.

5. Conclusion

The modification including the increase in waste throughput will facilitate a significant improvement in environmental performance by allowing BRO to construct a purpose built $20m 'state of the art' facility with inbuilt contemporary environmental and amenity management controls. Coupled with improved environmental management practices, the upgrade will enable significantly improved environmental performance and sustainable regulatory compliance. Potential impacts associated with the modification including traffic, noise, air quality, contamination, hydrology, visual impacts, hazards and fire safety have been carefully considered, assessed and supported by evidence based specialist studies. The environmental assessment demonstrates that the construction and operation of the upgraded facility will vastly improve environmental outcomes with the operation predicted to meet key environmental, land use safety and amenity criteria subject to the implementation of mitigation measures.

The decision during the assessment process to fully enclose all waste processing operations will further ensure that all environmental, amenity and land use standards are met in the short and long term.

In addition to significantly improved environmental performance, the operation of the upgraded facility will result in several other positive outcomes including:

- a resource recovery rate of greater than 75% consistent with the NSW Government's recycling goals;
- a positive contribution to the construction industry by providing efficient strategically located resource recovery facilities capable of diverting up to 187,500 tpa of waste from landfill; and
- ongoing economic stimulation of the local and regional economies through $20 million in capital investment and full-time employment for approximately 13 persons.

Accordingly, the proposals are considered to be in the public interest and should be approved.