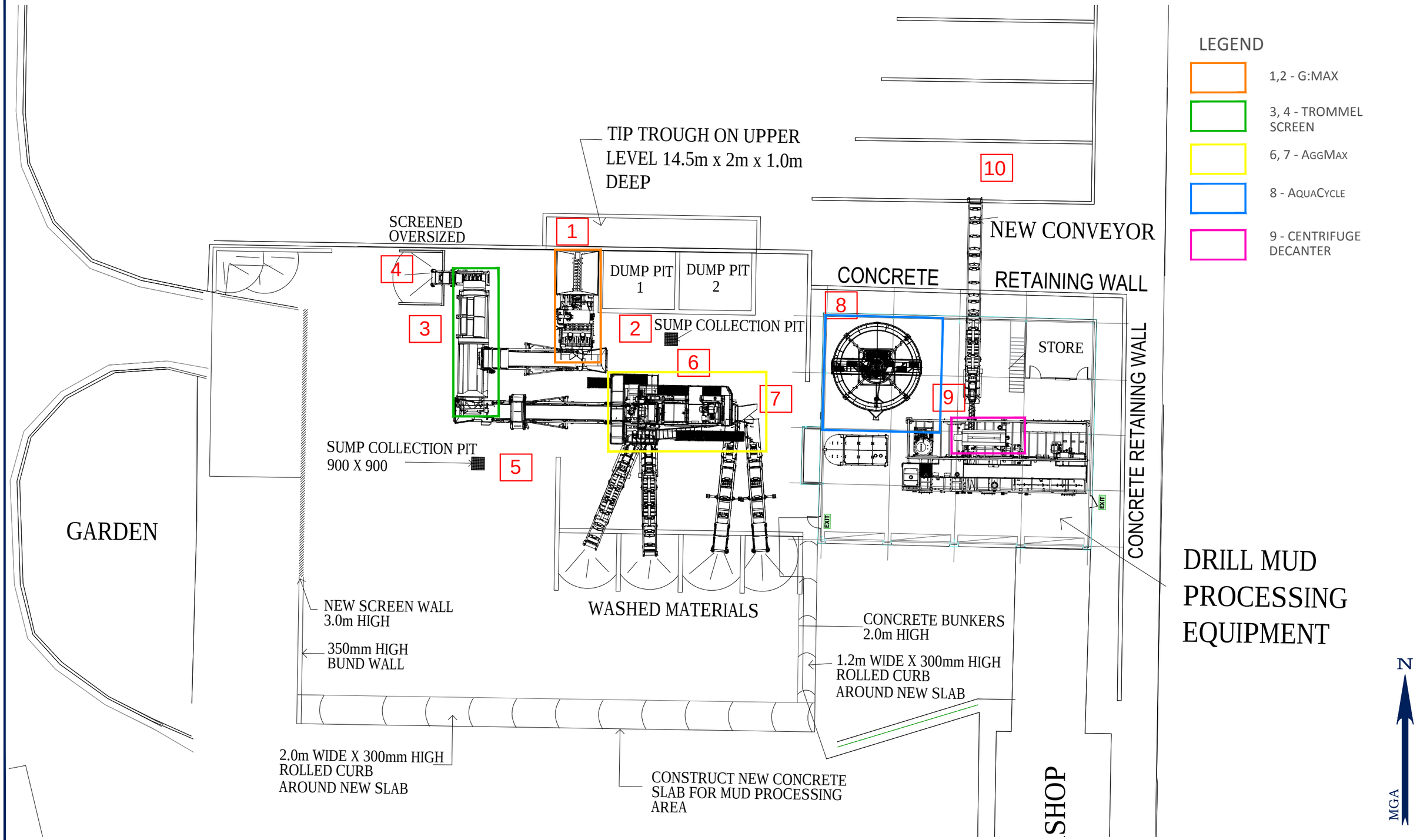

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DATA SOURCE: STYLE DEVELOPMENTS PTY LTD

TITLE: FIGURE 13: HYDRO-EXCAVATION AND DRILL MUD PROCESSING
LOCATION: DAVIS RD WETHERILL PARK
DATUM: GDA 94
PROJECTION: MGA ZONE 56
DATE: 7/04/2017
PURPOSE: PLANNING
AUTOCAD REF: J:\OBS\127k\127695 Wetherill Park\10 - Drafting\Acad Drawing Files
VERSION: D A3

CLIENT: BETTER GROW
JOB REF: PR127695

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3.4.2.2 Garden Organics and Mixed Food & Garden Organics Processing

All Garden Organics (GO) and Food and Garden Organics (FOGO) will enter the site via the incoming weighbridge. Once a consignment is weighed, checked and approved it will proceed up to a receival area (location 1 on **Figure 14**) at a dedicated organics processing building. The origin of each load will be confirmed prior to the vehicle being allowed to discharge its load.

Incoming GO and FOGO will be stockpiled in a dedicated area at the western end of the organics building (location 2) while waiting for processing. The area will be subject to odour management via the inclusion of sprays over the product which will provide active inoculants to minimise potential fermentation and odour release.

Unloaded material (location 2) will first be checked and decontaminated for gross contamination by staff operating a single, rubber-tyred front-end loader. Gross contamination will be stockpiled within the building before being loaded into skip bins also located inside the building for disposal at landfill.

Following gross decontamination, materials will be placed in a hopper (location 3) and travel via an inclined conveyor (location 4) to a decompactor (location 5). The decompactor "loosens" the organic material following its compaction inside collection trucks. This process releases any contamination bound within the organics, thereby maximising recovery and minimising generation of residual material to be sent to landfill.

Decompacted organic material then moves through to an elevated sorting cabin (location 6) where secondary smaller pieces of contamination are manually removed by plant operators and dropped down chutes into a skip bin (location 7) for disposal to landfill.

From the sorting cabin, organics transfer by conveyor (location 8) to a slow-speed shredder (location 9) to produce a mulched material ready for composting. Shredding also allows for the greater compaction of processed organic materials onto outbound transport trucks for composting off site.

Once shredded, organics will be moved by conveyor to a Star screen (location 10) which separates over-sized organics from the finely shredded material. Collected oversized material (location 11) will be returned to the beginning of the process line to be rechecked for contamination and re-shredded to maximise resource recovery and minimise generation of residual material for landfill disposal.

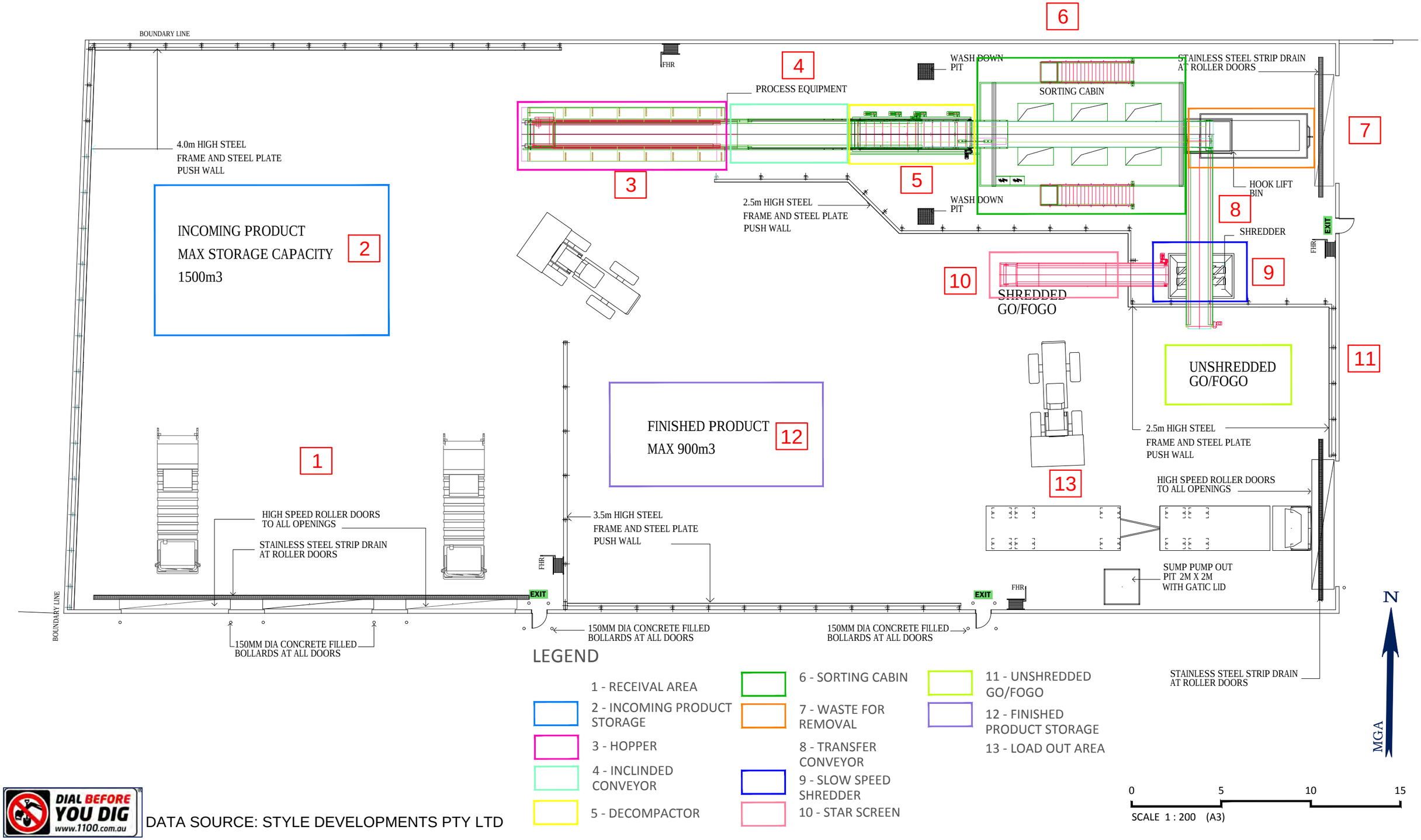
The building will have capacity to stockpile shredded organics (location 12) for up to two operational days at peak delivery period, although material on-site will only be held for a maximum of 24 hours. The building will be fully enclosed and contained to ensure leachate and odour is managed within the shed. Leachate will be captured within a central sump in the building and re-applied to the shredded material prior to transport off-site. This will help maintain the moisture content of material. Odour will be managed through the use of high speed automatic roller doors and the installation of 8 carbon filter units to treat shed air (refer to **Section 8.1**).

Stockpiled, shredded material (location 12) will be loaded daily into high-volume road transport trucks (location 13) and taken to Bettergrow's facility in the Hunter Valley for composting.

Any packaging and paper based recyclables recovered from the GO and FOGO will be transferred to the de-packaging building for inclusion into its recovery process.

In full operation the organics building is expected to receive and process approximately 70,000 tonnes of a combination of GO and FOGO annually. Detailed operating procedures regarding receival, checking, acceptance, and unloading of GO and FOGO will be developed and all staff will be appropriately trained.

The layout of the GO and FOGO process area is shown as **Figure 10** and the main components of the processing and plant (including locations 1-13 above) are shown as **Figure 14**.



LEGEND

- 1 - RECEIVAL AREA
- 2 - INCOMING PRODUCT STORAGE
- 3 - HOPPER
- 4 - INCLINDED CONVEYOR
- 5 - DECOMPACTOR
- 6 - SORTING CABIN
- 7 - WASTE FOR REMOVAL
- 8 - TRANSFER CONVEYOR
- 9 - SLOW SPEED SHREDDER
- 10 - STAR SCREEN
- 11 - UNSHREDDED GO/FOGO
- 12 - FINISHED PRODUCT STORAGE
- 13 - LOAD OUT AREA

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DATA SOURCE: STYLE DEVELOPMENTS PTY LTD

TITLE: FIGURE 14: FOOD ORGANICS AND MIX FOOD AND GARDEN ORGANICS PROCESS EQUIPMENT

LOCATION: DAVIS RD WETHERILL PARK

DATUM: GDA 94
PROJECTION: MGA ZONE 56

DATE: 7/04/2017
PURPOSE: PLANNING

AUTOCAD REF: J:\OBS\127k\127695 Wetherill Park\10 - Drafting\Acad Drawing Files
VERSION: D A3

CLIENT: BETTER GROW
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3.4.2.3 Food De-packaging and Processing

Food organics (FO) mixed with packaging will be received at site from a number of different sources including but not limited to the following:

- Large commercial waste collection contractors;
- Skip bin operators and small commercial collectors who provide dedicated pre consumer organics collection services; and
- Specific companies with product requiring secured product destruction.

All food organics, irrespective of nature or source, will enter the site via the incoming weighbridge and following weighing will proceed up to the dedicated food organics de-packaging and processing building. The source and nature of the incoming products will dictate what processing is required and determine the respective drop off location.

All incoming bulk solid food organics from commercial collectors will be unloaded into the dedicated tip pits (location 1 on **Figure 15**) on the eastern end of the food de-packaging building. The material will then be lifted from the tip pits by a dedicated product grab (location 2) at the rim of the pits and placed into the feed hopper of a Turbo Separator (location 3). The Turbo Separator and screen separate the liquid and solid fractions as well as remove any packaging for disposal to landfill. The solid organic fraction will be collected in hook lift bins (location 5) and transferred to the main GO and FOGO organics processing building for blending with the shredded organics prior to despatch.

The liquid fraction will be pumped into dedicated 2 x 27,000 litre (total 54,000 litres) liquid organics tanks (location 4) for temporary storage. This volume of storage allows for 4 days of liquid fraction capacity. These tanks will be fully bunded, with the bund area being able to accomodate 110% of the total storage capacity of the tanks. Once a total of 40,000 litres of liquid organics is reached across both the tanks a high level alarm will be activated, along with a flashing light, to notify operators that the tanks require emptying. If the alarm is ignored an overflow sensor will engage at 50,000 litres which will shut off the feed pump and sound another alarm. This will leave 4,000 litres of freeboard. The liquid fraction will be either be blended with outgoing shredded organics or removed from site via a liquid tanker. Liquid fractions removed from the facility will be taken to an EPA licenced land application site for soil injection or to one of Bettergrow's EPA licenced composting operations for further re-use.

Separate incoming organic liquids will be pumped into the 2 x 27,000 litre liquid food waste tanks (location 4) for bulking up prior to either being blended with outgoing shredded organics or being transferred offsite to an EPA licenced site for either composting or soil injection.

Trucks arriving to site with palletised solid or liquid organics will be directed to a secure product storage area (location 7) entered from the western end of the de-packaging building. Trucks will be unloaded using a fork lift and product will be temporarily stored prior to being processed through the Turbo Separator (location 3) or glass container crusher (location 6). The de-packaging systems being adopted, including the use of the Turbo Separator and screen will ensure maximum FO recovery from the dedicated source separated systems. The system has the capacity to process up to 30,000 tpa of solid and liquid food organics.

No processed wet food waste will be stored in the food de-packaging building for longer than 24 hours except for quantities of less than a truck load left over at day's end on a Friday. Such material will be held in a covered bunker over the weekend and will be the first material to be dispatched the following Monday morning.

Dry food waste will either be added to the garden organics or recovered as stock feed, depending on quality. If the quality is not good enough for inclusion in stock feed it will be added to the garden organics for transfer to one of the Bettergrow's composting facilities. Packaged food waste will be de-packaged using the Turbo Separator and allocated as above, depending on its type and quality.

The layout of the Food De-packaging process area is shown on **Figure 10** and the main components of the processing and plant (including locations 1-7 above) are shown on **Figure 15.**

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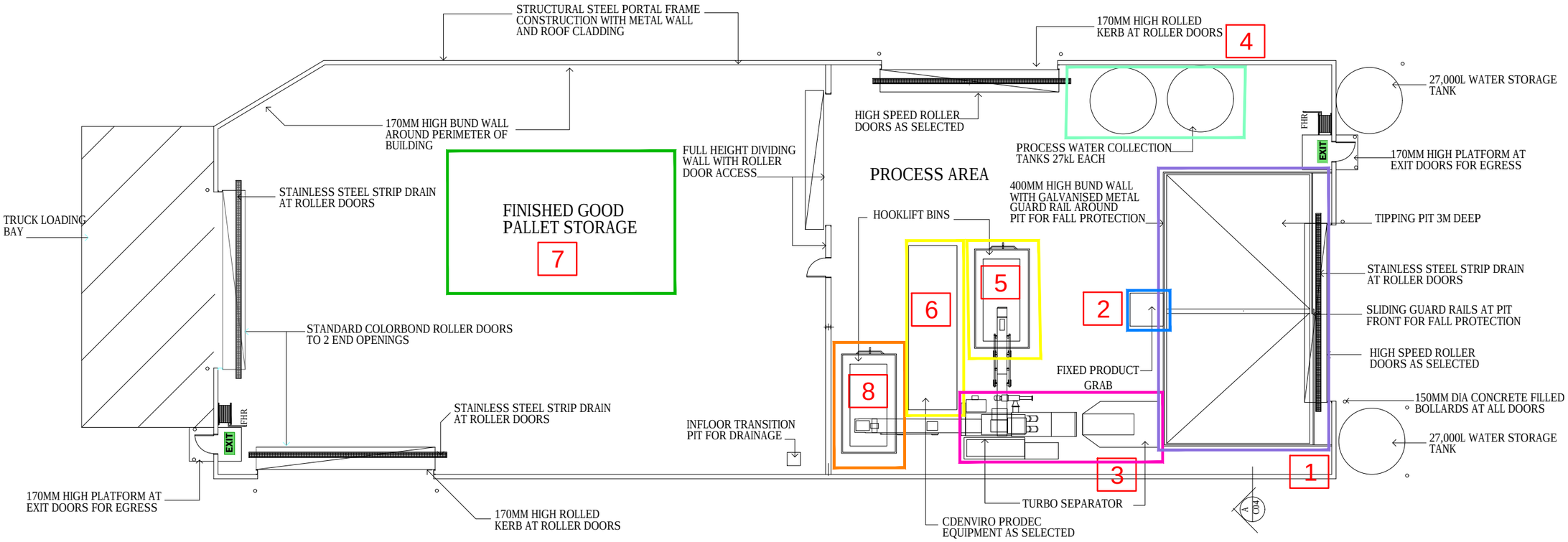

LEGEND

- 1 - TIP PIT (RECEIVAL)
- 2 - PRODUCT GRAB
- 3 - TURBO SEPARATOR
- 4 - LIQUID FOOD WASTE
- 5, 6 - GLASS CONTAINER CRUSHER
- 7 - FINISHED GOODS STORAGE
- 8 - SHREDDED ORGANICS

0 5 10 15

SCALE 1 : 200 (A3)

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DATA SOURCE: STYLE DEVELOPMENTS PTY LTD

TITLE: FIGURE 15: FOOD DE-PACKAGING PROCESS EQUIPMENT

LOCATION: DAVIS RD WETHERILL PARK

DATUM: GDA 94
PROJECTION: MGA ZONE 56

DATE: 7/04/2017
PURPOSE: PLANNING

AUTOCAD REF: J:\OBS\127k\127695 Wetherill Park\10 - Drafting\Acad Drawing Files
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3.4.3 Finished Products

Materials reclaimed from the processing and recycling activities will be utilised to produce a range of products either for direct sale, or for blending with other raw materials to produce soils, garden mixes, and other landscaping mediums. Reclaimed materials not targeted for re-use by Bettergrow will either be transferred off-site for further recycling or sent to landfill. **Table 6** below lists the finished products to be generated by the facility.

Table 6 Finished Products

Received Wastes and Raw Materials	Processing or End Use	Finished Products	Moisture Content of Product %
Soils (ENM and VENM)	Sold as raw product	Finished Products include Mine Mix, Naturaliser, BioNRich, Earth4Turf	~25%
Clay/Sands/Stone/Gravels/Aggregates (VENM)	Sale to end user	Clay/Sands/Stone/Gravels/Aggregates	~25% or greater
Drilling mud and/or muddy waters from hydro excavation, drilling and pot holing operations	Screening and Processing through CD Enviro System	Engineering material as per the EPA exemption	~25% or greater
		Liquid fraction either to sewer, to composting facility, or to another licenced facility for further processing/re-use	~95%
Garden Mixes/Top Dressings/Mulches	Sale to end user	Garden Mixes/Top Dressings/Mulches	~30% or greater
Garden Organics	Decontamination & shredding	Material transferred to EPA licenced composting sites for the production of a range of growing media suitable for domestic and agricultural use	~35%
Food and Garden Organics			~40%
Solid Food Waste	De-packaging and decontamination	Material transferred to EPA licenced composting sites for the production of a range of growing media suitable for domestic and agricultural use	~45%
Liquid Food Waste		Liquid fraction applied to processed FOGO, composting, or sent to another licenced facility for further re-use	~95%
Sawdust	Sale to end user	Sawdust	~25% - 40%
Spent filter sand media	Sold as raw product	Component of Mine Mix, Naturaliser, BioNRich, Earth4Turf	~25%

3.4.4 Prohibited Waste Management

It is essential that wastes entering the facility are effectively vetted to ensure that prohibited wastes are not accepted. As such, a visual inspection will be undertaken of the wastes being delivered to ensure that the load is in accordance with the materials approved for receival at the site, and with the facilities Environment Protection Licence (EPL). This will also ensure that the delivered waste matches the description of the product provided in the delivery manifest.

Once all relevant documentation has been exchanged, checked, and completed, and the initial inspection has been undertaken, the transporter will be directed to the relevant unloading area depending on the waste type.

All unloading activities will be monitored by an operational staff member who will scrutinise the load as it is discharged from the vehicle. This will further ensure that all prohibited wastes are prevented from being accepted.

For liquid waste received at the facility, a sample will be taken and stored in refrigeration for 30 days onsite. The holding period will provide Bettergrow with the ability to analyse received materials for possible contamination. Contamination can compromise the treatment process and also produce potential odour issues.

In the event that prohibited wastes are discovered after unloading has occurred, the offending transport company will be contacted with the expectation that the waste will be re-loaded and transported to a facility that can legally accept such waste. Where required, the EPA will be notified.

3.5 Mobile Plant and Equipment

Table 7 lists the mobile plant and equipment that will be utilised for the various process areas at the facility.

Table 7 Mobile Plant and Equipment

Plant and Equipment	Hydro-Excavation and Drill Mud	Bulk Landscape Supplies	Organics	Food De-Packaging	General Site
Volvo L120 Front End Loader or equivalent with high lift bucket			2		
Volvo L150 Front End Loader or equivalent with high lift bucket		1			
Volvo L150 Front End Loader or equivalent	1				
20 Tonne Excavator	1				
Tele-handler	1		1		
12 Tonne Excavator			1	1	
Bobcat			1		1
Forklift			1	1	
Commercial street sweeper					1

3.6 Traffic Generation

The development involves transport movements associated with staff vehicles, service vehicles, waste trucks, and delivery trucks entering and leaving the site. The proposed facility is projected to generate up to 304 truck movements per day to and from the site during peak operations. Access to the site will be via Davis Road.

The primary operational activities that would generate traffic to and from the development site would be:

- Delivery of hydro-excavation and drill muds in sucker trucks;
- Delivery of garden organics and mixed food and garden organics waste from collection trucks;
- Delivery of food organics from collection contractors or direct from manufacturers;
- Delivery and dispatch of landscaping materials and media;
- Service contractors in utes or vans;
- Staff cars; and
- Visitors.

In an effort to minimise daily truck movements, Bettergrow proposes to spread the estimated truck movements over a 24 hour period (Monday to Friday) and between the hours of 6:00 am to 2:30 pm on Saturdays. The hours of collection are also staggered to meet the needs of the various service industries, reduce traffic congestion, and impact to environmental amenity. The following wastes are proposed to be received during the following times:

- Hydro-excavation and drill muds over a 24 hour period (Monday to Friday) and between 6:00 am and 2:30 pm Saturday;
- Garden organics and mixed food and garden organics over extended hours, including 5:00 am to 10:00 pm Monday to Friday and 6:00 am to 2:00 pm on Saturday's. This is to maximise truck utilisation especially for transfer out of product.
- Food organics over extended hours, including 5:00 am to 10:00 pm Monday to Friday and 6:00 am to 2:00 pm on Saturday's This is primarily to capture the generation times for café's and food outlets; and
- Bulk landscape materials will be delivered to the site at any time over the 24 hour Monday to Friday operation to maximise opportunities for keeping trucks loaded at all times. Distribution throughout Sydney will only occur during normal working hours Monday to Saturday.

3.7 Vehicle Access and Parking

The development will be accessed by a right turn from Davis Road, at the southern boundary of the site. Trucks will stop at electronic boom gates to have their manifest checked, before being given access to move through the entry weighbridge. The truck and load will be weighed before being inspected at the designated truck inspection area on the internal roadway adjacent to the western boundary. Once the load is vetted and cleared the truck will then move on to the required process area. Once the truck is unloaded it will proceed to the exit via the exit weighbridge and boom gate, with a left turn on to Davis Road.

The current width of the site access is 11.5 m. As such it will be widened in accordance with RMS standards to a minimum of 12.5 m to accommodate dual access for heavy vehicles. The weighbridges have been positioned such that a 19 m B-Double is able to enter the site without queuing outside of the property boundary, and maximising vehicle queuing within the site boundary when exiting.

New and existing car parking areas will be utilised as part of the development, as well as a designated area for truck load inspections. A minimum of 36 car spaces will be provided onsite (plus two disabled car spaces) for light vehicle parking. There will be capacity for 3 trucks to queue on site at any one time. At no time will it be necessary to park heavy vehicles or light vehicles on the adjoining Davis Road. All roads and vehicle parking areas on site will be appropriately sealed to minimise dust impacts.

Further details on vehicle access and parking are discussed in **Section 8.4**.

3.8 Pedestrian Access

Pedestrian access will be via designated pedestrian pathways to ensure the safe interaction of staff and contractors with heavy vehicles. Pathways utilise areas outside of vehicle roadways and through undercover buildings where heavy vehicles are not actively moving. The location of pedestrian pathways is shown on the architectural drawings within **Appendix 6**.

3.9 Services & Utilities

Services including drainage, water, sewer, electrical, gas, and telecommunication supplies are either within or adjacent to the site. Any new services will be installed within sub-surface pipe work and ducting as per Australian Standards. The location of existing site services and utilities are shown on **Figure 16**.

3.9.1 Electricity

Endeavour Energy is the current provider of power to the area and there is an existing 11kva supply to the site. Power will be accessed from this existing supply however provision has been made in the design of building roof space and structural supports to accommodate solar power generation at a later date.

3.9.2 Water Supply

Rainwater will be harvested from the roofs of site buildings and stored in tanks at various locations across the facility. This rainwater will supplement the recycled water reclaimed from the hydro-excavation and drill mud settling process.

Rainwater will be used primarily for the flushing of toilets, landscaping, and truck washing, whereas the recycled water will be used for dust suppression, and the washing of trucks.

In addition to the rainwater and recycled water sources, potable water from Sydney Water's reticulated system will also be used but only in circumstances where rainwater and recycled water is not suitable, ie showering, kitchen/lunch rooms, and water dispensers. Further detail on site water usage will be discussed in **Section 8.6.**

3.9.3 Sewerage

Waste water generated by the onsite staff amenities would be discharged to the Sydney Water sewer system via the site's existing connection which is located adjacent to Davis Road at the south-eastern corner of the site. Further details are provided in **Section 8.6.**

3.9.4 Waste Water

The hydro-excavation/drill mud processing facility will produce on average of 103.4 kL/day of treated waste water that will need to be disposed of from site. It is proposed to release this water to the Sydney Water sewerage system by way of a Trade Waste Agreement (TWA) with Sydney Water. Further details are provided in **Section 8.6**.

3.9.5 Organics Leachate

Leachate collected within the garden organics and food organics building, food de-packaging building, and load out areas, will be collected in designated leachate sumps and a contained leachate management system. The amount of leachate to be managed will be minimal due to all organics activities being undertaken within enclosed buildings that are not impacted upon by runoff and have appropriately designed and drained concrete floors. Any leachate captured within internal shed drainage systems will be re-applied to the shredded material prior to transport off-site. This will help maintain the moisture content of material.

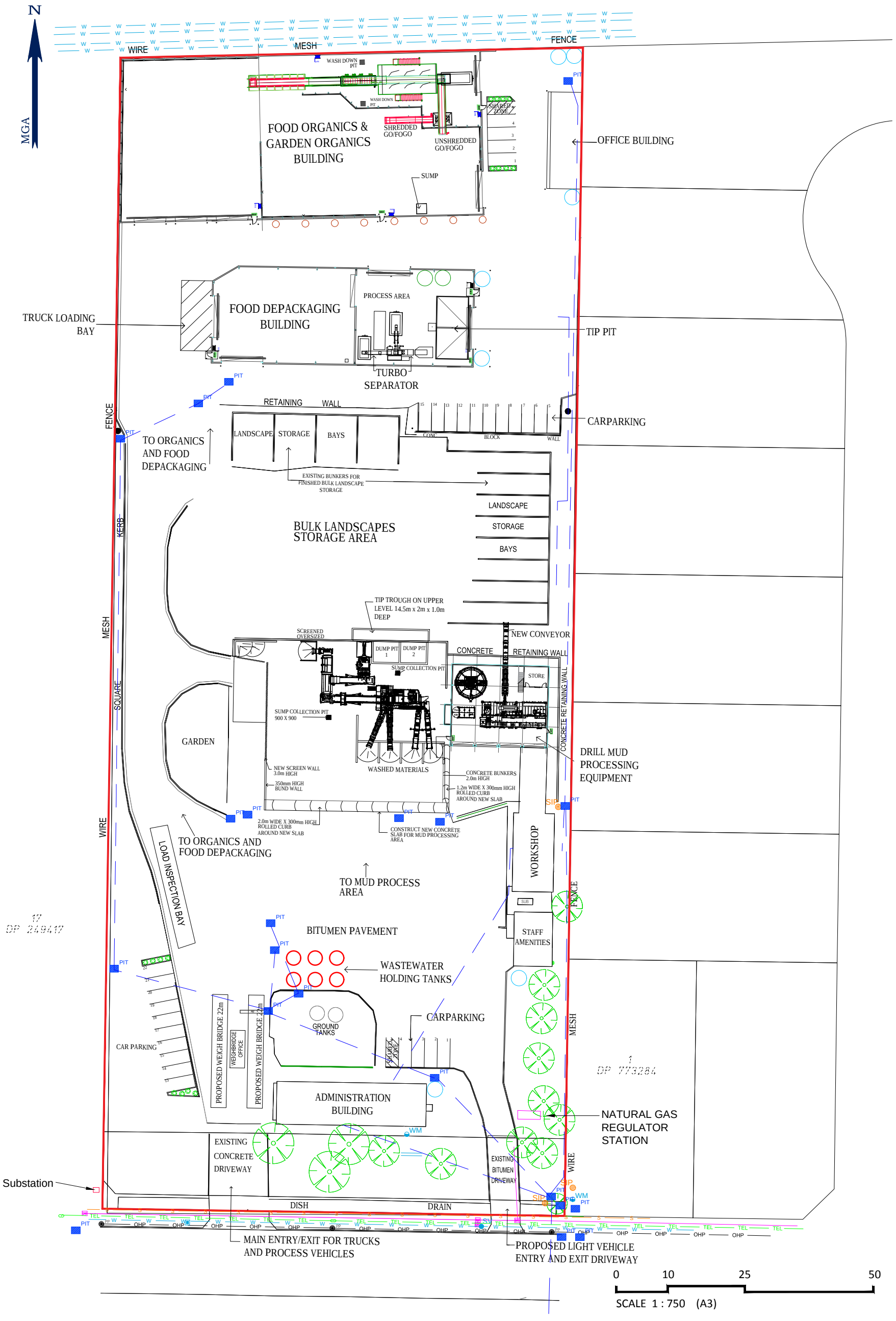
Further detail on leachate management is provided in **Section 8.6**.

3.9.6 Communications

Communications infrastructure traverses the nature strip along the southern boundary of the site that fronts Davis Road. As such, facilities are available to provide telephone and data services to the site.

LEGEND

- FIRE HYDRANT
- EXISTING TREES
- WATER STORAGE
- PROCESS WATER
- WASTE WATER
- ODOUR FILTERS
- SEWER PIPE
- WATER MAIN
- EXISTING STORM WATER
- TELSTRA
- GAS
- OVERHEAD POWER
- TELSTRA PIT
- HYDRANT
- WATER METER
- SEWER INSPECTION PIPE
- GAS MARKER
- STORM WATER PIT



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TITLE: FIGURE 16: SITE SERVICES AND UTILITIES	LOCATION: DAVIS RD WETHERILL PARK	DATUM: GDA 94 PROJECTION: MGA ZONE 56	DATE: 04/04/2017 PURPOSE: PLANNING	CAD REF: J:\JOBS\127k\127695 Wetherill Park\10 - Drafting\Acad Drawing Files VERSION : A A3 (JH-NW-SS)	

CLIENT: BETTER GROW
JOB REF: PR127695

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3.10 External Lighting

External lighting within the facility will be located around the building doorways where trucks are entering and around pedestrian and vehicle routes. Any lighting in and around processing buildings shall be fixed to the external structures and faced downwards. The lighting of internal vehicle roadways will be by inward facing light columns.

3.11 Site Security

The site will be secured by a 2.4 m fence and lockable entry gates. In addition there will be electronically controlled boom gates to manage the entry and exit of vehicles controlled by a weighbridge operator. Night lighting with louvers will be installed across the site, along with 24 hr CCTV cameras and monitored security alarms.

3.12 Fire Protection and Management

3.12.1 Fire Protection

Fire protection and management at the facility is to be undertaken in accordance with Building Code of Australia 2015 (BCA) requirements relating to the Building Classification of each structure. **Table 8** below describes the Building Classifications that apply to the proposed new processing buildings at the development.

Table 8 Building Classification

Building Classification	Floor Area (m^2)	Building Volume (m^3)	Type of Construction	No of Storeys
Organics Processing Building - Class 8	2,259	17,918	Type B	1
Food De-packaging Building - Class 8	961	6,936	Type C	1
Organics Office Building – Class 5	112.5	380	Type C	1

The above Building Classifications have been assigned to each building based on the following criteria from the BCA:

- Class 8 building Type B construction - (a) Area 3500 m^2 and (b) Volume 21,000 m^3
- Class 8 building Type C construction - (a) Area 2000 m^2 and (b) Volume 12,000 m^3
- Class 5 building Type C construction (a) Area 3000 m^2 and (b) Volume 18,000 m^3

In accordance with the above Building Classifications, **Table 9** below details the fire protection to be installed in the subject buildings and across the development site. All appliances will be designed and installed to the relevant Australian Standards.

Table 9 Fire Safety Schedule

BCA Clause	Design / Installation Standard	Required	Comments
E1.6 – Portable Fire Extinguishers	BCA requirements and AS2444-2001	Yes	To be installed in accordance with Table E1.6 of the BCA & AS2444-2001
E1.9 – Fire precautions during construction	BCA Clause E1.9	Yes	In a building under construction – not less than 1 fire extinguisher to suit class A, B and C fires and electrical fires will be provided at all times adjacent to each required exit
E4.2 – Emergency Lighting	BCA Clause E4.2 and AS 2293.1-2005	Yes	Emergency lighting will be installed throughout the transfer building and the offices/amenities
E4.5 – Exit Signs E4.6 – Direction Signs E4.8 – Design and operation of exit signs	BCA Clause E4.5 and AS 2293.1-2005 BCA Clause E4.6 Compliance with AS2293.1	Yes	Exit sign must be clearly visible to persons approaching the exit, and must be installed on, above or adjacent to each required exit Compliance with AS2293.1 - 2005
D1.10 – Exit Doors	BCA Part D Clause D1.10	Yes	
E1.4 – Fire Hose Reels	BCA E1.4 AS2441 - 2005	Yes	Required where building area is greater than 500 m^2
E1.3 – Fire Hydrants	As per AS2419 – Part 1 - 2005	Yes	Fire Hydrants required where building area is greater than 500 m^2 and where a fire brigade is able to attend
E2.2a – Smoke Detection Systems	As per AS 1603.8 - 1996	Yes	In kitchens and other areas
C3.5 – Fire Doors	As per BCA Clause C3.5	Yes and in switch rooms and transformer rooms	If switch rooms are inside the buildings

Although the GO/FOGO building will be storing materials in excess of 1000 m^3, and in some areas at a height greater than 4 m, the stored materials are not considered to be of an excessive fire hazard or listed as a 'Combustible Goods' as per Table E1.5 Requirements for Sprinklers within the BCA. Therefore sprinklers are not considered to be required for this building.

Further fire protection engineering and design will be undertaken as part of the submission of a Construction Certificate for site development works.

Specific details of the BCA requirements for the proposed buildings, fire protection, and the location of fire appliances is provided in the Building Code of Australia Assessment for the development attached as **Appendix 7**. The location of fire protection appliances is also shown on the architectural drawings attached as **Appendix 6**.

3.12.2 Fire Management

Waste materials received and processed at the facility generally all have a high water content (ranging from 25% to 95%) therefore the potential to combust is extremely low. Organic materials are only kept onsite for a maximum of 24 hrs, which further reduces the potential for fire. The organics within the buildings are treated with leachate water captured from within the buildings which keeps the material wet and further lowers the risk of fire. The processing buildings are mostly constructed of concrete and steel, as such they have very limited combustible materials in their design.

No organics processing will occur outside of the processing buildings and no waste materials will be stockpiled outside of these buildings. Stockpiles within the process sheds will also be kept to a maximum height of 4 m. While the drill mud processing will occur outside, it is a wet process with 65-95% water content, therefore it is not considered to be a combustible material.

The process areas at the facility (ie. organics, drill muds) will be contained within their own 'dirty water' systems. These systems are fully closed systems and will not release water off site. In the event of a fire, any fire water produced would be captured in this system. The 'clean water' areas, outside of the 'dirty water' catchments, are discharged to the Council stormwater system. In the event of a fire this system would be shut off from the Council stormwater system by way of a gate valve to prevent the release of fire water from the site.

As detailed above in **Section 3.11.1**, fire protection and appliances will be designed and installed in accordance with the required BCA requirements and also in accordance with the relevant Australian Standards.

3.13 Surface Water Management

An engineered surface water management system has been designed for the site to provide long-term structural controls and to mitigate the impact of surface water runoff throughout the life of the proposed development. The design of the surface water management system includes the separation of 'clean' and 'dirty' water areas to allow the release of 'clean' water to the street stormwater system and the return of 'dirty' water to the hydro-excavation/drill mud ground pits for recycling and re-use. The surface water management design also includes the installation of rainwater harvesting tanks to collect runoff from the roofs of onsite buildings. Water collected would be used as 'grey' water for toilet flushing, wash down of trucks and hard surfaces, and for maintaining gardens. Surface water collected on sealed internal haul roads will be conveyed via dish drains to in ground pits and pipes for treatment and/or release to the industrial precinct stormwater system.

Further detail on surface water design and management is discussed in **Section 8.6**.

3.14 Landscaping

Landscaping activities would be undertaken to improve the visual and environmental amenity of the site, particularly along the southern boundary that fronts Davis Road where there already exists significant native vegetation. The landscaping would comprise the planting of native understorey species of differing growth habits to supplement the vegetation that currently exists. The plantings would be progressively undertaken following construction and development of site infrastructure.

Smaller stands of vegetation and landscaping also exist along the south-eastern and south-western boundaries of the site, including some isolated stands in the central area of the facility and adjacent to the main administration office. These areas, where appropriate, will be retained and upgraded where possible.

The type of plants to be utilised in the landscaping will be native species endemic to the local area, and range from ground covers, bushes, and small trees. There are currently existing large trees across the site which will remain, therefore it is not envisaged to plant any further large species.

3.15 Workforce

3.15.1 Construction

During the construction phase of the Project there will be the need for many specialised contractors, suppliers, and labourers. It is anticipated that the Project will create 40-50 jobs during the construction period.

3.15.2 Operations

Once fully operational, the facility will employ up to 25 full-time staff. Depending on the process area, some staff will be on separate day and night shifts to cater for those activities undertaken during the night period. Shifts outside of these hours are only considered on a project by project basis, when material is required to be delivered during the night time period. Generally, there are two shifts for the site as follows:

- Day Shift: 5:00 am to 7:00 pm: up to 25 staff; and
- Night Shift: 7:00 pm to 5:00 am: up to 5 staff.

3.16 Hours of Operation

3.16.1 Construction

Construction activities at the site would occur from 7 am to 6 pm Monday to Friday and from 8 am to 1 pm on Saturdays. No construction activities would occur on Sundays or public holidays. It is anticipated that construction activities would staggered over a 2-3 year period which will allow the gradual development of the facility based on customer demand for particular recycling services.

3.16.2 Operations

The site is proposed to operate 24 hours a day, Monday to Friday, and from 6:00am to 2:30pm on Saturday's primarily for maintenance activities, deliveries, and minimal outgoing consignments. The facility also proposes to provide a 24 hour emergency callout provision for Saturday and Sunday primarily for the drill mud and hydro excavation deliveries and food waste collectors who provide out of hours service to the city. General office hours are proposed to be from 6:00 am to 5:00 pm Monday to Friday.

A modern waste recycling facility needs to be able to receive, process, and despatch 24 hours per day to align with customer requirements, however it can be expected that most operations would be carried out during weekday daytime hours.

3.17 Construction Activities

The construction of the proposed resource recovery facility is to be undertaken over a period of 2-3 years, with those aspects of the development considered to be in most demand by customers constructed first. It is generally considered that the drill mud/hydro excavation processing equipment will be installed first, followed by the food and garden waste processing building and then the food de-packaging building. All site services, stormwater drainage and management structures, hardstand re-surfacing, building upgrades, and site improvements will be undertaken during the first year of site development. This gradual development will reduce the impact to the surrounding road network and adjoining businesses through a steady increase from construction through to operations.

3.17.1 Site Preparation

As the site has been an industrial development in the past, and was previously subject to considerable cut and fill, including the establishment of three benched areas, no further bulk earthworks will be undertaken for the proposed development. The existing benching has been integrated into the design and layout of the operations.

All current site buildings, and the majority of remaining structures on the site, will be utilised as part of the proposed development. However, the existing wash bay roof at the site will be demolished.

Cranes will be utilised on site during the erection and installation of structural steel elements.

Existing retaining walls and substructures on the site will remain in place and have been integrated into the proposed design. This has reduced the need to undertake extensive site preparation activities.

3.17.2 Building and Infrastructure Construction

The installation of site services will include trenching, laying of pipe work and conduit, and backfilling in layers. These areas will then be suitably re-surfaced.

Building foundations will require temporary works in the form of excavation supports (where required), placement of mass concrete and reinforced concrete foundations. Given that the site had previously contained numerous potentially contaminating sources, an unexpected finds protocol will be established for excavation activities and/or in-ground works.

For the steel frame structures and concrete tilt panels, heavy vehicles and cranes would be required for delivery, unloading and erection of the steel frame. Scaffolding will be required for roof, wall cladding and installation of guttering and external fixtures.

The site is predominantly sealed roadway and hardstand, however some areas on the site have been disturbed to allow rehabilitation works to occur post the decommissioning of the previous asphalt plant. Where required, disturbed areas will be concreted or re-sealed with a two-coat bitumen seal suitable for the movement of heavy vehicles. Any areas of the site that are required to contain leachate or other potentially polluting materials will be suitably sealed and drained so as to prevent infiltration of these contaminants. Concrete poured in bays, together with bitumen, would be laid to form any new road pavements or ramps onsite.

Bulk water tanks will be trucked to the site and placed in situ once a suitable base substrate is established of either concrete or compacted road base.

The weighbridge decks would be installed on concrete foundations and would be delivered to site on a large flatbed float. The weighbridges would be craned into position from the flatbed trailer onto the concrete foundations.

Building services, such as lighting (internal and external), ventilation, odour management equipment, fire protection, and water services will be installed once the main structures have been erected.

Car parking areas will be suitably sealed, drained, and demarcated, including disabled parks and the truck inspection bay.

The access to the site will be widened to 12.5 m to allow the dual entry and exit of heavy vehicles, and the gates suitably positioned to allow the inward queuing of a heavy vehicle up to a maximum length of one 19 m B-Double. Boom gates will also be installed at the entry and exit weighbridges.

3.18 Environmental Management

The facility will operate under an Environmental Management Plan (EMP) that will be updated as necessary to incorporate any key operational changes. The EMP includes the following sections:

- Introduction
- Environmental Policy
- Organisational Structure
- Description of Activities
- Identification of Environmental Issues and Impacts

- Environmental Management
- Management Procedures
- Contingency Plans and Emergency Response
- Complaints Management
- Auditing and Reporting
- Continuous Improvement

A complete version of the EMP is attached as **Appendix 21**.

4.0 Project Need and Alternatives

4.1 Need for the Proposed Development

4.1.1 Social and Economic

Bettergrow believes the proposed recycling and resource recovery facility will provide many benefits to businesses in the greater Sydney region and the surrounding community. The estimated capital cost including site development, building upgrades, infrastructure establishment, and plant and equipment is estimated to be $16 Million.

When fully operational, Bettergrow will employ up to 25 staff at the site, which will provide jobs for the local community and surrounds. Associated supply businesses will also benefit from the operation of the site. When considering the estimated turnover for the proposal, Bettergrow believes that this could be in the order of $20 Million.

The proposed facility will further assist the NSW government to achieve its goals to increase the diversion of waste from landfill disposal through the development of strategic recycling infrastructure and processing facilities. There is also an under supply of processing capacity for organic wastes and resource recovery in NSW, therefore the proposed faciltiy will provide additional processing capacity to ensure more wastes are recovered and re-used and less are sent to landfill. Details of these government initiatives are discussed further in **Section 4.1.3**.

4.1.2 Strategic

The facility will assist the NSW Government in meeting their waste management targets in relation to the diversion of waste from landfill and increasing the economic use of recycled products. The development is consistent with the following regulations and policies:

- NSW Waste Avoidance and Resource Recovery Strategy 2014-21;
- Western Sydney Regional Waste Avoidances and Resource Recovery Strategy 2014-2017; and
- Protection of the Environment Operations (Waste) Regulation 2014.

The key objectives of the above strategies relevant to the development are:

- Decrease the amount of waste sent to landfill to 25%;
- By 2021-2022 increase the recycling rates of municipal solid waste (MSW) to 70%; and
- By 2021-2022 reduce the amount of waste generation per capita.

The development will address these objectives by:

- Providing combined capacity of up to 200,000 tonnes of resource recovery for food and garden organics, commercial and industrial (C&I) food wastes, hydro excavation and drill muds and other related recycled products;
- Recycling materials that would traditionally be disposed of to landfill; and
- Increasing the amount of household waste that is recycled.

The following sections expand on the need for the development in relation to current and future waste projections in NSW and the existing policy framework.

4.1.3 Government Recycling Initiatives and Strategies

4.1.3.1 NSW Waste Avoidance and Resource Recovery Strategy 2014-2021

The NSW Environment Protection Authority's (EPA's) Waste Avoidance and Resource Recovery Strategy (WARR Strategy) 2014-21 provides a clear framework for waste management up to 2021 and sets a number of objectives and targets applicable to the MSW and C&I waste sectors.

Constrained capacity for the recycling of waste has been highlighted in the WARR Strategy as a key issue due to the lack of recycling infrastructure in the Sydney Metropolitan Area. An analysis of the municipal, commercial and industrial, and construction and demolition waste data for 2010–11 indicates that there is significant potential to increase recycling.

In the MSW stream, the major untapped waste sources are food and garden organics, which account for almost half of the average household waste. Significant quantities of paper/cardboard, glass, plastics and metals in household waste bins also go to landfill. Based on this, tackling household food and garden waste and increasing the effectiveness of kerbside recycling systems are clear priorities.

Areas for priority recycling action in the C&I sector also include addressing food waste, along with paper/cardboard, plastics and timber wastes.

In order to address this capacity shortfall, the WARR Strategy identifies the need for increased recycling and recovery of waste to meet growing demands. Critical to meeting this demand is the availability of waste recycling infrastructure. The proposed Greenspot recycling and resource recovery facility will provide additional infrastructure and processing capacity for the Sydney region, and assist the NSW government to meet its waste targets and initiatives for MSW and C&I waste recycling.

4.1.3.2 Western Sydney Regional Waste Avoidance and Resource Recovery Strategy 2014-2017

At a regional level, the Western Sydney Region of Councils (WSROC), of which Fairfield City Council is a member, produced the Western Sydney Regional Waste Avoidance and Resource Recovery Strategy 2014-2017.

The WSROC Region (comprising 10 Councils) has a population of just over 1.6 million people. Population forecasts published in the Metropolitan Strategy for Sydney indicate that Sydney's population will grow by 1.6 million people in the next 20 years with 900,000 of this population growth occurring in Western Sydney.

Domestic waste generation in the WSROC region for 2011/2012 was reported to be upwards of 700,000 tonnes. Volumes are expected to grow to more than 800,000 tonnes per annum by 2020/2021. The strategy has developed the following targets in line with the State-wide WARR targets:

- Work towards reducing regional waste generation from current generation of 7.8 kg/capita/week to 7.5 kg/capita/week by 2021;
- Gradually improve the regional resource recovery rate to 58% by 2017 and 70% by 2021 (currently 53%);
- Work towards achieving the WARR target for diversion of waste from landfill by 2021;
- Build, upgrade or facilitate 10 community recycling centres or innovative solutions for household problem wastes by 2021;
- Partner with the State to establish a litter baseline by 2015 and work towards reducing the incidence of litter by 2017;
- Partner with the State to establish an illegal dumping baseline by 2015 and work towards reducing the incidence of illegal dumping by 10% by 2017; and
- Work towards enhancing regional cooperation and governance.

The strategy also presented an infrastructure gap analysis for the region to identify the potential future shortfall in waste treatment and disposal capacity within the region. One of the key challenges identified by the strategy is the availability of facilities within a reasonable distance of the region.

The modelling presented in the strategy identifies a potential shortfall of organic and residual treatment capacity in the region of approximately 300,000 tonnes by 2021.

The proposed development would contribute to meeting the targets of both the State and Regional WARR strategies with regard to diverting waste from landfill and providing much needed recycling infrastructure.

4.1.3.3 Waste Less Recycle More Initiative

The NSW Government's Waste Less, Recycle More Initiative is a 5 year, $465.7 million package to transform waste and recycling in NSW. Waste Less, Recycle More provides funding for business recycling, organics collections, market development, managing problem wastes, new waste infrastructure, local councils and programs to tackle illegal dumping and litter. The initiative is funded through the Waste Levy and is the largest waste and recycling funding program in Australia.

The Waste Less, Recycle More programs seek to achieve the following:

- Encourage local communities to think differently about waste avoidance, recycling, littering and illegal dumping;
- Deliver conveniently located, value-for-money waste infrastructure to make it easier for households and business to do the right thing; and
- Drive innovative regulatory approaches to protect the environment and support investment in new waste programs.

Bettergrow have obtained grant funding for the proposed development through the NSW EPA's Waste Less Recycle More Initiative, with a particular focus on funding for organics infrastructure. The *Organics Infrastructure (Large and Small)* Program supports new and enhanced infrastructure and on-site processing for organic waste, food donation projects and local Council run home composting programs.

The proposed facility would recycle food organics and garden organics that are currently collected by kerbside services, or from transfer stations, and taken to landfill. The development will provide further recycling infrastructure and capacity and also further divert waste from landfill.

4.1.4 Competitors

There are several approved or proposed waste recycling facilities surrounding the Project site, however most are not vertically integrated, as will be the case for the subject development, through providing recycled water and organics to Greenspot's Ravensworth and Mount Stewart composting facilities. The Greenspot business model is to own and operate recycling facilities that can provide synergies with other recycling operations within the Greenspot group. Creating a higher and better value end product combined with investing in infrastructure further down the value chain provides Bettergrow with a distinct edge over its competitors even with them operating in close proximity and vying for similar waste materials.

Table 10 below provides details of the surrounding approved and proposed recycling and resource recovery facilities.

Table 10 Surrounding Resource Recovery Facilities and Projects

Facility or Project	Location	Company	Materials Recycled
Erskine Park Resource Management Facility	Erskine Park	Transpacific Cleanaway Pty Ltd	Commercial and Household Waste, Processing and Transfer
Windemere Recycling Facility	Wetherill Park	Boral Recycling Pty Ltd	Construction and Demolition Waste, Recycling and Re-Use
Wetherill Park Resource Recovery Facility	Wetherill Park	Suez Environment	Residential and Commercial Waste, Sorting and Transfer
Waste and Resource Management Facility	Wetherill Park	Resource Co Pty Ltd	Construction and Demolition Waste, Commercial and Industrial, and Municipal Solid Waste Sorting and Re-Use

4.2 Project Options

4.2.1 Preferred and Alternate Locations

The site of the proposed development is an existing industrial site that has been subject to the production of asphalt material. These previous activities have left the site with minimal options for future re-use due to the hazardous nature of those activities.

The proposed recycling facility will re-use the site in its current form without the need to undertake significant modification to the land surface. This will allow the re-use of a site that might otherwise be unfavourable to other types of developments which would need to undertake significant re-design works.

The Davis Road site is also strategically located close to major transport routes, including the M4 and M7 motorways, which will allow access for larger vehicles from the site to the motorway network through RMS approved routes for large vehicles.

The site was also selected as the preferred location for the development due to its distance from residential dwellings, shopping districts, schools, and public services. The location is also boarded in the north by the Prospect Dam Reservoir which provides further buffering for the development.

The site is centrally located close to markets where wastes will be sourced, and where end products will be sold.

All other locations considered were either too close to residences, removed from access to major transport routes, or to far from waste sources making transport costs too high and the project uneconomic.

4.2.2 Do Nothing Option

In addition to the alternatives described above, another option to be considered is the ‘do nothing’ option, with Bettergrow not developing this site.

The proposed development involves the construction and operation of a resource recovery and recycling facility on an existing industrial site which, due to its previous use, would be unsuitable for many types of future development. Much of the existing infrastructure at the Project site is be to be utilised as part of the proposed development. This represents an efficient use of existing infrastructure, particularly when compared with constructing the facility on a greenfield site, and utilises a site that may otherwise remain vacant.

The operation of the proposed facility would support employment for up to 25 full-time staff on roster. Additional indirect employment associated with supplying and servicing the site will also be generated.

In addition to these social and economic benefits, the facility would service the increasing demand for waste recycling infrastructure in the Sydney region.

Based on the above arguments, the overall balance of environmental, social and economic impacts of the development is considered to be positive, and the 'do nothing' option was not considered further.

5.0 Planning and Statutory Framework

5.1 Introduction

This chapter outlines the statutory framework that applies to the proposal. It describes the relevant

Commonwealth and NSW legislation, and the regulatory framework under which the proposal would be assessed.

5.2 Commonwealth Legislation

5.2.1 Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) is administered by the Commonwealth Department of the Environment (DoE) and provides a legal framework to protect and manage places defined as Matters of National Environmental Significance (MNES). The EPBC Act lists the following places as MNES:

- World Heritage properties;
- Wetlands of International Significance (including Ramsar wetlands);
- Listed threatened species and communities;
- Listed Migratory Species protected under international agreements (CAMBA and JAMBA);
- Protection of the Environmental from Nuclear Actions; and
- Marine Environment.

Under Part 9 of the EPBC Act, actions that may have a significant impact on a MNES are deemed 'controlled actions' and require approval from the Commonwealth Minister for the Environment.

An assessment of whether the Development would have a significant impact on any MNES was undertaken as part of the ecology assessment (refer **Section 8.8**). This assessment found that there were no MNES.

The proposal would not have an impact on MNES, and accordingly, approval from the Commonwealth Minister for the Environment is not required.

5.3 NSW Legislation

5.3.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) forms the statutory framework for environmental assessment and planning approval in NSW. The Project is considered 'State Significant Development' (SSD) in accordance with Division 4.1 of Part 4 of the EP&A Act. Specifically, section 89C of the EP&A Act states the following:

> ***89C Development that is State significant development***
>
> *(1) For the purposes of this Act, State significant development is development that is declared under this section to be State significant development.*
>
> *(2) A State environmental planning policy may declare any development, or any class or description of development, to be State significant development.*

In accordance with s89C(2), the development is declared to be SSD as it is a type listed in Schedule 1 of the *State Environmental Planning Policy* (SEPP) - *State and Regional Development*. Namely;

23 Waste and resource management facilities

(3) Development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste.

Having triggered as SSD, the relevant consent authority is the Minister pursuant to s89D of the EP&A Act:

89D Minister consent authority for State significant development

(1) The Minister is the consent authority for State significant development.

Note. *Section 23 enables the Minister to delegate the consent authority function to the Planning Assessment Commission, the Secretary or to any other public authority.*

Based on the intended handling capacity of the Resource Recovery Facility being 200,000 tonnes per annum, the developed is classified as SSD.

5.3.2 Protection of the Environment Operations Act 1997

The Protection of the Environment Operations Act 1997 (POEO Act) establishes the State's environmental regulatory framework and includes licensing requirements for certain activities. As the Development would receive more than 12,000 tonnes of waste per year from offsite, it would be a premises-based activity under Clause 42(3), Schedule 1 of the POEO Act and would be required to operate under an EPL administered by the Environment Protection Authority (EPA) under Section 43(b) of the Act.

Consultation has been undertaken with the EPA on a number of occasions throughout the preparation of this EIS. Bettergrow will seek an EPL following approval of the Development.

5.3.3 Waste Avoidance and Resource Recovery Act 2001

The objectives of the NSW Waste Avoidance and Resource Recovery Act 2001 (WARRA) are to encourage efficient use of resources and reduce environmental harm. This is aimed to be achieved with the principles of ecologically sustainable development and considering resource management options against the hierarchy of avoid, reuse and dispose.

The proposed facility is consistent with these objectives by promoting a reduction of waste and facilitating waste re-use. Further detail on the NSW Governments Waste Avoidance and Resource Recovery Strategy and a Strategic Justification are discussed above in **Section 4.0.**

5.3.4 Other Relevant State Legislation

5.3.4.1 Water Management Act 2000

The NSW Water Management Act 2000 (WMA) regulates the use and interference with surface and groundwater in NSW. The proposal is located within the area covered by the Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2011 (the Water Sharing Plan). The facility is within the Georges River management zone.

Under Section 89J of the EP&A Act, water use approvals, water management works approvals and controlled activity approvals are not required for development that is SSD.

No groundwater is to be taken or intersected as a result of the proposal; therefore, no permits or licences are required under the WMA.

The proposal would result in no net increase in the volume of surface runoff captured as there is no increase in the area of impervious surfaces.

The surface water assessment, flooding assessment, and water balance for the proposal are detailed in **Section 8.6**.

5.3.4.2 National Parks and Wildlife Act 1974

The NSW National Parks and Wildlife Act 1974 (NPW Act) provides for the conservation of places, objects and features of significance to Aboriginal people and protection of native flora and fauna. A person must not harm or desecrate an Aboriginal object or place without an Aboriginal heritage impact permit under Section 90 of the NPW Act. However, a Section 90 permit is not required for SSD approvals by provisions of Section 89J of the EP&A Act. Potential impacts on Aboriginal heritage objects or places are unlikely due to the current highly developed nature of the existing site. An assessment of Aboriginal heritage is discussed further in **Section 8.10**.

5.3.4.3 Threatened Species Conservation Act 1995

The development is not anticipated to damage critical, or other habitat, or otherwise significantly affect threatened species, populations and ecological communities as the Project has been designed to avoid impact to the remaining native vegetation at the site (refer to **Section 8.9**).

5.3.4.4 Heritage Act 1977

A search of the Local and State heritage registers found that there are no recorded heritage items within the Project site (refer to **Section 8.11**). It is considered there will be no impact to historic heritage in the locality of the development.

5.3.4.5 Contaminated Land Management Act 1997

The proponent is not proposing to undertake any contaminating activities as part of the proposed resource recovery and recycling facility, rather any contaminated non-approved material received at the site will be vetted and rejected as per a site incoming Waste Quality Management Plan.

A search of the EPA's Contaminated Land Register found that there are no previous or pending contaminated land notices related to the property. The site has been subject of considerable site remediation following the decommissioning of a former Emoleum plant operated by Mobil. Several contaminated site assessments, including groundwater and soil sampling, have been undertaken as part of these assessments. A review of all previous contaminated site assessments has been undertaken for this EIS by Douglas Partners, with the results discussed further in **Section 8.8**.

5.3.4.6 Roads Act 1993

Both the Roads and Maritime Services (RMS) and Fairfield City Council have been consulted with regard to the potential local road impacts resulting from the development of the facility. These potential impacts included increased truck movements through the Wetherill Park industrial precinct, heavy vehicle queuing on to Davis Road, the provision of adequate staff car parking, site access, and the Level of Service (LoS) at intersections on heavy vehicle routes. A Traffic Impact Assessment has been prepared for the Project and is discussed in more detail in **Section 8.4**.

5.4 Environmental Planning Instruments and Policies

5.4.1 State Environmental Planning Policies

5.4.1.1 State Environmental Planning Policy (State and Regional Development) 2011

The Project triggers SSD in accordance with Division 4.1 of Part 4 of the EP&A Act, as it is a type of development listed in Schedule 1 of the State Environmental Planning Policy (State and Regional Development) 2011. Pursuant to Clause 8 of the SEPP:

> ***8 Declaration of State significant development: section 89C***
>
> *(1) Development is declared to be State significant development for the purposes of the*

Act if:

> *(a) the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and*
>
> *(b) the development is specified in Schedule 1 or 2.*

Specifically, Clause 23 of Schedule 1 lists "*Waste and Resource Management Facilities"* as SSD if the development triggers one of the six sub-clauses.

This proposal is triggered by sub-clause 3 as it is expected to process up to 200,000 tonnes of material per year:

> *3) Development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste.*

The proposed facility falls within this category of development and accordingly has been declared to be a SSD.

5.4.1.2 State Environmental Planning Policy (Infrastructure) 2007

Clause 104 in conjunction with Schedule 3 of the Infrastructure SEPP identifies what is considered to be a traffic generating development requiring consultation with RMS. Resource recovery or waste transfer stations of any size or capacity are identified as a traffic generating activity under Column 1 of Schedule 3 and therefore this provision of the SEPP applies.

Consultation with the RMS was undertaken during the preparation of this EIS and DP&E have also referred this application to RMS during assessment. Detail on traffic generation is discussed further in **Section 8.4**.

5.4.1.3 State Environmental Planning Policy No. 33 – Hazardous Development

State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP 33) provides definitions for hazardous and offensive industry based on the likely impacts of the proposal. A potentially hazardous industry is defined within SEPP 33 as *"a development for the purpose of any industry which, if the development were to operate without employing any measures to reduce or minimise its impact, would pose a significant risk to human health, life or property, or to the biophysical environment*".

The *Hazardous and Offensive Development – Applying SEPP33* Guideline sets out a risk screening and threshold procedure to assist in determining whether a particular proposal exceeds specified threshold limits and falls within the definition of a "Potentially Hazardous Industry", and therefore whether SEPP 33 applies.

A risk screening procedure to determine whether the development is considered to be a 'Potentially Hazardous Industry' under the SEPP 33 has been completed as part of the EIS (refer to Section 8.13).

5.4.1.4 State Environmental Planning Policy No. 55 – Remediation of Land

State Environmental Planning Policy No 55 (Remediation of Land) provides that a consent authority cannot grant development consent unless it has considered whether or not the land is contaminated.

Clause 7(1) of SEPP 55 states:

> ***7 Contamination and remediation to be considered in determining development application.***
>
> *(1) A consent authority must not consent to the carrying out of any development on land unless:*
>
> *(a) It has considered whether the land is contaminated; and*
>
> *(b) If the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out; and*

(c) If the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

The proposal provides for the sorting, processing, treatment and blending of various organic and drill mud materials into recycled products. The facility will not accept waste that is contaminated or not permitted to receive. To ensure that contaminated wastes don't enter the facility a detailed Prohibited Waste Management Protocol will be prepared to ensure waste quality is maintained (refer to **Section 3.4.4**).

Since the site was decommissioned from being an Emoleum manufacturing operation by Mobil, several contaminated site assessments have been undertaken as part of the site remediation process. A review of all previous contaminated site assessments has been undertaken for this EIS by Douglas Partners with no significant contamination being evident. Details of the contamination assessment review are discussed further in **Section 8.8**.

5.4.2 Fairfield Local Environment Plan 2013

The Fairfield LEP 2013 governs land use within the Fairfield City Council LGA. The Project site is zoned IN1 General Industrial under the Fairfield LEP 2013.

The proposed development is consistent with the objectives of the IN1 General Industrial zone which are:

- To provide a wide range of industrial and warehouse land uses;
- To encourage employment opportunities;
- To minimise any adverse effect of industry on other land uses;
- To support and protect industrial land for industrial uses; and
- To ensure development is not likely to detrimentally affect the viability of any nearby business centre.

The proposal is consistent with the aims of the Fairfield LEP as the construction and operation of the facility will result in an increase in employment, and both direct and indirect economic benefits for the wider area. In addition, the Project is aiming to respond to changes in market demands, while optimising the use of the site, improving waste consolidation for the improvement of broader resource recovery outcomes, and assisting in meeting waste avoidance and resource recovery objectives.

5.4.3 Fairfield Development Control Plan 2013

The Fairfield DCP 2013 (the DCP) supplements the Fairfield LEP by providing more detailed controls and guidelines for development across the Fairfield LGA. The proposal is SSD; therefore clause 11 the SRD SEPP applies. Clause 11 states:

Development control plans (whether made before or after the commencement of this Policy) do not apply to:

(a) State significant development, or

(b) development for which a relevant council is the consent authority under section 89D (2) of the Act.

Whilst the provisions of the DCP do not apply to the Project, the development has been designed to take into consideration the requirements of the Fairfield DCP (2013).

5.4.4 Section 94A Fixed Development Contributions

Section 94A of the EP& A Act provides as follows:

94A Fixed development consent levies

(1) A consent authority may impose, as a condition of development consent, a requirement that the applicant pay a levy of the percentage, authorised by a contributions plan, of the proposed cost of carrying out the development.

(2) A consent authority cannot impose as a condition of the same development consent a condition under this Section as well as a condition under Section 94.

(3) Money required to be paid by a condition imposed under this Section is to be applied towards the provision, extension or augmentation of public amenities or public services (or towards recouping the cost of their provision, extension or augmentation). The application of the money is subject to any relevant provisions of the contributions plan.

(4) A condition imposed under this Section is not invalid by reason only that there is no connection between the development the subject of the development consent and the object of expenditure of any money required to be paid by the condition.

(5) The regulations may make provision for or with respect to levies under this Section, including:

(a) the means by which the proposed cost of carrying out development is to be estimated or determined; and

(b) *the maximum percentage of a levy.*

Based on the *Fairfield City Council – Indirect Section 94A Development Contributions Plan 2011*, Section 94A contributions would be in the order of $16,000 based on 1% of the total development cost ($16 million) of the resource recovery facility.

6.0 Consultation and Stakeholder Engagement

6.1 Overview

A stakeholder and community consultation program has been undertaken by the proponent to assist in the preparation of the EIS for the Project. This chapter provides an overview of stakeholder engagement for the Project, a description of the stakeholder engagement activities undertaken and a summary of the findings that have been incorporated into this EIS.

6.1.1 Formal Consultation Requirements

Stakeholder engagement and consultation is an integral component in the preparation of an EIS for State Significant Development (SSD) projects. The SEARs for the Project state that:

"During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, service providers, community groups and affected landowners. In particular you must consult with:

- *Fairfield City Council;*
- *Environmental Protection Authority;*
- *Office of Environment and Heritage;*
- *Department of Primary Industries;*
- *Roads and Maritime Services;*
- *Rural Fire Service;*
- *Sydney Water; and*
- *The surrounding land owners and occupiers that may be affected by the proposal.*

The EIS must describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided."

6.2 Government Consultation

Consultation with government agencies was initiated by the Department of Planning and Environment (DP&E) during the preparation of the Secretaries Environmental Assessment Requirements (SEARs). Government Agencies that provided a response to DP&E for inclusion in the SEARs included:

- NSW Environment Protection Authority;
- Fairfield City Council;
- NSW Roads and Maritime Services;
- NSW Department of Primary Industries (DPI) Agriculture;
- NSW DPI Water;
- NSW Office of Environment and Heritage (OEH); and
- Sydney Water.

Consultation was undertaken by the proponent with numerous government agencies during the preparation of this EIS to clarify agency requirements, discuss methodologies, and to seek feedback. A summary of the consultation undertaken with Government Agencies is provided in **Appendix 2**.

6.3 Aboriginal Community Consultation

Consultation with the local Aboriginal community was undertaken by RPS in accordance with clause 80C of the NPW Regulation and the four stage process as detailed in *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (ACHCRs) (DECCW, 2010, now part of OEH). An overview of the consultation process is outlined below. Further detailed information is provided in the Aboriginal Cultural Heritage Assessment (ACHA) (RPS, 2016) included in **Appendix 17.**

6.3.1 Stage 1 – Notification of Project and Registration of Interest

Formal consultation for the Project commenced on 1 February 2016 with the distribution of letters to the following parties requesting the identification of interested Aboriginal groups that may have an interest in the Project:

- National Native Title Tribunal;
- Native Title Services Corporation Limited;
- Registrar of Aboriginal Owners NSW Department of Aboriginal Affairs;
- Fairfield City Council;
- Office of Environment and Heritage (OEH) - Parramatta;
- Gandangara Local Aboriginal Land Council; and
- Local Land Services.

Letters were then sent to the interested Aboriginal groups on 21 & 23 February 2016 inviting a registration of interest in the Project consultation process.

In addition, an advertisement was placed in the Fairfield Advance on 3 February 2016 inviting registration of interest from Aboriginal parties in the Project consultation process. A list of the interested aboriginal parties and those that registered an interest in the Project are included in the ACHA in **Appendix 17**.

6.3.2 Stage 2 – Provision of Project Information

Project information was provided to the Registered Aboriginal parties on 7 March 2016 which included an outline of project activities, proposed impact areas and the environmental assessment process.

6.3.3 Stage 3 – Gathering Information on Cultural Significance

Stage 3 was concerned with the gathering of information regarding cultural significance. The aim of Stage 3 was to facilitate a process by which the RAPs could have input into the heritage assessment methodology and management options, and provide information on the cultural significance of Aboriginal objects or places.

The RAPs were provided with a proposed methodology for the cultural heritage assessment on 7 March 2016 and given a minimum of 28 days to respond. In addition, the views of the RAPs on potential management options for Aboriginal objects or places were also sought. The RAPs did not disclose any specific traditional/cultural knowledge or information on sites or places of cultural significance within the Project area or surrounding area.

The registered Aboriginal stakeholders who responded to the methodology were offered the opportunity to participate in a field survey of the Project site. One group participated in the survey.

6.3.3.1 Survey

One RAPs attended the survey on 26 May 2016. The purpose of the survey was to inspect visible ground surfaces, observe exposed soil profiles and other visible features such as gardens, access paths, mature

trees and exposed areas around mature trees, and to assess the potential for archaeological deposits in the Project Area. The survey also aimed to record any cultural sites or Aboriginal landscapes, if identified by the Aboriginal stakeholders.

No archaeological deposits were discovered in the Project Area and no cultural sites or Aboriginal landscapes were identified during the survey.

6.3.4 Stage 4 – Review of Draft Aboriginal Cultural Heritage Assessment

The draft ACHA for the Project was provided to the RAPs on 26 August 2016 for review and comment. No comments were received from any of the RAPs by 23 August 2016 which was the end of the 28 day response period. Accordingly, the ACHA was made final.

6.4 Community Consultation

The purpose of the community consultation program was to identify the key community stakeholders, present the stakeholders with details of the proposed Project and give the stakeholders an opportunity to provide feedback and identify any issues or concerns they may have.

The community consultation program focused upon three main groups, namely:

- Those adjacent to or likely to be directly impacted upon by the construction and or the operation of the Project;
- Those adjacent to the principal transport route (Elizabeth Street and Davis Road) within the Wetherill Business Park: and
- Those within the wider community that have an interest in the way that wastes are managed.

A number of consultation activities were undertaken during the preparation of the EIS. An overview of these activities is outlined below.

6.4.1 Project Factsheet

A project factsheet was prepared to introduce the project to key community stakeholders and provide information on the various ways that people could find out additional detail on the project and provide their feedback. The project factsheet provided information on Greenspot, a project summary which included the purpose of the facility, proposed waste streams, and site infrastructure. The project factsheet also included an indicative project timeline, why the facility is needed, the employment and economic opportunities and where additional information could be found on the project.

The project factsheet was distributed to community stakeholders via face to face (i.e door knocking and targeted interviews), mailout and at the community information sessions. In addition, a copy of the project factsheet was posted on Bettergrow's website. Approximately 260 factsheets were distributed in total. A copy of the project factsheet is provided in **Appendix 2**.

6.4.2 Project Feedback Form

A feedback form was prepared and distributed with the project factsheet (approximately 260 copies) to community stakeholders via door knocking, mailout and community information sessions. Stakeholders were invited to record any issues or concerns along with any other comments they may have on the Project. In addition, stakeholders could also include their contact details to receive further information on the Project. A total of 5 feedback forms were received. Comments received have been considered in the preparation of the EIS and recorded within the consultation database. A copy of the feedback form is provided in **Appendix 2**.

6.4.3 Door Knocking

A Project factsheet and feedback form (including a reply paid envelope) was provided to community stakeholders via door knocking on 2 & 3 February 2016. The purpose of door knocking was to record stakeholder contact details for ongoing project updates and record any initial issues, concerns or feedback associated with the project. Details of the door knocking were recorded in a consultation form at the time of the visit. Approximately 80 factsheets were distributed via doorknocking. A copy of the form is provided in **Appendix 2.**

6.4.4 Mail-out

160 project factsheets and associated feedback forms were mailed out to community stakeholders on 4 February 2016 who did not receive the material via door knocking on 2 and 3 February 2016.

6.4.5 Community Information Sessions

Community information sessions were held at the Project site at 24 Davis Road, Wetherill Park, NSW on 25 February 2016, between 2:00 pm and 4:00 pm. The community information sessions were attended by a representative from RPS and Greenspot and provided an opportunity for community stakeholders to view the project site and proposed plans and to speak to members of the project team. Display boards were used to show the proposed plans. The information sessions were relaxed and informal in nature and stakeholders were encouraged to read the project factsheet, visit the website and or download a copy of the PEA and complete a feedback form. One stakeholder attended the community information session.

6.4.6 Targeted Interviews

Targeted interviews were undertaken with stakeholders along Davis Road and Elizabeth Street, Wetherill Park to gather specific responses with regards to the proposed project. The interviews were undertaken by a representative from RPS on Friday 18 March 2016. The targeted interviews created a two way discussion with the interviewee about the proposed project. A total of 19 stakeholders were targeted. Details of the targeted interviews were recorded in a consultation form at the time of the visit. A summary of the feedback received is provided in **Table 9**.

6.4.7 Consultation Database

A consultation database has been created and maintained to record community stakeholder contact details and any issues, concerns or feedback received on the Project. A copy of the log is included in **Appendix 2**.

6.4.8 Project Website

Project information has been provided on the Bettergrow website at www.bettergrow.com.au/#!greenspot-davis-road/etl1d. The website includes an overview of the Project and provides a link to the EIS.

6.4.9 Issues Raised

A consolidated summary of the responses received from the community consultation activities and where they have been addressed within the EIS are provided below in **Table 11**. The community consultation log is presented in **Appendix 2**.

Table 11 Summary of Community Consultation

Stakeholder Details	Date	Description/Issue Raised
Quickskips	2/2/16	Feedback received from Quickskips noting that the project (should it be approved) would be able to accept waste from Quickskips.
Universal Mobile Tower Hire	25/2/16	Feedback form received from Universal Mobile Tower Hire noting that the site seemed suitable for the proposed project and the project planning is addressing the two main problems – traffic and odour.
Mal Hooley Truck Repairs and Servicing	2/2/16	Feedback received from Mal Hooley Truck Repairs and Servicing noting that trucks from across the road (OneSteel) are backing up along the street and as a result there is limited street parking. Also noted that there is a smell in the air first thing in the morning.
Cafe On Davis	2/2/16	Questions asked in regards to the project approval timeline and the number of staff who will be working on site should the project be approved.
Newly Weds	18/3/16	Questions asked in regards to whether the proposed project would have an odour problem from rotting vegetation smell and potentially increase insect activity due to the processing of organics. Noted that noise would not be an issue due to the location of the project and dust would not be a problem due to the Newly Weds building being closed.

6.5 Continuing Consultation Activities

The proponent will continue to undertake consultation with stakeholders as necessary throughout all phases of the Project. Lines of communication between the proponent and stakeholders will remain open through various communication mediums as detailed in **Section 6.0**.

6.5.1 EIS Public Exhibition and Post Exhibition

This EIS will be placed on public exhibition for a minimum period of 30 days. The proponent will continue to commit resources to satisfy consultation requirements during the public exhibition phase and throughout the life of the Project. The proponent will actively engage with key stakeholders to ensure they are aware the EIS is on exhibition. Information about the EIS will be made available on the Project website www.bettergrow.com.au/#!greenspot-davis-road/etl1d and contact details for key Project representatives will continue to be made available on the Project website and on any distributed material.

The proponent will continue to undertake consultation with stakeholders as necessary post determination of the EIS for the Project.

7.0 Environmental Risk Assessment

7.1 Environmental Risk Assessment

To assist in identifying the key environmental and social impacts associated with the Project and the likely severity, an Environmental Risk Assessment (ERA) was undertaken in accordance with Australian Standard AS/NZS ISO 31000:2009 Risk Management Principles and Guidelines. The risk assessment is presented in full in **Appendix 3**. The methodology used for the ERA process, and a summary of the results, are outlined below in the following sections.

7.2 Methodology

7.2.1 Key Environmental and Social Impacts

The key environmental and social impacts associated with the Project and requiring further assessment and reporting were identified through:

- The existing environmental context of the site and surrounding locality (**Section 2**);
- The outcomes of consultation undertaken to date with government agencies and other relevant stakeholders (**Section 6**);
- Project SEARs (**Section 1.7**);
- Legislative and statutory framework (**Section 5**); and
- Specialist studies undertaken as part of the preparation of this EIS (**Section 8**).

The key environmental and social impacts identified for the Project, in no particular order, were:

- Waste;
- Hazardous materials;
- Traffic and transport;
- Odour;
- Greenhouse gas;
- Noise and vibration;
- Surface water;
- Groundwater;
- Soils and contamination;
- Aboriginal cultural heritage;
- Historic Heritage;
- Biodiversity;
- Dust;
- Visual amenity; and
- Socio-economic.

7.2.2 Evaluating Likelihood

The key environmental and social impacts for the Project were assigned a likelihood between almost impossible and certain in accordance with **Table 12** (column 1). Column 2 provides a description that elaborates on the possible likelihood categories and column 3 provides the frequency.

Table 12 Likelihood Table

Likelihood	Description	Frequency
Certain	Common Occurrence	At least daily
Very Likely	Expected to occur in most circumstances	Once per week
Likely	Probably will occur or has happened in the past	Once per month
Unlikely	Occurs Infrequently	Less than once per year
Possible	Could happen at some time	Less than once per 10 years
Almost Impossible	Not Likely to Occur	Less than 1 per 100 years

7.2.3 Evaluating Consequence

The key environmental and social impacts were assigned a consequence between catastrophic and negligible in accordance with **Table 13** (column 1). Columns 2 to 7 provide a guide to the elements considered when evaluating a consequence and column 8 provides the severity level.

Table 13 Consequence Table

	Health and Safety	Natural Environment	Community Relations & Cultural Heritage	Reputation/Media	Legal	Damage/Loss/business Interruption	Severity Level
Catastrophic	Multiple Fatality	Significant and irreversible impact on threatened species, habitat(s) or ecosystem(s)	Irreparable damage to sites of high cultural significance	Undeniably justified Government condemnation for illegal / unacceptable behaviour	Major prosecutions and fines resulting in incarcerations for senior executives	Significant Financial Loss. >$10 million	6
Critical	Fatality	Very serious long term environmental impairment of eco-system function	Very serious widespread social impact. Irreparable damage to valued cultural items	Prolonged condemnation by media and/or NGO (national outcry)	Significant prosecutions and fines. Very serious litigation, including class actions	Major $1 M - $10 M	5
High	Lost Time Injury	Serious medium term environmental effects	Ongoing serious social issues. Significant but repairable damages to structures/items of cultural significance	Serious public and/or media outcry	Major breach of regulation. Major litigation	High $100,000 - $1 M	4
Moderate	Medical Treatment required. Medical Treatment Injury	Moderate short term effects but not effecting overall ecosystem function	Ongoing social issues. Minor permanent damage to items of cultural significance.	Attention from media and/or heightened concern by local community	Moderate legal issues, non-compliances and breaches of regulation	Low financial Loss <$100,000	3
Minor	First Aid Treatment	Minor effects on biological or physical environment	Minor medium term social impacts	Minor adverse local public or media attention and complaints	Minor legal issues, non-compliances and breaches of regulation.	Low Financial Loss <$10,000	2
Almost Impossible	No medical attention. Report only	Limited damage to minimal areas of low significance	Low level repairable damage to commonplace structures	Public concern restricted to local complaints	Low level legal issues	Min Financial Loss <$1000	1

7.2.4 Risk Assessment Matrix

The key environmental and social impacts were assigned a risk ranking between negligible and catastrophic in accordance with **Table 14**, based on the assessment of likelihood and consequence as described above.

Table 14 Risk Matrix Table

Likelihood	Consequence					
	Negligible	Minor	Moderate	High	Critical	Catastrophic
6 – Certain	6	12	18	24	30	36
5 – Very Likely	5	10	15	20	25	30
4 – Likely	4	8	12	16	20	24
3 – Unlikely	3	6	9	12	15	18
2 – Possible	2	4	6	8	10	12
1 – Almost Impossible	1	2	3	4	5	6

Risk Scores: 1 - 3 = Low; 4 - 10 = Moderate; 12 - 16 = High; 18 - 24 = Very High; 25 - 36 = Extreme

7.2.5 Summary of Risk Rankings

Table 15 below provides a summary of the risk rankings for the environmental and social impacts considered as part of the ERA. The risk assessment did not identify any aspects of the Project with a residual risk of catastrophic or critical.

Table 15 Summary of Environmental Risk Assessment

Category	Issue
Extreme	None
Very High	None
High	Traffic and Transport
Moderate	Socio-economic Dust Noise and Vibration Odour Surface water Groundwater Soil and Water Waste and Contamination Hazardous Materials Cumulative Impacts
Low	Biodiversity Historic Heritage Heritage (Aboriginal and Historic) Visual Green House Gas

Where the individual risks were deemed unacceptable, or where a knowledge gap was identified, specialist technical studies were undertaken and additional mitigation measures and or management responses proposed. The following sections provide a detailed assessment of the key environmental and social impacts for the Project as identified above.

8.0 Impact Assessment, Mitigation and Management

8.1 Odour

8.1.1 Introduction

An assessment of odour impacts from the proposed development has been undertaken by Advanced Environmental Dynamics. The purpose of this report was to determine the potential odour generating sources from the Project, undertake modelling of the worst case scenarios likely at the site, determine the likely impacts, and propose suitable mitigation measures and strategies. The **Odour Impact Assessment** is attached as **Appendix 8**.

The assessment has also been prepared to satisfy the SEARs, which requested the following be considered:

- A quantitative assessment of the potential air quality, dust and odour impacts of the development in accordance with relevant Environment Protection Authority guidelines;
- The details of buildings and air handling systems and strong justification for any material handling, processing or stockpiling external to a building; and
- Details of proposed mitigation, management and monitoring measures.

A full summary of the SEARs requirements (including agency responses) are included within **Appendix 1**.

8.1.2 Existing Environment

The existing odour conditions of the surrounding area have been considered through a review of the *NSW EPA Western Sydney Regional Odour Assessment (2013)* (WSROA), a review of currently operating waste facilities within the vicinity with the potential to give rise to emissions of odour, and also proposed resource recovery developments. Whilst the WSROA did not cover the Wetherill Park industrial precinct specifically, the sites assessed are in the locality of the proposed development, and odour complaints regarding these sites were received from the broader Wetherill Park industrial area and beyond. Therefore the WSROA is considered a relevant reference document for this assessment.

The WSROA identified three waste facilities emitting odours detectable at levels beyond their site boundaries and in areas surrounding the subject development site. These were:

- SITA Eastern Creek (now Suez);
- Erskine Park Landfill (Cleanaway); and
- SITA Kemps Creek (now Suez).

In terms of proposed developments, there is the existing Suez Wetherill Park Resource Recovery Facility at 20 Davis Road Wetherill Park. This site is currently subject to an application with DP&E to increase its approved capacity. Further, there is a proposed waste and resource management facility at 35 Frank Street Wetherill Park which is also currently subject to an application with DP&E.

It is understood that the SUEZ Wetherill Park Resource Recovery Facility is seeking development consent to increase the approved capacity from the existing 10,000 tpa of general solid waste (putrescible) to 140,000 tpa of general solid waste (putrescible). A review of the information contained in the SUEZ EIS available from the DP&E major projects web portal has not highlighted any impacts of concern to the Project site.

8.1.3 Methodology

8.1.3.1 Odour Dispersion Modelling

The odour assessment for the proposed development has been undertaken in accordance with the following publications and technical guides:

- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (DEC, 2005);
- Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW (DEC, 2006a); and
- Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW (DEC, 2006b).

Further, the modelling has also been undertaken using the following:

- Odour dispersion modelling has been undertaken using a combination of the US EPA approved CALMET/CALPUFF modelling system with numerically simulated upper air data based on TAPM;
- A total of three years of ½ hourly meteorology was developed corresponding to years 2013, 2014 and 2015; and
- Odour emission sources associated with the proposed development have been represented in the dispersion model using:
  - Point emission sources; and
  - Volume sources for the fugitive emissions associated with the opening of the doors into the food and garden organics building and the food de-packaging building.

Additional information pertaining to the technical set up of the specific models is provided in **the Odour Impact Assessment** attached as **Appendix 8**.

8.1.3.2 Odour Emission Sources

Potential odour emission sources from the proposed development are associated with the intake, handling, processing and/or storage of GO, FOGO and C&I organics on site. These include:

- Vehicles delivering and/or removing material from site;
- The release of fugitive odour emissions during the opening and/or closing of the high-speed roller doors on processing buildings; and
- The release of emissions from odour treatment points.

Note, as there are no odour producing activities during the construction phase of the development an odour assessment for construction has not been undertaken.

8.1.3.3 Odour Assessment Criteria

For odour assessment in NSW, which assessment criteria is appropriate depends on the extent and scale of the population that is predicted to be impacted upon. Criteria ranging from 2 Odour Units (OU) to 7 OU is applied relative to the scale of the affected population.

For this odour assessment, it was assumed that the results of the dispersion modelling would be assessed against the 2 OU odour criteria at all locations beyond the boundaries of the facility. Details of the population based odour criteria are shown in **Table 16.**

Table 16 Population Based Odour Criteria for NSW

Population of Affected Community	Impact Assessment Criteria for Complex Mixtures of odorous Pollutants (OU)
Urban and/or schools and hospitals (≥ 2000)	2.0
~500	3.0
~125	4.0
~30	5.0
~10	6.0
Single rural residence (≤~2)	7.0

8.1.3.4 Odour Emissions Inventory

As there are expected to be minimal odour impacts associated with the drill mud and hydro-excavation fluids processing area, the focus of this assessment has been on the two organics processing buildings (ie. food and garden organics building and the food de-packaging building), located on the upper level of the site.

Specific Odour Emission Rates (SOERs) considered and/or used in the assessment are summarised below in **Table 17**. These rates are considered conservative for the type of wastes being received at the facility. Fugitive emmisions released during the short periods when the roller doors on the organics processing sheds are open have also been modelled as part of this odour assessment.

Table 17 Odour Emission Rates

Odour Source	SOERs ($OUm^3/(m^2)$)(sec)
Green waste (shredded, uncovered)	2.37[1]
Solid food processing wastes	2.5-5.0
Green waste (storage)	2.37[1]
Directional drilling muds	0.001

Notes 1: GHD Pty Ltd (2003). Camden Soil Mix Composting and Recycling Facility Local Environmental Study – Air Quality Assessment.

8.1.3.5 Modelled Scenarios

A total of 6 odour emissions scenarios have been considered for this odour assessment. These included:

- 4 scenarios associated with emissions from the food and garden organics building and food de-packaging building through 8 proposed Carbon Filter Units (CFUs) located along the southern side of the food and garden organics building; and
- 2 vehicle movement scenarios corresponding to average and peak incoming tonnages.

Carbon Filter Units

Four odour emissions scenarios have been considered representing typical and potential worst-case emissions of odour associated with the discharge of efflux gas from the proposed CFUs. Each of the 4 scenarios is detailed in **Table 18**. The number of operating units, the assumed odour removal efficiency and the modelled odour emission rate (per unit) for each of the scenarios are also provided in **Table 18** below.

Table 18 CFU Stack Odour Emission Scenarios

Scenario	Description	Stack ID	No of Units	Efficiency	Odour Emission Rate (OU/s)
1	Normal	S1-S8	8	99.9%	0.91 per unit
2	Normal with reduced CFU efficiency	S1-S8	8	90%	90.7 per unit
3	Worst Case East (reduced CFU efficiency)	S1-S7[1]	7	90%	103.7 per unit
4	Worse Case West (reduced CFU efficiency)	S2-S8[1]	7	90%	103.7 per unit

Notes 1: Assumes 1 CFU is off line

Further details on the modelled scenarios for the CFUs are provided in the **Odour Impact Assessment** attached as **Appendix 8**.

Vehicle Movements

In relation to the potential for fugitive emissions when the access doors into either the food and garden organics building or the food de-packaging building are open, two scenarios have been considered:

a. The average tonnage scenario - daily total vehicle movements were provided for the proposed facility based on average tonnages corresponding to:

   i. Garden Organics / Food and Garden Organics 1350 tonnes per 5 day week; and

   ii. Food organics 580 tonnes per 5 day week.

The hourly distribution of vehicle movements was inferred from those provided for the peak tonnage scenario.

b. The peak tonnage scenario - vehicle movements per hour were provided for the proposed facility based on peak tonnages corresponding to:

   i. Garden Organics / Food and Garden Organics 1750 tonnes per 5 day week; and

   ii. Food organics 700 tonnes per 5 day week.

Further details on the modelled scenarios for vehicle movements are provided in **Odour Impact Assessment** attached as **Appendix 8**.

8.1.4 Impact Assessment

8.1.4.1 Model Assumptions

The following assumptions have been applied to the modelling for each scenario:

- Air is well mixed within the food and garden organics building and food de-packaging building;
- The food and garden organics building and food de-packaging building are operated under negative pressure;
- The food and garden organics building and food de-packaging building have high speed roller doors that are controlled with auto-sensors;
- Maximum volumes within the food and garden organics building and food de-packaging building at all times - 24/7, 365 days per year;
- Applied SOER of 5 OU/m^2/s for all odour emission sources within the food and garden organics building and food de-packaging building;

- During vehicle movements into/out of the organics processing buildings it is assumed, at most, that emmisions will be twice the volume of the vehicle;
- All building doors will be utilised equally; and
- Assumed 99.9% (normal) and 90% (reduced efficiency).

For modelling implications to these assumptions refer to Table 14 of the **Odour Impact Assessment** attached as **Appendix 8**.

8.1.4.2 Maximum Odour Impacts

Results of the odour modelling suggest that the maximum odour impact at the boundary will be 1.4 OU. Note that the minimum perceptible level of odour is 1.0 OU and the regulatory criterion is 2 OU. **Table 19** below presents the maximum 99th percentile 1-second average concentration of odour that is predicted to occur for each scenario.

Table 19 Results for the 99th Percentile 1-Second Average Concentration of Odour

Scenario	CFU Stack Scenario	Vehicle Movement Scenario	Meteorology Year	Maximum Outside the Site Boundary (OU)
1A	Normal (8 CFU @ 99.9% efficiency)	Average	2013	0.7
			2014	0.7
			2015	0.7
2A	Normal (reduced efficiency) (8 CFU @ 90% efficiency)	Average	2013	1.3
			2014	1.2
			2015	1.3
3A	East (reduced efficiency) (7 CFU @ 90% efficiency)	Average	2013	1.3
			2014	1.2
			2015	1.3
4A	West (reduced efficiency) (7 CFU @ 90% efficiency)	Average	2013	1.3
			2014	1.3
			2015	1.4
1B	Normal (8 CFU @ 99.9% efficiency)	Peak	2013	0.8
			2014	0.8
			2015	0.8
2B	Normal (reduced efficiency) (8 CFU @ 90% efficiency)	Peak	2013	1.3
			2014	1.3
			2015	1.4
3B	East (reduced efficiency) (7 CFU @ 90% efficiency)	Peak	2013	1.3
			2014	1.3
			2015	1.4
4B	West (reduced efficiency) (7 CFU @ 90% efficiency)	Peak	2013	1.3
			2014	1.3
			2015	1.4

8.1.4.3 Contour Plots

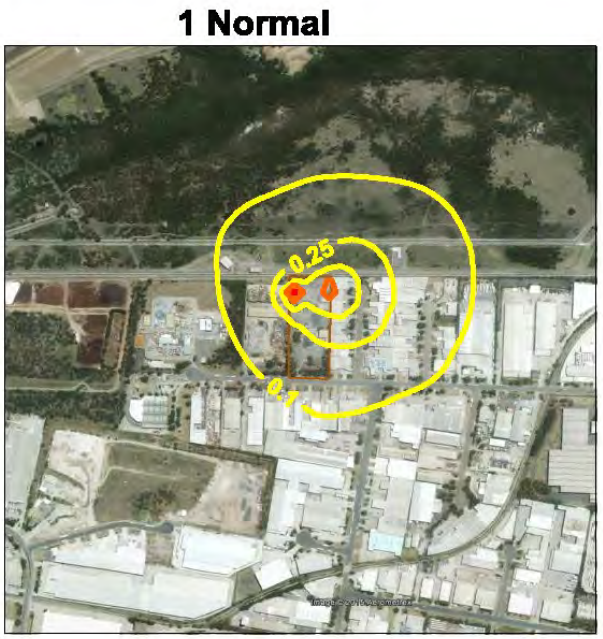
Contour plots have been prepared for average and peak tonnages for each of the meteorological years modelled above in **Section 8.1.4.1**. **Figures 17** to **19** shows the contour plots of the 99th percentile, 1-second average concentration of odour as predicted using the CALPUFF dispersion model for meteorological years 2013 through 2015 for the average tonnage scenario. **Figures 20** to **22** shows the contour plots of the 99th percentile, 1-second average concentration of odour for meteorological years 2013 through 2015 for the peak tonnage scenario.

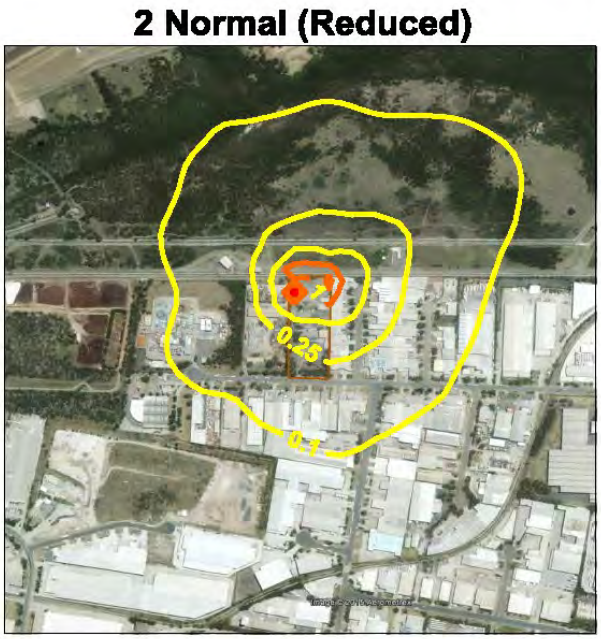
The contour plots present the 99th percentile (i.e. 87th highest) 1-second odour concentration at each location in the study area, which for each receptor may occur at different times of the year and under different atmospheric conditions.

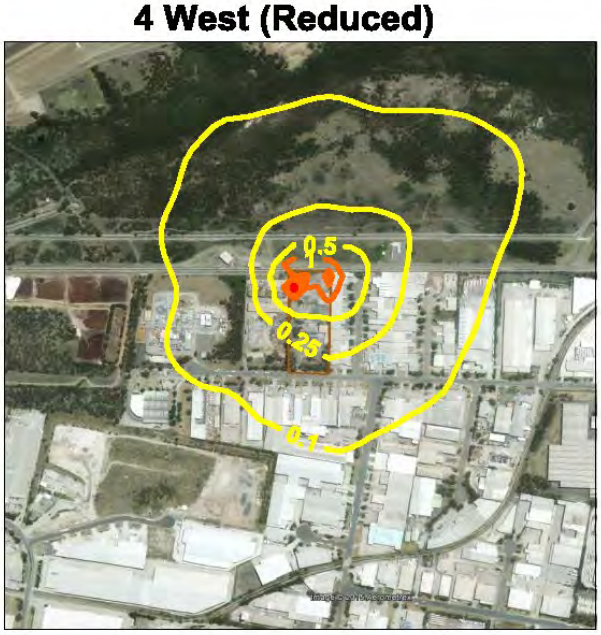
Colour coding within the contour plot figures represent the following:

- Green contours < 0.1 OU;
- Yellow contours 0.1 OU to 1.0 OU;
- Orange contours 1.0 OU to 2.0 OU; and
- Red contours > 2 OU.

The results of the dispersion modelling indicate that there will be no significant issues at surrounding locations for any of the scenarios considered, with odour impacts predicted to be less than the regulatory criterion of 2 OU. The results also suggest that the proposed odour mitigation measures associated with the operation of the proposed waste facility will be sufficient to manage odour impacts at off-site locations.

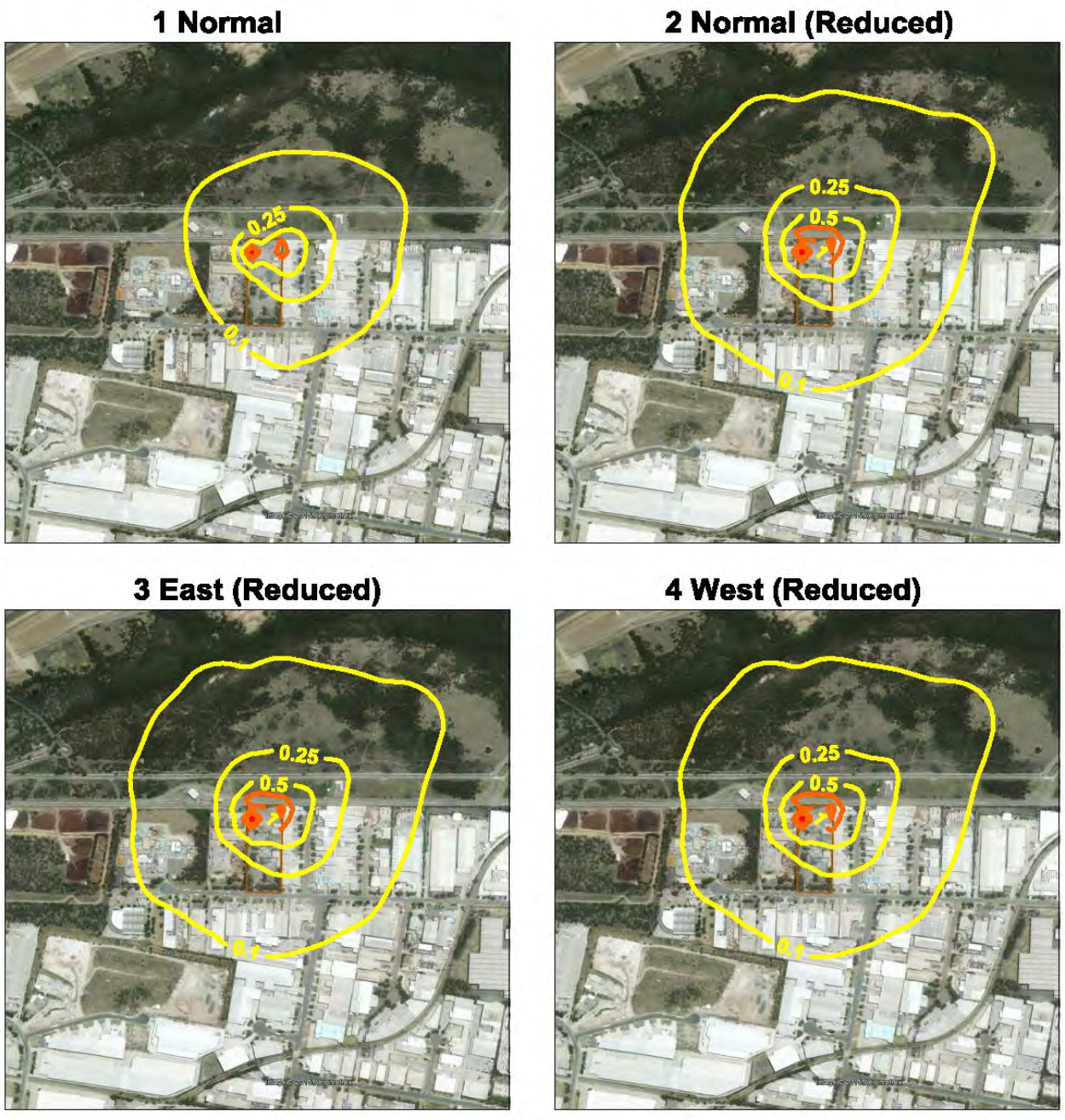






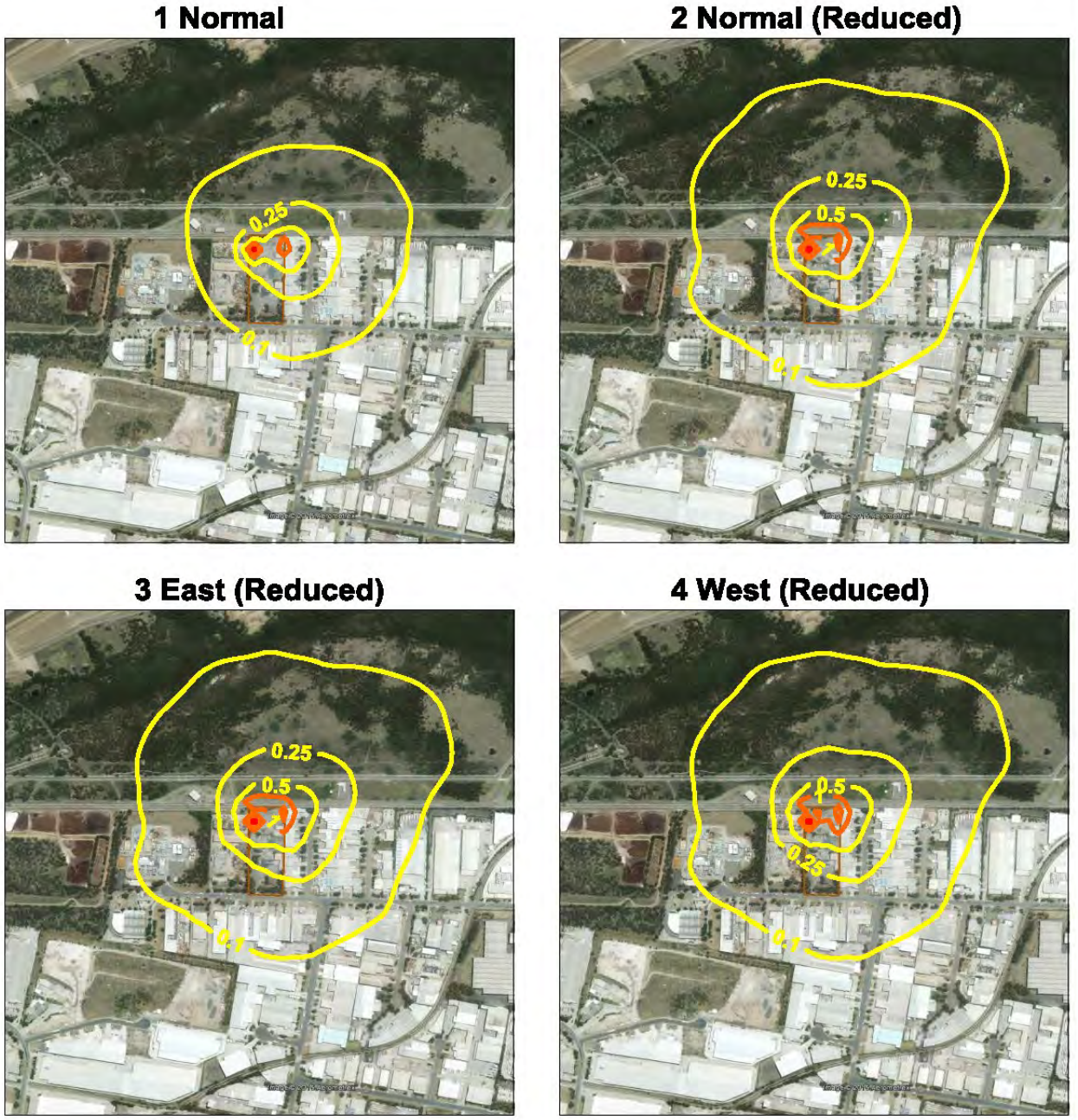
Scenario: As labelled		**Sources included:** CFU Stacks and Open Doors	
Pollutant:	Odour	Averaging Period:	1-second
Background-level:	N/A	Rank:	99th percentile based on 2013 meteorology
Project Goal:	2 OU	Contour level(s):	0.001, 0.0025, 0.005 (green), 0.1, 0.25, 0.5 (yellow), 1, 1.5 (orange), 2 (red) OU

Figure 17: Average Tonnage Scenario - 99th Percentile 1-Second Average Concentration of Odour based on Meteorology for 2013



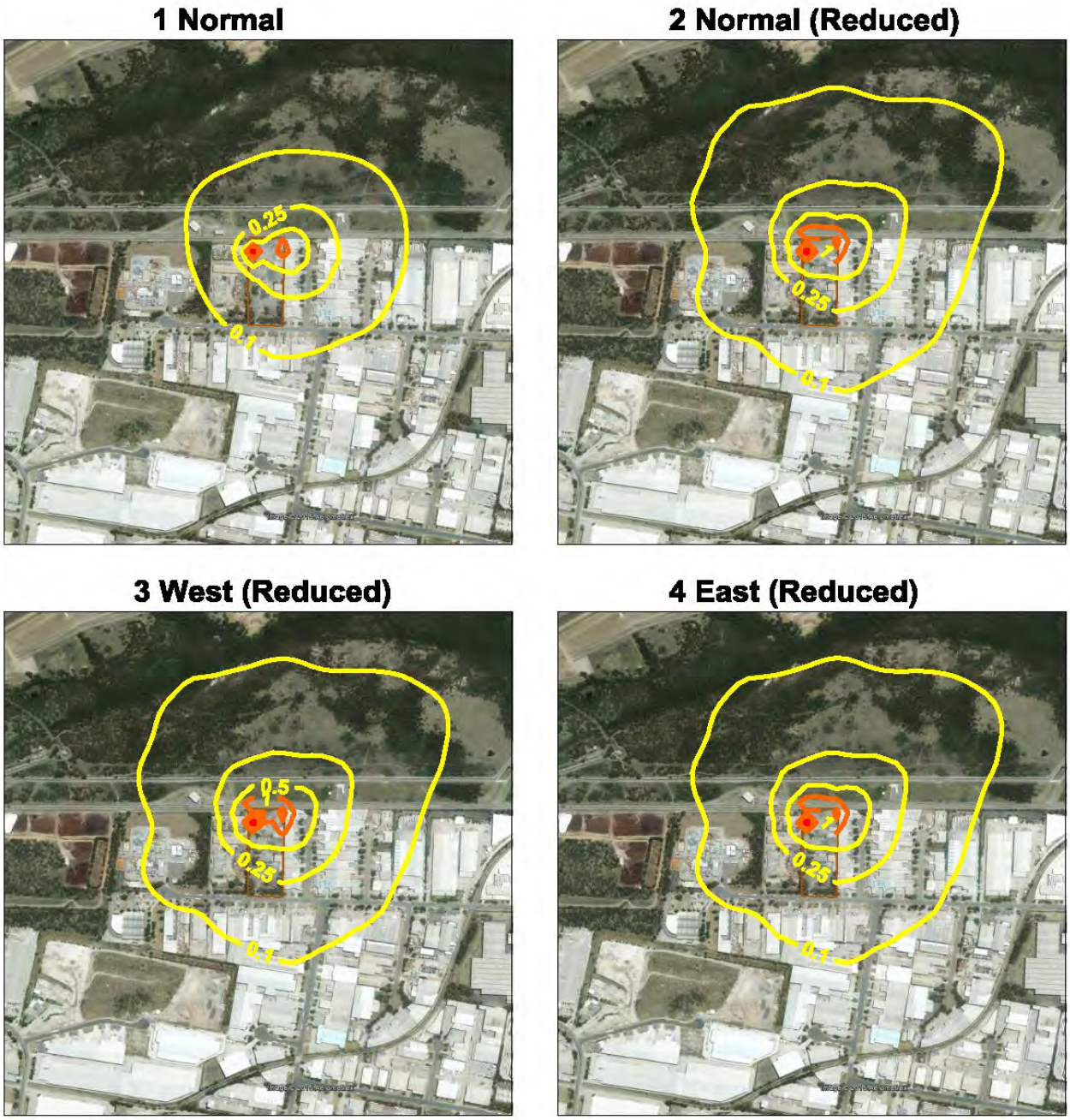
Scenario: As labelled		**Sources included:** CFU Stacks and Open Doors	
Pollutant:	Odour	Averaging Period:	1-second
Background-level:	N/A	Rank:	99th percentile based on 2014 meteorology
Project Goal:	2 OU	Contour level(s):	0.001, 0.0025, 0.005 (green), 0.1, 0.25, 0.5 (yellow), 1, 1.5 (orange), 2 (red) OU

Figure 18: Average Tonnage Scenario - 99th Percentile 1-Second Average Concentration of Odour based on Meteorology for 2014



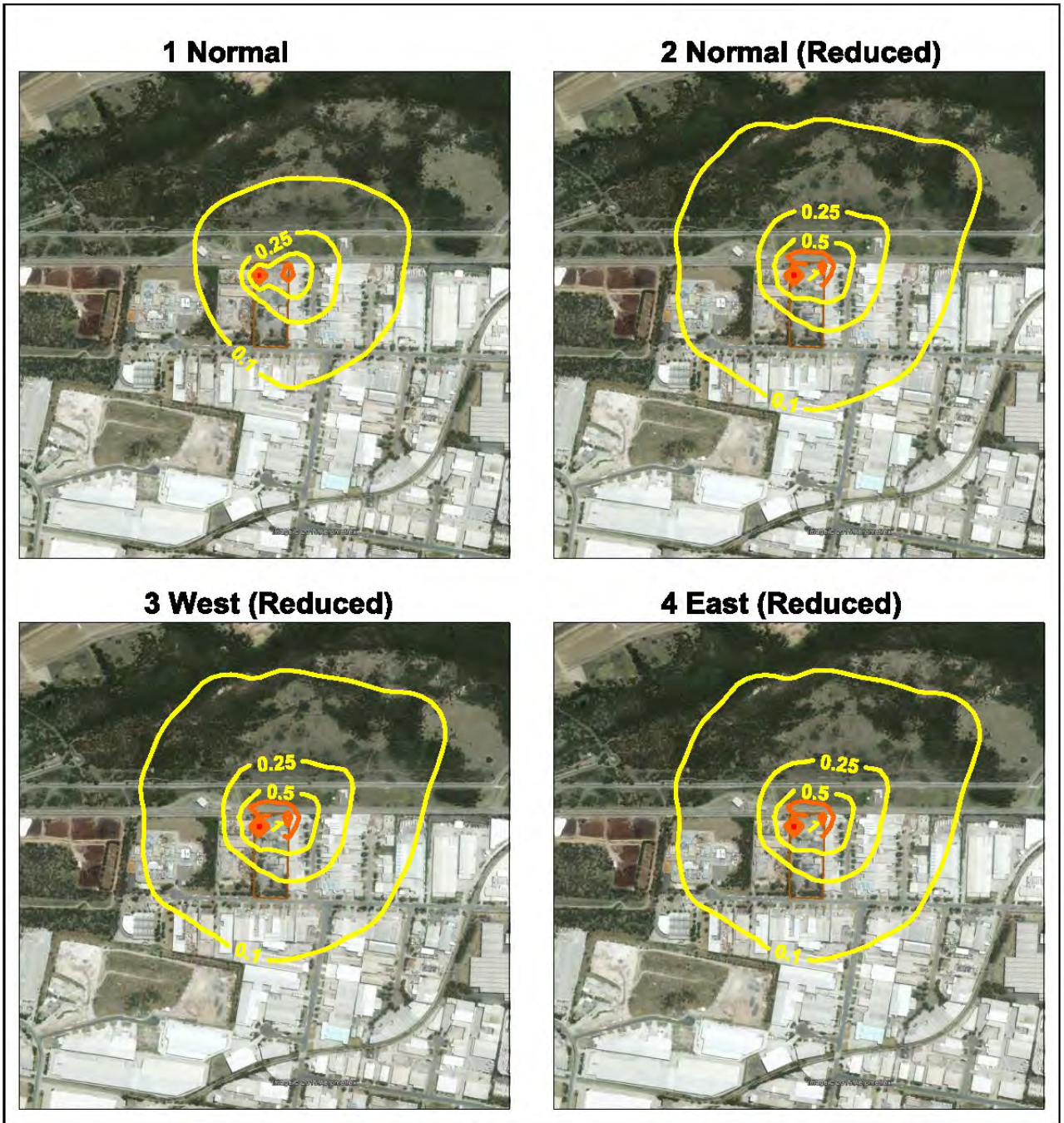
Scenario: As labelled		**Sources included:** CFU Stacks and Open Doors	
Pollutant:	Odour	Averaging Period:	1-second
Background-level:	N/A	Rank:	99th percentile based on 2015 meteorology
Project Goal:	2 OU	Contour level(s):	0.001, 0.0025, 0.005 (green), 0.1, 0.25, 0.5 (yellow), 1, 1.5 (orange), 2 (red) OU

Figure 19: Average Tonnage Scenario - 99th Percentile 1-Second Average Concentration of Odour based on Meteorology for 2015



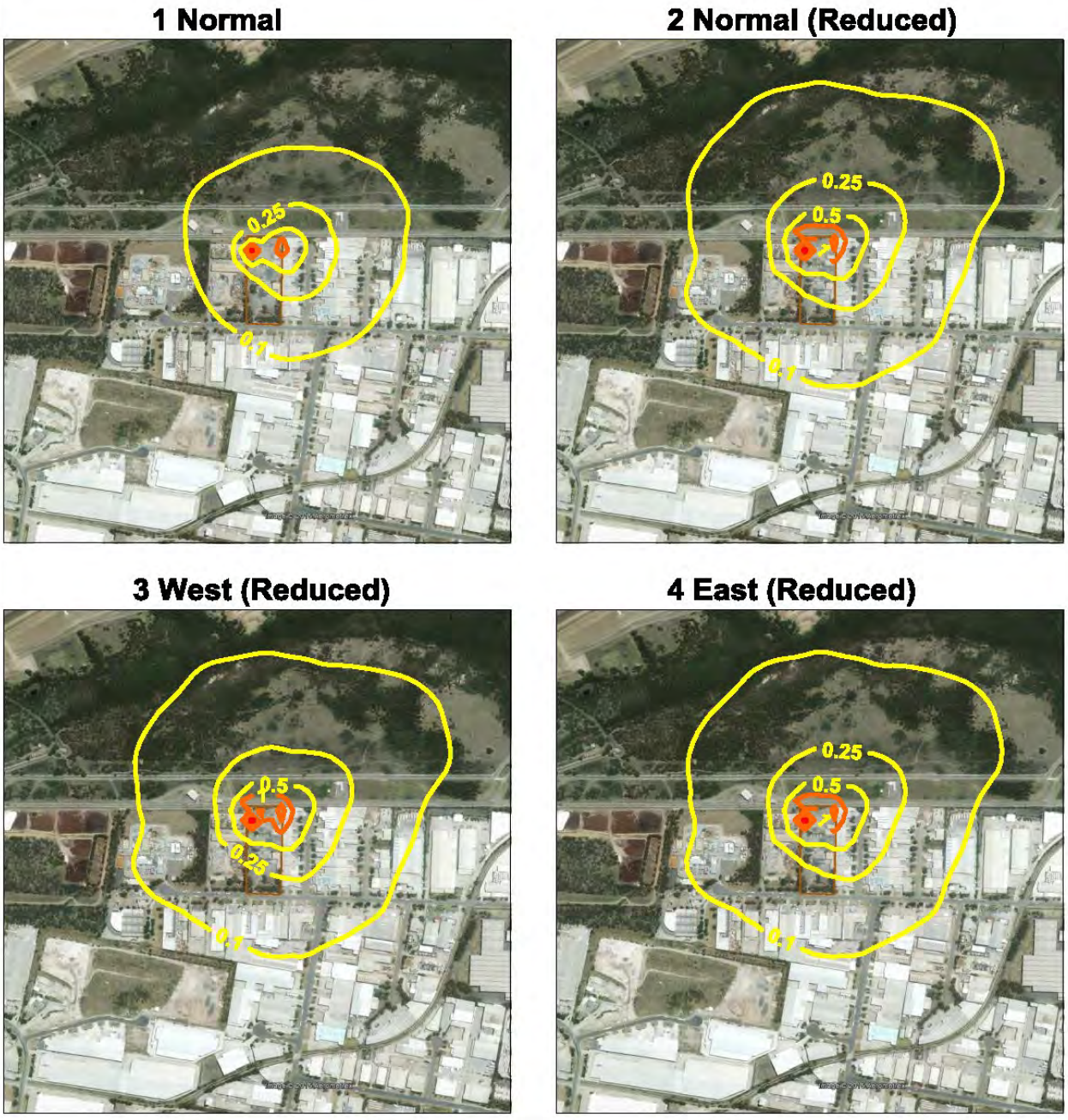
Scenario: As labelled		**Sources included:** CFU Stacks and Open Doors	
Pollutant:	Odour	Averaging Period:	1-second
Background-level:	N/A	Rank:	99th percentile based on 2013 meteorology
Project Goal:	2 OU	Contour level(s):	0.001, 0.0025, 0.005 (green), 0.1, 0.25, 0.5 (yellow), 1, 1.5 (orange), 2 (red) OU

Figure 20: Peak Tonnage Scenario - 99th Percentile 1-Second Average Concentration of Odour based on Meteorology for 2013



Scenario: As labelled		**Sources included:** CFU Stacks and Open Doors	
Pollutant:	Odour	Averaging Period:	1-second
Background-level:	N/A	Rank:	99th percentile based on 2014 meteorology
Project Goal:	2 OU	Contour level(s):	0.001, 0.0025, 0.005 (green), 0.1, 0.25, 0.5 (yellow), 1, 1.5 (orange), 2 (red) OU

Figure 21: Peak Tonnage Scenario - 99th Percentile 1-Second Average Concentration of Odour based on Meteorology for 2014



Scenario: As labelled		**Sources included:** CFU Stacks and Open Doors	
Pollutant:	Odour	Averaging Period:	1-second
Background-level:	N/A	Rank:	99th percentile based on 2015 meteorology
Project Goal:	2 OU	Contour level(s):	0.001, 0.0025, 0.005 (green), 0.1, 0.25, 0.5 (yellow), 1, 1.5 (orange), 2 (red) OU

Figure 22: Peak Tonnage Scenario - 99th Percentile 1-Second Average Concentration of Odour based on Meteorology for 2015

8.1.5 Mitigation and Management

The potential for odour-related impacts to off-site receptors will be managed through the adoption of the following odour reduction measures:

- All incoming consignments will be unloaded within the food and garden organics building or the food de-packaging building;
- No GO, FOGO or C&I organics will be stored outside the food and garden organics building or the food de-packaging building;
- High speed roller doors with auto-close sensors will be fitted to the food and garden organics building and the food de-packaging building to ensure minimal release of fugitive emmisions;
- Any movement of processed C&I organics to the food and garden organics building for consolidation will be contained or covered so that fugitive emissions are not released during the transfer;
- When receiving incoming GO, FOGO, or C&I organics, air extraction in the processing buildings will be in operation to direct odours to the designated high grade activated carbon filters;
- When the doors of the processing buildings are opened misting sprays positioned above each door opening will be operated to suppress any fugitive volatile odour emissions;
- All plant and equipment utilised for the processing of organic material will be regularly cleaned down to ensure they do not become a point source of pollution;
- Proprietary inoculums will be utilised to deodorise equipment and process areas within the organics buildings;
- Activated carbon filter media for 2 odour treatment units will be stored on site so as to allow for the immediate change of filters if required;
- Spent filter media will be incorporated into the consignment of FOGO that is to be removed from the facility;
- All stormwater improvement devices must be regularly maintained and serviced such that anaerobic conditions do not occur; and
- All general waste generated at the facility must be contained in an appropriate waste receptacle and be removed from the site regularly.

Further odour reduction measures are included within the site EMP attached as **Appendix 21.**

8.1.6 Conclusions

The odour assessment has determined that the key potential odour emission sources are associated with the intake, handling and processing of FO and FOGO within the food and garden organics building as well as C&I organics within the food de-packaging building.

Results of the odour dispersion modelling for the 8 odour emission scenarios considered have not highlighted any issues with impacts beyond the site boundary, indicating that the operation can meet the regulatory criterion of 2 OU. Nonetheless, prioritising the use of door A3, door A2 and lastly door A1 in practice will assist in managing odour from the facility by maximising the distance between potential fugitive emissions during vehicle movements in and out of the food and garden organics building and the site boundary.

The risk of fugitive emissions as a result of other potential odour emission sources will be minimised through the strict adherence to the odour management strategies outlined above in **Section 8.1.5** and also in the site EMP attached as **Appendix 21**.

The odour assessment for the development suggests that the mitigation and management strategies proposed for the operation of the facility will be adequate to ensure compliance with regulatory requirements for odour.

8.2 Noise and Vibration

8.2.1 Introduction

An assessment of noise and vibration impacts from the proposed development has been undertaken by Global Acoustics. The purpose of this assessment was to determine potential noise and vibration impact at the nearest residential and industrial receivers to the site. The assessment also considered construction, operational and transport noise impacts associated with the development.

The assessment has been prepared in accordance with the NSW Industrial Noise Policy (INP), NSW Interim Construction Noise Guideline (ICNG), NSW Road Noise Policy (RNP), NSW Assessing Vibration: a Technical Guideline, and NSW Draft Industrial Noise Guideline (DING). The Noise and Vibration Impact Assessment is attached as **Appendix 9**.

The assessment has also been prepared to satisfy the SEARs, which requested the following be considered:

- A quantitative assessment of potential construction, operational and transport noise and vibration impacts in accordance with relevant Environment Protection Authority guidelines;
- Identify all noise sources from the development (including both construction and operation phases). Detail all potentially noisy activities including ancillary activities such as transport of goods and raw materials;
- Specify the times of operation for all phases of the development and for all noise producing activities;
- Identify any noise sensitive locations likely to be affected by activities at the site, such as residential properties, schools, churches, and hospitals. Typically the location of any noise sensitive locations in relation to the site should be included on a map of the locality;
- Determine the existing background and ambient (LAeq) noise levels in accordance with the NSW Industrial Noise Policy.
- Determine the existing road traffic noise levels in accordance with the NSW Environmental Criteria for Road Traffic Noise, where road traffic noise impacts may occur; and
- Details and justification of the proposed noise mitigation and monitoring measures.

A full summary of the SEARs requirements (including agency responses) are included within **Appendix 1**.

8.2.2 Existing Environment

The Project area is situated within an existing industrial area, in an IN1 (General Industrial) zone as per the Fairfield Local Environmental Plan 2013.

The area has mixed heavy and light industrial businesses, and bulky goods storage. Prospect reservoir is located to the north. The areas south, east and west of the subject site are all considered industrial.

The nearest private residential receivers are located approximately 1,500 metres to the south of the subject site on Maugham Crescent, Wetherill Park. These residences are located immediately south of the industrial estate, and approximately 170 metres north of The Horsely Drive, an arterial road with high traffic flows.

Approximate distances to the nearest residential receivers in all directions from the site are indicated in **Table 20**, and shown in **Figure 23** below.

Table 20 Nearest Residential Receivers

Location	Distance (m)	Direction (degrees)	Address
R01	1,500	170	21 Maugham Crescent, Wetherill Park
R02	2,000	135	164 Chifley Street, Wetherill Park
R03	2,300	110	54 Eyre Street, Smithfield
R04	2,200	85	5 Hyland Road, Greystanes
R05	1,800	260	38-50 Trivet Street, Wetherill Park
R06	2,400	225	73 Castlereagh Street, Bossley Park

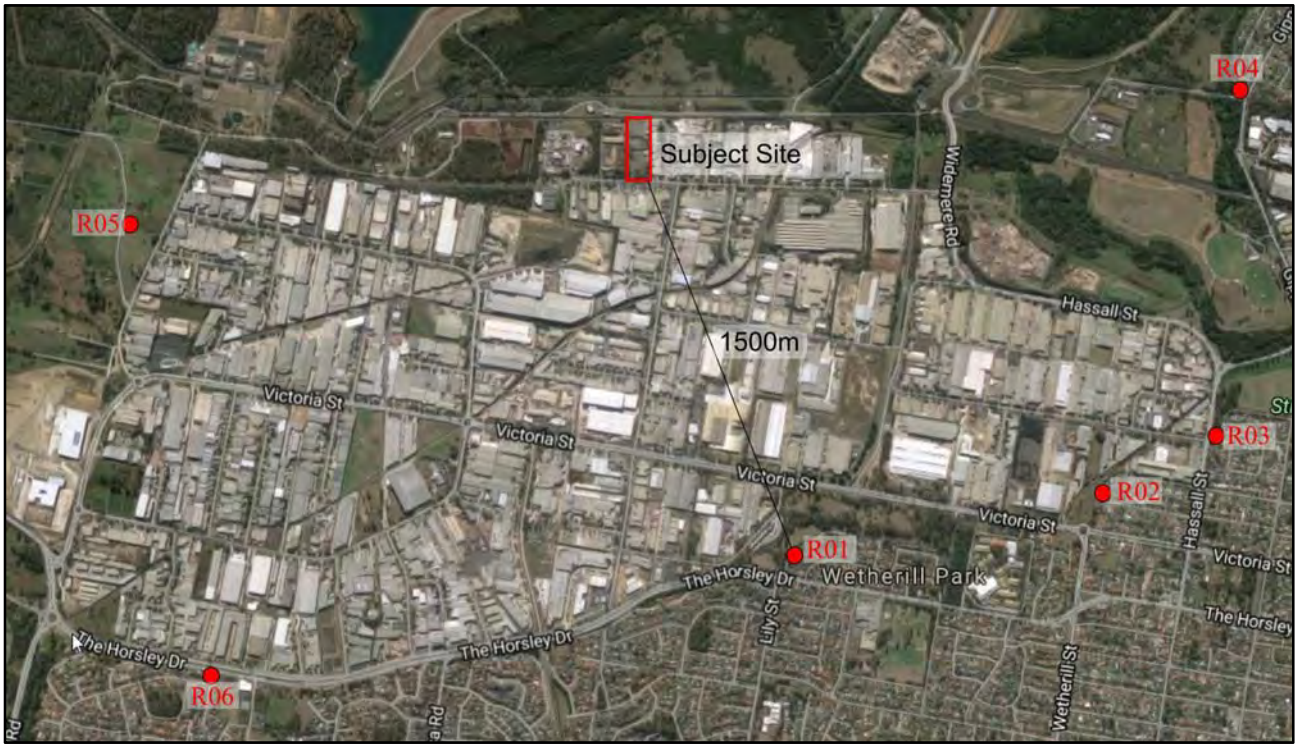


Figure 23: Nearest Residential Receivers

Directly adjoining the Project site to the west is a metal recycling operation, which generates relatively high noise levels when operating. Adjoining the subject site to the east are commercial type storage sheds which are the nearest industrial receivers to the subject site. The location of the nearest industrial receivers is shown on **Figure 24**.

Figure 24: Industrial Receivers

8.2.3 Methodology

The following methodology and criteria were applied to the proposed development to determine potential noise impacts.

8.2.3.1 Unattended Noise Monitoring

Unattended noise monitoring was undertaken for the proposed development from 2 February 2016 to 11 February 2016 inclusive at both the site and the nearest sensitive receptor. **Table 21** below provides details of the 2 locations monitored and **Figures 25** and **26** shown the monitoring locations.

Table 21 Unattended Monitoring Locations

Monitoring ID	Address
NM1 (subject site)	24 Davis Road, Wetherill Park
NM2 (adjacent to R01)	21 Maugham Crescent, Wetherill Park

Figure 25: Location of NM1 – Subject Site

Figure 26: Location of NM2 – 21 Maugham Crescent Wetherill Park

Table 22 and **Table 23** below provide a summary of the noise levels collected at the respective monitoring sites detailed in **Table 21**.

Table 22 Average Logged Noise Levels – NM1 (Subject Site)

Site	Period	L_{Aeq} dB[2]	L_{A10} dB	L_{A90} dB	RBL dB[1]
Location NM1	Day	59	61	54	49
	Evening	52	52	48	46
	Night	51	53	47	44

Notes 1: Rating Background Level (RBL)
2: LAeq are logarithmic averages; and
3: Day 7:00 am to 6:00 pm, Evening 6:00 pm to 10:00 pm, Night 10:00 pm to 7:00 am

Table 23 Average Logged Noise Levels – NM2 (21 Maugham Crescent)

Site	Period	L_{Aeq} dB[2]	L_{A10} dB	L_{A90} dB	RBL dB[1]
Location NM2	Day	56	60	48	46
	Evening	56	58	52	45
	Night	58	61	51	43

Notes 1: Rating Background Level (RBL)
2: LAeq are logarithmic averages; and
3: Day 7:00 am to 6:00 pm, Evening 6:00 pm to 10:00 pm, Night 10:00 pm to 7:00 am

8.2.3.2 Attended Noise Monitoring

Attended noise monitoring was conducted at the subject site to quantify the existing noise environment, including noise contributions from existing industrial noise sources.

Measurements were performed in accordance with the Environment Protection Authority (EPA) 'Industrial Noise Policy' (INP) guidelines and Australian Standard AS1055 ' Acoustics, Description and Measurement of Environmental Noise'. Atmospheric condition measurements were also undertaken during attended monitoring at 15 minute durations.

Results of the attended monitoring showed that another industrial operation west of the subject site was primarily responsible for measured levels. Impact noise from this industrial operation to the west generated the measured LAmax and LA1. Truck deliveries, excavators and processing at that site primarily generated measured LA10 and LAeq, with insects contributing to the measured LA10 and LAeq.

The measured LA90 was generated by engine and fan noise from excavators and trucks, combined with road traffic engine noise on Davis Road, and continuum from a different industrial operation. Birds, aircraft, reverse alarms and road traffic tyre noise were regularly audible.

The estimated existing industrial $L_{Aeq,15minute}$ was 59 dB. Analysis of unattended monitoring data indicates the day period industrial $L_{Aeq,15hour}$ over the logging period ranged from 54 to 59 dB. The measured $L_{Aeq,15minute}$ during attended monitoring is consistent with the upper end of that range.

Refer to the full Noise and Vibration Impact Assessment (**Appendix 9**) for a graphical representation of the environmental noise levels measured at NM1.

8.2.3.3 Operational Noise Criteria

The following section details operational noise amenity criteria that apply to residential and industrial receivers and the also the intrusiveness and amenity criteria that apply during the morning shoulder, day, evening and night periods for NM2/R01 and other residential receiver locations. Refer to **Tables 24, 25, 26** and **27** below for specific criteria adopted.

Table 24 Urban Amenity Criteria - LAeq,period dB

Period	Acceptable	Maximum
Day	60	65
Evening	50	55
Night	45	50

Table 25 Amenity Criteria for other Land Uses – LAeq,period dB

Type of Receiver	Period	Acceptable	Maximum
Industrial	When in use	70	75

Table 26 Project Specific Noise Levels – NM1/R01

Period[1,2]	RBL L_{A90} dB	Intrusiveness Criterion $L_{Aeq,15minute}$ dB	Acceptable Amenity Criterion[3] $L_{Aeq,period}$ dB	Project Specific Noise Levels $L_{Aeq,15minute}$ dB
Morning Shoulder	-	-	-	47[3]
Day	46	51	60	51
Evening	45	50	50	50
Night	39[2]	44	45	44

Notes 1: Day 7:00 am to 6:00 pm, Evening 6:00 pm to 10:00 pm, Night – the remaining periods;

2: Lowest measured ABL adopted in place of RBL; and
3: The morning shoulder (5:00 am to 7:00 am) has been adopted as the midpoint between day and night periods.

Table 27 Project Specific Noise Levels – Other Residential Receivers

Period[1]	RBL L_{A90} dB	Intrusiveness Criterion $L_{Aeq,15minute}$ dB	Acceptable Amenity Criterion[3] $L_{Aeq,period}$ dB	Project Specific Noise Levels $L_{Aeq,15minute}$ dB
Morning Shoulder	-	-	-	37[2]
Day	35	40	60	40
Evening	30	35	50	35
Night	30	35	45	35

Notes 1: Day 7:00 am to 6:00 pm, Evening 6:00 pm to 10:00 pm, Night – the remaining periods; and
2: The morning shoulder (5:00 am to 7:00 am) has been adopted as the midpoint between day and night periods.

8.2.3.4 Sleep Disturbance Criteria

As an initial assessment of sleep disturbance, a criterion of background (RBL) plus 15 dB adopted for the Project. The derived criterion for each receiver is presented in **Table 28** below.

Table 28 Sleep Disturbance Criteria – L_{Amax} dB

Receiver	RBL L_{A90} dB	Adjustment	Criterion
NM2/R01	39[2]	+15	54
Other Residential Receivers	30	+15	45

Notes 1: Day 7:00 am to 6:00 pm, Evening 6:00 pm to 10:00 pm, Night - the remaining periods; and
2: Lowest measured ABL adopted in place of RBL

8.2.3.5 Construction Noise Criteria

Based on measured RBL presented in **Table 23** above and as per the NSW Interim Construction Noise Guideline 2009, the construction noise criterion for private residential receiver R01 is $L_{Aeq,15minute}$ 56 dB for activities undertaken during standard construction hours. For construction work performed outside standard construction hours, criteria of $L_{Aeq,15minute}$ 51, 50 and 47 dB apply for the day, evening and night periods respectively (refer **Table 26**).

For other residential receivers, a construction noise criterion of $L_{Aeq,15minute}$ 45 dB applies for work undertaken during standard construction hours. For construction work performed outside standard construction hours, criteria of $L_{Aeq,15minute}$ 40, 35 and 35 dB apply for the day, evening and night periods respectively.

For industrial premises surrounding the subject site, a construction noise criterion of $L_{Aeq,15minute}$ 75 dB applies. As this criterion applies at the most affected point of the premises, compliance with this criterion is required at the subject site boundary, where this is common with neighbouring industrial receivers.

8.2.3.6 Traffic Noise Criteria

The NSW Road Noise Policy (RNP) outlines traffic noise criteria applicable to this project. The policy applies different noise limits dependent upon the road category and type of project/land use. **Table 29** below presents noise criteria from the RNP for various road categories.

Table 29 Road Traffic Noise Criteria (dB)

Road Category	Project/Land use	Day	Night
Local Roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	$L_{Aeq,1hour}$55	$L_{Aeq,1hour}$50
Sub-arterial Roads	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq,15hour}$60	$L_{Aeq,9hour}$55

In assessing feasible and reasonable mitigation measures, an increase of up to 2 dB represents a minor impact that is considered barely perceptible to the average person. A relative increase in road traffic noise levels has been considered in this assessment.

8.2.3.7 Vibration Criteria

Vibration criteria in NSW are outlined in the guideline Assessing Vibration: A Technical Guideline, published by the NSW Department of Environment and Conservation (2006).

Construction

Vibration generated by short term construction works such as vibrating roller compaction, pile driving and rock/concrete breaking (if required), are generally assessed as intermittent activities. When assessing vibration for intermittent activities, the guideline recommends use of the vibration dose value (VDV).

Construction plant is successfully operated on many sites in NSW with similar proximity to neighbouring buildings as will occur for the proposal. Structural damage to neighbouring industrial premises should not result, provided general best practice work methods are employed. The nearest residential receivers to the site are approximately 1,500 metres away; vibration impact would not occur over that distance. Construction vibration is not discussed further in this report.

Operations

Operational vibration sources proposed include shredding and screening equipment associated with FOGO and C&I food organics processing, truck loading activities, and, screens and a centrifuge in the drilling mud and hydro-excavation waste processing area. These sources have potential to operate over the course of the day period, and are therefore assessed as continuous vibration sources in accordance with the vibration guideline. This type of vibration is assessed on the basis of weighted rms acceleration values.

Vibration data was not available for proposed equipment. It is recommended vibration testing of vibration generating equipment be undertaken upon commissioning to ensure relevant limits are achieved at the nearest industrial receivers. In the unlikely event that limits are exceeded, mitigation controls should be implemented.

No measurable vibration will result at residences due to substantial separation distances from the site.

8.2.4 Impact Assessment

8.2.4.1 Construction

The construction modelling scenario included sources as listed in **Table 30** below. This is considered a representative worst case construction scenario, as it considers all construction equipment operating continuously at full power. Such a scenario is unlikely to eventuate.

Table 30 15 Minute Sound Power Data – Construction Plant

Plant Item		Octave Band Sound Power Spectrum, L_{eq} dB						Total L_{eq} dB				
Description	**Quantity**	**31.5**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**Lin**	**A wt**
Excavator (20t)	3	-	112	113	101	99	93	89	84	79	116	102
Crane	2	-	112	108	100	98	93	91	92	82	114	101
Telehandler	2	-	112	113	101	99	93	89	84	79	116	102
Concrete Truck	1	-	107	101	99	103	100	95	87	78	110	104
Delivery Truck	2	-	107	101	99	103	100	95	87	78	110	104
Dozer	1	-	106	115	116	110	106	102	96	87	120	113
Loader	1	-	112	101	92	89	91	84	79	70	113	95
Roller	1	-	105	109	108	106	107	100	93	91	114	110

Figure 27 and **Figure 28** present maximum envelope noise contours for the construction scenario, for industrial receivers surrounding the subject site and nearest residential receivers respectively. Specific $L_{Aeq,15minute}$ levels at points on the site boundary, and, adjacent residential receivers are indicated by text boxes containing dB values.

Model results indicate:

- Predicted construction noise levels are below relevant construction noise criteria at the nearest industrial receivers to the site. The criterion for industrial receivers is $L_{Aeq,15minute}$ 75 dB. The noise contour figure shows the 75 dB contour line is contained within the boundary of the subject site; and
- Predicted construction noise levels are well below relevant criteria at the nearest residential receivers to the site.

Figure 27: Near Field Noise Contours - Construction $L_{Aeq,15minute}$ dB

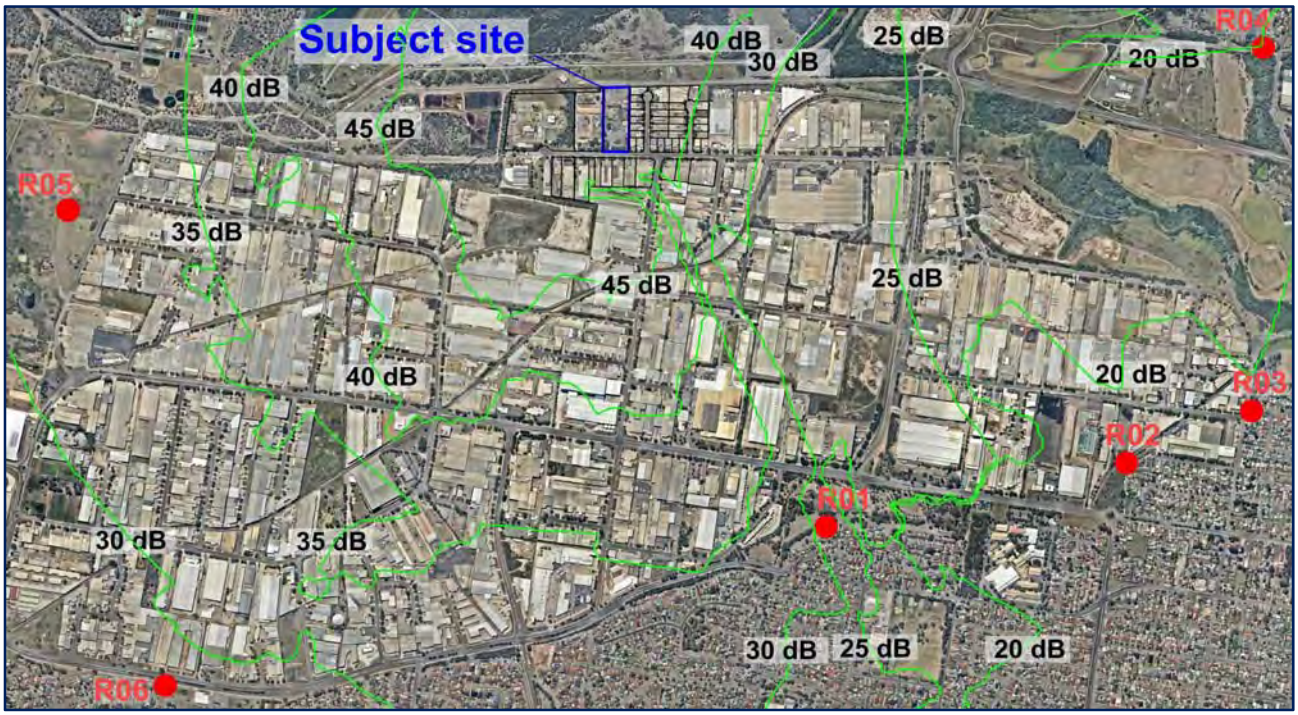


Figure 28: Far Field Noise Contours - Construction $L_{Aeq,15minute}$ dB

8.2.4.2 Operations – Day Period and Morning Shoulder

The model scenario for the morning shoulder and day periods considered a potential worst case operating scenario, and includes all four operating areas operating concurrently at full capacity. All roller doors on processing buildings are considered to be open, and peak period trucking movements are included. As such, this is considered a conservative scenario, and resulting noise levels from the site should typically be less than predicted.

Figure 29 and **Figure 30** below present maximum envelope noise contours for the worst case morning shoulder / day period scenario, for industrial receivers surrounding the subject site and nearest residential receivers respectively. Specific $L_{Aeq,15minute}$ levels at points on the site boundary and adjacent residential receivers are indicated by text boxes containing dB values.

Model results indicate:

- Predicted operational noise levels are below relevant noise criteria at the nearest industrial receivers to the site. The criterion for industrial receivers is $L_{Aeq,period}$ 70-75 dB; and
- Predicted operational noise levels are 5 dB or more below relevant criteria at the nearest residential receivers to the site.

Figure 29: Near Field Noise Contours – Operational Morning Shoulder/Day Period $L_{Aeq,15minute}$ dB

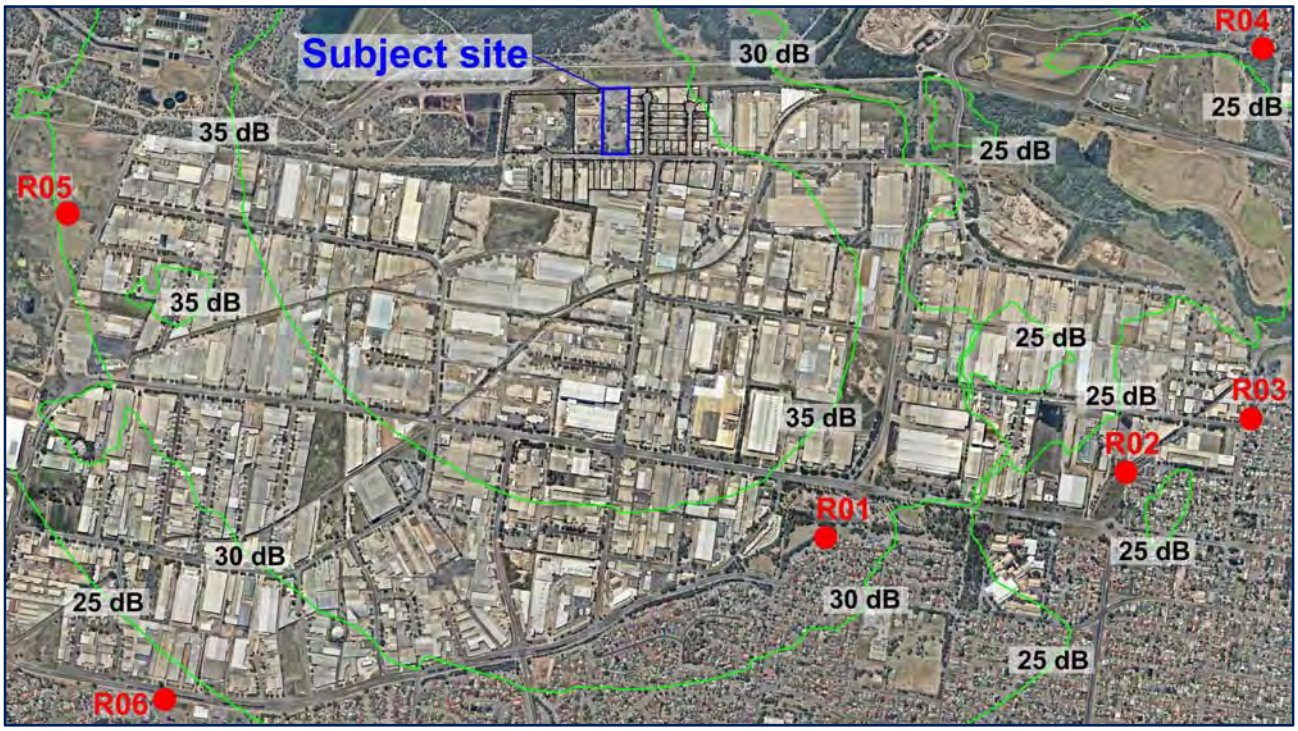


Figure 30: Far Field Noise Contours – Operational Morning Shoulder/Day Period $L_{Aeq,15minute}$ dB

8.2.4.3 Operations – Evening and Night Period

The model scenario for the evening and night periods considers worst case trucking movements to and from the site. No processing activities are proposed for these periods, except for the hour between 6 am and 7 am, which is assessed as the morning shoulder period.

Figure 31 below presents maximum envelope noise contours for the worst case evening/night period scenario, for industrial receivers surrounding the subject site. Specific $L_{Aeq,15minute}$ levels at points on the site boundary are indicated by text boxes containing dB values.

Model results indicate:

- Predicted operational noise levels are below relevant noise criteria at the nearest industrial receivers to the site. The criterion for industrial receivers is LAeq,period 70-75 dB. The highest $L_{Aeq,15minute}$ predicted on the site boundary is 59 dB; and
- Predicted operational noise levels are well below relevant criteria at the nearest residential receivers to the site. General traffic movements on site would not be audible at residential locations.

Figure 31: Near Field Noise Contours – Operational Evening/Night Period $L_{Aeq,15minute}$ dB

8.2.4.4 Sleep Disturbance

Two sleep disturbance scenarios were considered:

1. Outside of the morning shoulder period, assessed by inclusion of a point source with L_{Amax} sound power of 120 dB to represent possible impact noise associated with unloading material on site during the night period. The source was located in an exposed location in an elevated area on the site; and
2. Within the morning shoulder period, assessed by inclusion of a point source with L_{Amax} sound power of 120 dB to represent possible impact noise associated with unloading material on site during the morning shoulder period. The source was located in an exposed location in an elevated area on the site, and was combined with the morning shoulder operational scenario.

Figure 32 presents maximum envelope noise contours for the two sleep disturbance scenarios, for nearest residential receivers to the site.

Specific $L_{Aeq,15minute}$ levels at points adjacent residential receivers are indicated by text boxes containing dB values. Model predictions are well below the sleep disturbance screening criterion indicating sleep disturbance impact is unlikely.

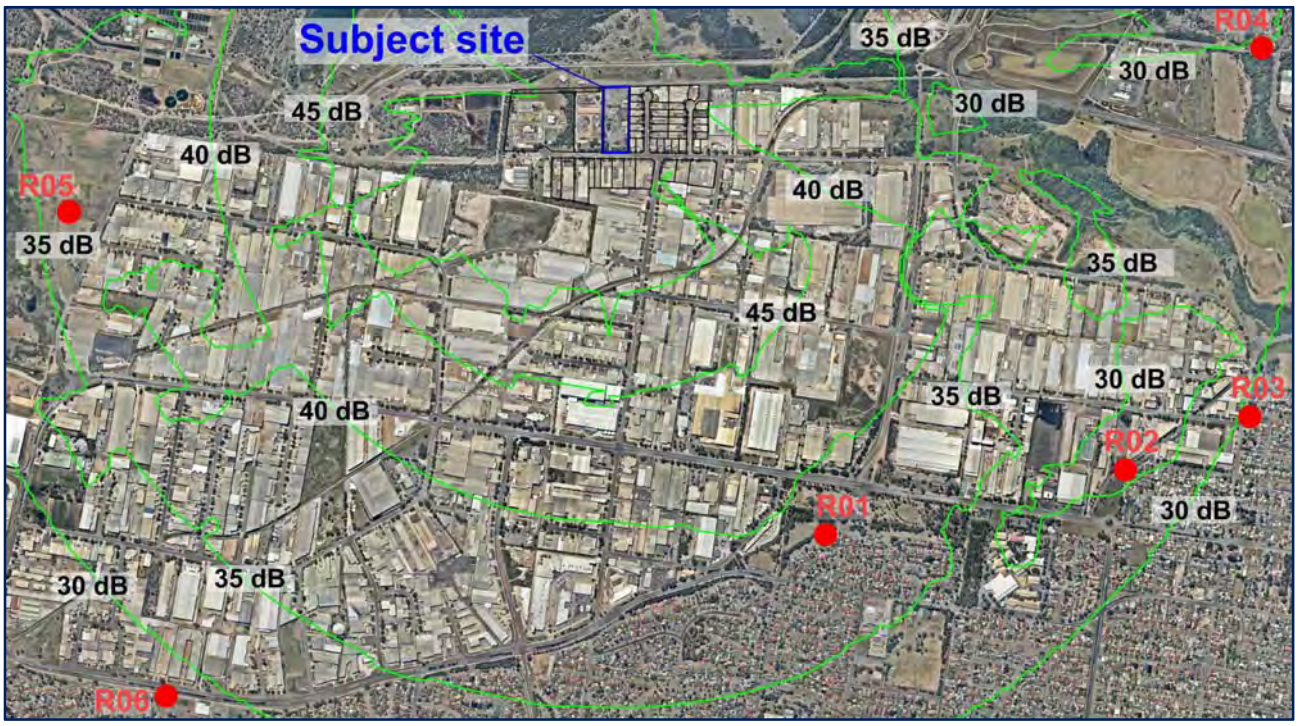


Figure 32: Far Field Noise Contours – Sleep Disturbance LAmax dB

8.2.4.5 Modifying Factors

Modifying factors are characteristics of noise received at residential receptor locations that could result in more annoyance than would normally occur from that level. The modifying factors are tonal noise, low frequency noise, impulsive noise, intermittent noise and duration (if single event).

None of the noise sources proposed are known to exhibit any of these characteristics; therefore it is considered unlikely that modifying factor penalties would result. Further, model predictions are more than 5 dB below relevant criteria, and even if a penalty was to be applied no exceedence to noise assessment criteria would be expected.

8.2.4.6 Road Traffic

The majority of traffic to access the subject site is anticipated to originate via The Horsely Drive, Elizabeth Street, and Victoria Street into Davis Road. In considering the high traffic volumes that already exist on The Horsley Drive, it is assumed road traffic noise criteria are already exceeded. Assessment is therefore made against the relative increase criterion, which limits increases to existing noise levels from new development to 2 dB.

Annual average daily traffic volumes for the Horsely Drive are 21,295 vehicles per day. Total peak daily movements for the subject site are 358 vehicles per day, which represents an increase of 1.7 percent in overall vehicle volumes. In acoustic terms, this represents an increase of less than 0.1 dB, which is considered insignificant. Relative to the high traffic volumes already present on The Horsley Drive, traffic generated by the proposal would have negligible acoustic impact.

8.2.5 Results

The following sections detail the results for the various scenarios modelled.

8.2.5.1 Construction Noise

A worst case construction scenario was developed that considered all construction equipment operating concurrently and continuously at full power. Such a scenario is unlikely to eventuate.

Predicted construction noise levels were below relevant construction noise criteria at the nearest industrial and residential receivers to the site. No construction noise impact is predicted.

8.2.5.2 Operational Noise

A model of the proposed site was developed, including separate morning shoulder/day (6 am to 6 pm) and evening/night period scenarios (6 pm to 6 am).

The morning shoulder/day period scenario considered a potential worst case operating configuration, including all four operating areas operating concurrently at full capacity. All roller doors on processing buildings were considered to be open, and peak period trucking movements were included. As such, this is considered a conservative scenario, and resulting noise levels from the site should typically be less than predicted. Predicted operational noise levels were below relevant noise criteria at the nearest industrial receivers to the site, and, were 5 dB or more below relevant criteria at the nearest residential receivers to the site.

The evening /night period scenario considered worst case trucking movements to and from the site. No processing activities are proposed for these periods. Predicted operational noise levels were below relevant noise criteria at the nearest industrial receivers to the site, and, were well below relevant criteria at the nearest residential receivers to the site. General traffic movements on site would not be audible at residential locations.

No operational noise impacts are predicted.

8.2.5.3 Sleep Disturbance

Sleep disturbance impact was assessed by inclusion of a point source with L_{Amax} sound power of 120 dB to represent possible impact noise associated with unloading material on site during the night period and concurrently with operational activities during the morning shoulder period. The source was located in an exposed location in an elevated area of the site. Model predictions were well below the sleep disturbance screening criterion, indicating sleep disturbance impact is unlikely.

8.2.5.4 Road Traffic Noise

The majority of traffic accessing the site will do so directly via The Horsley Drive, Elizabeth Street and Davis Road. This route remains entirely within the industrial zone until The Horsley Drive. With consideration of

high traffic volumes on The Horsley Drive, it is assumed road traffic noise criteria are already exceeded. The predicted increase to existing road traffic noise due to traffic generated by the proposal is approximately 0.1 dB, which is insignificant and would be imperceptible to the human ear. Relative to the high traffic volumes already present on The Horsley Drive, traffic generated by the proposal would have negligible acoustic impact.

8.2.5.5 Vibration

No vibration impact is predicted at residential receivers due to separation distances from the site of typically 1,500 metres or more. Vibration data was not available to allow a detailed assessment of potential vibration impact to neighbouring industrial premises. It is recommended vibration testing of vibration generating equipment be undertaken upon commissioning to ensure relevant limits are achieved at the nearest industrial receptors.

8.2.6 Mitigation and Management

As there would be no construction and operational noise impacts as a result of the development, no specific noise mitigation measures or monitoring is required. This reflects the location of the development within an industrial precinct and the enclosed nature of the facility including concrete push walls and rapid acting roller shutter doors which assist in containing noise within the process buildings.

8.2.7 Conclusions

Results of this assessment indicate noise and vibration generated by the proposal would have minimal to no impact on the nearest residential receivers to the site. These residential receivers are located more than 1,500 metres away and there are a substantial number of industrial premises and buildings along the propagation path. It is considered highly unlikely proposed operations would be discernible at residential locations.

Model predictions at the site boundary are less than recommended noise amenity criteria for industrial premises. The premises immediately to the west are a metal recycling operation which currently generates relatively high noise levels. Premises located east of the subject site all have a solid concrete wall adjoining the common boundary, which form the rear walls of the buildings located along that boundary. Predicted external noise levels at the front of those buildings are typically 20 dB or more below the amenity criterion, and, are less than day period background noise levels (RBL) measured at the subject site.

Compliance with relevant assessment noise level targets is predicted for all activities, therefore no specific noise management or monitoring is proposed.

8.3 Dust

8.3.1 Introduction

A review of potential dust impacts from the proposed development has been undertaken by Zambelli Environmental. The purpose of this assessment was to evaluate the potential for the development to generate dust, identify the potential sources of dust generated by the waste facility, determine the likelihood for impacts, and propose mitigation and management strategies. A letter report detailing the evaluation of dust impacts is attached as **Appendix 10**.

Whilst the SEAR's have requested that a quantitative assessment be undertaken of dust impacts, the potential for the development to create dust beyond the boundary is considered low as the majority of wastes and products being handled on site will have a moisture content greater than 25% (refer to **Tables 5** & **6** in **Section 3.4**).

It is considered that due to the moisture content of wastes and materials to be handled at the site, the use of enclosed buildings, and the manner in which materials will be managed, there will be no measurable

increase in total suspended particulate beyond the development site boundary. Accordingly, it is considered that a qualitative assessment of dust impacts is sufficient for this development.

Further discussion and justification is provided below in **Section 8.3.3**.

8.3.2 Existing Environment

As detailed previously, the Project area is situated within an existing industrial precinct, within an IN1 (General Industrial) zone as per the Fairfield Local Environmental Plan 2013.

The area has mixed heavy and light industrial businesses, and bulky goods storage. Prospect reservoir is located to the north. The areas south, east and west of the subject site are all considered industrial.

To the west of the Project site is another recycling facility and landfill operated by Suez. Adjoining the subject site to the east are commercial type storage sheds which are the nearest industrial receivers to the subject site.

The nearest private residential receivers are located approximately 1,500 metres to the south of the subject site on Maugham Crescent, Wetherill Park. These residences are located immediately south of the industrial estate, and approximately 170 metres north of The Horsely Drive, an arterial road with high traffic flows.

8.3.3 Impact Assessment

As discussed in the **Project Description** in **Section 3.0**, the following wastes are proposed to be received and processed at the proposed waste facility:

- 60,000 tonnes per year of hydro-excavation drilling muds and fluids for storage, separation and consolidation within the Hydro-excavation and Drill Muds Processing Area;
- 40,000 tonnes per year of various bulk landscaping products for short term storage whilst awaiting to be delivered into the Sydney market;
- 70,000 tonnes of Garden Organics (GO) and Mixed Food and Garden Organics (FOGO) to be processed and consolidated within the Organics Receival and Processing Building; and
- 30,000 tonnes of Food Organics to be processed in the Food De-packaging building.

Apart from the hydro-excavation drilling muds (65% to 95% moisture content) and the landscape supplies (25% moisture content or greater), all other materials (ie. food and garden organics - 35% moisture content or greater) will be received, handled, and processed within enclosed processing sheds. For further details on the moisture content of wastes and products refer to **Tables 5** & **6** in **Section 3.4**.

Due to the types of wastes and resources intended to be received at the proposed facility, the enclosed nature of more than half of the operations, and the moisture content of received wastes and products it is unlikely that environmental amenity will be impacted by dust and particulate materials. As such it is not considered necessary to perform a quantitative assessment against the assessment criteria contained within the *DECC Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*.

Further, it is considered that the activities will not affect the background concentrations of total suspended particulate by any measurable degree due to the practices and management process to be adopted at the facility (refer to **Appendix 21** for the site **EMP**).

The hydro-excavation drill mud treatment process is a wet process whereby muds are dewatered. Follwing dewatering the remaining solid fraction retains a 25% moisture content, and as such dust generation will not occur.

Sand and gravels produced from the drill mud treatment process will be managed through conditioning with water recovered from the original treatment process. Stockpiles of gravel and sand will not be left to dry out below a 25% moisture content through regular inspection.

As the processing of GO and FOGO will occur inside a purpose built enclosure, and receive organic wastes with a moisture content greater than 40%, dust nuisance will not occur. Moisture is to be re-introduced to shredded organics from overhead misting sprays as required based on observations of the dryness of the material.

Similarly, the processing of C&I organics within the purpose built Food De-packaging Building will not create dust due to the high mositure content of the received materials and the enclosed nature of the processing building.

Due to the volume of traffic that is to utilise the facility on a daily basis, it is not considered necessary to perform a quantitative assessment of PM^{10} and $PM^{2.5}$ generated from the exhaust of vehicles, wheels, or brakes whilst entering and exiting the facility. The slow speed limit on site of 10 km/hr will ensure there is no wheel dust generated and no heavy braking to generate excessive brake dust. Similarly, exhaust emissions will also be low as trucks will be travelling at low speeds whilst on site.

8.3.4 Mitigation and Management

Whilst the proposed activities at the site have a low potential to generate particulate or fine dust, the following mitigation and management strategies will be applied the construction and operational activities:

- All incoming and outgoing loads of bulk landscaping materials will be effectively tarped such that dust or particulate is not released;
- Onsite speed limit will be 10 km/hr to ensure minimal dust generation from vehicle movements;
- Driveways and haulage paths will be regularly swept so that dust and or particulate is not re-entrained during windy periods;
- Bulk landscaping will be managed with sprays so as to minimise the release of dust at the time of unloading or loading;
- Drill mud products will not be accumulated over a period whereby they dry to the point of dust being created;
- Material stockpiles will have moisture content maintained through the use sprinklers and sprays;
- Dust on site will be visually monitored. Should there be adverse weather conditions and the potential for dust to leave site those activities will be reduced or ceased until dust levels return to acceptable levels;
- Fogger units will be utilised within enclosed sheds to further reduce air quality impacts from the operations; and
- Recycled water will be utilised across the operations to maintain hard surfaces and areas that have the potential to produce dust.

Further detail on dust mitigation and management is contained in the site EMP attached as **Appendix 21**.

8.3.5 Conclusions

Due to the high moisture content of the wastes being handled, the enclosed nature of over 50% of the processing operations, and the level of mitigation measures to be employed across the site, it is considered that the development will have negligible dust impacts on the surrounding areas. Accordingly, a quantitative dust assessment is not considered justified for the proposed development.

8.4 Traffic and Transport

8.4.1 Introduction

An assessment of traffic and access impacts of the proposed development has been undertaken by Thompson Stanbury Associates. The purpose of this report was to determine the potential traffic impacts resulting from the proposed facility and to recommend treatments to mitigate these impacts. The Traffic Impact Assessment is attached as **Appendix 11**.

The assessment has also been prepared to satisfy the SEARs, which requested the following be considered:

- Details of all traffic types and volumes likely to be generated during construction and operation, including a description of haul routes;
- An assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts at key intersections using SIDRA or similar traffic model;
- Detailed plans of the proposed layout of the internal road network and parking on site in accordance with the relevant Australian Standards;
- Plans of any proposed road upgrades, infrastructure works or new roads required for the development;
- Daily and peak traffic movements likely to be generated by the proposed development including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required). Depending on the anticipated traffic generation, key intersections to be examined / modelled may include (but not necessarily be limited to) Victoria Street / Elizabeth Street;
- Details of the proposed accesses and the parking provisions associated with the proposed development including compliance with the requirements of the relevant Australian Standards (i.e. turn paths, sight distance requirements, aisle widths);
- Proposed number of car parking spaces and compliance with the appropriate parking codes; and
- Details of heavy vehicle movements.

A full summary of the SEARs requirements (including agency responses) are included within **Appendix 1**.

8.4.2 Existing Environment

8.4.2.1 Local Road Network

The following provides a description of the surrounding road network that services connectivity between the proposed and adjoining developments within the Wetherill Park Industrial Precinct.

Davis Road performs a local industrial access function under the care and control of Fairfield City Council. In this regard, it facilitates an east/west connection between Prospect Highway/Widemere Road in the east and Elizabeth Street in the west, with which it intersects under traffic signal and unsigned priority control respectively. At its western extremity, Davis Road terminates in a cul-de-sac.

Davis Road provides a 12 m wide pavement, providing one through lane of traffic in each direction in conjunction with parallel parking lane along both formalised kerb and gutter alignments.

Elizabeth Street performs a collector function under the care and control of Fairfield City Council. It provides a north/south route connecting Davis Road in the north to The Horsley Drive (a State Road) to the south, with midblock connections to Victoria Street (a regional road). Elizabeth Street provides an 18 m wide carriageway comprising two 3 m wide travel lanes and two 6.0 m wide parking lanes. At its southern extremity, Elizabeth Street intersects with The Horsley Drive under traffic signal control. Traffic flow is governed by a sign posted speed limit of 60 km/hr.

8.4.2.2 Traffic Volumes

In order to obtain an indication of the existing operation of the primary access intersection servicing Davis Road, morning and evening peak hour traffic surveys were undertaken at the following locations:

- Intersection of Elizabeth Street and Davis Road;
- Junction of Elizabeth Street and Frank Street; and
- Intersection of Victoria Street and Elizabeth Street.

Surveys of the above intersections were undertaken on 14 October 2015 between 7.00 am – 8.00 am and 4.00 pm – 5.00 pm.

Peak hourly traffic movements at the above intersections determined the following:

- Bi-directional traffic demands within Davis Road are approximately between 150 – 250 vehicles during peak times;
- Bi-directional traffic demands within Frank Street are approximately between 50 – 100 vehicles during peak times;
- Elizabeth Street at its junction with Frank Street accommodates bi-directional traffic demands in the order of between 600 – 700 vehicles during peak times;
- Elizabeth Street at its junction with Victoria Street accommodates bi-directional traffic demands in the order of between 500 – 600 vehicles during peak times; and
- Bi-directional traffic demands within Victoria Street are approximately between1,800 – 1,900 vehicles during peak times.

Peak hourly traffic movements at the above intersections are further detailed in **Figure 33** below.

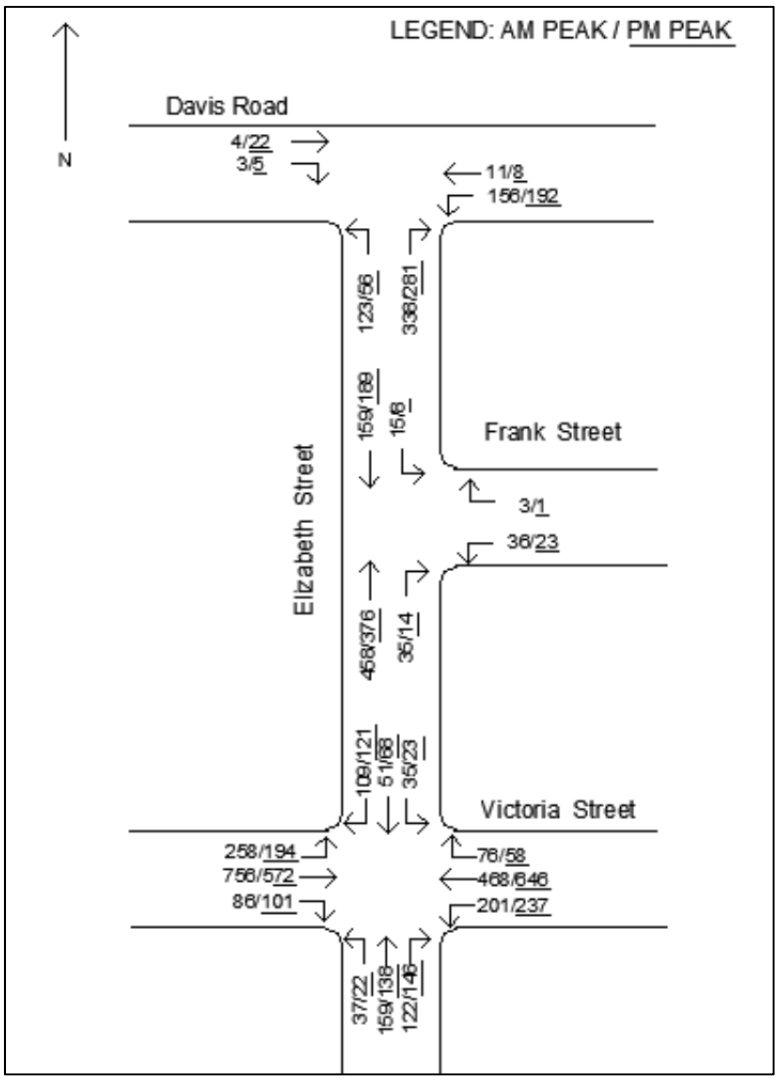


Figure 33: Existing Weekday Peak Traffic Volumes

8.4.2.3 Site Access

An existing vehicular driveway adjacent to the western boundary currently connects the subject site with the adjoining public road and is proposed to be widened to 12.5 m to readily accommodate heavy vehicles (being the largest to frequent the site) and in accordance with the requirements of *The Australian Standard for Parking Facilities Part 2: Off-Street Commercial Vehicle Facilities* (2002).

A second vehicular driveway to the site exists adjacent to the eastern boundary and will be utilised as access for light vehicles only.

8.4.2.4 Traffic Generation from Existing Operations

The subject land currently accommodates a series of outbuildings previously associated with an Emoleum plant operated by Mobil. This industrial processing development has been decommissioned and rehabilitated since operations ceased in 2004, hence there is currently no existing traffic generation from the subject site.

8.4.2.5 Existing Intersection Performance

In order to estimate the existing peak efficiency of the critical road network, a SIDRA computer network analysis was undertaken at the junction of Elizabeth Street / Davis Road and the intersection of Victoria Street / Elizabeth Street. Key indicators of the SIDRA analysis included level of service (LoS) where results

are placed on a continuum from A to F, with A providing the greatest intersection efficiency and therefore being the most desirable by the Roads and Maritime Services.

The results of the SIDRA analysis indicated the following:

- The junction of Davis Road and Elizabeth Street currently provides motorists with a level of service 'A', representing good operation with spare capacity during both commuter peaks; and
- The intersection of Victoria Street and Elizabeth Street is assessed to currently provide motorists with a level of service 'C', representing satisfactory conditions with some delays.

Further details of the SIDRA analysis are provided within the Traffic Impact Assessment attached as **Appendix 11.**

8.4.2.6 Existing Car Parking

As the subject site has not been occupied since 2004, there is currently no car parking utilised onsite, however areas previously provided for car parking will be re-instated as parking for the proposed waste facility.

The subject development is proposing to provide a total of 36 off-street passenger vehicle parking spaces, distributed throughout the site within standard 90 degree angled parking rows serviced by an adjoining parking aisle.

8.4.2.7 Public Transport

Transit Systems operates a single bus service (Route 812) in the immediate vicinity of subject site, with the closest bus stop being 200 m walking distance to the south-east of the subject site, along the western side of Elizabeth Street.

Route 812 operates from Fairfield to Blacktown, generally every 30 minutes.

8.4.3 Methodology

The Traffic Impact Assessment assesses the impact of the proposed development on the performance of the existing road network as well as the provision of parking, site access arrangements and internal circulation. The assessment has utilised traffic counts of the local road network, RMS data, intersection performance, and traffic modelling (SIDRA) to determine the likely traffic impacts of the development.

A detailed methodology is provided in the Traffic Impact Assessment attached as **Appendix 11.**

8.4.4 Impact Assessment

8.4.4.1 Traffic Generation

Traffic generation of the proposal has been calculated based on the employment levels in conjunction with the level of waste disposal and collection vehicles required by the operation. Projected traffic generation associated with staff and visitors (comprising both passenger and heavy vehicles) during AM and PM peak hour commuter periods is estimated to be between 15 – 30 vehicle movements to and from the site. Incorporating the worst case scenario, the upper bound traffic generation of 30 vehicle movements comprising 15 inbound trips and 15 outbound trips anticipated to be generated during peak hour was used for the purposes of this assessment.

Table 2 of the Traffic Impact Assessment (attached as **Appendix 11**) provides a summary of the anticipated average and daily vehicle movements in and out of the proposed resource recovery facility.

8.4.4.2 Trip Assignment

It is expected that 70% of traffic generated by the development will arrive from the east via Davis Road, whilst the remaining 30% are projected to originate from the south via Elizabeth Street. The same

assignment has been applied to vehicles exiting the site. The following peak hour trip assignment has been applied to this assessment:

- 4 vehicles approach the site from the south via Elizabeth Street, left turn into Davis Road and a right turn into the site;
- 11 vehicles approach the site from the east via Davis Road and a right turn into the site;
- 4 vehicles exit the site via a left turn into Davis Road and a right turn into Elizabeth Street to the south; and
- 11 vehicles exit the site via a left turn onto the Davis Road travelling towards the east.

Figure 34 provides a graphical representation of the development generated trip assignment throughout the local road network.

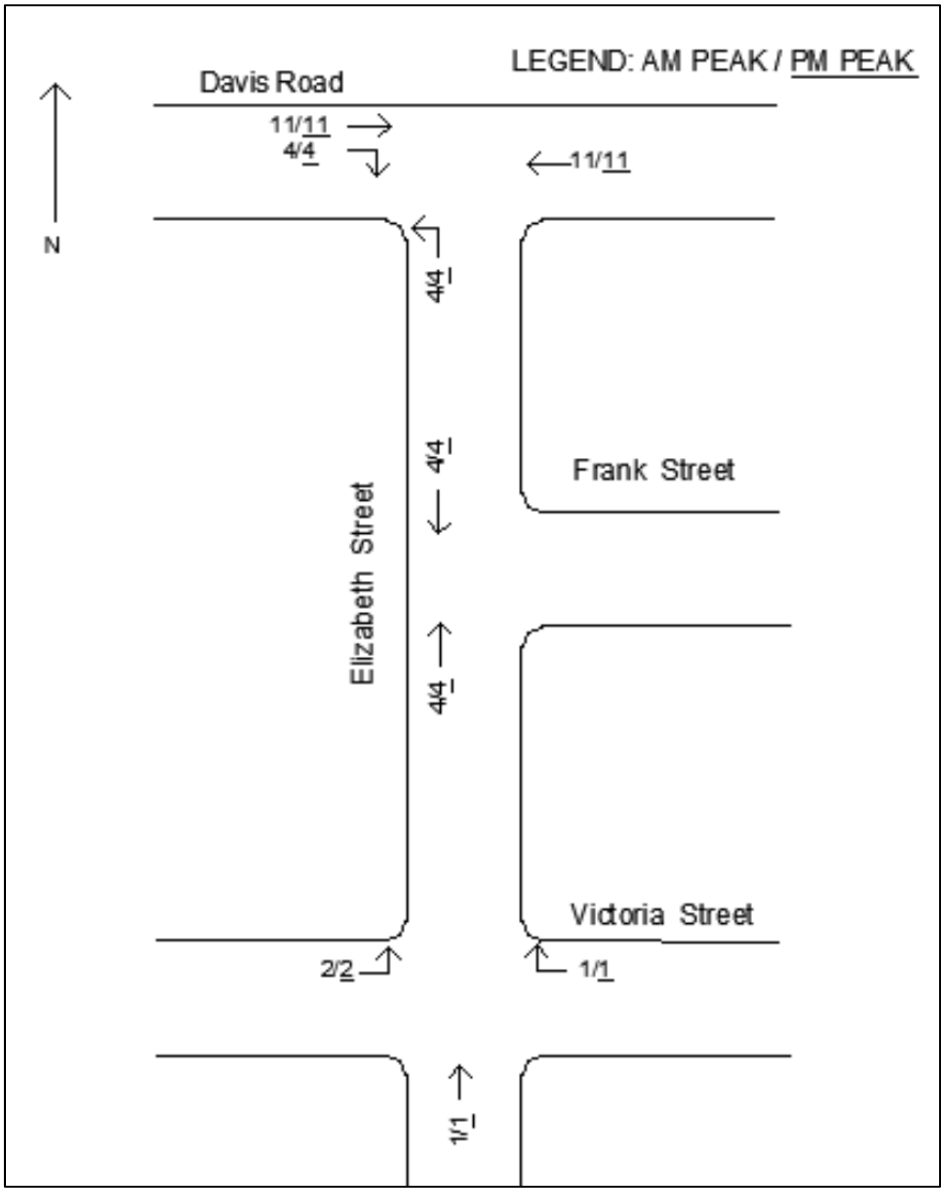


Figure 34: Proposed Development Trip Assignment

8.4.4.3 Projected Traffic Volumes

The projected peak hour traffic volumes have been determined by adding the trip assignment presented within **Figure 33** to the existing volumes surveyed during peak conditions provided in **Figure 34**. **Figure 35** below provides an estimation of the future traffic volumes associated with and adjoining the subject site.

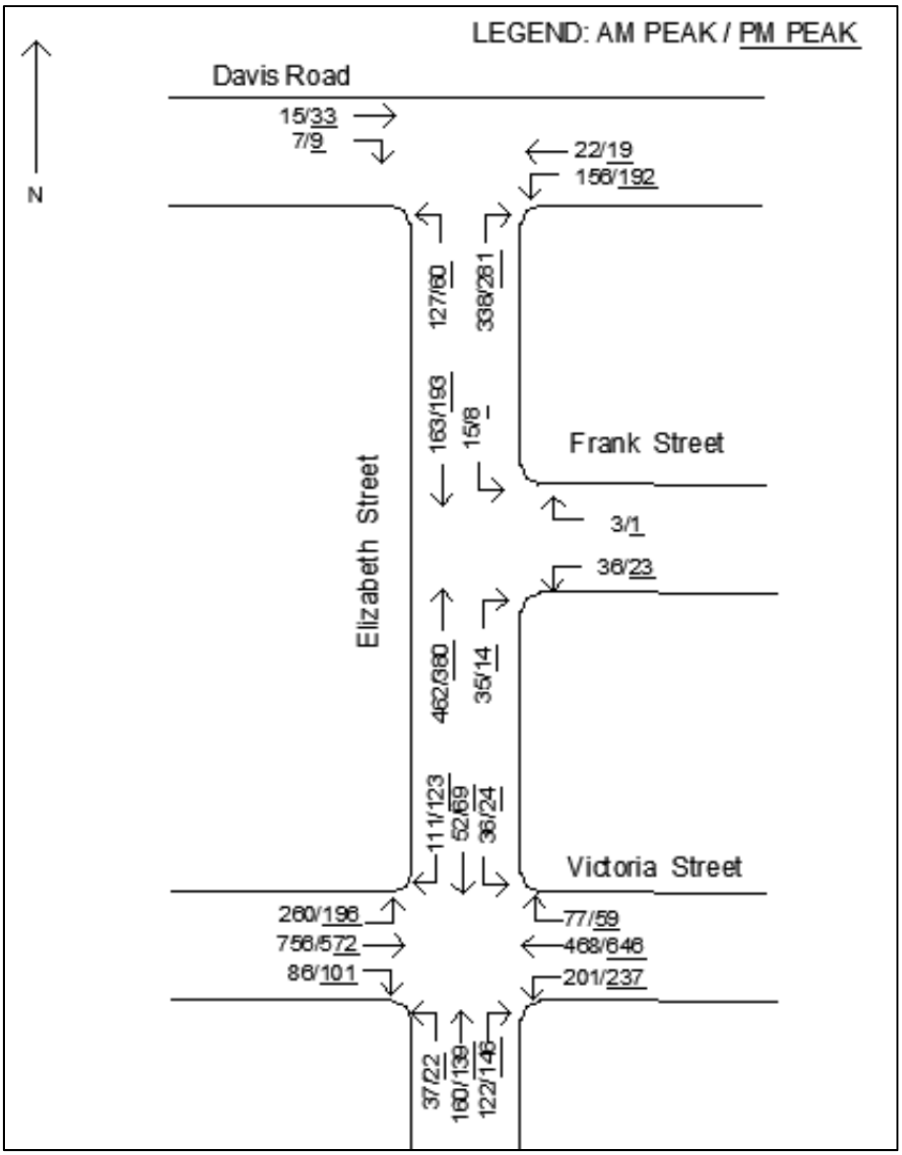


Figure 35: Predicted Weekday Peak Hour Traffic Volumes Incorporating Proposed Development

8.4.4.4 Projected Intersection Performance

Utilising the projected traffic generation characteristics of the proposed development and the abovementioned assumed trip assignment, the junction of Elizabeth Street/Davis Road and intersection of Victoria Street/Elizabeth Street were modelled in order to estimate that likely impact on traffic safety and efficiency.

Modelling indicates that the traffic projected to be generated by the subject proposal is expected to result in some minor increase to the average vehicular delay, number of stops and degree of saturation at modelled intersections. However, the existing intersection LoS is projected to remain unaltered at all modelled intersections.

A summary of the modelled results are proved in the Traffic Impact Assessment attached as **Appendix 11**.

8.4.4.5 Site Access

The low traffic demands within Davis Road provide regular and extended gaps within directional traffic flows thereby providing good conditions with which to undertake turning movements to and from the site access driveways. Impedance associated with such movements is therefore projected to be minimal resulting in efficient site access conditions.

Access to the site has been designed such as to provide the maximum possible sight distance between the access driveway and the adjoining public road traffic movements. Accordingly, the projected additional traffic movements generated by the proposed use are envisaged to provide for safe and efficient conditions within which to access and exit the site.

8.4.4.6 Operational Impacts

Projected AM peak traffic generation for the proposed development coincides with the morning peak hour, while the PM peak traffic demand of the proposed development (comprising 40 passenger and heavy vehicle movements to and from the site) is anticipated to occur outside of the afternoon peak period surveyed.

Observations undertaken of the traffic conditions within the surrounding roads during non-commuter peak periods and on weekends indicate quieter, less traffic demands on the surrounding roads. As such, the additional traffic envisaged to be generated by the proposed development during these times is not expected to have any adverse impacts on existing road network servicing the site.

As such, a SIDRA analysis of these conditions incorporating the cumulative impacts of the recycling facility during these times are not expected to yield different LoS results to those already determined.

8.4.4.7 Construction Impacts

When considering the location of the site with respect to the surrounding State Road network, construction vehicle routes would not be dissimilar to the routes of trucks associated with the operations of the development. Further, peak period construction vehicle volumes are expected to be considerably lower compared with trucks movements during peak operations. The Traffic Assessment has modelled the additional peak hour traffic generated based on the operating conditions of the site which has indicated that the adjoining road network is still able to operate with a good LoS and minimal delays. As such the traffic generated by construction vehicles is not anticipated to alter the existing road conditions or adversely impact on the industrial amenity of the surrounding area.

8.4.4.8 Access Suitability

Passenger Vehicles

The suitability of the proposed access driveway for passenger vehicles has been assessed against the Australian Standard for Off-Street Car parking (AS2890.1-2004). This publication provides driveway design recommendations based on the number and classification of vehicles to be accommodated onsite and the functional role of the frontage road.

The proposed 12.5 m wide access exceeds the design criteria specified within AS2890.1-2004 and is therefore considered to be satisfactory in terms of servicing passenger vehicles.

Heavy Vehicles

In order to demonstrate the suitability of the proposed access to accommodate heavy vehicles up to 19 m long (ie. B-doubles), swept path plans where generated for the site. The plans were generated based on standard B-double truck turning specifications provided within AustRoads. The swept paths indicated that B-double vehicles are able to enter and exit the site without any unreasonable encroachment on the opposing Davis Road eastbound travel lane, formalised road verge and/or internal development kerbing.

In addition, the total length of the entry and exit weighbridges are 22 m which are located approximately 18 m inside the property boundary. With the addition of the waiting space behind it, the entry access is capable of accommodating up to two 19 m long B-doubles onsite without extension/encroachment onto the adjoining frontage road. The weighbridge location is therefore assessed to be appropriate with respect to minimising the potential for queuing onto the public road.

Accordingly, the proposed driveway design is therefore deemed to be capable of satisfactorily accommodating the largest vehicles required to service the site.

Site Access Safety Assessment

The safety and efficiency of access / egress movements are assisted by the relatively level grade within the first 6 m of the property boundary and the provision of a triangular area measuring 2.5 m into the site and 2 m along the boundary that allows visibility for traffic exiting the site. The consistent horizontal and vertical alignment of Davis Road in the immediate vicinity of the subject site will provide motorists with good sight distance between the public roadway and the site access driveway.

Accordingly, the proposed site access arrangements are considered to be of an adequately safe standard.

Parking Provisions

The subject development is proposing to provide a total of 36 off-street passenger vehicle parking spaces, distributed throughout the site within standard 90 degree angled parking rows serviced by an adjoining parking aisle. Parking demand associated with the proposed use is most likely to be limited to that generated by staff and visitors. It is anticipated that proposed site operations will generate a demand for up to 25 employees and two visitors on-site at any one time. Assuming a worst case scenario that all staff and visitors access the site at the same time, a peak passenger vehicle parking demand of 27 is anticipated. The proposed parking provision of 36 spaces is therefore expected to readily accommodate operational demands and is considered to be satisfactory.

There will be adequate space at the faclity for the temporary parking of up to 7 trucks onsite at any one time. This includes 1 truck inside the food and garden organics processing building, 1 truck inside the food de-packaging building, 1 truck in the truck parking/inspection bay to the east of the weighbridges, 2 trucks at the trip trough on the mid-level dumping drill muds, 1 truck on the entry weighbridge, and 1 truck on the exit weighbridge. No trucks will be parked onsite overnight with full loads.

8.4.4.9 Vehicle Circulation

Passenger Vehicles

Upon entry to the subject site, passenger vehicles will move in a forward direction to access the at-grade passenger vehicle parking areas located within the front and rear of the site. The passenger vehicle parking areas are proposed to comprise 90 degree angled parking rows, being serviced by adjoining parking aisles.

The internal circulation of the parking areas have been designed in accordance with the requirements of AS2890.1-2004 and AS2890.6-2009, and include the following minimum dimensions:

- Standard vehicle parking space width of 2.5 m;
- Disabled (if required) vehicle parking space width of 2.5 m (plus an adjoining 2.5 m wide shared area);
- Additional space width adjoining obstruction of 0.3 m;
- Standard and disabled (if required) vehicle parking space length of 5.4 m; and
- Parking aisle width of 5.8 m.

The above compliance with the relevant AS2890.1-2004 and AS2890.6-2009 specifications is anticipated to result in safe and efficient internal manoeuvring and parking space accessibility.

Heavy Vehicles

The facility is proposed to accommodate vehicles up to and including 19 m long B-doubles. These vehicles will access the site in a simple forward direction and undertake all loading / unloading activities and manoeuvring within on-site. Upon completion of the loading / unloading activities, these vehicles exit the site via the site access driveway to Davis Road in a simple forward manoeuvre.

In order to demonstrate the ability of the internal circulation arrangements to accommodate the required manoeuvring throughout the site, a turning path analysis has been undertaken, whereby a number of swept path plans have been prepared incorporating turning specifications of Medium Rigid Vehicles (MRVs), truck and dog combination vehicles and 19 m long B-doubles provided within Austroads. This analysis has indicated that all heavy vehicles proposed to service the facility are capable of manoeuvring within the site in a safe and efficient manner without any unreasonable encroachment on internal passenger vehicle parking areas or structures. Accordingly, the internal heavy vehicle manoeuvring arrangements are considered to be satisfactory.

8.4.5 Mitigation and Management

As there would be no impact on the performance of the local road network, road upgrades are not required. While the traffic assessment concludes that the additional traffic generated by the facility will not adversely impact on road capacity, Bettergrow will schedule its heavy vehicle movements to avoid the busy morning and afternoon peak hours. The performance capacity of the local road network and intersections is being further enhanced with a number of road upgrades in the vicinity of the proposed development. The movement of trucks into and out of the facility will be maximised through trucks entering and leaving with a full load where possible.

8.4.6 Conclusions

The Traffic Impact Assessment for this proposal considered impacts associated with increased traffic generation, site access, parking, intersection performance, and safety. The following conclusions are made based on the results of this assessment:

- The on-site parking provisions are adequate to accommodate for projected demand given the likely number of employees and visitors on-site at any one time;
- The proposed site access arrangements provide for the safe and efficient conditions to access and vacate the site;
- The internal circulation arrangements are projected to provide for safe and efficient internal movements and are capable of accommodating the peak operational demands of the use, wholly within the site;
- The surrounding road network, in particular the junction of Elizabeth Street/Davis Road and the intersection of Victoria Street/Elizabeth Street, operates with a good LoS during peak and non-peak periods (including weekends);
- The proposed use is projected to generate up to 30 peak hour trips (comprising both passenger and heavy vehicles) to and from the site corresponding to peak commuter periods and a maximum of 40 vehicle trips to and from the site during other times; and
- The surrounding road network is capable of accommodating the vehicular traffic generated by the proposal at all times.

8.5 Visual Amenity

8.5.1 Introduction

An assessment of visual impacts from the proposed development has been undertaken by Moir Landscape Architecture. The purpose of this report was to provide a qualitative and quantitative assessment of the

visibility and potential visual impacts generated by the development. The full Visual Impact Assessment (VIA) is attached as **Appendix 12**.

The assessment has also been prepared to satisfy the SEARs, which requested the following be considered:

- An assessment of the potential visual impacts of the project on the amenity of the surrounding area.

A full summary of the SEARs requirements (including agency responses) are included within **Appendix 1**.

8.5.2 Existing Environment

8.5.2.1 Landscape Character

The development site is a 'brownfield' holding within an existing industrial precinct on land zoned as IN1 under the Fairfield LEP (2013). The IN1 zone applies to the majority of land located within the industrial precinct. This land zoning allows for the establishment of light and heavy industrial activities which immediately surround the Project site.

Beyond the surrounds of the site are residential properties 1.5 km to the south, and Prospect Reservoir and associated parklands immediately to the north.

A number of arterial roads, including the M4 Motorway, Great Western Highway, Smithfield Road, Horsely Drive and the M7 Westlink are adjacent to the site.

The topography surrounding the site is predominantly flat with slight slopes, with land rising to the north towards Prospect Reservoir.

Vegetation on the site and in the immediate surroundings is limited to a mix of exotic and native trees and shrubs associated with street trees and boundary planting within industrial lots. There is limited vegetation on the site with some stands of vegetation and a strip of native trees located along the eastern and southern boundaries. Vegetation to the north of the site is associated with Prospect Creek.

Plates 20 to **23** show the landscape features at and surrounding the site.

Plate 20 View of Wetherill Park and Subject Site Over Prospect Reservoir

Plate 21 View of Sydney Water Pipeline to the North of the Site

Plate 22 View of Site Vegetation Towards the South

Plate 23 View of Existing Site Infrastructure and Neighbouring Building Towards the North-East

8.5.3 Methodology

A VIA is used to identify and determine the value, significance and sensitivity of a landscape. The method applied to this study involved systematically evaluating the visual environment pertaining to the site and using judgements based on landscape values.

The following methodology was applied to the assessment of the site:

- Objective assessment of the relative aesthetic value of the landscape, defined as visual quality and expressed as high, medium or low. This assessment generally relates to variety, uniqueness, prominence and naturalness of the landform, vegetation and water forms within each character type;
- Determination of the landscape sensitivity and its ability to absorb different types of development on the basis of physical and environmental character;
- An assessment of viewer sensitivity to change. This includes how different groups of people view the landscape (for example, a resident as opposed to a tourist), and how many people are viewing and from how far;

- The undertaking of a viewpoint analysis to identify areas likely to be affected by development of the site and a photographic survey using a digital camera and a handheld GPS unit to record position and altitude;
- An assessment of visual impacts and the preparation of recommendations for impact mitigation. Suggestions are made for suitable development patterns that would maintain the areas visual quality; and
- The purpose of the above methodology is to reduce the amount of subjectivity entering into the visual impact assessment and to provide sufficient data to allow for third party verification of results.

8.5.4 Impact Assessment

8.5.4.1 Viewpoint Analysis

Viewpoints have been carefully selected to be representative of the range of views within the study area. The selection of viewpoints was informed by topographical maps, field work observations and other relevant influences such as access, landscape character and the popularity of vantage points.

A total of 10 viewpoints were recorded as part of the field work process. The majority of these viewpoints were taken from publicly accessible roads surrounding the site. The viewpoints which have been included represent the areas from where the development would appear most prominent, either based on the degree of exposure or the number of people likely to be affected. The locations of viewpoints are shown on **Figure 36.**

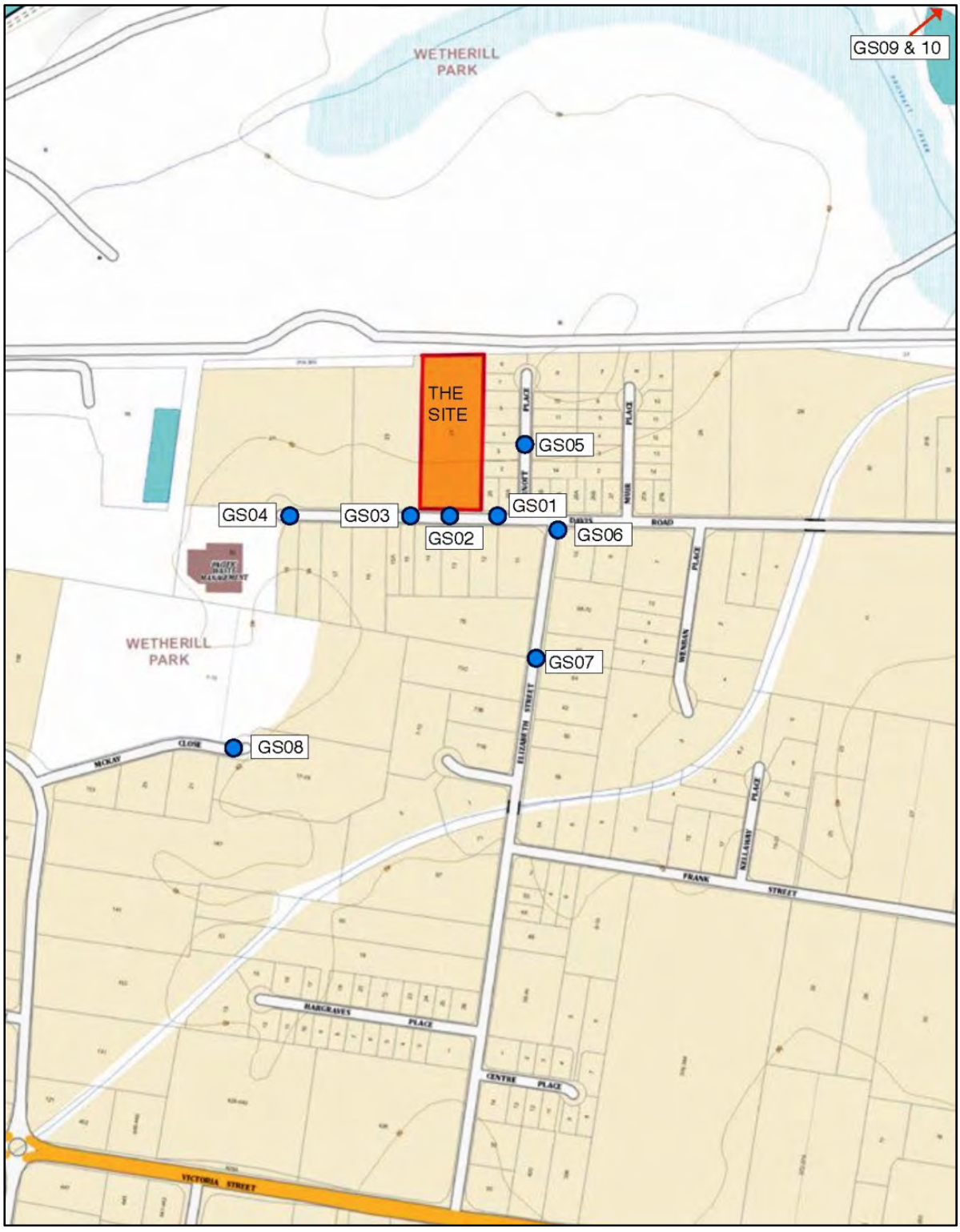


Figure 36: Viewpoint Assessment Locations

From each viewpoint, panoramic photographs were taken at eye level towards the development location. The visual impact of the viewpoint was then assessed both on site and with the topographic and aerial information to ensure accuracy. Viewpoint photographs and photomontages are included in the full VIA attached as **Appendix 12**. The findings of the viewpoint analysis have been quantified and are summarised in **Table 31** below.

Table 31 Summary of Viewpoint Visual Impact

Viewpoint	Visual Sensitivity	Visual Effect	Potential Visual Impact
GS01	Low	Low	Low
GS02	Low	Low	Low
GS03	Low	Low	Low
GS04	Low	Nil	Nil
GS05	Low	Nil	Nil
GS06	Low	Nil	Nil
GS07	Low	Nil	Nil
GS08	Low	Nil	Nil
GS09	High	Nil	Nil
GS10	High	Nil	Nil

Of the 10 viewpoints assessed as part of this VIA, the development would be visible from a total of 3 viewpoints. Of the 3 viewpoints from which the facility would be visible, all 3 of these have been assessed as having a low visual impact.

It is noted that visual impacts associated with the proposed development are likely to be higher during the construction phases; however with the implementation of mitigation measures (discussed below in **Section 8.4.5**) the level of visual impact will ultimately achieve a low or negligible visual impact level.

8.5.4.2 Visual Impact

The following section provides an overview of the potential visibility from local areas surrounding the site and is intended to provide an overall assessment of the potential visual impact on areas potentially affected by the proposal. **Figure 37** below shows the local areas considered for the visual impact assessment.

The existing character along Davis Road is commercial and industrial buildings with large power lines along the southern side of the road. The proposal will retain the existing site office which is currently visible from Davis Road. The additional buildings are set back from Davis Road and views are likely to be fragmented by the existing buildings and vegetation.

Views from roads within the Wetherill Park Industrial area are generally contained by industrial and commercial buildings and associated vegetation. The proposal is in keeping with the existing industrial land use and the existing visual character is likely to be unaffected by the proposal.

The proposed development intends to retain existing pockets of vegetation within the site and along the southern boundary, while the existing vegetation buffer along the southern boundary currently fragments the site from Davis Road. Proposed signage on the frontage of the site is likely to be visible from Davis Road, however it will be in keeping with the existing visual character and LEP and DCP requirements.

The nearest residences are located in excess of 1.5 kilometres to the south and east of the site. The proposal would not be visible from these residences.

Land to the north of the development site is associated with Sydney Water and remains inaccessible to the general public. Additionally, dense vegetation associated with Prospect Creek screen views towards the Fairfield Industrial Area from Walder Park and Prospect Reservoir.

Figure 37: Area of Visual Impact Assessment

Maunder Lookout is located approximately 1.5 km to the north east of the site with expansive views over Prospect Reservoir and industrial buildings associated with Davis Road. The entry road to Maunder Lookout was closed at the time of the field work, however topographic mapping indicates the proposal would likely be visible, yet as the scale is in keeping with the existing visual character it would likely remain unnoticeable and appear as a continuation of the existing industrial zone.

Night lighting will be required at the facility for safety and security reasons. Other sources of light will come from vehicular traffic, street lighting, and surrounding industrial buildings.

The proposal is likely to be viewed as a continuation of the existing industrial development in a large scale industrial zone and the visual impacts are negligible.

Signage at the facility will be located to the right of the existing western access point to the site. Signage will be sized in accordance with *Section 9.3 of the Fairfield City Council DCP - Advertising Signage* requirements which allows for a maximum sign size up to 30 m^2 total advertising area.

Photomontages from the locations discussed above are included in the full VIA attached as **Appendix 12**.

8.5.5 Mitigation and Management

The following mitigation and management measures will be applied to the proposed development to reduce visual impacts, including:

- The built form of the proposed buildings are of a similar scale to the surrounding industrial and commercial buildings;
- Night lighting is to be positioned such that is does not extend off site into neighbouring businesses and is to focussed towards the ground;
- Building materials selected will reduce colour contrast and blend any new and existing structures, as far as possible, into the surrounding landscape;
- The existing buildings are being reused, which will reduce the visual impact during the construction phase;
- The existing vegetation buffer along the southern boundary will be retained and supplementary planting incorporated where possible;
- The retention of existing trees within the site to assist in fragmenting views of the proposed development; and
- The use of native flora species, consistent with vegetation already on the site, which will create habitat for fauna.

Where planting is proposed, this is a long-term strategy requiring establishment and maturation of the plantings. Overtime, as vegetation matures, the visual impacts associated with development are further diminished.

8.5.6 Conclusions

The existing landscape character is a mix of commercial and industrial buildings and businesses. The scale of the proposal is in keeping with the existing visual character of the Fairfield Industrial Area.

The design principles of the development seek to avoid, reduce and where possible, remedy adverse effects on the environment through the implementation of mitigation measures, which propose a combination of primary mitigation measures (site planning principles) and secondary measures (landscaping, street trees, colour and material selections).

With the implementation of the recommended mitigation measures, the proposed development can be undertaken whilst maintaining the core landscape character of the area, and have a negligible visual impact on the surrounding visual landscape.

8.6 Surface Water and Flooding

8.6.1 Introduction

An assessment of surface water and flooding impacts of the proposed development has been undertaken by Northrop Engineers. The purpose of this report was to determine the potential surface water and flooding impacts resulting from the proposed facility, storm water management, water consumption, leachate treatment, and to recommend strategies to mitigate these impacts. The Surface Water Assessment is attached as **Appendix 13**.

The assessment has also been prepared to satisfy the SEARs, which requested the following be considered:

- A quantitative assessment of existing flooding on the site, potential impacts from the development and proposed mitigation measures;
- An investigation to identify any soil or water contamination on the site and proposed management measures;
- A description of water and soil resources, topography, hydrology, watercourses and riparian lands on or nearby to the site;
- A detailed site water balance, including identification of water requirements for the life of the Project, measures that would be implemented to ensure an adequate and secure water supply is available for the proposal and a detailed description of the measures to minimise the water use at the site;
- Details of stormwater/wastewater/leachate management systems including the capacity of onsite detention systems, and measures to treat, reuse or dispose of water;
- A description of erosion and sediment controls;
- An assessment of potential impacts to soil and water resources, topography, drainage lines, watercourses and riparian lands on or nearby to the site; and
- Consideration of salinity and acid sulfate soil impacts.

A full summary of the SEARs requirements (including agency responses) are included within **Appendix 1**.

8.6.2 Existing Environment

8.6.2.1 Surrounding Land Uses

Neighbouring land uses include chemical manufacturing, petroleum product production, and resource recovery. A water supply easement operated by Sydney water runs along the northern boundary of the site. Beyond this easement to the north are the Prospect Nature Reserve and Prospect Reservoir.

8.6.2.2 Landform

The Project area is divided into three distinct levels, each of which is made up of a relatively flat area of hardstand remaining from the sites previous use. The grade from the north to the south of the site is on average 5%.

The northern boundary is a localised high point with all runoff flowing to the south towards Davis Road. The southern frontage is relatively flat along Davis Road with slight falls to the east. Within the surrounding catchment, Davis Road acts as an overland flow path for upstream developments.

8.6.2.3 Surface Hydrology

Stormwater from the existing site is conveyed from the high point in the north to Davis Road in the south via an existing pit and pipe network and overland flow paths. The existing piped drainage system consisting of reinforced concrete and vitrified clay pipes remain in situ, however inspection by camera indicates varying states of disrepair, including pipe cracking, sediment blockage, and tree root invasion.

The existing Council owned stormwater network within Davis Road conveys stormwater to the east discharging into an unnamed concrete lined channel running from the south-west to the north-east of the Wetherill Park industrial estate. The concrete channel discharges into Prospect Creek near Widemere Road, approximately 1 km east of the site.

The site lies within the Georges River catchment which covers an approximate area of 960 km^2. Flowing through south-western Sydney, the Georges River eventually discharges into Botany Bay. The primary tributary of the Georges River in the area is Prospect Creek which begins at Prospect Reservoir and flows for approximately 26 km through the local government areas of Holroyd, Fairfield, Liverpool and Bankstown, before discharging into the Georges River downstream of Chipping Norton Lake. The site is approximately 500 m south of Prospect Creek and 800 metres south of Prospect Reservoir.

8.6.2.4 Existing Flow Regimes

The Prospect Creek catchment is highly urbanised, and the natural flow regime has been significantly altered. Historically, Prospect Creek was dammed to create Prospect Reservoir in the late 1800s. Since then, source flows have been limited to infrequent, controlled releases from the reservoir and downstream inflows of stormwater originating from urbanised sub-catchments along the length of the creek.

8.6.2.5 Vegetation

The site and much of surrounding land to the west, south and east have been extensively cleared and disturbed through commercial and industrial land uses. The scattered areas of vegetation that exist across the site primarily consist of small trees and shrubs. The widest strip of vegetation is across the site frontage where larger trees provide screening. To the rear of the site, land between the northern boundary and the Prospect Reservoir remains undeveloped around Prospect Creek. This area consists primarily of disturbed grassland and pockets of sparse bushland.

Prospect Creek is surrounded by generally poor quality disturbed riparian vegetation zones for the majority of its length. The unnamed concrete lined channel, which runoff from site reports to, has limited vegetation along either side which is largely made up of grasses and scatted small trees and shrubs.

8.6.2.6 Features of Conservation Significance

No features of conservation significance within the site, nor located within 1 km downstream have been identified. It is noted that Prospect Creek's surrounding riparian vegetation is subject to ongoing conservation efforts through the NSW Environment Trust.

8.6.2.7 Soils and Geology

The 1:100,000 Penrith Geological Sheet indicates that the site is located within the Blacktown residual soil landscape area. The soil landscape is described as gently undulating rises on Wianamatta Group shales and Hawkesbury Sandstone. This formation is characterised by units of shale, claystone, laminite and fine to medium-grained lithic sandstone. Prospect Creek is situated over medium-grained sand, clay and silt.

8.6.2.8 Surface Water Quality

The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000) sets standard objectives to assess the water quality of aquatic ecosystems. Under the ANZECC guidelines the Georges River Catchment, containing highly urbanised areas, falls into the category of 'highly disturbed ecosystems'.

In 2010, the Georges River Combined Councils' Committee (GRCCC) engaged SMEC Pty Ltd to undertake a study to compare water quality data collected by Bankstown City Council from 1997 to 2009 with the relevant ANZECC trigger values. The results are summarised as a percentage of the time the trigger values recommended by ANZECC are exceeded. The values for Prospect Creek and the wider Georges River Catchment are summarised below in **Table 32**.

Table 32 Water Quality Indicators ANZECC 2000 Water Quality Triggers

Indicator	Prospect Creek (% Time Exceeded)	Georges River Catchment (% Time Exceeded)
Total Nitrogen (TN)	67.10	57.15
Total Phosphorus (TP)	86.69	86.69
Dissolved Oxygen (DO) %	71.04	75.95
pH	37.11	14.21
Turbidity (NTU)	67.15	60.25
Chlorophyll a	42.90	59.17

From the data shown in **Table 32**, it is evident that both Prospect Creek and the wider Georges River Catchment do not meet ANZECC guidelines and record regular to frequent exceedances for all parameters.

8.6.2.9 Groundwater Quality

The site is located within the Blacktown residual soil landscape area on Wianamatta Group shales and Hawkesbury Sandstone. Groundwater quality in the Wianamatta Group is generally saline with previous groundwater assessments reporting values in the range of 5,000 – 50,000 mg/L, whilst groundwater salinity levels are low in the Hawkesbury Sandstone. Groundwater in the Hawkesbury Sandstone also often has naturally elevated concentrations of iron and manganese and is generally acidic with pH varying between 4.5 and 6.5 (Douglas Partners, 2016).

The groundwater resource identified as most likely to be present beneath the site comprises of a confined sandstone aquifer at a depth greater than 100 m overlain by relatively low permeability aquitards of the Wianamatta Group. Whilst groundwater bearing zones may be present within fractures of the Wianamatta Group the potential for significant impact is considered to be low. Further to this no down-hydraulic gradient Groundwater Dependent Ecosystems (GDEs) have been mapped within 10 kilometres of the site, while the Department of Primary Industry (DPI) bore register indicates that groundwater is not being used within 1 km of the site (Douglas Partners, 2016).

Douglas Partners (2016) concluded that the proposed development will have a low risk of significantly impacting groundwater supply or quality.

8.6.3 Methodology

The following methodology has applied to the assessment of the site to address the relevant requirements of the SEARs. This included:

- Assessment of the site's existing surface water environment, surface water flow regimes, surface water quality and quantity, local and regional hydrology, surface water features and surrounding land uses;
- Design and proposal of surface water management measures to ensure minimal impact of the development on surface water resources;
- Development of a site water balance to assist with the assessment of water security and predicted discharges;
- Design and recommendation of maintenance and monitoring measures; and
- Assessment of the flooding regime and potential flood impacts of the development.

8.6.4 Impact Assessment

8.6.4.1 Potential Surface Water Impacts

Any development that proposes to change the existing land use has potential to directly impact on the catchments hydrologic regime and water quality characteristics. With the site of the proposed development already highly altered, mainly absent of vegetation, and covered by hardstand areas, the proposed development has:

- A reduced likelihood of having a negative impact on the receiving environment subject to the proposed development implementing adequate controls and management principles; and
- A greater opportunity to improve the quality of stormwater leaving site via upgrading the current infrastructure and implementing new devices to treat stormwater prior to leaving site.

The most commonly identified surface water pollutants are Total Suspended Solids (TSS), Total Nitrogen (TN), Total Phosphorus (TP) and Gross Pollutants (GP), Heavy Metals and Hydrocarbons.

The transportation of waste materials onsite presents a potential risk of pollutants discharging to stormwater. The increased risk of higher levels of TP and TN leaving Site is a result of the proposed garden organics and food waste sorting facilities. Elevated risks of increased TSS, heavy metals, hydrocarbons and GP are a result of higher vehicle movements and receival of drill muds and bulk landscape supplies.

The content and subsequent pollutants contained within the drill muds and fluids can vary depending upon the drilling operation. The average solids content of product delivered to Site is expected to be approximately 40%. Typically drilling fluid is a mixture of water and other chemicals additives including but not limited to bentonite, soda ash (sodium carbonate), sodium hydroxide, lime and polymers. The drilling mud is generally a mixture of naturally occurring rock and soil including but not limited to materials such as sandstone, shale, clay and drilling fluid generated during drilling operations.

Drilling waste testing has shown that spent drilling mud has the potential to contain elevated values of pH, solid materials, total dissolved solids, surfactants, chloride ions, sulphate ions, Dissolved Organic Carbon (DOC), oil hydrocarbons, heavy metals such as arsenic, barium, cadmium, chromium, copper, mercury, nickel, lead, antimony, selenium, zinc, tin, and cobalt. As the impact of such pollutants into receiving environments would be detrimental, the NSW EPA enforce strict management and handling procedures for drill mud disposal to land applications outside of licenced waste facilities under the provisions of the *2014 Drill Mud Order* and associated exemption. The separated liquid from the drill muds also have the potential to contain similar pollutants and therefore will be contained and managed through the Site wastewater management system.

Further detail is provided in Section 5.3 of the **Surface Water Assessment** prepared by Northrop attached as **Appendix 13**.

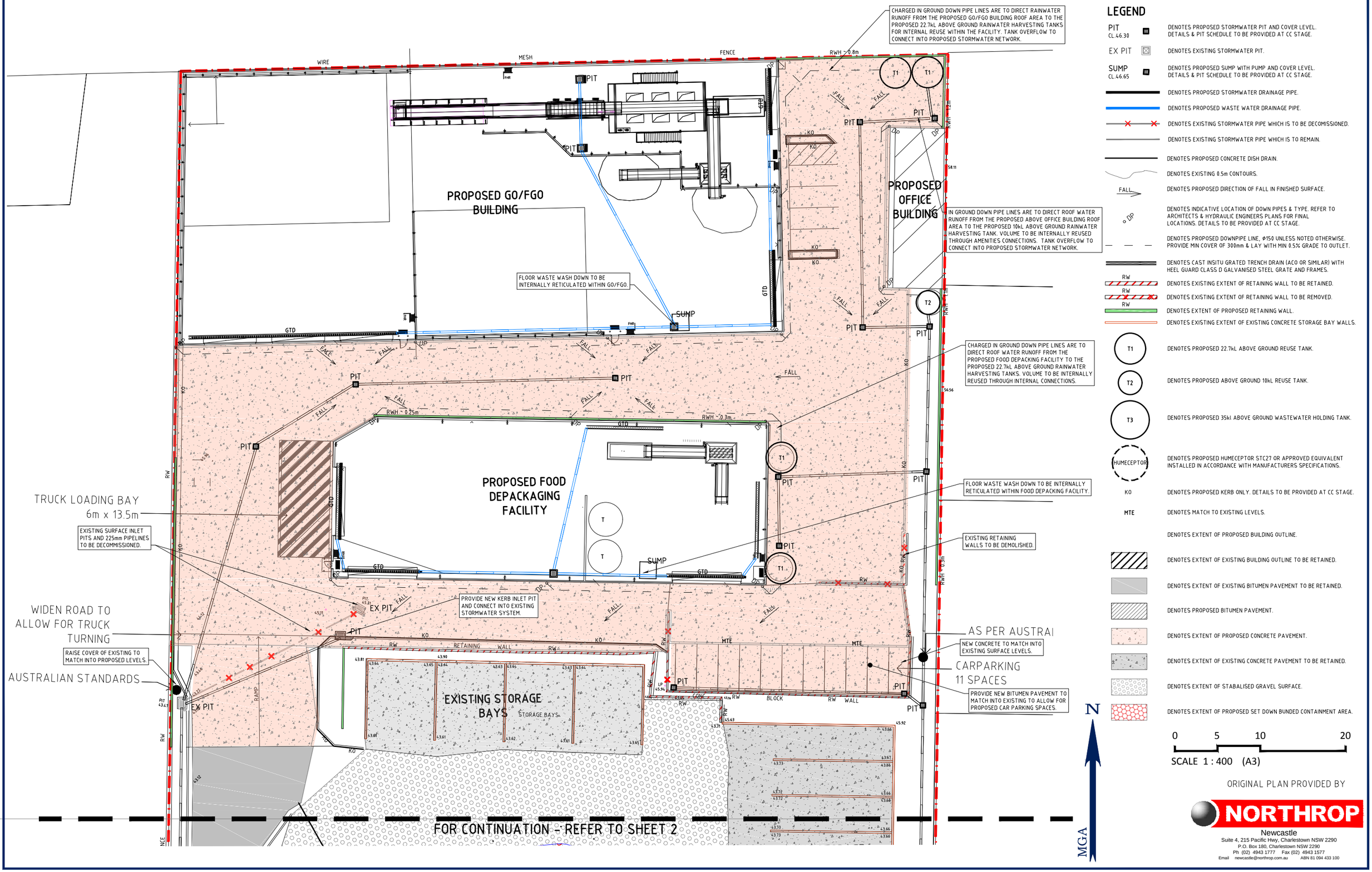
8.6.4.2 Proposed Stormwater Management System

The proposed stormwater management system for the site is detailed on **Figures 38, 39** and **40**, while the adopted stormwater management design is summarised as follows:

- Roof water runoff from buildings is to be directed to 7 rainwater harvesting tanks with a combined capacity of 120 kL. The harvested water is to be internally reused through amenities connections, with tank overflows reporting to the stormwater system. Harvested runoff from the proposed GO/FOGO and Food De-packaging buildings is to be reused for internal wash down of the facilities;
- Surface water runoff from the hardstand areas in conjunction with the tank overflow is to be conveyed via the stormwater network in a southerly direction across the site. The existing pit and pipe infrastructure is to be retained and incorporated into the new stormwater network where possible;
- Surface water runoff from the Bulk Landscaping Supplies area is to be directed to a sediment trap with a minimum storage volume of 41 kL. The system has been designed in accordance with NSW Managing

Urban Stormwater: Soil's and Construction 'Blue Book' guidelines to capture sediment laden rainfall from across the area. Given the stabilised nature of the gravel surface with minimal fines, the trap has been sized as a type C basin to collect course sediment, assuming a peak runoff coefficient of 0.8;

- Prior to release from site, the piped stormwater network is to be directed to a proprietary STC- 27 Humeceptor system. The Humeceptor system is an underground, precast concrete stormwater treatment solution that utilises hydrodynamic and gravitational separation to efficiently remove total suspended solids (≥10 microns) and entrained hydrocarbons. The proposed system has been designed to provide a storage volume of 27 kL, including an emergency oil storage volume of approximately 4000 L in case of onsite spillages; and
- From the Humceptor, water will be discharged to the existing outlet connection point for stormwater into Fairfield City Councils stormwater system along Davis Road.



LEGEND

- PIT CL.46.30 — DENOTES PROPOSED STORMWATER PIT AND COVER LEVEL. DETAILS & PIT SCHEDULE TO BE PROVIDED AT CC STAGE.
- EX PIT — DENOTES EXISTING STORMWATER PIT.
- SUMP CL.46.65 — DENOTES PROPOSED SUMP WITH PUMP AND COVER LEVEL. DETAILS & PIT SCHEDULE TO BE PROVIDED AT CC STAGE.
- DENOTES PROPOSED STORMWATER DRAINAGE PIPE.
- DENOTES PROPOSED WASTE WATER DRAINAGE PIPE.
- DENOTES EXISTING STORMWATER PIPE WHICH IS TO BE DECOMMISSIONED.
- DENOTES EXISTING STORMWATER PIPE WHICH IS TO REMAIN.
- DENOTES PROPOSED CONCRETE DISH DRAIN.
- DENOTES EXISTING 0.5m CONTOURS.
- FALL — DENOTES PROPOSED DIRECTION OF FALL IN FINISHED SURFACE.
- DP — DENOTES INDICATIVE LOCATION OF DOWN PIPES & TYPE. REFER TO ARCHITECTS & HYDRAULIC ENGINEERS PLANS FOR FINAL LOCATIONS. DETAILS TO BE PROVIDED AT CC STAGE.
- DENOTES PROPOSED DOWNPIPE LINE, Φ150 UNLESS NOTED OTHERWISE. PROVIDE MIN COVER OF 300mm & LAY WITH MIN 0.5% GRADE TO OUTLET.
- DENOTES CAST INSITU GRATED TRENCH DRAIN (ACO OR SIMILAR) WITH HEEL GUARD CLASS D GALVANISED STEEL GRATE AND FRAMES.
- RW — DENOTES EXISTING EXTENT OF RETAINING WALL TO BE RETAINED.
- RW — DENOTES EXISTING EXTENT OF RETAINING WALL TO BE REMOVED.
- RW — DENOTES EXTENT OF PROPOSED RETAINING WALL.
- DENOTES EXISTING EXTENT OF EXISTING CONCRETE STORAGE BAY WALLS.
- T1 — DENOTES PROPOSED 22.7kL ABOVE GROUND REUSE TANK.
- T2 — DENOTES PROPOSED ABOVE GROUND 10kL REUSE TANK.
- T3 — DENOTES PROPOSED 35kl ABOVE GROUND WASTEWATER HOLDING TANK.
- HUMECEPTOR — DENOTES PROPOSED HUMECEPTOR STC27 OR APPROVED EQUIVALENT INSTALLED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
- KO — DENOTES PROPOSED KERB ONLY. DETAILS TO BE PROVIDED AT CC STAGE.
- MTE — DENOTES MATCH TO EXISTING LEVELS.
- DENOTES EXTENT OF PROPOSED BUILDING OUTLINE.
- DENOTES EXTENT OF EXISTING BUILDING OUTLINE TO BE RETAINED.
- DENOTES EXTENT OF EXISTING BITUMEN PAVEMENT TO BE RETAINED.
- DENOTES PROPOSED BITUMEN PAVEMENT.
- DENOTES EXTENT OF PROPOSED CONCRETE PAVEMENT.
- DENOTES EXTENT OF EXISTING CONCRETE PAVEMENT TO BE RETAINED.
- DENOTES EXTENT OF STABALISED GRAVEL SURFACE.
- DENOTES EXTENT OF PROPOSED SET DOWN BUNDED CONTAINMENT AREA.

0 5 10 20

SCALE 1 : 400 (A3)

ORIGINAL PLAN PROVIDED BY

NORTHROP
Newcastle
Suite 4, 215 Pacific Hwy, Charlestown NSW 2290
P.O. Box 180, Charlestown NSW 2290
Ph (02) 4943 1777 Fax (02) 4943 1577
Email newcastle@northrop.com.au ABN 81 094 433 100

TITLE: FIGURE 38: SURFACE WATER MANAGEMENT PLAN - SHEET 1

LOCATION: DAVIS RD WETHERILL PARK

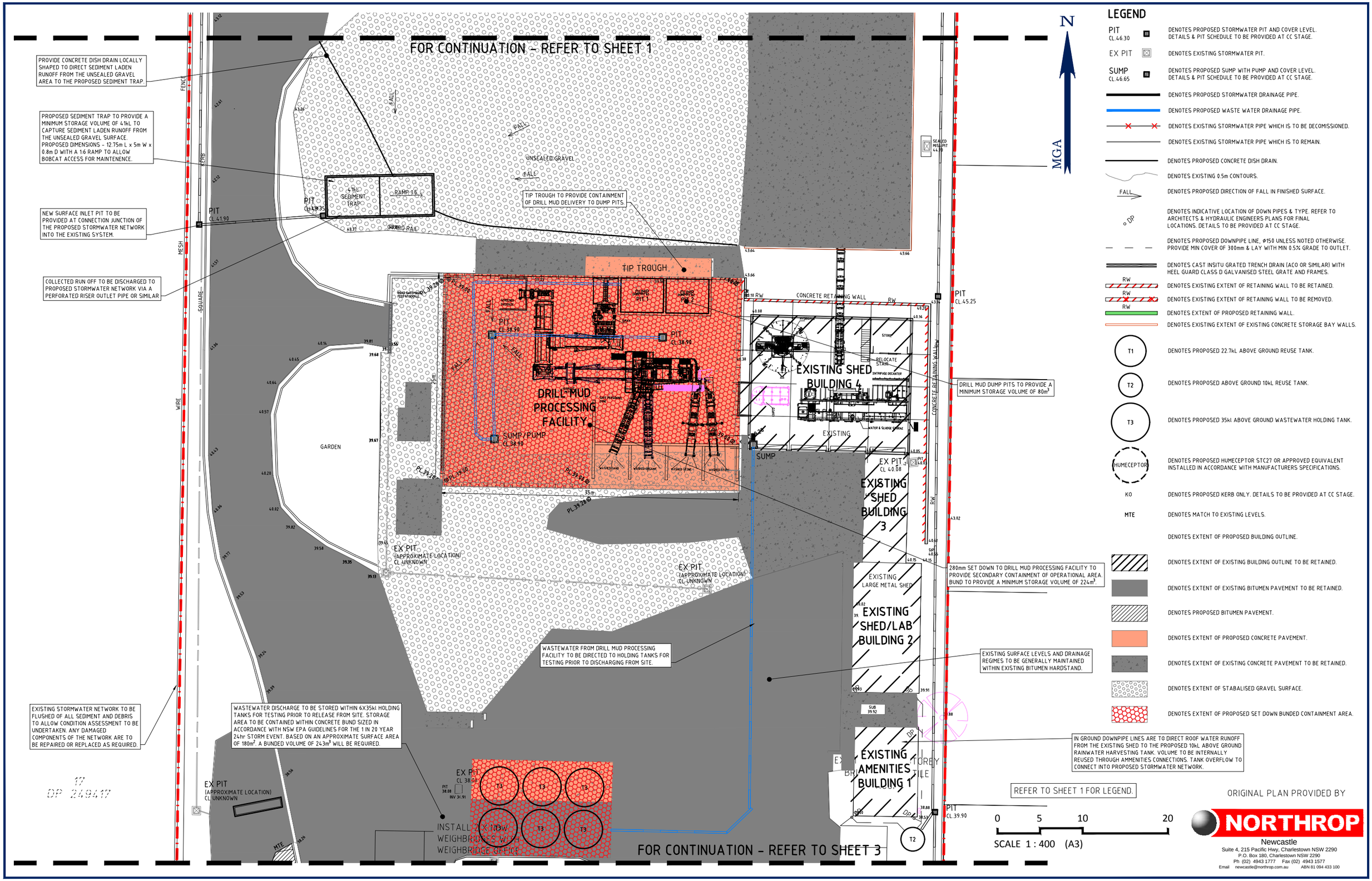
DATUM: GDA94
PROJECTION: MGA ZONE 56

DATE: 10/04/2017
PURPOSE: PLANNING

AUTOCAD REF: J:\JOBS\127k\127695 Wetherill Park\10 - Drafting\\Northrop
VERSION: B A3 (JH-NW)

CLIENT: BETTER GROW
JOB REF: 127695

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au



LEGEND

- PIT CL.46.30 — DENOTES PROPOSED STORMWATER PIT AND COVER LEVEL. DETAILS & PIT SCHEDULE TO BE PROVIDED AT CC STAGE.
- EX PIT — DENOTES EXISTING STORMWATER PIT.
- SUMP CL.46.65 — DENOTES PROPOSED SUMP WITH PUMP AND COVER LEVEL. DETAILS & PIT SCHEDULE TO BE PROVIDED AT CC STAGE.
- DENOTES PROPOSED STORMWATER DRAINAGE PIPE.
- DENOTES PROPOSED WASTE WATER DRAINAGE PIPE.
- DENOTES EXISTING STORMWATER PIPE WHICH IS TO BE DECOMISSIONED.
- DENOTES EXISTING STORMWATER PIPE WHICH IS TO REMAIN.
- DENOTES PROPOSED CONCRETE DISH DRAIN.
- DENOTES EXISTING 0.5m CONTOURS.
- FALL — DENOTES PROPOSED DIRECTION OF FALL IN FINISHED SURFACE.
- DP — DENOTES INDICATIVE LOCATION OF DOWN PIPES & TYPE. REFER TO ARCHITECTS & HYDRAULIC ENGINEERS PLANS FOR FINAL LOCATIONS. DETAILS TO BE PROVIDED AT CC STAGE.
- DENOTES PROPOSED DOWNPIPE LINE, ⌀150 UNLESS NOTED OTHERWISE. PROVIDE MIN COVER OF 300mm & LAY WITH MIN 0.5% GRADE TO OUTLET.
- DENOTES CAST INSITU GRATED TRENCH DRAIN (ACO OR SIMILAR) WITH HEEL GUARD CLASS D GALVANISED STEEL GRATE AND FRAMES.
- RW — DENOTES EXISTING EXTENT OF RETAINING WALL TO BE RETAINED.
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- RW — DENOTES EXTENT OF PROPOSED RETAINING WALL.
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- KO — DENOTES PROPOSED KERB ONLY. DETAILS TO BE PROVIDED AT CC STAGE.
- MTE — DENOTES MATCH TO EXISTING LEVELS.
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- DENOTES EXTENT OF EXISTING BITUMEN PAVEMENT TO BE RETAINED.
- DENOTES PROPOSED BITUMEN PAVEMENT.
- DENOTES EXTENT OF PROPOSED CONCRETE PAVEMENT.
- DENOTES EXTENT OF EXISTING CONCRETE PAVEMENT TO BE RETAINED.
- DENOTES EXTENT OF STABALISED GRAVEL SURFACE.
- DENOTES EXTENT OF PROPOSED SET DOWN BUNDED CONTAINMENT AREA.

17 DP 249417

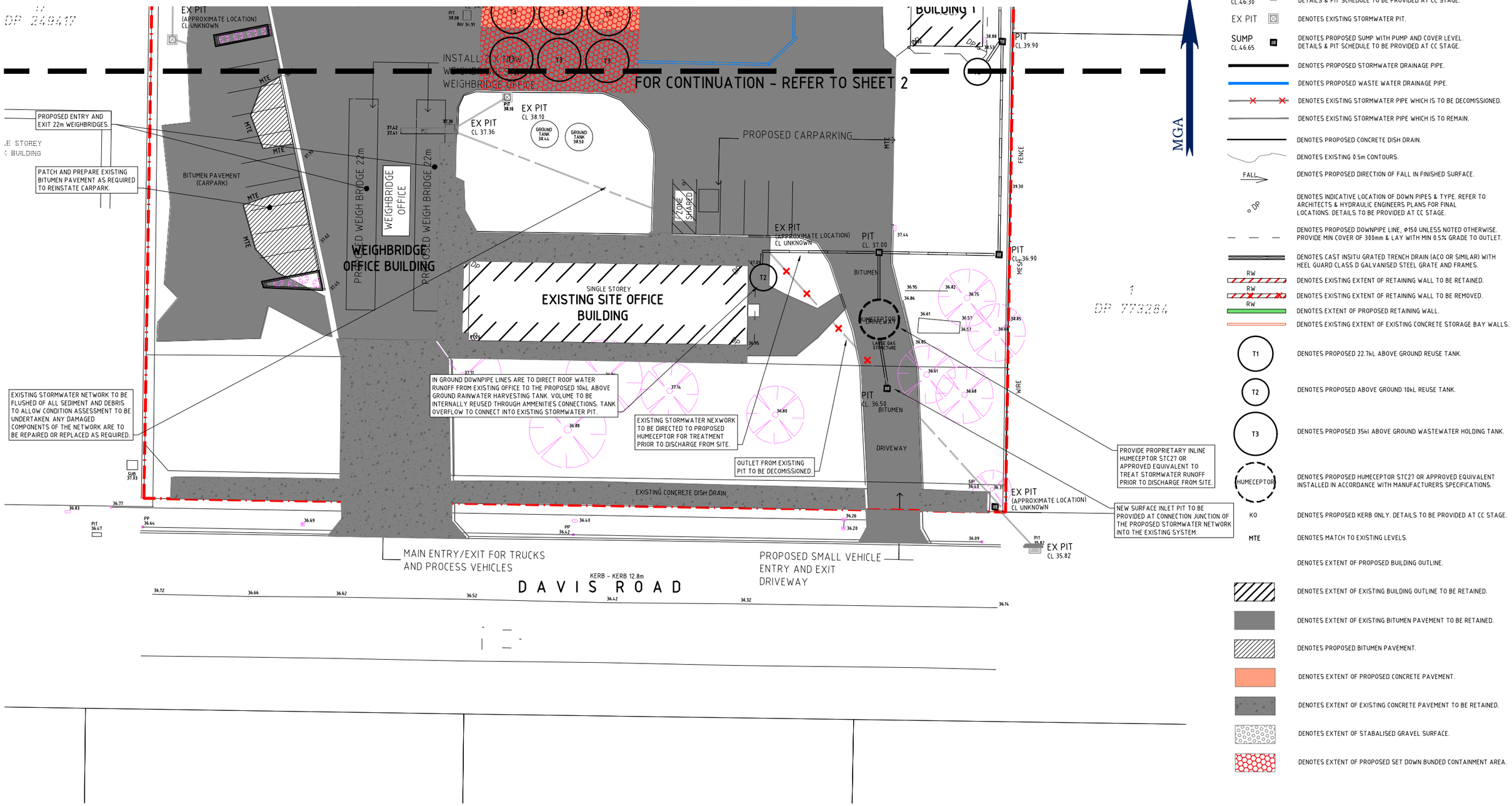
ORIGINAL PLAN PROVIDED BY

NORTHROP
Newcastle
Suite 4, 215 Pacific Hwy, Charlestown NSW 2290
P.O. Box 180, Charlestown NSW 2290
Ph (02) 4943 1777 Fax (02) 4943 1577
Email newcastle@northrop.com.au ABN 81 094 433 100

TITLE: FIGUR 39: SURFACE WATER MANAGEMENT PLAN - SHEET 2
LOCATION: DAVIS RD WETHERILL PARK
DATUM: GDA94
PROJECTION: MGA ZONE 56
DATE: 10/04/2017
PURPOSE: PLANNING
AUTOCAD REF: J:\JOBS\127K\127695 Wetherill Park\10 - Drafting\\Northrop
VERSION: B A3 (JH-NW)

CLIENT: BETTER GROW
JOB REF: 127695

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au



REFER TO DRAWING C20 FOR LEGEND.

0 5 10 20

SCALE 1 : 400 (A3)

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Newcastle
Suite 4, 215 Pacific Hwy, Charlestown NSW 2290
P.O. Box 180, Charlestown NSW 2290
Ph (02) 4943 1777 Fax (02) 4943 1577
Email newcastle@northrop.com.au ABN 81 094 433 100

TITLE: FIGURE 40: SURFACE WATER MANAGEMENT PLAN - SHEET 3

LOCATION: DAVIS RD WETHERILL PARK

DATUM: GDA94
PROJECTION: MGA ZONE 56

DATE: 10/04/2017
PURPOSE: PLANNING

AUTOCAD REF: J:\JOBS\127k\127695 Wetherill Park\10 - Drafting\\Northrop
VERSION: B A3 (JH-NW)

CLIENT: BETTER GROW
JOB REF: 127695

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
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Onsite Stormwater Detention

Preliminary modelling has been undertaken using DRAINS software to simulate the expected stormwater runoff from the catchment for both the pre- and post-development conditions. The site was split into three sub catchments for the pre- and post-developed models. Given the developed nature of both scenarios and catchment sizes, a time of concentration of 5 minutes was estimated for all sub-catchments.

Modelling indicates that the proposed development will result in a small net decrease in discharge flowrates and therefore would reduce the current effect of runoff from site. Given the relatively small size of the site compared to the receiving environments catchment, it is not expected that the small decrease would not have any impact on the downstream hydrologic regime with no significant changes proposed to the frequency or magnitude of flow as a result of the proposed development.

Details of the modelling, including catchment areas, and discharge results are included in the Surface Water Assessment attached as **Appendix 13.**

Stormwater Quality

In order to minimise any adverse impacts upon the ecology and health of the downstream watercourses, stormwater treatment devices have been incorporated into the design of the development. The performance of the proposed stormwater management strategy has been assessed against the current state of the existing site using the conceptual software MUSIC. MUSIC estimates the efficiency of Stormwater Quality Improvement Devices (SQIDs) at capturing common stormwater pollutants including TSS, TN, TP and GP from stormwater runoff.

The catchment area was broken down into sub-catchments based on surface type to effectively simulate the proposed treatment measures along the treatment train. A schematic of the MUSIC model can be seen below in **Figure 41**. In developing a MUSIC model, rainfall and evaporation records in the vicinity of the Site were sought. In addition, the catchment had to be categorised based on the proposed land use.

Figure 41: MUSIC Model Schematic

Results of the modelling show that the proposed treatment train will effectively reduce all residual pollutant loads beneath the pre-developed source loads currently released into the downstream receiving waters. The development is not expected to result in changes to the downstream hydrologic flow regime and as such is not expected to result in additional nutrient enrichment within downstream water bodies. From a regional perspective, given the net decrease in pollutant loads the development would be considered to have a beneficial impact on the water quality objectives.

Details of the modelling, including the adopted treatment train and pollutant removal efficiency are included in the Surface Water Assessment attached as **Appendix 13**.

8.6.4.3 Proposed Wastewater Management System

The proposed wastewater management system is detailed on **Figures 38, 39** and **40** above. An independent wastewater management system has been proposed for the food/organics and drill mud processing areas as discussed below.

Sorting and Consolidation of Garden Organics and Food Waste

It is anticipated that the site will receive approximately 100,000 tonnes per year of garden organics (GO), commingled garden and food organics and food waste (FOGO) for sorting and consolidation. To avoid the potential contamination risk of leachate generation, all unloading and storage of the raw organics will occur within the proposed building enclosures, with wash down facilities provided internally.

Localised floor sumps and grated trench drains at all trafficable doorways will collect generated leachate and prevent flows leaving the covered facility. Leachate collected within the enclosed sumps of the GO/FOGO facility will be applied to outgoing product. Should there be an excess of runoff build up within the sumps (not considered likely), the leachate would be transferred offsite via truck to an approved licenced facility.

Leachate collected from the Food De-packaging Building would either be:

- Transported via truck to sites for land application in accordance with the EPA approved Liquid Food Waste Resource Recovery Exemptions and Orders;
- Transported via truck to a licenced composting facility for use in the composting process to add both nutrients and liquid; and/or
- Transferred into the GO/FOGO building for addition to the outgoing product.

Consolidated solid waste will also be trucked from site to a regional composting facility operated by Bettergrow for further processing or land application as applicable.

Separation and Consolidation of Hydro-excavation and Drill Mud Fluids

The drill mud processing plant has been designed to optimise water recovery to minimise the water content in outgoing products. Wastewater discharge from the site is unavoidable due to the high moisture content of the products processed within the facility. To avoid any potential stormwater contamination on downstream waterways, all extracted liquid from the mud processing facility will be piped to 6 x 35 kL holding tanks for discharged to sewer subject to the following:

- The holding tanks will be bunded in accordance with the NSW EPA's Spill Management Bunding guidelines. This equates to a minimum containment volume of 243 m^3 created via providing a set down around the tanks. The volume comprises of the 6 x 35 kL holding tanks plus the runoff generated from the 1 in 20 year average reoccurrence interval (ARI) 24 hr storm event (7.61 mm/hr) over the estimated 180 m^2 bunded catchment;
- Bettergrow (or operator) will be required to obtain a Trade Waste Approval (TWA) from Sydney Water;
- Stored wastewater will be tested in accordance the requirements of the TWA to ensure compliance with acceptance standards prior to a metered release; and

- Wastewater failing to meet the acceptance standards outlined by the TWA will be required to be trucked from site to a licensed facility capable of accepting contaminated material.

The holding tanks have been designed to store on average 2 days volume of treated wastewater output from the drill mud plant to allow time for required testing prior to discharge or to arrange for disposal at a licenced waste facility should there be any contamination issues.

8.6.4.4 Sediment and Erosion Control Measures

The soils across the site have been largely striped of their topsoil and covered with unsealed stabilised gravel, AC bitumen or concrete left over from the sites previous use as an asphalt plant. The development proposes to utilise these existing hardstand areas which are located on three distinct levels or pads. Slopes are also gentle across the site as a result of the terracing/retaining walls installed for the previous site use.

Construction

There are some minor changes to the levels proposed across the three pads to direct stormwater runoff to the new stormwater layout and provide adequate bunding and separation of the wastewater system. As a result, the potential for significant amount of sediment to leave site during construction works are expected to be minimal. An Erosion and Sediment Control Plan has been prepared for the site to minimise erosion during construction activities. The plan has been prepared in accordance with *Managing Urban Stormwater Volume 1 – Blue Book (Landcom, 2004).* The principles of the plan include:

- Minimising the amount of disturbance (limited to required changes in surface levels only);
- Installation of upslope 'clean water' diversions where possible to divert runoff around the proposed disturbance areas to minimise the generation of sediment laden water; and
- Treatment of sediment laden runoff from disturbance areas via installation of downslope sediment controls.

The proposed Erosion and Sediment Control Plan for the site is shown below as **Figure 42**.

Operations

Once the construction activities are complete, the potential for significant erosion across the site is considered negligible with the majority of areas sealed. There is the potential for sediment generation from vehicle movements to and from the bulk landscape storage area. As such, the proposed stormwater management system includes treatment measures to minimise any sediment leaving site as outlined above.

LEGEND

- DENOTES CUT OFF SWALE.
- DENOTES SEDIMENT CONTROL FENCE.
- DENOTES PROPOSED STOCKPILE LOCATION.
- DENOTES SANDBAG OR GEOTEXTILE SOCK FILLED WITH NO FINES GRAVEL, PLACED AND AROUND EXISTING PITS.
- RW — DENOTES EXTENT OF EXISTING RETAINING WALL.
- DENOTES EXTENT OF PROPOSED BUILDING OUTLINE.
- DENOTES EXTENT OF EXISTING BUILDING OUTLINE TO BE RETAINED.
- DENOTES EXTENT OF EXISTING BUILDING OUTLINE TO BE REMOVED.
- DENOTES EXTENT OF EXISTING BITUMENT PAVEMENT.
- DENOTES EXTENT OF EXISTING CONCRETE PAVEMENT.
- DENOTES EXTENT OF STABALISED GRAVEL SURFACE.

NOTE: PRIOR TO UNDERTAKING DISTURBANCE ACTIVITIES, INSTALL TEMPORARY UPSLOPE DIVERSIONS (I.E. SANDBAGS) TO DIVERT UP SLOPE WATER AROUND THE PROPOSED DISTURBANCE AREA TO MINIMISE SEDIMENT LAIDEN WATER GENERATION.

N

MGA

0 10 20 30 40 50

SCALE 1 : 1000 (A3)

ORIGINAL PLAN PROVIDED BY

NORTHROP
Newcastle
Suite 4, 215 Pacific Hwy, Charlestown NSW 2290
P.O. Box 180, Charlestown NSW 2290
Ph (02) 4943 1777 Fax (02) 4943 1577
Email newcastle@northrop.com.au ABN 81 094 433 100

TITLE: FIGURE 42: EROSION AND SEDIMENT CONTROL PLAN

LOCATION: DAVIS RD WETHERILL PARK

DATUM: GDA94
PROJECTION: MGA ZONE 56

DATE: 10/04/2017
PURPOSE: PLANNING

AUTOCAD REF: J:\JOBS\127k\127695 Wetherill Park\10 - Drafting\\Northrop
VERSION: B A3 (JH-NW)

CLIENT: BETTER GROW
JOB REF: 127695

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au

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8.6.5 Site Water Balance

This section examines the water usage requirements of the development and the water management strategies adopted. The overarching objective for site water usage is to minimise the reliance on potable water sources by taking advantage of rainwater harvesting measures via collecting roof runoff in rainwater tanks and wastewater recycling. A daily time step water balance has been developed utilising 129 years of rainfall data form the region.

8.6.5.1 Key Assumptions

The following assumptions and exclusions were used in developing the daily time step water balance:

- The effects of evaporation and groundwater seepage were not considered;
- Standard potable water consumption (drinking water and showers) were not considered. Only potable water used for processing requirements and toilet flushing was included;
- All leachate collected within the GO/FOGO Processing Facility and Food De-packaging Facility will be removed from site via outgoing products to licenced facilities and therefore has not been modelled; and
- On average 60,000 tonnes of hydro-excavated drill muds and fluids will be brought to site annually for processing. The drill mud will be 60% fluid on average.

8.6.5.2 Water Balance Systems

A total of 6 different closed system water balance models have been created for the site based on the catchment areas and re-use opportunities. They are as follows:

- GO/FOGO Processing Facility (Closed System A);
- Food De-packaging Facility (Closed System B);
- Proposed Office Building (Closed System C);
- Existing Amenities Building 1 (Closed System D);
- Existing Site Office Building (Closed System E) and
- Drill Mud Processing Facility (Closed System F).

These closed system areas are shown on **Figure 43** below.

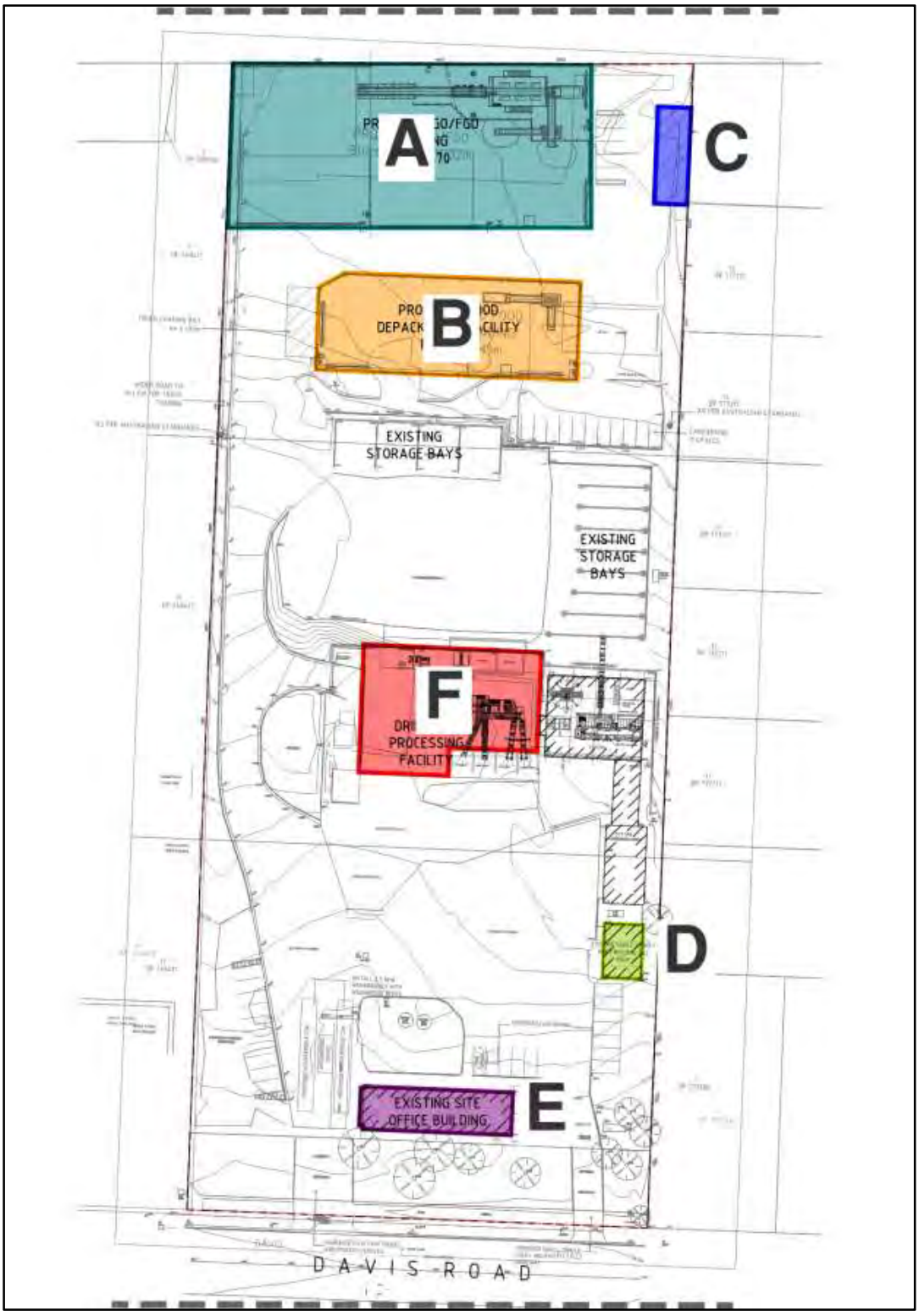


Figure 43: Closed Water Balance Systems

For Systems A to E (inclusive), the proposed process is to capture roof runoff from the proposed and existing buildings, store within rainwater tanks and then reuse for machinery wash down, dust suppression and staff amenities (toilets). Any excess water reporting to the rainwater tanks will overflow to the stormwater system. Water (or leachate) collected within the sumps of the GO/FOGO processing and Food De-packaging

buildings will be re-used or leave site on product. System F involves recycling of water within the drill mud processing plant and discharge of treated water to the sewer system under a TWA.

Details on water sources, water losses and usage, and related model inputs are discussed in the Surface Water Assessment attached as **Appendix 13**.

8.6.5.3 Water Balance Results

Water balance results for Systems A to E are presented based on how the percentage of days reuse demand is met by the proposed rainwater harvesting measures. A sensitivity analysis was performed on the systems to determine peak efficiency storage volume of harvested rainfall given the harvest catchment area and reuse opportunity within each system. The results also present the required potable water use for tank top ups. Water balance results are provided in **Table 33.**

Table 33 Water Balance Results – System A-E

Water Source	Average Annual Total Water Usage (kL/year)	Average Annual Potable Water Usage (kL/year)	Average Annual Potable Water Use of the Total Average Annual Demand (%)
A – GO/FOGO Processing Facility	730	127	17.4
B – Food De-packaging Facility	730	256	35.1
C – Proposed Office Building	82	16	19.5
D – Existing Amenities Office Building	82	14	17.1
E – Existing Site Office Building	82	6	7.3

The daily time step water balance for the Drill Mud Processing Facility (System F) was used to determine the amount of water that would need to be released to sewer under a trade waste agreement (TWA) with Sydney Water. The connection point is proposed to be the 225 mm diameter gravity sewer main located on the northern side of Davis Road. **Table 34** below outlines the key results of this water balance based on a bunded catchment area of 785 m^2.

Table 34 Water Balance Results – System F

Parameter	Volume (kL/day)
Average Daily Volume to Sewer	103.4
Maximum Daily Volume to Sewer (based on largest rainfall event)	353.4
10^{th} percentile Daily Volume to Sewer	101.6
90^{th} percentile Daily Volume to Sewer	105.9

The implementation of rainwater harvesting measures in the form of rainwater tanks to collect roof runoff from some of the site buildings is predicted to reduce the amount of potable water usage by 65%-90% within those systems. The collected water will be used for washing down equipment within the GO/FOGO Processing and Food De-packaging Facilities as well as toilet flushing. Potable water will still be required to meet the water demands from these systems during dry periods.

Water extracted from the drill mud processing plant, combined with the rainfall collected within the bunded area, and additional potable water input, will result on average of 103.4 kL/day needing to be released to sewer. This rate is based on 7 days per week operations with 164 tonnes of hydro-excavated drill muds and fluids received at the site per day.

8.6.6 Flooding

A qualitative flood impact assessment has been undertaken to satisfy the flooding requirements of the SEARs. The assessment was based on a flood information sheet obtained from Council, and a review of the Wetherill Park Overland Flood Study. The detailed Flood Impact Assessment is attached as Appendix D to Northrop's **Surface Water Assessment** which is attached as **Appendix 13**.

The subject site is marginally affected by the Probable Maximum Flood (PMF) and 1% Annual Exceedance Probability (AEP) flood extent, with levels for the 1% AEP event ranging from approximately 36.4 to 36.9 m AHD. The extent from Fairfield Council's mapping is shown below in **Figure 44**. Mapping based on detailed survey has been undertaken and this is included with the detailed Flood Impact Assessment attached as Appendix D to Surface Water Assessment.

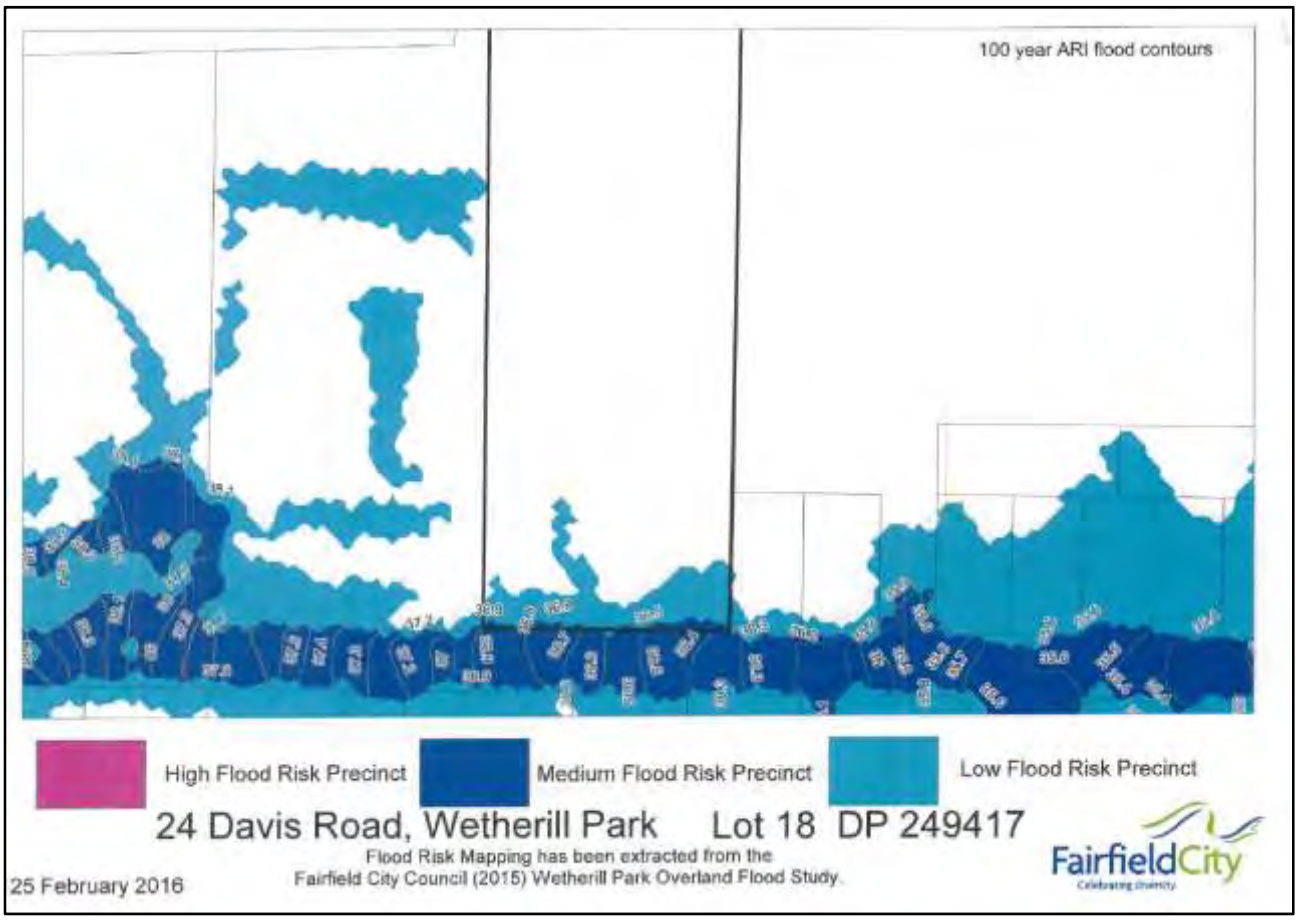


Figure 44: 1% AEP Contours and PMF Extent

The only structures within the PMF extent are the proposed weighbridges and weighbridge office, and the existing office at the site. The weigh bridges and weighbridge office are to be raised slightly from the ground and are expected to have a negligible impact on the flood behaviour and impact in the vicinity of the subject site.

Accordingly, it is considered that the proposed development complies with the intent of Fairfield Council's DCP Chapter 11 – Flood Risk Management and satisfies the requirements of the SEARs. Further detail is included as Appendix D to Northrop's **Surface Water Assessment** which is attached as **Appendix 13**.

8.6.7 Mitigation and Management

The following mitigation and management items have been developed to ensure that the risk of sediment, nutrients, and leachate leaving the site is minimised. These include:

- Pipes, pits and bunds to be regularly checked for the build-up of excessive sediment;
- Site structures to be regularly checked for erosion and scouring;
- Treatment areas and structures to be regularly checked for the build-up of litter material;
- Inflow areas and pit grates are to be clear of litter and debris;
- The sediment chamber of the Humeceptor is to be regularly checked and cleaned and any damaged covers replaced;
- Ensure downpipe leaf eaters, first flush devices and litter screens are unblocked and are operating correctly; and
- Rainwater tanks to be regularly checked for any accumulation of litter, sediment or debris on or within the tanks.

A site EMP has also been developed for the proposed development which is attached as **Appendix 21**.

8.6.8 Conclusions

The proposed resource recovery and recycling centre will satisfy the SEARs for surface water based on the proposed management systems. The development is not anticipated to impact negatively on the surrounding surface water environment, flow regimes, quality, quantity, features, or local or regional hydrology.

The proposed development will be capable of receiving up to 200,000 tonnes of waste per annum, comprising of hydro-excavation drill muds and fluids, garden organics, mixed food and garden waste, food organics, and landscape supplies. The proposed Surface Water Management Plan will deliver an integrated solution for the use and discharge of wastewater and stormwater for the facility.

The proposal has considered suitable containment and treatment practices through the identification of potential pollution risks and has been designed to maximise onsite reuse. The implementation of rainwater harvesting measures at the proposed facility is predicted to reduce the amount of potable water usage by 65%-90% within the individual systems.

Generated pollutant loads conveyed in stormwater runoff are to be mitigated via the proposed treatment train consisting of rainwater harvesting tanks, a sediment trap, and a proprietary hydrodynamic separator. Adoption of regular monitoring and maintenance practices will ensure the proposed devices within the stormwater management system function as designed.

Wastewater leachate generated within the GO/FOGO building and the food de-packaging building will be managed within a closed system, either applied to outgoing product or trucked from site for re-use or disposal at licenced facilities.

A proprietary treatment system (CD Enviro System) is to be installed to separate and consolidate the received hydro-excavation drill muds and fluids. The treatment facility has been designed to optimise water recovery and minimise the water content in outgoing products. To avoid any potential stormwater contamination all wastewater from the drill mud treatment facility will be stored onsite within holding tanks for testing prior to its release to either sewer or trucked from site for re-use.

Finally, a qualitative flood impact assessment has been undertaken to satisfy the flooding requirements of the SEARs. New structures located within the PMF extent are expected to have a negligible impact on the

flood behaviour. It is considered all issues raised by Council and OEH in the SEARs can be adequately addressed through mitigation and management.

8.7 Groundwater

8.7.1 Introduction

An assessment of groundwater impacts from the proposed development has been undertaken by Douglas Partners. The purpose of this report was to determine the existing hydrogeological and groundwater quality conditions of the site and to assess the potential of the proposed development to impact groundwater or groundwater dependant ecosystems. The Groundwater Impact Assessment is attached as **Appendix 14**.

The assessment has also been prepared to satisfy the SEARs, which requested the following be considered:

- Known or predicted highest groundwater table at the site;
- Works likely to intercept, connect with or infiltrate the groundwater sources;
- Proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes;
- Description of the watertable and groundwater pressure configuration, flow directions and rates and physical and chemical characteristics of the groundwater source;
- Baseline monitoring for groundwater quantity and quality and Groundwater Dependant Ecosystems (GDE's) to establish a baseline incorporating typical temporal and spatial variations;
- Existing groundwater users within the area, any potential impacts on these users and safeguard measures to mitigate impacts;
- Assessment of groundwater quality, its beneficial use classification and prediction of any impacts on groundwater quality;
- Assessment of the potential for groundwater contamination and measures for preventing groundwater pollution;
- Measures proposed to protect groundwater quality, both in the short and long term and protective measures for GDE's; and
- Proposed methods of the disposal of waste water and approval from the relevant authority.

A full summary of the SEARs requirements (including agency responses) are included within **Appendix 1**.

8.7.2 Existing Environment

8.7.2.1 Regional Topography and Surface Water

The site is located down-gradient of Prospect Reservoir, with Prospect Dam located approximately 600 m north of the site. Prospect Reservoir releases water into Prospect Creek which flows generally in a north-west to south-east direction. Prospect Creek flows into the Georges River at Georges Hall.

An unnamed tributary of Prospect Creek flows generally in a west-south-west to east-north-east direction passing within 450 m of the subject site. Surface water from the site is expected to ultimately drain into this Unnamed Watercourse.

The site is situated on the northern slopes of a small valley with the Unnamed Watercourse, and slopes generally south. Topographical mapping for the area shows that the site's original landform has been considerably modified through past development.

8.7.2.2 Regional Geology

The Penrith 1:100,000 Geological Series Sheet for the region indicates that the site and surrounding area is generally underlain by Bringelly Shale of the Wianamatta Group. Bringelly Shale comprises Middle Triassic Shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff. Sandstone constitutes about 20-30% of the Bringelly Shale though mainly in the top half of the formation. Sandstone beds are typically less than 2 m thick.

Quaternary Fluvial sediments comprising medium-grained sand, clay and silt are mapped in Prospect Creek and the unnamed tributary, while an outcrop of the igneous Prospect Picrite is present to the north east of the site.

8.7.2.3 Soil Landscapes

The Penrith 1:100,000 Soils Landscape sheet indicates that the site is located within the Blacktown residual soil landscape area. The soil landscape is described as gently undulating rises on the Wianamatta Group Shales and Hawkesbury Sandstone. Local relief is to 30 m and slopes are generally less than 5% and broad rounded crests and ridges with gently inclined slopes are typical.

Limitations are given as moderately reactive highly plastic subsoil, low soil fertility, and poor soil drainage. The Map of Salinity Potential in Western Sydney, 2002 (NSW Department of Infrastructure, Planning and Natural Resources) indicates that the site has a moderate salinity potential.

8.7.2.4 Groundwater

Registered Bores

A search of the NSW Department of Primary Industries (DPI) groundwater register found that twenty three registered bores exist within 1 km of the site, four of which are within 500 m of the site. Twenty two of the bores are shallow (<10m depth) monitoring wells, with only limited data recorded.

The remaining bore (GW109317) is a test bore drilled to a depth of 165 m located approximately 1 km north east (cross-gradient) of the site. Construction information for this bore shows four water bearing zones exist between 53 m and 164 m depth, and have a thickness of 0.1 m to 1 m. Yields for these bores are between 0.45 L/s and 2.1 L/s and salinity between 6,000 mg/L and 10,000 mg/L.

Formation Characteristics

Bringelly and Ashfield Shale are best considered as aquitards, due their generally low permeability and poor ability to support producing wells.

McNally (2004) has described the Wianamatta Group as having generally two water bearing horizons. The upper water bearing horizon being the regolith to typical depths of 3-10 m, comprising scattered zones of fracture porosity within the weathered shale and soil profile, and with typical bulk hydraulic conductivity of 10-6 to 10-9 m/s. The lower second water bearing horizon is at depth in the unaltered shale bedrock with typical bulk hydraulic conductivity of 10-7 to 10-9 m/s.

The best aquifer in the region of the site is expected to be within the Hawkesbury Sandstone. This comprises a typically horizontally bedded sandstone formation, with variable hydraulic conductivity, which hosts a generally confined fractured rock aquifer. The majority of groundwater within the Hawkesbury Sandstone migrates through features such as fractures, joints, shears and bedding planes, however some intra-granular flow also occurs.

Groundwater Quality

Groundwater quality in the Wianamatta Group is generally saline. McNally (2004) reports typical salinity values in the range 5,000-50,000 mg/L. Groundwater quality in the Bringelly Shale is typically not suitable for beneficial use for human or stock consumption or for irrigation.

Groundwater in the Hawkesbury Sandstone often has naturally elevated concentrations of iron and manganese, and is generally acidic with a pH varying between 4.5 and 6.5. Salinity levels are low, although the salinity of the upper part of the aquifer may be elevated due to flows from the overlying shales.

Water Sharing Plan

The site is located in the area subject to the Water Sharing Plan for the *Greater Metropolitan Region Groundwater Sources 2011 (*the WSP). The site is located within the Sydney Basin Central groundwater source covered by the WSP. The WSP is informed by the NSW Office of Water (NOW) Water Sharing Plan *Greater Metropolitan Region Groundwater Sources Background document* (2011) (NOW, 2011).

NOW (2011) described the Sydney Basin Central groundwater source as a porous rock aquifer with low to moderate connectivity to surface waters and an estimated "travel time between groundwater and unregulated river" of years to decades.

This project does not require access to the underlying groundwater for extractive purposes, therefore the provisions of the WSP are not relevant.

Groundwater Aquifer Conditions

The Department of Environment, Climate Change and Water (DECCW) *State of the Catchments 2010: Sydney Metropolitan region: Groundwater* (2010) (DECCW, 2010) assigns the Sydney Basin–Central aquifer as poor to very poor for all indicators, including groundwater levels, quality and GDE condition, with an overall condition assessment of poor.

DECCW (2010) also assesses the "pressures" from potential impacts from human activity. The pressures on the Sydney Basin–Central aquifer have been assessed as ranging from very low to very high, with an overall pressure assessment of moderate. Assessments of very low and low were assigned for extraction rates and regional impacts; an assessment of moderate was made for localised impacts and groundwater quality impacts; and assessments of very high to high were made for GDE availability, land-use pressures and aquifer structure pressures.

DECCW (2010) identified the main pressure in the Sydney Basin–Central groundwater management area as being mining, with existing mining activities causing dewatering of the aquifer and permanent alteration of the aquifer matrix.

Groundwater Vulnerability

Groundwater vulnerability is defined in the Agriculture and Resource Management Council of Australia and New Zealand, Australian and New Zealand Environment and Conservation Council (ANZECC) *Guidelines for Groundwater Protection in Australia, September 1995* (ANZECC, 1995) as a relative evaluation of the potential exposure of a groundwater resource and its beneficial use to contamination from planned and unplanned sources. The vulnerability assessment is a qualitative assessment based upon the hydrogeological regime, as well as the thickness and nature of the unsaturated zone overlying the aquifer.

The groundwater resource most likely to be present beneath the site comprises a confined sandstone aquifer at depths of greater than 100 m overlain by the relatively low permeability aquitards of the Wianamatta Group. Whilst groundwater bearing zones may be present within fractures in the Wianamatta Group, the potential for significant impact on these is also considered to be limited by overlying low permeability horizons.

On this basis the aquifer vulnerability in the area of the site is considered to be low.

Beneficial Groundwater Use

Based on above information reviewed and provided in this assessment it is considered that groundwater within the Wianamatta Shales in the region of the site is not subject to, or suitable for, beneficial use.

Registered bore GW109317 recorded salinity in the Hawkesbury Sandstone at depths of 127 m and 164 m bgl in the region of the site of 10,000 mg/L. The lack of production bores registered in the area indicates that water in Hawkesbury Sandstone in the region of the site is not suitable for beneficial use.

8.7.2.5 Groundwater Dependant Ecosystems

GDE's are communities of plants, animals and other organisms whose extent and life processes are dependent on groundwater. Examples of GDE's include wetlands, springs, swamps, and certain groundwater fed ecosystems.

GDE mapping undertaken by NOW (2011) has identified high priority GDE's in NSW. A review of mapping for the Sydney Metropolitan Region High Priority GDE's (refer **Figure 45**) indicates that the nearest down-hydraulic gradient GDE is over 10 km from the site. Therefore it is considered that that development will have no impact on GDE's.

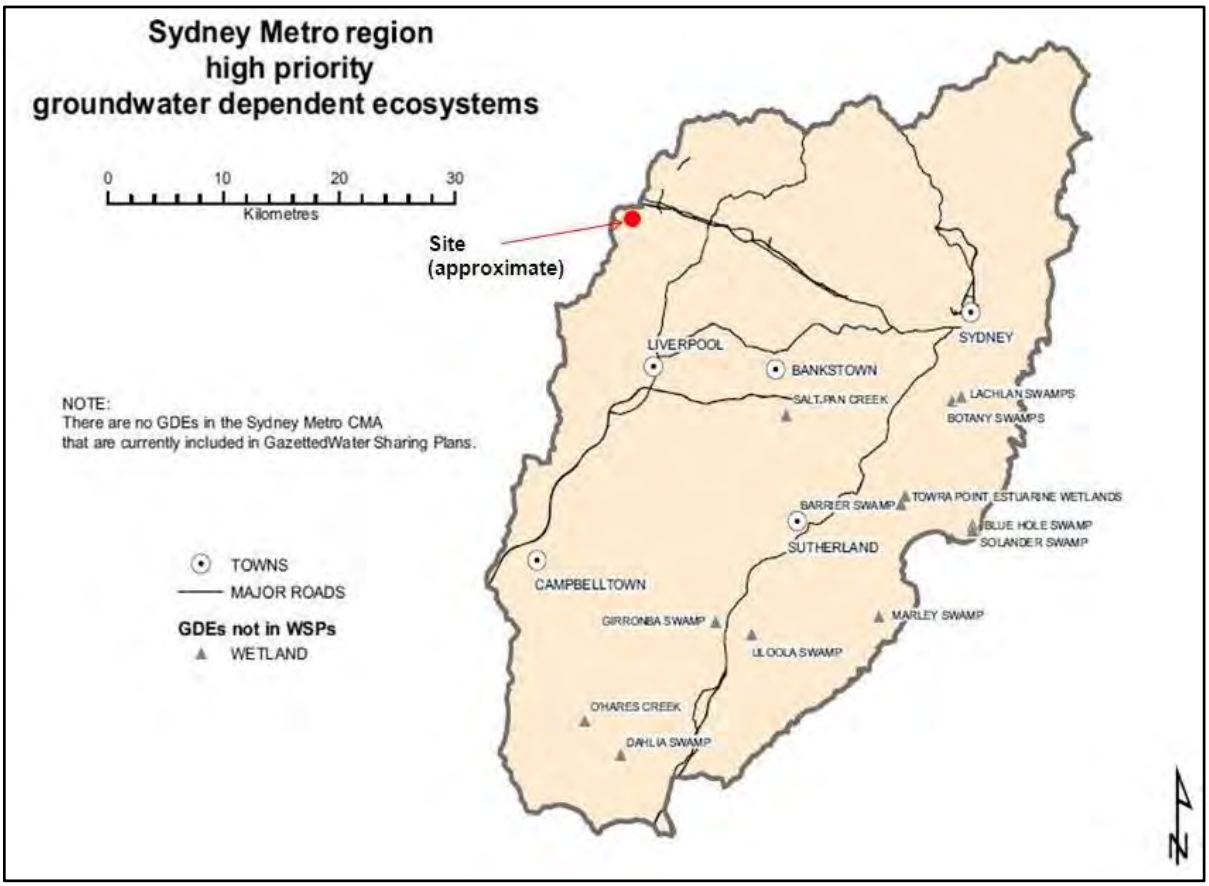


Figure 45: Sydney Metro Region High Priority Groundwater Dependant Ecosystems (NOW, 2011)

8.7.3 Methodology

The following methodology was applied to this groundwater assessment:

- Review of previous groundwater and site contamination assessments for the site;
- Review of published information on the local hydrogeology and aquifers at the site;
- Review of local registered groundwater bores and users;
- Review of groundwater assessments undertaken for developments surrounding the site;
- Installation of groundwater monitoring bores to establish a baseline for water quality, quantity, and water table height;

- Groundwater sampling and analysis for organic and inorganic substances;
- Validation of current and historical groundwater data;
- Assessment of potential development impacts; and
- Provision of recommendations and conclusions to mitigate potential impacts.

Due to the relatively low risk of impacts from this proposed development and the amount of historical data and reporting available for the site, a formal groundwater model was not prepared for this groundwater assessment. Existing environmental reports, contamination assessments, and supplementary groundwater monitoring were utilised to inform this study.

8.7.4 Impact Assessment

8.7.4.1 Review of Historical Activities and Reporting

Due to the contaminating nature of the previous Emoleum operations at the subject site, considerable monitoring and reporting on groundwater and contamination has been undertaken during the period from 1990 to 2016. In 2015, Douglas Partners were engaged to undertake a review and assessment of all previous monitoring results and environmental assessment reports prepared for the site.

In summary the following conclusions were drawn from the review of documentation:

- Soil sampling has been conducted at more than 60 test bores with a minimum sampling density of 30 locations for a 2 ha site as per the NSW EPA Sampling Design Guidelines 1995. However, soil sample analysis was generally limited to potential contaminants associated with fuel/chemical storage and asphalt manufacturing and not for other potential contaminants such as pesticides and asbestos;
- Soil beneath the existing workshop and laboratory buildings has not been investigated. Soil behind the laboratory has not been investigated;
- Soil down-gradient (south) of an existing interceptor pit at the eastern site boundary was not assessed;
- Potential soil contamination from the former substation at the west of the site (next to former main manufacturing area) and the current substation between the buildings at the east of the site have not been investigated for PCB impacts;
- Hydrocarbon impacted soil (predominantly impacted with TPH C10-C36) remains in situ at the former manufacturing area. Previous assessment concluded that no further excavation (chase-out) of TPH C10-C36 impacted soil was required during remediation works and the 95% UCL for contaminants of concern were within the adopted assessment criteria;
- Groundwater was monitored from 13 previous wells spread across the site in three separate events, therefore it is considered that groundwater has been subject to previous detailed assessment; and
- Data from previous groundwater monitoring events suggest that significant groundwater contamination was not evident prior to site remediation works. Removal of contaminated soil as a result of previous site remediation works may have resulted in improved groundwater quality across the site.

Overall, the results and findings of the contamination review indicate that the site does not have concentrations of soil and groundwater contaminants which would preclude the use of the site for the proposed resource recovery and recycling facility. As guidelines for the assessment of contaminated sites have changed since previous investigations were undertaken, some limited and targeted soil sampling has been recommended to confirm the above findings.

A full copy of the contamination review report is attached in **Appendix 15**.

8.7.4.2 Recent Groundwater Monitoring

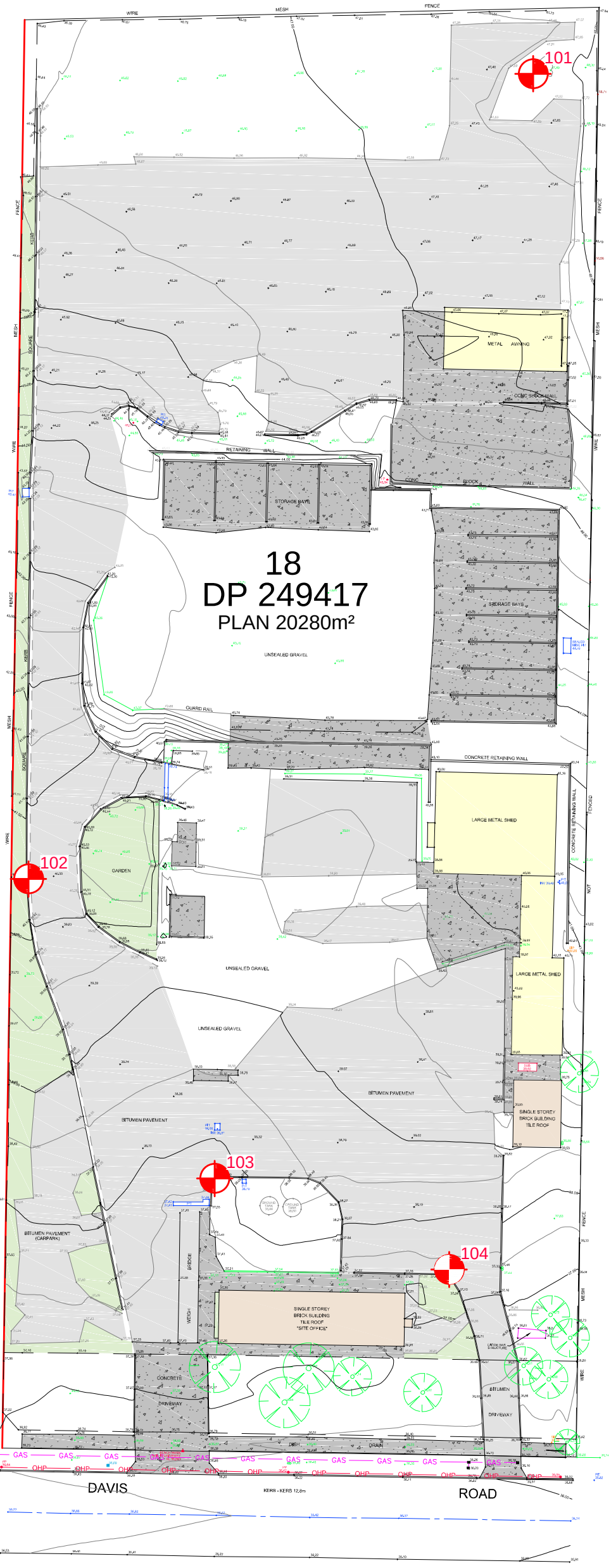
In March 2016, four new groundwater monitoring wells were established at the site. Locations of these bores are shown on **Figure 46**. These bores were installed to validate the results of previous historical monitoring at the site, and also to establish a baseline dataset of the groundwater conditions for the Project.

LEGEND

- BOUNDARY
- ADJOINING BOUNDARY
- FENCE
- GAS
- OVERHEAD POWER
- TELSTRA PIT
- HYDRANT
- TREE
- GAS MARKER
- BUILDING HATCH
- MISC HATCH
- CONCRETE HATCH
- ROAD HATCH
- GARDEN HATCH
- BOREHOLE LOCATION

N

MGA



0 10 25 50

SCALE 1 : 750 (A3)

TITLE: FIGURE 43: LOCATION OF SITE MONITORING BORES

LOCATION: DAVIS RD WETHERILL PARK

DATUM: GDA 94

PROJECTION: MGA ZONE 56

DATE: 10/04/2017

PURPOSE: PLANNING

CAD REF: J:\JOBS\127k\127695 Wetherill Park\10 - Drafting\Acad...\127695-Wetherill Park - Site Plans_MGA56

VERSION : D A3 (JH-NW-SS)

CLIENT: BETTER GROW

JOB REF: PR127695

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
241 DENISON STREET BROADMEADOW PO BOX 428 HAMILTON NSW 2303
T: 02 4940 4200 F: 02 4961 6794 www.rpsgroup.com.au

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The following parameters were assessed at each of the four well sites:

- On-site parameters: water level, light non-aqueous phase liquid (LNAPL), pH, EC, temperature, dissolved oxygen;
- Laboratory parameters: total suspended solids (TSS), total dissolved solids (TDS), total organic carbon (TOC), major anions (Cl, SO4, alkalinity), minor anions (NO2, NO3, F, PO4), cations (Ca, K, Mg, Na, hardness), ionic balance, other nitrogen (TKN, NH3), total phosphorus (P), phosphate (PO4), biological oxygen demand (BOD), chemical oxygen demand (COD); and
- Laboratory parameters: organochlorine pesticides (OCP), organophosphorus pesticides (OPP), total recoverable hydrocarbons (TRH), benzene toluene ethyl benzene total xylenes (BTEX), metals (17 suite), phenols, polychlorinated biphenyls (PCB), cyanide.

Monitoring results for each well are provided in **Table 35, Table 36** and **Table 37** below. Results for organics show that TRH, BTEX and PAH were below detection limits. Some minor exceedances of the reference criteria were recorded for inorganics (including metals) however these were generally in line with historical monitoring results and are not considered to be significant.

Table 35 Organic Analysis

Sample	Date Sampled	TRH							BTEX					PAH			Total Phenol	OCP	OPP	PCB
		C6 – C10	>C10 – C16	C6 – C10 less BTEX (F1)	>C10 – C16 less Naphthalene (F2)	>C10 – C16	>C16 - C34	>C34 - C40	Benzene	Toluene	Ethylbenzene	m+p-xylene	o-xylene	Naphthalene	Benzo(a)pyrene	Total +ve PAH's				
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L
Reference Criteria																				
ANZECC (freshwater)									950			200	350	16			0.003			
ADWG									1	800	300	600			0.01		0.01			
Laboratory Results - April 2016																				
101	19/04/16	<10	<50	<10	<50	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	NIL (=)VE	<0.05	<0.001	<0.02	<0.01
102	19/04/16	<10	<50	<10	<50	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	NIL (=)VE	<0.05	<0.001	<0.02	<0.01
103	19/04/16	<10	<50	<10	<50	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	NIL (=)VE	<0.05	<0.001	<0.02	<0.01
104	19/04/16	<10	<50	<10	<50	<50	<100	<100	<1	<1	<1	<2	<1	<0.2	<0.1	NIL (=)VE	<0.05	<0.001	<0.02	<0.01

Acronyms

OCP Organochlorine pesticides
OPP Organophosporus pesticides
PCB Polychlorinated biphenyls

Table 36 Metals and Cyanide

Sample	Date Sampled	Metals (dissolved)																				Total Fe	CN
		Al	Sb	As	Ba	Be	B	Ca	Cd	Cr	Co	Cu	Pb	Mg	Mn	Hg	Ni	K	Se	Ag	Na	Zn		
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	mg/L	µg/L	µg/L	mg/L
Reference Criteria																							
ANZECC (freshwater)		55		24/13			370		0.2	1		1.4	3.4		1,900	0.06	11		5	0.05		8		0.007
ADWG			3	10	2,000	60	4,000		2	50		2,000	10		500	1	20		10	100				80
Laboratory Results - April 2016																							
101	19/04/16	<10	<1	4	110	<0.5	34	46	<0.1	<1	3	1	<1	59	86	<0.05	5	4.3	3	<1	220	6	2,200	<0.004
102	19/04/16	<10	<1	<1	66	<0.5	64	200	0.5	<1	12	3	<1	840	1,800	<0.05	9	60	<1	<1	4,500	15	3,700	<0.004
103	19/04/16	<10	<1	6	82	<0.5	64	270	<0.1	<1	13	<1	<1	770	880	<0.05	7	41	<1	<1	5,600	9	4,300	<0.004
104	19/04/16	<10	<1	14	64	<0.5	81	150	<0.1	<1	7	<1	<1	410	290	<0.05	12	32	<1	<1	3,000	12	18,000	<0.004

Notes

Guideline for As(III) of 24; As(V) of 13
Guideline for Cr(VI)
Bold Result above Reference Criteria

Acronyms

Ag	Silver-Dissolved Fe Iron-Total	Be	Beryllium-Dissolved Na Sodium – Dissolved	CN	Total Cyanide Sb Antimony-Dissolved
Al	Aluminium-Dissolved Hg Mercury-Dissolved	Ba	Barium-Dissolved Mn Manganese-Dissolved	Co	Cobalt-Dissolved Se Selenium-Dissolved
As	Arsenic-Dissolved K Potassium – Dissolved	Ca	Calcium - Dissolved Ni Nickel-Dissolved	Cr	Chromium-Dissolved Zn Zinc-Dissolved
B	Boron-Dissolved Mg Magnesium – Dissolved	Cd	Cadmium-Dissolved Pb Lead-Dissolved	Cu	Copper-Dissolved

Table 37 Inorganic Analytes

Sample	Date Sampled	Solids		TOC	Oxygen Demand		Phosphorus		Nitrogen		Alkalinity				SO4	Cl	Ionic Balance
		TSS	TDS		BOD	COD	P	PO4	TKN	NH3	OH-	HCO3	CO3	Total			
		mg/L	mg/L	mg/L	mg/L	mg O2/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	%
Reference Criteria																	
ANZECC (freshwater)										0.9							
ADWG															500		
Laboratory Results - April 2016																	
101	19/04/16	59	880	1	6	<50	<0.05	0.007	<2	0.008	<5	610	<5	610	43	84	4.7
102	19/04/16	260	15,000	2	<5	100	0.06	0.006	<2	0.12	<5	1,100	<5	1,100	710	5,600	18
103	19/04/16	220	17,000	2	6	90	0.1	<0.005	<2	0.66	<5	920	<5	920	490	7,000	17
104	19/04/16	320	9,800	<1	12	60	0.3	<0.05	<2	0.48	<5	1,100	<5	1,100	260	3,400	17

Acronyms

TSS	Total Suspended Solids	TKN	Total Kjeldahl Nitrogen
TDS	Total Dissolved Solids (grav)	NH3	Ammonia as N
TOC	Total Organic Carbon	OH-	Hydroxide Alkalinity (OH-) as CaCO3
BOD	Biological oxygen demand	HCO3	Bicarbonate Alkalinity as CaCO3
COD	Chemical oxygen demand	CO3	Carbonate Alkalinity as CaCO3
P	Phosphorus – Total	SO4	Sulphate, SO4
PO4	Phosphate as P	Cl	Chloride, Cl

8.7.4.3 Potential Groundwater Impacts

The current site gradient and significant area of hardstand / compacted soils will limit infiltration over much of the site in its current condition. Where possible the proposed development will use the current site infrastructure, minimising changes to infiltration at the site. Soft landscaping areas, with the highest potential for infiltration, are proposed to be retained.

An enclosed building will be constructed for handling of food, garden, and organic wastes, minimising the potential for runoff from these materials entering the groundwater. No composting is proposed to be undertaken at the site. Further, this building will be constructed with a concrete floor and internal drainage system to manage any liquid waste produced.

Previous groundwater monitoring at the site, adjacent to the location of the proposed tipping pit in the food de-packaging building, has recorded groundwater levels between 41.42 m and 43.97 m AHD. The tipping pit will be suitably designed so as to not impact on the groundwater table by ensuring that the base of the pit is, as a minimum, at 44.5 m AHD. The pit is proposed to be lined with an impermeable barrier to prevent leakage of leachate into the surrounding ground.

Purpose built settling bays, storage and settling tanks will be constructed for the hydro-excavation and drill muds/fluids, limiting the potential for these materials to enter groundwater at the site. These materials are generally considered to have a low risk of containing significant quantities of contamination.

The proposed development is considered to have negligible potential for significant interference with groundwater as it involves only minor changes to the potential for infiltration at the site, and has a relatively low risk of discharging potential contaminants due to the inclusion of an appropriately designed stormwater management and leachate system (refer to **Section 8.6**).

The hydrogeological review indicates that it is unlikely that any significant groundwater resource is located in the upper 100 m of the subsurface profile. The Hawkesbury Sandstone aquifer vulnerability is considered to be low due to its depth, and the low permeability and connectivity of water in the Wianamatta Group which is exposed at the site.

8.7.5 Mitigation and Management

As with any activity of this type, the appropriate management of the site in accordance with the *Protection of the Environmental Operations Act 1997* is required. This will further mitigate the already low risk posed by the development on groundwater at the site. The following mitigation and management strategies will apply to manage impacts to groundwater:

- Areas where liquid wastes or dangerous goods are to be handled will have appropriate containment measures to prevent leachate and contaminants from entering the ground (ie. proposed tip pit in the food de-packaging and process building);
- The proposed tipping pit will be suitably tanked or lined to ensure leachate is fully contained;
- The pit is to be designed to reduce the potential for interference with groundwater by ensuring the base of the pit is no lower than 44.5 m AHD;
- The tip pit will include an appropriate pressure relief system / valve installed to prevent high hydrostatic pressures developing below the base of the pit during any high groundwater events;
- Should groundwater be encountered during the construction of foundations, standard construction and water management / disposal methods are to be employed;
- Monitoring wells 101, 102, 103, and 104 are to be monitored at 6 monthly intervals over a period of two years to provide a reliable background dataset for the proposed development;
- If a potentially contaminating substance is to be stored or used on the site, further groundwater monitoring will be undertaken if necessary, to provide data on the background concentrations (if any) of the substance in the groundwater; and

- In the event of a leakage or spillage of leachate or other potentially contaminating liquid, assessment of the impacts should be undertaken to determine the need for any clean up works. This may include soil and / or groundwater testing. In this event groundwater results should be assessed with respect to both the background data and relevant guideline thresholds.

8.7.6 Conclusions

Overall, it is considered that the proposed development poses a low risk of significantly impacting groundwater supply or quality. Specifically:

- Groundwater in the Bringelly Shale is considered to be unsuitable for beneficial use in the area of the site;
- Groundwater in the Hawkesbury Sandstone is at a significant depth below the site, and DPI registered bores do not show any current beneficial use in the area of the site;
- The proposed development is considered to have a negligible risk of impacting the quality or supply of groundwater at the site;
- There are no high priority GDE's within or near the site. The proposed development is not considered to present a potential risk to GDE's; and
- The proposed development is not considered to present a potential risk to bores or natural drainage features.

8.8 Soils, Geology and Contamination

8.8.1 Introduction

A review of the current soil and contamination conditions over the site, and the potential environmental impacts associated with the construction and operation of the development, has been undertaken by Douglas Partners. The purpose of the report was to establish the presence of any historical contamination from the previous use of the site through a review of existing information, specifically an Environmental Summary Report prepared for the site by URS (2013). The Contamination Review Report, and a further Addendum Letter Report, prepared by Douglas Partners are attached as **Appendix 15**.

The assessment has also been prepared to satisfy the SEARs, which requested the following be considered:

- Provide details of site history - if earthworks are proposed, this needs to be considered with regard to possible soil contamination;
- Provide an overview of the methodology used to identify and prioritise issues. The methodology should take into account:
  - relevant NSW government guidelines;
  - industry guidelines;
  - ElSs for similar projects;
  - relevant research and reference material;
  - relevant preliminary studies or reports for the proposal; and
  - consultation with stakeholders.
- Provide a summary of the outcomes of the process including:
  - all issues identified including local, regional and global impacts;
  - key issues which will require a full analysis; and
  - issues not needing full analysis though they may be addressed in the mitigation strategy.
- Justification for the level of analysis proposed.

A full summary of the SEARs requirements (including agency responses) are included within **Appendix 1**.

8.8.2 Existing Environment

8.8.2.1 Topography

The topography of the site slopes moderately steeply from its northern boundary with an elevation ranging from 36 m to 48 m AHD. The property is also tiered into three distinct levels, with upper, mid and lower areas at varying elevations. Existing water sources surrounding the site include Prospect Creek and Prospect Reservoir 500 m and 800 m to the north respectively.

8.8.2.2 Geology and Soils

The general area is mapped on the Penrith 1:100 000 Geological Series Sheet as being underlain by Bringelly Shale (Rwb) of Triassic Age, with some alluvial deposits (Qpn) along Prospect Creek to the south-east of the site.

Bringelly Shale typically comprises beds of dark grey to black siltstone, claystone, finely interlaminated siltstone and sandstone (laminite), shale and fine grained sandstone. These rocks, particularly the claystones, usually weather to form moderately to highly reactive clay soils. Investigations of the surrounding sites found residual clay soils and weathered bedrock derived from Bringelly Shale, with some areas of alluvial soils adjacent to the creeks.

Soils of the Blacktown soil landscape underlie the disturbed terrain at the site. The soils range from shallow to moderately deep (less than 1 m thick) and are hard setting, mottled textured clay soils. The soils are typically moderately reactive with a highly plastic subsoil, have a low soil fertility, moderate erodibility, poor soil drainage and localised salinity or sodicity (OEH Espade, 2014). The subject site does not fall within an area prone to acid sulphate soil conditions.

A previous site investigation conducted by URS has found that the first 0.2 m of material consists mainly of grass, concrete or asphalt. From 0.2 m to 2.4 m a fill layer is present with areas of grey, brown to black sand, and gravel material. From 2.4 m to 3 m sandy clay, hard light brown clays with shale fragments and gravel are found. The remaining 3 m to 10.2 m is mostly bedrock, weathered shale and siltstone (URS, 2013).

8.8.2.3 Hydrogeology

Information and data on the regional hydrogeology relevant to the site was obtained from the NSW Natural Resource Atlas. A search of the atlas for registered groundwater bores within a 1km radius of the site was conducted. The search indicated that there are 16 registered bores within the 1km radius of the site. Only one registered bore (GW109317) refers to a water bearing zone. Information on GW109317 also indicated that the standing water level (SWL) is 19 m below ground level (mbgl) with a saline water content of 10,000 ml/L. The log for GW109317 shows a layer of fill from 0 to 1.5 mbgl, sandy clay from 1.5 to 10 mbgl, shale from 15 to 127 mbgl, and sandstone from 127 to 165 mbgl.

Based on the regional hydrogeology of the area, and that of the site, surface water would most likely migrate towards the unnamed stormwater drain located 550 m to the south, which then discharges into Prospect Creek. Similarly, subsurface and groundwater flow is also likely to move in a southerly direction towards the abovementioned unnamed stormwater drain.

8.8.3 Methodology

Douglas Partners have undertaken a review of the Environmental Summary Report prepared by URS in May 2013, including those reports shown below which detail site assessment works undertaken from 2006 to 2012. URS were engaged to prepare a report to summarise all previous investigations undertaken of the site and provide an assessment of the soil and groundwater quality with respect to the future use of the site for industrial or commercial use. Douglas Partners review was to further validate the suitability of the site for the proposed development.

The following previous assessments have been undertaken to ascertain the soil and groundwater conditions at the site. These include:

- Phase 2 Environmental Site Assessment (ESA) (URS, 2006). Scope included the drilling and sampling of 31 soil bores (SB14 to SB32 and MW01 to MW13) and the installation and sampling of 13 monitoring wells (MW01 to MW13);
- Annual Groundwater Monitoring Event (GME) (URS, 2010). Scope of works included gauging and purging of all 13 on site monitoring wells;
- Annual GME (URS, 2012a). Scope of works included gauging and purging of all 13 on site monitoring wells;
- Post Phase 2 ESA (URS, 2012b). Scope included service locating in the vicinity of potential underground storage tanks (UST), test pitting to determine the number of USTs present, and collection and analysis of soils in targeted areas;
- Post Phase 2 ESA (URS, 2012e). Scope included the drilling of 29 soil bores (SB101 TO SB129) and analysis of select soil samples. In addition, all 13 monitoring wells onsite were gauged and sampled; and
- Soil Validation ESA (URS, 2012f). Scope of work included removal of all identified USTs and above ground storage tanks, associated infrastructure, and perform soil remediation works to validate the site for commercial/industrial use.

Figure 47 shows the location of the previous soil and groundwater sampling undertaken at the site by URS between 2005 and 2012.

As part of the groundwater assessment for this EIS, Douglas Partners have also installed a further 4 groundwater monitoring wells at the site. The location of these wells and the results of this assessment are discussed in **Section 8.7** above.

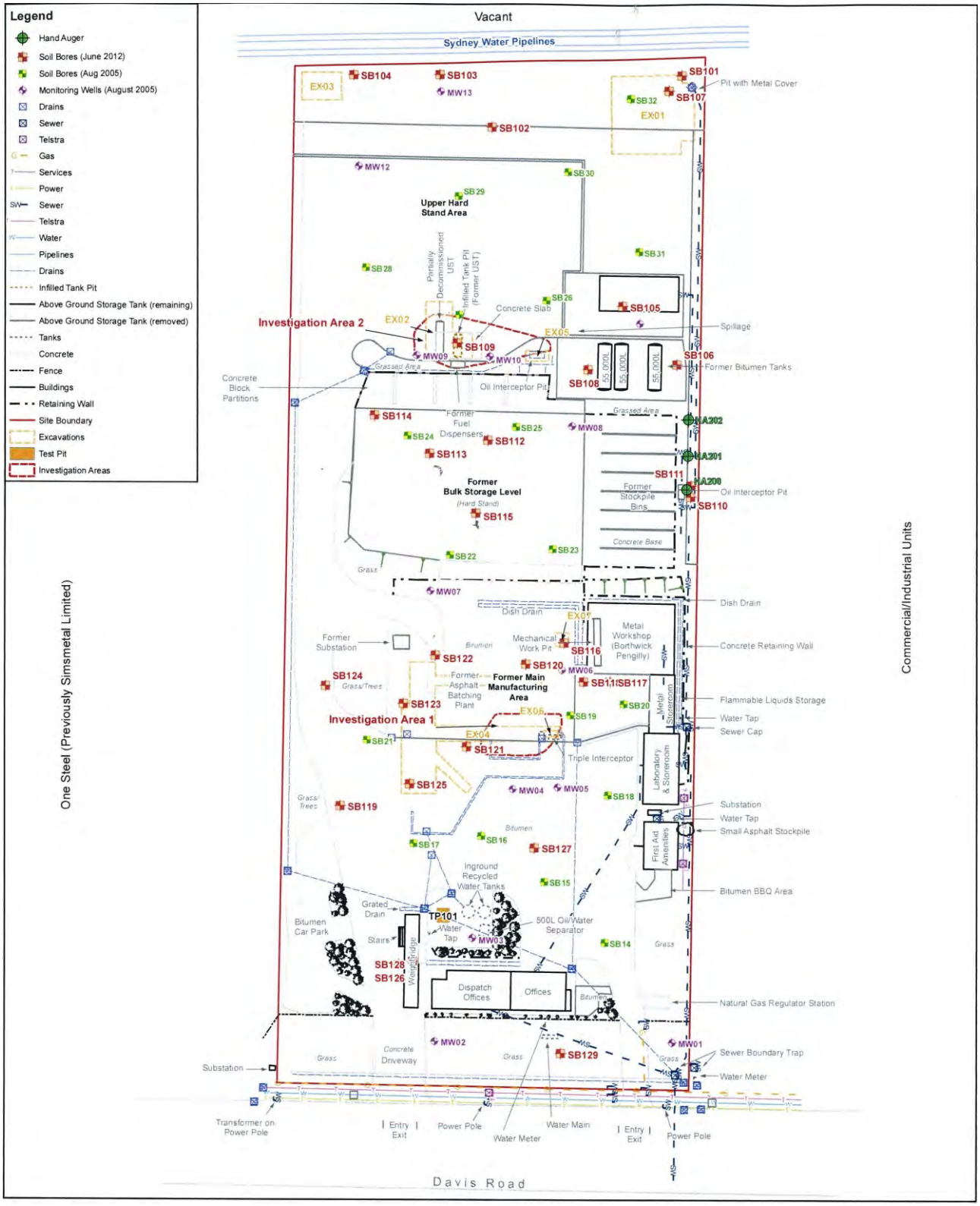

Figure 47: Previous Soil and Water Sampling (URS 2005 – 2012)

8.8.4 Potential Impacts

8.8.4.1 Soils

The findings from both the URS (2013) report and the Douglas Partners report have been considered in assessing the current condition of soils and contamination at the site.

Based on a review of the previous investigations undertaken at the site, detailed soil investigations have been undertaken, particularly given that soil sampling has been conducted from more than 60 test bores, with the minimum sampling density for a 2 ha site being 30 test locations (as per NSW EPA Sampling Design Guidelines, 1995).

Soil sampling results can generally be summarised as follows:

- An initial soil investigation (31 sample bores) completed in 2005 found concentrations of TPH above the adopted soil acceptance criteria (SAC) in samples at MW13 and SB24. Relatively low concentrations of inorganics were detected;
- A subsequent investigation in 2012 was undertaken through test pitting at Investigation Area 1 and Investigation Area 2. At Investigation Area 1 there was the presence of heavy end hydrocarbons in fill material or at the interface between the fill and the natural material. At Investigation Area 2 some isolated TPH impacts were found at the location of previous fuel dispensers; and
- Following the investigations above, a further 29 sampling bores were installed. Sites were targeted at locations of soil impacts based on historical use. Results found that there were soil impacts at varying depths to 2 mbgl and extending to the saturated soil zone at site SB125. Impacts were mostly confined to the upper tier and the lower southern portion of the site. All impacts were vertically delineated with the exception of SB125 due to the potential cross contamination of underlying soils with perch water.

8.8.4.2 Groundwater

The site has been subject to 4 groundwater sampling events commencing in 2005 through to 2012. Phase separated hydrocarbons were not found on site during any of the events carried out during this period. Groundwater standing water levels have also remained relatively static over the sampling period, ranging from 33.14 m to 44.25 m AHD.

The following is a summary of the groundwater results from the 4 monitoring periods:

- TPH fractions and BTEX compounds were not detected above their respective limits of reporting (LOR) in all investigations with the exception of TPH C10-C36 which was detected in MW02 (730 µg/l), MW07 (100 µg/L), and MW09 (200µg/L) during the GME in 2008 only;
- Lead concentrations were generally considered low, ranging from 0.001 to 0.004 mg/L;
- PAH concentrations were detected in MW08 in 2005 (12 µg/l) above GAC for total PAHs. Subsequent monitoring rounds reported results less than their respective LORs in all events where monitored; and
- Heavy metal concentrations exceeding the GAC for arsenic, chromium, copper, nickel and zinc were detected in all monitoring events with the exception of cadmium which was below the GAC in the 2010 event. Due to the widespread nature of the detections it was considered likely that the concentrations are indicative of the local groundwater quality.

Given that groundwater has been monitored previously from 13 wells spread across the site in 4 separate events, it is considered that groundwater has been subject to detailed assessment, the results are generally acceptable, and will not be a constraint to the development.

URS (2013) considered that the remedial works for soils completed at the site have removed any remaining sources or impacts identified in previous site investigations. As groundwater was previously reported to not be impacted by chemicals of potential concern above groundwater acceptance criteria, with the exception of heavy metals, it was considered by URS that the risks to human health and the environment are low and

acceptable. Due to the widespread nature of the detections it was considered by URS (2013) that the detected heavy metals in the groundwater beneath the site are indicative of local groundwater quality.

8.8.5 Mitigation and Management

Given that the site has previously contained potentially contaminating sources, there is the possibility for contamination or buried infrastructure (such as USTs) to exist between the previously sampled locations. Accordingly, an Unexpected Finds Protocol has been prepared. In the event that a UST or similar buried structure is encountered during site works, the UST or structure and any associated pipework will be managed or removed as follows:

- Any water seepage encountered during construction activities will be appropriately managed;
- Upon discovery of a structure, the site supervisor is to be notified and the area barricaded;
- A suitably qualified and licenced contractor will be engaged to remove and dispose of any stored liquid, the structure, and associated pipework. In the case of an UST, the tank will be removed in accordance with Australian Standard AS 4976 – 2008 *The Removal and Disposal of Petroleum Underground Storage Tanks* and WorkCover NSW, *Code of Practice: Storage and Handling of Dangerous Goods*, 2005;
- Excavated impacted soils are to be placed within containment bins for testing and re-use or disposal;
- Validation of the tank pit by a qualified environmental consultant through soil sampling and laboratory analysis for the contaminants of concern;
- Remove all of soils in the tank pit identified to be impacted by the contaminants of concern and further validation sampling and analysis to determine appropriate disposal;
- The environmental consultant is to sample and assess stockpiled soils for waste classification and / or possible re-use; and
- Inclusion of validation results, waste classification information and disposal documents (including liquid waste disposal dockets, landfill dockets and, in the case of USTs, tank and pipe work destruction certificates) in a validation report. Any validation report prepared will be served to the relevant authority within 60 days of decommissioning.

Further detail on the Unexpected Finds Protocol is included with the Contamination Review Report and the Addendum Letter Report attached as **Appendix 15**.

8.8.6 Conclusions

Overall, the results and findings presented in the URS (2013) report and Douglas Partners report indicate that the site does not contain concentrations of soil and groundwater contaminants which would preclude the use of the site for the proposed resource recovery and recycling facility development.

Given the remediation works documented by URS (2013), the detailed nature of previous soil and groundwater investigations, and the current guidelines it is considered that the likelihood of widespread contamination existing at the site is very low. Targeted soil investigation (instead of a detailed investigation) is recommended as a ‘check’ and to address data gaps including at workshop and laboratory buildings, existing interceptor pit and future landscape areas which cover a relatively minor part of the entire site area. It is considered that the site is suitable for the proposed resource recovery and recycling facility subject to these limited and targeted soil investigations and adoption of the Unexpected Finds Protocol prepared for the Site.

The Contamination Review Report and the Addendum Letter Report (including Unexpected Finds Protocol) prepared by Douglas Partners is attached as **Appendix 15**. Further details on groundwater impact are also discussed in **Section 8.7** of this EIS and attached in **Appendix 14**.

8.9 Flora and Fauna

8.9.1 Introduction

A Flora and Fauna Assessment has been prepared by RPS. Whilst there was no specific requirement within the SEARs to undertake an assessment of flora and fauna, a low level assessment was prepared regardless to examine the likelihood of the proposal having a significant effect on any threatened species, populations or ecological communities listed under the *NSW Threatened Species Conservation Act 1995* (TSC Act). This report recognises the relevant requirements of the EP&A Act 1979 as amended by the *NSW Environmental Planning and Assessment Amendment Act 1997*. Assessment is also made with regard to those threatened entities listed under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Threatened biodiversity listed under the TSC Act and EPBC Act of potential relevance to the site was initially identified from database searches and subject to a preliminary 'likelihood of occurrence' analysis. A preliminary vegetation cover and condition map was also prepared from desktop resources. A site investigation on 2 February 2015 by Mr Mark Aitkens B.Sc. (Accredited BioBanking Assessor) was performed to validate the likelihood of occurrence analysis and preliminary vegetation typing/ boundary definition. Revised vegetation mapping and likelihood of occurrence analysis was prepared following this site inspection. Key constraints were identified and mapped. Impact avoidance, minimisation and mitigation principles were applied, as required by the Framework for Biodiversity Assessment (OEH 2014a) followed by an impact assessment for residual impacts.

8.9.2 Methodology

8.9.2.1 Desktop Database Search

A review of relevant information was performed to gain an understanding of ecological values occurring or potentially occurring within the site. Information sources reviewed for a 10 km radius of the site (i.e. locality) included:

- Fauna and flora records contained in the Office of Environment and Heritage (OEH) Atlas of NSW Wildlife that may occur within the sites' locality (OEH 2016a); and
- Fauna and flora records contained in the Department of the Environment (DotE) Protected Matters Search tool that may occur within the sites' locality (DotE 2016a).

The preliminary 'likelihood of occurrence' assessment produced was used to provide a framework for defining investigation methods necessary for performing an adequate site investigation.

8.9.2.2 Likelihood of Occurrence Analysis

Four 'likelihood of occurrence' categories were used to classify habitat value for threatened biodiversity. Habitat descriptions were generally taken from the online Threatened Species Profile Database (TSPD) (OEH 2016b) and SPRAT database (DotE 2016b). The categories are outlined in **Table 38**. The desktop analysis was revised following a site inspection, which had the purpose of assessing the accuracy of vegetation mapping, condition and availability of suitable habitat values.

Table 38 Likelihood of Occurrence Criteria

Likelihood rating	Threatened flora criteria	Threatened and migratory fauna criteria
Known	The species was observed within the site.	The species was observed within the site.
Likely	Plant Community Type (PCT) and micro-habitat conditions present. Habitat condition moderate to high. Species recorded within locality.	PCT and micro-habitat conditions present. Habitat condition moderate to high and likely to support important lifecycle processes such as breeding. Species recorded within locality.
May	Broad habitat predictor present (i.e. PCT). Habitat condition low (i.e. micro-habitat conditions either disturbed or of limited suitability). Species records may not occur within locality.	Broad habitat predictor present (i.e. PCT). Habitat condition low (i.e. micro-habitat conditions either disturbed or of limited suitability). Species records may not occur within locality. If present the species would likely be a transient visitor and unlikely to rely on habitat for important lifecycle processes.
Unlikely	Habitat unsuitable for the species.	Habitat unsuitable for the species.

8.9.2.3 Vegetation Mapping

Recent relevant native vegetation mapping was reviewed in combination with current aerial imagery to map the likely extent of native vegetation cover. Preliminary plant community types (PCTs) were assigned to areas of relatively homogenous land cover (i.e. vegetation units), as identified by aerial photography interpretation and database review (OEH 2012). PCT extent was calculated in a GIS to determine required survey effort.

8.9.2.4 Biodiversity Condition

Site investigations were performed involving the completion of BioMetric plots (Gibbons et al. 2009) as modified by the NSW BioBanking Assessment Methodology 2014 (BBAM 2014) (OEH 2014b). BioMetric plots comprise a detailed investigation of a 50 m x 20 m area (i.e. 1,000 m^2) to measure 10 variables, as indicated below:

- Native plant species richness (NPSR);
- Native Overstorey Cover (NOC);
- Native Midstorey Cover (NMSC);
- Native Groundcover Grasses (NGCG);
- Native Groundcover Shrubs (NGCS);
- Native Groundcover Other (NGCO);
- Exotic Species (ES);
- Number of Hollow-bearing Trees (NHT);
- Overstorey Regeneration (OR); and
- Fallen Log Length (FL).

NPSR richness is determined from a 20 m X 20 m quadrat nested within the 1,000 m^2 BioMetric plot. Cover and abundance for each plant species was estimated and recorded in accordance with the Framework for Biodiversity Assessment (OEH 2014a).

A site value score was calculated using the BioBanking Credit Calculator and linked PCT benchmark database to evaluate overall biodiversity condition. Individual BioMetric measures were used to explain the measured condition state.

8.9.2.5 Targeted Surveys

Targeted searches for flora and fauna species of conservation significance were conducted during field surveys within potential habitats of the study area using the Random Meander Technique (Cropper 1993). Plant specimens were identified using the Flora or NSW (Harden 1992, 1993, 2000, 2002) and Plantnet (http://plantnet.rbgsyd.nsw.gov.au/). Plants of unknown or significant status were collected for later identification or lodgement with the National Herbarium in Sydney.

8.9.3 Results

8.9.3.1 Vegetation

Preliminary vegetation mapping identified native vegetation cover at the front of the site adjacent to Davis Road and was notionally classified as Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (HN528). The presence and extent of this vegetation was confirmed during the site inspection. Approximately 920 m^2 or 0.09 ha of Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (HN528) was mapped within the site.

8.9.3.2 Biodiversity Condition

A single BioBanking plot was placed within the tract of native vegetation mapped within the site to quantify the biodiversity metrics specified in Section 8.9.2.4, thus evaluate overall condition (i.e. calculate site value score). The results are provided in **Table 39** including benchmark values for HN528 for comparison.

Table 39 BioBanking Plot Data

Plot number	BioBanking Site Attributes (% unless otherwise indicated)										
	Site Value Score	NPSR (#)	NOC	NMSC	NGCG	NGCS	NGCO	ES	NHT (#)	OR (0-1)	FL (m)
1	34	13	35	0.7	10	0	26	26	0	1	0
Benchmark (HN528)	100	>=31	10-29	4-39	18-65	1-22	13-48	0	>=1	1	>=50

The native vegetation mapped within the site was considered to be in 'moderate/good' condition due to the presence of an intact overstorey canopy and presence of native groundcover plant species. However, overall condition is classed as poor (i.e. site value score of 34) due to:

- Relatively low NPSR;
- Absence of FLs;
- Absence of HBTs;
- Presence of high exotic plant species cover; and
- Small patch size and isolation from nearby patches.

The absence of hollow-bearing trees and fallen logs substantially reduces the potential for incidence of biodiversity values of conservation significance such as hollow dependant fauna and/ or species reliant on complex ground habitat (i.e. fallen logs). The influence of existing edge effects (i.e. poor patch size to edge ratio) is also likely to be have a strong influence on biodiversity values (i.e. patch has low resilience to biological invasions). This is evident in the high exotic flora percent cover to the detriment of the percent of native groundcover grasses (i.e. below benchmark state).

8.9.3.3 Threatened Species

A likelihood of occurrence analysis is provided in **Appendix 16** for threatened biodiversity identified through desktop and field investigations as having potential to occur within the locality. Habitat was limited to the patch of poor condition Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (HN528) occurring in the front of the site.

Most of the species listed in **Appendix 16** were identified as unlikely to occur. The incidence of highly mobile species may be infrequently observed, although it should be noted that such incidence would not be associated with important lifecycle processes such as breeding (e.g. absence of key habitat attributes such as hollow-bearing trees, minimum patch size, fallen logs and connectivity).

Targeted surveys for the Cumberland Plain Woodland Land Snail (*Meridolum corneovirens*) failed to detect this species within the site. No threatened plant species were detected within the site during the survey period.

8.9.3.4 Threatened Ecological Communities

The patch of native vegetation mapped at the front of the site, adjacent to Davis Road, conforms to the description of Cumberland Plain Woodland critically endangered ecological community (CEEC) as defined by the listing advice under the TSC Act (NSW Scientific Committee 2010).

Adjoining offsite vegetation was also examined to determine patch extent. Vegetation adjacent to the western boundary of the site fronting Davis Road (i.e. One Steel property) comprises planted *Casuarina glauca*, various landscape species (native and exotic) and a single remnant eucalypt. The exotic understorey, comprising lawn species, is routinely managed for this landscaping purpose. No adjoining native vegetation occurred to the east or north. In applying the State guidelines for identifying Cumberland Plain Woodland, it is considered that this adjoining tract of vegetation cover does not meet the inclusion criteria as forming part of a patch of the threatened ecological community as the overstorey canopy is not characterised by Cumberland Woodland tree species (i.e. *Casuarina glauca* is not a characteristic species). Furthermore, the stand of *Casuarina glauca* is likely to be planted as opposed to naturally occurring, given the position it was growing in the landscape (i.e. not on a floodplain).

The patch identified within the site is smaller than the minimum mappable area required for assessment in accordance with the BBAM 2014 (i.e. 0.25 hectares). Unless the vegetation can be amalgamated into an adjacent patch of native vegetation, it is considered that the vegetation cannot be properly assessed in accordance with the FBA. Notwithstanding, the principles of avoid, mitigate and offset still apply in the assessment of the patch.

In reference to the Commonwealth Policy Statement 3.31 (i.e. Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest CEEC), it is considered that the offset patch of Cumberland Plain Woodland located west of the 'One Steel' facility is not connected with the patch contained within the site. An identified offsite patch west of the One Steel facility is separated from vegetation within the site by a distance of over 100 m, with the intervening gap comprising barriers such as permanent man-made structures, such as roads and buildings (lands excluded from a patch). Vegetation cover located within the One Steel site and adjacent Davis Road is not Cumberland Plain Woodland and does not contribute to the functionality of the ecological community in either identified patch (i.e. constrained movement of wildlife or dispersal of plant spores and seeds between each patch through fencing, landscaping and poor patch dynamics). As such, the patch of native vegetation contained within the site does not conform to the listing advice for Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest CEEC as listed under the EPBC Act (TSSC 2010) (i.e. patch size is less than the minimum 0.5 ha necessary for inclusion in the listed ecological community).

8.9.4 Impact Assessment

Existing pre-development impacts on the mapped extent of HN528, such as small patch size and edge effects, have served to substantially reduce the biodiversity condition and values of the patch. Further, with ongoing patch isolation, it is considered unlikely that this patch would exhibit improved biodiversity values

over time (e.g. movement of native plant and fauna species in and out of the site). Accordingly, in terms of impact magnitude, it is considered that the loss of this patch represents the main development related impact possible (i.e. no offsite indirect impacts on adjacent patches expected).

An impact avoidance approach has been adopted as the most suitable method for minimising impacts on Cumberland Plain Woodland CEEC and associated threatened species habitat. On this basis, it is considered that the project impacts are limited to 'indirect' impacts not dissimilar to existing conditions (i.e. small patch size and edge effects).

8.9.5 Mitigation and Management

In addition to the impact avoidance approach adopted for the development, which has resulted in no direct impacts on Cumberland Plain Woodland CEEC and associated threatened species habitat, it is recommended that the patch of native vegetation occurring within the site be suitably managed to minimise any indirect impacts on this vegetation. Mitigation and management recommendations are provided as follows:

- Perform, prior to construction, a weed management program to reduce weed cover within the patch of Cumberland Plain Woodland CEEC;
- Supplement ground cover native plant species within the patch using a single application of native grass and herb seed mix. The seed mix is to contain no less than 10 species and must comprise at least 20% Kangaroo Grass (*Themeda triandra*);
- Installation of perimeter sediment and erosion control fencing to prevent ingress of sediment laden water and weed propagules into the area of native vegetation;
- Exclude all machinery and human activity from the patch of Cumberland Plain Woodland CEEC; and
- Install a barrier suitable for operation in the post construction stage to separate site operations from the biodiversity values present within the patch.

8.9.6 Conclusions

A small patch of Cumberland Plain Woodland CEEC listed under the TSC Act occurs within the site. The proposal design has been altered to reflect the identified biodiversity values resulting in an avoidance outcome. Recommendations are provided to protect and enhance the condition of this patch through the construction and operation phase of the proposal. As there is unlikely to be an impact on listed threatened biodiversity, it is considered that there is no requirement for a biodiversity offset as a result of the proposal.

8.10 Aboriginal Cultural Heritage

8.10.1 Introduction

An assessment of Aboriginal Cultural Heritage impacts from the proposed development has been undertaken by RPS. The purpose of the Aboriginal Cultural Heritage Assessment was to identify what Aboriginal sites were present (if any), the risk of impact to these Aboriginal sites, and to provide assessment and mitigation measures based on those findings. The Aboriginal Cultural Heritage Assessment is attached as **Appendix 17**.

The assessment has also been prepared to satisfy the SEARs, which requested the following be considered:

- Heritage – including an assessment of Aboriginal Cultural Heritage;
- The EIS must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the project and document these in the EIS. This may include the need for surface survey and test excavation. The identification of cultural heritage values should be guided by the *Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW* (DECCW, 2011);

- Where Aboriginal cultural heritage values are identified, consultation with Aboriginal people must be undertaken and documented in accordance with the *Aboriginal cultural heritage consultation requirements for proponent 2010* (DECCW) (ACHCR's). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the EIS; and
- Impacts on Aboriginal cultural heritage values are to be assessed and documented in the EIS. The EIS must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the EIS must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to OEH.

A full summary of the SEARs requirements (including agency responses) are included within **Appendix 1**.

8.10.2 Existing Environment

8.10.2.1 Geology and Soils

Aboriginal people often made stone tools using siliceous, metamorphic or igneous rocks and, therefore, understanding the local geology can provide important information regarding resources in a Project area. The nature of stone exploitation by Aboriginal people depends on the characteristics of the source, for example whether it outcrops on the surface (a primary source), or whether it occurs as gravels (a secondary source) (Doelman et al. 2008).

The underlying geology in the Fairfield Local Government Area (LGA) area is predominantly the Wianamatta Group and Ashfield Shale which consists of laminate and dark grey siltstone and Bringelly Shale, all of which overlay Hawkesbury Sandstone. Alluvial deposits consisting of fine-grained sand, silt and clay are associated with parts of the larger creek systems in the Fairfield LGA. The location of the siltstone and sandstone raw materials, particularly in association with ephemeral and permanent watercourses would have been preferred as areas of occupation or resource across the landscape.

The Project Area is situated on the Blacktown (bt) Soil Landscape. The Blacktown soil landscape is a shallow to moderately deep soil (<100 cm) of Red and Brown Podzolic soils on crests, upper slopes and across well-drained areas. Yellow Podzolic soils and Soloths occur on lower slopes and in areas of poor drainage. The A1 horizon is brownish black loams (friable loam to clay loam) generally occur as topsoils. The depth of topsoil occurs up to 30 cm. The A2 horizon is brown clay loam to silty clay loam, and occurs from 20 cm up to 50 cm. Underlying subsoil horizons (B2, B3 and C) comprise clays ranging from mottled brown to light grey plastic mottled clay.

If present, Aboriginal artefacts would most likely occur in the A1 and A2 horizons within the upper 30 cm of the soil profile.

8.10.2.2 Topography and Hydrology

The Fairfield LGA forms a part of the Cumberland Plain, which is a relatively shallow basin, with a network of creeks and rivers in the local landscape which flow to the southeast and drain into the Georges River. The Project Area is located 530 metres south of Prospect Creek, a major tributary of the Georges River. The creek and associated ephemeral drainage lines would have provided temporary and permanent sources of fresh water for past Aboriginal people. The available ephemeral water sources would have been available seasonally in the form of first and second order tributaries of the creek. The local environment would have provided a number of reliable water sources for the Aboriginal people occupying the area.

8.10.2.3 Flora and Fauna

Past Aboriginal communities would have likely encountered the vegetation of the Southern Tableland Dry Sclerophyll Forests in the locality of the Project Area. The trees are low in stature, reaching heights of just 15-20 cm, and typically include stringybarks, peppermints and scribbly gums, but a dearth of the red gums and box eucalypts that characterise the adjoining grassy woodlands. This vegetation community provides

habitat for a variety of animals and would have also provided potential food and raw material sources for Aboriginal people.

8.10.2.4 Synthesis

A review of the environmental context of the Project Area and surrounds indicates there would have been available food resources and other flora reserves which would have encouraged Aboriginal occupation. The topography surrounding the Project Area is generally low undulating slopes and plains, which suggest it is unlikely that suitable sandstone outcrops would be available for either grinding of stone artefacts or for use as shelters.

8.10.3 Methodology

8.10.3.1 Summary of Methodology

The methodology applied to this assessment considers the proposed impacts of the development, the survey results, sensitivity map and assessment of significance. The following was undertaken as part of this assessment:

- Liaison and partnership with the Aboriginal community through the DECCW *Aboriginal Cultural Heritage Requirements for Proponents* (2010);
- A review of all relevant documentation and statutory requirements with regard to Aboriginal heritage;
- Review of data from the Aboriginal Heritage Information Management System (AHIMS) to identify known Aboriginal sites;
- A review of environmental information and previous archaeological work to develop a predictive model for Aboriginal archaeological site patterning within the study area;
- An assessment of archaeological sensitivity within the study area;
- An archaeological survey; and
- Recommendations for the management for Aboriginal cultural heritage objects and places and non-Indigenous heritage items.

This Aboriginal Cultural Heritage Assessment Report has also been prepared accordance with:

- *The National Parks and Wildlife Act* (1974);
- *The Heritage Act* (1977); and
- *The National Parks and Wildlife Service Guidelines for Archaeological Survey and Reporting* (1997).

8.10.3.2 Aboriginal Cultural Heritage Consultation Requirements

Aboriginal consultation was undertaken as part of heritage best practice and in accordance with the ACHCRs. The ACHCRs include a four stage Aboriginal consultation process that stipulates specific timeframes for the components of each stage. The four stages are summarised as follows:

- **Stage 1** requires that Aboriginal people who hold cultural information are identified, notified and invited to register an expression of interest in the assessment. The identification process should also include an advertisement placed in a local newspaper circulating in the general location of the Project Area;
- **Stage 2** requires that project information is provided to Aboriginal community stakeholders by the proponent. Relevant project information may include an outline of the project activities, proposed impact areas and environmental assessment process;
- **Stage 3** is concerned with the gathering of information regarding cultural significance. The aim is to facilitate a process by which Aboriginal community stakeholders can have input into the heritage assessment methodology and management options, and provide information on the cultural significance

of Aboriginal objects or places. The proponent must provide a proposed methodology for the cultural heritage assessment and allow a minimum of 28 days to respond; and

- **Stage 4** requires that the proponent prepare a draft cultural heritage assessment report and provide a copy to the registered Aboriginal stakeholders for comment. A minimum of 28 days must be provided for the registered Aboriginal stakeholders to comment on the draft report. To finalise the report the proponent must consider the submissions made by the registered Aboriginal stakeholders and include the proponent's response to each submission. The finalised report must be provided to the registered Aboriginal stakeholders and the relevant Local Aboriginal Land Council.

In accordance with Stage 1 of the ACHCRs, letters were sent (date 1 February 2016) to the Gandangara Local Aboriginal Land Council, the National Native Title Tribunal, Native Title Services Corporation Limited, Registrar of Aboriginal Owners, the Fairfield City Council, Office of Environment and Heritage, Parramatta and Local Land Services requesting the identification of interested Aboriginal groups. Letters were sent out inviting expressions of interest (date 21 & 23 February 2016) and as a result of conducting Stage 1 of the ACHCR process the following organisations have been identified as Registered Aboriginal Parties (RAPs). Details of the RAPs are provided in **Table 40.**

Table 40 Registered Aboriginal Parties (RAPs)

Organisation	Contact	Date Registration Received	Comment
Darug Land Observations	Jamie Workman	4/03/2016	RAP
Kamilaroi-Yankuntjatjara	Philip Khan	3/03/2016	RAP
Darug Aboriginal Cultural Heritage Assessments	Celestine Everingham	4/03/2016	RAP
Darug Tribal Aboriginal Corporation	Denise Newham	4/03/2016	RAP
Murra Bidgee Mullangari A Corp	Darleen Johnson	4/03/2016	RAP
Widescope	Steven Hickey	6/06/2016	RAP
Carolyn Hickey - A1 Indigenous Services	Carolyn Hickey	7/03/2016	RAP
Goobah	Basil Smith	6/06/2016	RAP
Amanda Hickey	Amanda Hickey	6/06/2016	RAP
Aboriginal Archaeology Service Darug Traditional Owners	Anthony Williams	25/2/2016	RAP
Rane Contracting	Tony Williams	28/2/2016	RAP
Murramarangs	Roxanne Smith	6/06/2016	RAP
Biamangas	Seli Storer	6/06/2016	RAP
Gulaga	Wendy Smith	7/03/2016	RAP
Callendulla	Corey Smith	7/03/2016	RAP

Information regarding the proposed heritage assessment methodology, and strategy for collecting information on cultural heritage significance, was provided in writing to the Aboriginal stakeholders on 7 March 2016. Five groups responded to the methodology by the closing date as detailed in **Table 41**.

Table 41 RAP Responders to Methodology

Organisation	Name of Representative	Date of Reply for Methodology - 18/4/2016
Aboriginal Archaeology Services Darug Traditional Owners	Andrew Williams	15/03/2016
Deerubbin Local Aboriginal Land Council	Steve Randall	18/04/2016
Darug Custodian Aboriginal Corporation	Justine Coplin	11/03/2016
Darug Land Observations	Jamie Workman	14/03/2016
Murra Bidgee Mullangari Aboriginal Corporation	Darleen Johnson	18/03/2016

The registered Aboriginal stakeholders who responded to the methodology were offered the opportunity to participate in a field survey of the Project site. Steve Randall from Deerubbin Local Aboriginal Land Council attended the survey of the site on 26 May 2016.

8.10.3.3 Aboriginal Heritage Information Management System (AHIMS)

A search was undertaken of the Aboriginal Heritage Information Management System (AHIMS) database 22 February 2016, for this ACHAR. The search co-ordinates used for the Project Area were Lot 18, DP 249417, with a one kilometre buffer zone. The search within these co-ordinates revealed that there are 10 previously recorded Aboriginal sites which are surface Artefact Sites with the number of artefacts unspecified. All of these registered sites are outside of the Project Area. **Table 42** below provides the results of the AHIMS search. For a plan of the locations of the artefacts determined by the AHIMS search refer to the Aboriginal Cultural Heritage Assessment attached as **Appendix 17**.

Table 42 AHIMS Sites within Co-Ordinate Search

AHIMS Site ID	AHIMS Site Name	Site Type
45-5-0801	PB1 Prospect Reservoir	Artefact Site (Number Unspecified)
45-5-0802	PB2 Prospect Reservoir	Artefact Site (Number Unspecified)
45-5-0803	PB3 Prospect Reservoir	Artefact Site (Number Unspecified)
45-5-0804	PB4 Prospect Reservoir	Artefact Site (Number Unspecified)
45-5-0805	PA1 Prospect Reservoir	Artefact Site (Number Unspecified)
45-5-0806	PA2 Prospect Reservoir	Artefact Site (Number Unspecified)
45-5-0868	PP1 Prospect Reservoir	Artefact Site (Number Unspecified)
45-5-0869	PP2 Prospect Reservoir	Artefact Site (Number Unspecified)
45-5-0836	PT 1 Prospect Tunnel	Artefact Site (Number Unspecified)
45-5-3952	PP3 Prospect Pipe head	Artefact Site (Number Unspecified)

8.10.3.4 Aboriginal Heritage Context

Aboriginal occupation of the larger Wetherill Park area, which also includes the Project Area, would have been supported by Prospect Creek and associated drainage. Aboriginal populations would have likely inhabited elevated land above the creek. The local catchment areas would have provided a natural resource to Aboriginal people, of fresh water and, flora and fauna resources for food and raw materials.

Previous assessments have shown that Aboriginal occupation is often concentrated on the gently sloping landforms above watercourses. Low density artefacts scatter is commonly identified during the excavations. Occasional areas of archaeological sensitivity are found across the Cumberland Plain, but the majority of the region has been subject to intense disturbances through previous land uses and modern modifications through industrial and commercial development.

The absence of elevated landforms suitable for short and long term accommodation for past Aboriginal people limit the likelihood for high density numbers of artefacts in the Project Area.

8.10.3.5 Predictive Model

The AHIMS results identified that the most common site types in the Wetherill Park locality are artefacts with numbers unspecified. On the basis of the AHIMS data, the artefact sites are located within remnant vegetated areas and are associated with Prospect Reservoir and Prospect Creek. Prospect Creek is situated 530 metres north-west of the Project Area.

As the underlying geology generally consists of thin sub-surface sandstone, outcropping sandstone which may be suitable for rockshelters or grinding grooves are not predicted to be identified in the Project Area. Scarred trees commonly occur on matured trees of a certain age in unmodified and unlogged elevated landforms. Surface stone artefacts may potentially be identified near to available water sources, on soil exposures and in disturbed contexts with minimal vegetation coverage.

A review of the site data from previous archaeological works in the locality, indicate that artefact scatters are the most common site types. Artefacts types are predicted to comprise predominantly broken flakes and flaked tools, with cores being less common. Due to the high level of disturbance, it is unlikely that PAD sites will be identified within the Project Area, as PADs are generally located on undisturbed land, in close proximity to reliable water bodies and often have good views over the landscape, or an open or north facing aspect.

8.10.3.6 Field Survey

The Project Area was surveyed in accordance with the requirements set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010) and the Guide for Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011).

All heritage assessments relevant to the Project Area have been undertaken in accordance with OEH guidelines for survey reporting (Black and Mooney 2006) and included the following components:

- Documentation of survey coverage;
- Documentation of results; and
- Documentation of significance of sites/areas to the Aboriginal community.

8.10.4 Impact Assessment

8.10.4.1 Field Survey

A pedestrian survey of the Project Area was undertaken 26 May 2016 by RPS Archaeologist Jo Nelson and Deerubbin Local Aboriginal Land Council Site Officer, Steve Randall. The survey was conducted on foot (pedestrian) for the whole of the Project Area.

The documentation of the Project Area was undertaken using the following methods:

- Digital photography;
- GPS recording (differential); and
- Field notes.

In accordance with OEH guidelines, photographic recording was undertaken of landforms, survey units, Aboriginal cultural material, and evident modifications and disturbances.

Differential GPS units were used to record the location of Aboriginal heritage sites/objects. GPS tracking logs were also used for recording the location of survey units.

Field notes incorporated details including site location, size and features, artefact types and raw materials of Aboriginal heritage sites/objects identified in the survey units. A description of disturbances such as erosion, land clearing, disturbances and modifications was also recorded.

Areas with ground surface visibility and exposure generally had substantial land surface disturbance and modifications. These areas may have the potential to expose archaeological material, particularly stone artefacts.

Areas with low visibility and low exposure particularly due to native vegetation coverage are generally more intact (undisturbed) landscapes. The identification of Aboriginal sites, particularly isolated finds and artefact scatters in such areas are generally low. There is low potential for intact archaeological deposits in disturbed or modified landscapes and which have been protected by vegetation coverage.

8.10.4.2 Field Survey Results and Conclusions

At conclusion of the site survey, RPS Archaeologist Jo Nelson and Deerubbin LALC Site Officer, Steve Randall agreed that the Project Area had been subject to high levels of modifications which included existing concrete walling, office buildings, raised levels for elevated infrastructure, drainage, bitumen access road running north-south, industrial sheds, gardens, road guttering and fencing. No undisturbed landscapes were identified within the Project Area.

The vegetation across the Project Area consisted of garden beds with young and juvenile trees, leaf and branch litter. All areas were inspected for items of archaeological significance. The ground surface visibility across these areas was generally considered low to moderate.

No new Aboriginal objects or sites were identified.

8.10.5 Mitigation and Management

The following mitigation and management recommendations have been formulated with consideration of the significance of Aboriginal cultural heritage, as well as, potential impacts and have been prepared in accordance with the relevant legislation. The management recommendations are based upon the NSW legislation designed to address the impact of development on sites of cultural significance. Recommendations for the Project area are based upon:

- The legal requirements of the *National Parks and Wildlife Act of 1974;*
- The results documented within this report and management recommendations formulated during the field survey investigation between Steve Randall (Deerubbin Local Aboriginal Land Council) and Jo Nelson (RPS Archaeologist), as well as consultation with the RAPs.

Recommendation 1

No Aboriginal objects or areas of archaeological sensitivity have been identified and thus there is no requirement for salvage; however, recommendations 2-4 are to be followed post approval and may be formalised in a Cultural Heritage Management Plan.

Recommendation 2

If unrecorded Aboriginal objects are identified in the Project Area during works, then all works in the immediate area must cease and the area should be cordoned off. OEH must be notified by ringing the Enviroline 131 555 so that the site can be adequately assessed and managed.

Recommendation 3

In the unlikely event that skeletal remains are identified, work must cease immediately in the vicinity of the remains and the area must be cordoned off. The proponent must contact the local NSW Police who will make an initial assessment as to whether the remains are part of a crime scene or possible Aboriginal remains. If the remains are thought to be Aboriginal, OEH must be contacted by ringing the Enviroline 131

555. An OEH officer will determine if the remains are Aboriginal or not; and a management plan must be developed in consultation with the relevant Aboriginal stakeholders before works recommence.

Recommendation 4

If, during the course of development works, suspected European historic material is uncovered, work should cease in that area immediately. The Office of Environment & Heritage (Enviroline 131 555) should be notified and works only recommence when an approved management strategy has been developed.

8.10.6 Conclusions

The Project site has been subject to high levels of modification associated with the previous construction of infrastructure. The assessment has considered the available archaeological information for the Project Area, the land condition and the nature of the proposed activity. The purpose of the investigation was to identify if there was risk of impact to Aboriginal objects or sites from the proposed works. The Project site has undergone ongoing patterns of disturbance associated with previous industrial and commercial use of the site.

Following conclusion of the field survey, RPS Archaeologist Jo Nelson and the Deerubbin LALC Site Officer, Steve Randall agreed that the Project Area had been subject to high levels of modifications and the likelihood of insitu artefacts to be low.

8.11 Historic Heritage Assessment

8.11.1 Introduction

An assessment of historical heritage impacts from the proposed development has been undertaken by RPS. The purpose of the Historic Heritage Assessment was to identify the presence of any significant historic heritage items (if any) within the locality of the development site, whether any of these items would be impacted upon by the development, and provide relevant mitigation and management strategies where appropriate. The Historic Heritage Assessment is attached as **Appendix 18**.

The assessment has also been prepared to satisfy the SEARs (including agency responses), which requested that Heritage be considered.

8.11.2 Methodology

Due to the low risk of impact to historic heritage items surrounding the locality, a desktop assessment was undertaken for this Project. The methodology applied to this assessment was a search of Local, State, and World heritage registers, and a review of relevant existing studies and historical resources.

8.11.3 Existing Environment

8.11.3.1 Historic Context

The suburb of Wetherill Park was named after the family of John Wetherill, a landowner and business man who gave land in the Wetherill Park area to be designated as parkland around 1870s. This land became Wetherill Park suburb. Wetherill Park is immediately adjacent to the southern boundary of Prospect Reservoir.

Prospect Reservoir, Wetherill Park

The Prospect Reservoir was built between 1882 and 1888 (OEH 2016). The State Heritage listing for the Reservoir includes landscape elements, associated water supply structures such as pump stations and residences from the 1920s and 1930s.

The Reservoir is an earth embankment dam 26 metres in height and approximately 2.2 kilometres in length. The heritage curtilage includes the boundary of the grounds owned by Sydney Water Corporation and the

components within it; the reservoir itself; side spillway and channel at the southern end of the wall; drainage and monitoring installations at the toe on the downstream face of the wall; the access road along the toe of the downstream face of the wall; and the outlet works which connect the stored water to the Lower Canal - consisting of outlet tower, pipelines, valve house and valve, scour lines and valves, and the other metering, screening and control installations (Water NSW 2016).

8.11.3.2 Review of Existing Studies and Historical Resources

F. Zambre (2010) Proposing a Cultural Landscape Paradigm a Case study: Prospect Reservoir at Western Sydney

This report was a case study of Prospect Reservoir which placed it within the rapidly developing context of Western Sydney. It determined that the study would utilise a framework of cultural landscapes, their meanings and values to create a broader sense than the traditional interpretation of the term heritage. The report summarised Prospect Reservoir as a place with continual occupation by both Aboriginal and modern Australian culture, evidenced in its Local and State listings as a heritage site for the past five decades. It stated that Prospect Reservoir was situated in a multilayered landscape, dominated by historic, religious and technological and economical values, and was a good example of landscape displaying generational modifications.

The report states the location of the Reservoir as being the rapidly developing geographic and demographic centre of Western Sydney. It concluded that this rapid development was a major threat to the landscape of the Reservoir and proposed a need to understand and assess this in order to properly manage the pressure of urbanisation and new usages of the surrounding land.

D. Steele (2012) Aboriginal and Non-Aboriginal Archaeological and Cultural Heritage Assessment for Horsley Drive Business Park

Dominic Steel Archaeology was commissioned by the Western Sydney Parklands Trust to assess a State Significant Development site on the corner of The Horsley Drive and Cowpasture Road, Horsley Park, NSW. The objective was to identify potential Aboriginal and non-Aboriginal archaeological and cultural heritage constraints and to guide future developments in context of historic and cultural heritage.

No State or Local heritage register sites were located within the project area. Existing built structures on the site, including farm houses, dams and previous landscape plantings, related to the period following the subdivision of the Horsley Estate in 1925. The project area was assessed as having minimal archaeological potential, low Local heritage significance and nil State heritage significance.

8.11.4 Impact Assessment

8.11.4.1 State Heritage

A search of the State Heritage Inventory register on 29 August 2016 identified no items or places within the Project Area. One listed item within the Wetherill Park area, Prospect Reservoir, is located approximately 800 metres north of the Project Area. Davis Road, Wetherill Park is listed as an alternative address for the listing. The Reservoir will not be impacted by the proposed works in the Project Area.

The State Heritage Curtilage which includes Prospect Reservoir abuts the Project Area to the north. The Heritage Curtilage does not encompass the Project Area.

8.11.4.2 Local Heritage

A search of Schedule 5 of the Fairfield LEP (2013) on 29 August 2016 found no items or places within the Project Area. Two local heritage items were identified in the vicinity of the study area. Item I101 (Bunya Pines) is approximately 1.2 kilometres south of the Project Area and item I102 (Monastery) is approximately 1.5 kilometres south-east of the Project Area. These items will not be impacted by the proposed works within the Project Area. The Project Area does not fall into the Heritage Curtilage as designated by Fairfield Council LEP.

8.11.4.3 World Heritage

There are no World Heritage items within or adjacent to the Project Area.

8.11.5 Mitigation and Management

As the development is not anticipated to have any impact on historic heritage items, no site specific mitigation measures are necessary, however should any heritage items been discovered or unearthed during construction all works will cease in that locality of the site and OEH notified immediately.

8.11.6 Conclusions

There are no Local or State listed heritage items within the Project Area and here are no World Heritage listed items in or adjacent to the Project site.

On the basis of the Project Area's extensive modifications and disturbances as identified during a pedestrian survey undertaken 26 May 2016 by RPS and the search of the Historical and Heritage registers which identified no items, the Project Area has low archaeological potential.

Accordingly, the proposed works to construct and operate a Resource Recovery and Recycling Facility are unlikely to have any adverse impact upon non-Aboriginal historic archaeological values. No significant archaeological constraints are apparent that would restrict the proposed works.

8.12 Greenhouse Gas

8.12.1 Introduction

An assessment of greenhouse gas impacts from the proposed development has been undertaken by Advanced Environmental Dynamics. The purpose of this report was to determine the potential greenhouse gas sources from the project, undertake a Scope 1 and Scope 2 emissions calculation, and suggest strategies to minimise greenhouse gas producing activities. The Greenhouse Gas Assessment is attached as **Appendix 19.**

The assessment has also been prepared to satisfy the SEARs, which requested the following be considered:

- Identify all sources of air emissions from the development. Note emissions can be classed as either:
  - point (eg emissions from stack or vent) or
  - fugitive (from wind erosion, leakages or spillages, associated with loading or unloading, conveyors, storage facilities, plant and yard operation, vehicle movements (dust from road, exhausts, loss from load), land clearing and construction works).
- Provide details of the project that are essential for predicting and assessing air impacts including:
  - the quantities and physio chemical parameters (eg concentration, moisture content, bulk density, particle sizes etc) of materials to be used, transported, produced or stored;
  - an outline of procedures for handling, transport, production and storage; and
  - the management of solid, liquid and gaseous waste streams with potential for significant air impacts.

A full summary of the SEARs requirements (including agency responses) are included within **Appendix 1.**

8.12.2 Methodology

A Green House Gas (GHG) inventory for the proposed development has been prepared based on the accounting and reporting principles detailed within the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard Revised Edition (WBCSD & WRI).

The Greenhouse Gas Protocol defines direct and indirect emissions through the concept of emission scopes, including:

- **Scope 1** - Direct GHG emissions. Direct GHG emissions occur from sources that are owned or controlled by a company. For example emissions from combustion in owned or controlled boilers, furnaces or vehicles;
- **Scope 2** - Electricity indirect GHG emissions. This accounts for GHG emissions from the generation of purchased electricity consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organisational boundary of the company. Scope 2 emissions physically occur at the facility where electricity is generated but the emissions are allocated to the organisation that owns or controls the plant or equipment where the electricity is consumed; and
- **Scope 3** - Other Indirect GHG emissions. This is an optional reporting category that allows for the treatment of all other indirect GHG emissions resulting from a company's activities, which occur from sources not owned or controlled by the company. Examples include extraction and production of purchased materials; transportation of product by contractors; use of sold products and services; and employee business travel and commuting.

For the purposes of this proposed development a Scope 1 and Scope 2 calculation has been undertaken.

8.12.2.1 Calculation Approach

The GHG emission inventory for the development is based on the methodology detailed in the Greenhouse Gas Protocol (WBCSD & WRI) and the relevant emission factors in the National Greenhouse Accounts (NGA) Factors (DEE, 2016a).

There are several GHGs including carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). However, to simplify inventory accounting, a single unit of measurement, the carbon dioxide equivalent (CO2-e) is used. This unit of measure accounts for the various global warming potentials of non-CO2 gases as specified by DEE (2016a).

8.12.2.2 Emission Factors

The National Greenhouse Accounts Factors (DEE, 2016a) provides emission factors for a variety of activities. Scope 1 emissions factors associated with the proposed development are provided in **Table 43**, while Scope 2 emissions factors detailed in **Table 44.**

Table 43 Scope 1 Emission Factors: Consumption of Liquid Fuel for Transport (DEE, 2016a)

Category	Fuel Type	Energy Factor (GJ/KL)	EF (kg $CO_{2\text{-}e}$/GJ)		
			CO_2	CH_4	N_2O
General Transport	Diesel Oil	38.6	69.9	0.10	0.5
Post-2004 Vehicles	Diesel Oil	38.6	69.9	0.01	0.5
Heavy Vehicles – Euro iv	Diesel Oil	38.6	69.9	0.06	0.5
Heavy Vehicles – Euro iii	Diesel Oil	38.6	69.9	0.10	0.5
Heavy Vehicles – Euro i	Diesel Oil	38.6	69.9	0.20	0.5

Table 44 Scope 2 Emission Factors: Consumption of Electricity (DEE, 2016a)

Category	State	Units
Electricity Use	NSW	Kg $C0_{2\text{-}e}$/kwh

8.12.2.3 Materiality

Materiality is a concept used in accounting and auditing to minimise time spent verifying amounts and figures that do not impact a company's accounts or inventory in a material way. The exact materiality threshold that

is used in GHG emissions accounting and auditing is subjective and dependant on the context of the site and the details of the inventory.

All emissions that originate within the boundary are to be included in the inventory unless they are excluded on materiality grounds. Information is considered to be material if, by its inclusion or exclusion it can be seen to influence any decisions or outcomes. However, emissions are assumed to be immaterial if they are likely to account for less than 5% of the overall emissions profile.

The following emissions are not included in the inventory for this Project on the basis of materiality:

- The inventory does not consider emissions associated with the organic waste material intake streams. These are very small surface areas therefore the GHG emissions from such sources are considered to be immaterial; and
- Consumption of unleaded petroleum (ULP).

8.12.3 Impact Assessment

8.12.3.1 Greenhouse Gas Emission Sources

Table 45 below provides a summary of the relevant project specific information that has been applied to this greenhouse gas assessment. Specifically, an estimated 300,872 litres of diesel and 3,397 megawatt hours of electricity will be consumed on-site per annum. A breakdown of fuel and electricity use as a function of process/area is shown below.

Table 45 Total Diesel and Electricity Usage (per annum)

Process/Area	Diesel (litres)	Electricity (kwh)
Organics Receival and Processing	118,560	1,210,040
Food De-packaging	24,440	248,040
Bulk Landscape Supplies	36,400	0
Hydro-excavation and Drill Mud Processing	107,952	546,000
Workshop and Amenities	13,520	9,360
Office, Weighbridge, Security, Road Lighting	0	219,000
Site Total (per annum)	**300,872**	**3,397,240**

8.12.3.2 Greenhouse Gas Emissions

Scope 1 Emissions

Based on the use of the worst-case Scope 1 emission factors for the consumption of diesel fuel (refer **Table 43**) and an annual total of 300,872 litres of diesel fuel consumed on site, Scope 1 emissions are estimated to be 819.9 tonnes of CO2-e per annum. Refer to **Table 46** for a breakdown of the calculations for each process area.

Table 46 Scope 1 Emissions: Diesel Consumption

Process/Area	Diesel (litres)	CO_2	CH_4	N_2O	Total
		t CO_{2-e}	t CO_{2-e}	t CO_{2-e}	t CO_{2-e}
Organics Receival and Processing	118,560	319.9	0.9	2.3	**232.1**
Food De-packaging	24,440	65.9	0.2	0.5	**66.6**
Bulk Landscape Supplies	36,400	98.2	0.3	0.7	**99.2**
Hydro-excavation and Drill Mud Processing	107,952	291.3	0.8	2.1	**294.2**
Workshop and Amenities	13,520	36.5	0.1	0.3	**36.8**
Office, Weighbridge, Security, Road Lighting	0	0	0	0	**0**
Site Total (per annum)	**300,872**	**811.8**	**2.3**	**5.8**	**819.9**

Scope 2 Emissions

Based on Scope 2 emission factors for the consumption of electricity in NSW (refer **Table 44**), Scope 2 emissions are estimated at 2,853.7 tonnes of CO2-e per annum as shown below in **Table 47**.

It is estimated that 59% of electricity usage at the facility will be associated with the operation of the Organics Receival and Processing Building's eight carbon filter units that manage odour from the facility. For the purposes of this assessment, it has been assumed that all 8 units operate 24 hours a day, seven days per week.

Table 47 Scope 2 Emissions: Electrical Usage

Process/Area	Electricity Usage (kwh)	Scope 2 Emissions (t CO_{2-e})
Organics Receival and Processing	2,374,840	1,994.9
Food De-packaging	248,040	208.4
Bulk Landscape Supplies	0	0
Hydro-excavation and Drill Mud Processing	546,000	458.6
Workshop and Amenities	9,360	7.9
Office, Weighbridge, Security, Road Lighting	219,000	184
Site Total (per annum)	**3,397,240**	**2,853.7**

Total Greenhouse Gas Emissions

Based on total Scope 1 emissions per annum of 819.9 tonnes of CO2-e and total Scope 2 emissions of 2,853.7 tonnes of CO2-e, the total Scope 1 plus Scope 2 emissions of greenhouse gases per annum is estimated to be **3,673.6 tonnes of CO2-e.**

Comparison with National Total

Australia's annual total emissions for the year to June 2016 were estimated to be 536.5 megatonnes (Mt) of CO2-e (DEE, 2016c). A comparison of the project emissions with those of the waste sector suggests that the project will contribute an additional 0.031% to this sector and an additional 0.0007% to the annual national total (excluding land use, land use change and forestry).

8.12.4 Mitigation and Management

The following mitigation and management strategies will be considered to increase the energy efficiency of the proposed development and reduce GHG impacts:

- Use of building materials for walls, floors, roofs, that provide insulation and aid in reduced energy costs;
- Integration of energy efficient glazing and shading where possible;
- Fully enclosed buildings to maintain internal climate;
- Maximisation of natural ventilation and use of inverter air conditioning systems;
- Use of natural lighting;
- Potential use of photovoltaic cells and battery storage to generate power onsite;
- Use of light sensors to minimise lighting related electricity usage;
- Use of high efficiency lighting;
- Use of variable frequency drive motor controls on stationary equipment to minimise electricity consumption;
- Waste transfer vehicles to leave site with full loads to reduce the number of traffic movements and diesel consumption;
- All vehicles/plant and machinery will be turned off when not in use and regularly serviced to ensure efficient operation; and
- Truck routes and loading capacity will be designed and optimised to reduce the distance and effort required by the vehicles.

8.12.5 Conclusions

As the proposed development will not consume more than 10 GWh of electricity, the project will not be required to develop an Energy Savings Action Plan (DEUS, 2005). It is noted that approximately 59% of the electricity usage is associated with the operation of the Organics Receival and Processing Building and Food De-packaging Building's eight shared carbon filter units which manage odour from the facility. For the purposes of this assessment, it has been assumed that all 8 units operate 24 hours a day, seven days per week. Reducing electricity demand whilst maintaining environmental amenity at nearby receptor locations, may be achievable in practice, however this will need to be considered once the facility is operational.

8.13 Hazard and Risk

8.13.1 Introduction

A Preliminary Risk Screen (PRS) under State Environmental Planning Policy No. 33 Hazardous and Offensive Development (SEPP 33) has been undertaken for the development. The assessment has been prepared to satisfy the SEARs, which requested the following be considered:

- A preliminary risk screening completed in accordance with State Environmental Planning Policy No. 33 - Hazardous and Offensive Development and Applying SEPP 33 (DoP, 2011), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the development; and
- Should preliminary screening indicate that the Project is "potentially hazardous" a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No - Guidelines for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011).

A full summary of the SEARs requirements (including agency responses) are included within **Appendix 1.**

The preliminary screening assessment involves the identification of classes and quantities of all dangerous goods to be used, stored or produced on site with respect to storage depot locations as well as transported to and from the site, and to determine if a more detailed assessment is required.

Where SEPP 33 identifies a development as potentially hazardous and/or offensive, developments are required to undertake a Preliminary Hazard Analysis (PHA) to determine the level of risk to people, property and the environment at the proposed location and in the presence of controls.

If the risk levels exceed the criteria of acceptability and/or if the controls are assessed as inadequate, then the development is classified as 'hazardous industry'. Where it is unable to prevent offensive impacts on the surrounding land users, the development is classified as 'offensive industry'. Both of these classifications may not be permissible within most industrial zones in NSW.

8.13.2 Existing Environment

The development site is located within an industrial precinct at 24 Davis Road, Wetherill Park NSW, within land described as Lot 18 DP249417.

The site is surrounded by existing manufacturing, processing, and heavy industry businesses, with the nearest residential dwellings located approximately 1.5 kilometres to the south-east on Maugham Crescent, off The Horsely Drive (refer to **Figure 2**).

Details of neighbouring properties and businesses are shown in **Table 48.**

Table 48 Adjacent Properties and Use

Location	Distance from Development Site	Ownership	Use	Zoning
West	Adjoining	One Steel	Metal Recycling	IN1
East	Adjoining	Field Furnace Refractories Pty Ltd Adex Group Taylors Aluminium Reliable Powder Coating PRM Refrigeration Baken Extra B & J Bench Tops	Manufacturers Ventilation Design Fabrication Powder coating Engineers Bakery Supplies Manufacturer	IN1
North	Adjoining	Sydney Water	Buffer lands for Prospect Reservoir	Western Sydney Parklands
South-East	Across Davis Road	General Staircase	Manufacturing	IN1
South-west	Across Davis Road	Lizzie's Takeaway & Cafe	Takeaway Food	IN1

8.13.3 Methodology

The approach to the PRS is to identify the quantity of each dangerous goods class to be stored on site and to compare it to the storage screening threshold in Table 3 of Applying SEPP 33 (NSW Planning, 2011).

The number of generated traffic movements for significant quantities of dangerous goods to and from the site is also considered, with the number of traffic movements compared to the thresholds in Table 2 of the SEPP 33 guideline.

The dangerous goods to be stored on the site were grouped into their respective Australian Dangerous Goods (ADG) classes. If more than one packaging group was present in an ADG class it was assumed that the total amount for that class was the more hazardous packing group.

8.13.4 Potential Impacts

Bulk diesel (up to 5,000 litres or 4.25 tonnes) will be stored onsite in accordance with *AS 1940-2004: The Storage and Handling of Flammable and Combustible Liquids* in an appropriately bunded tank, and located adjacent to the workshop and maintenance buildings. Diesel is considered a Class 3 PGIII dangerous good.

The PRS has identified that one dangerous good will be stored onsite, however based on the amount being stored onsite, the thresholds under SEPP 33 are not triggered

Bettergrow has also confirmed that there will be no Dangerous Goods classified wastes received or handled at the proposed operations. Dangerous goods to be stored onsite are shown in **Table 49** below.

Table 49 Dangerous Goods Classes Stored Onsite

Substance	Hazardous Class	Packaging Group	Total to be Stored	Threshold Quantity	SEPP 33 Threshold
Diesel Fuel	3	PGIII	4.25 tonnes	5 tonnes	Under threshold

A proposed development may also be deemed potentially hazardous if the amount of traffic generated from dangerous goods entering and leaving a site is above the SEPP 33 threshold. The level of maximum proposed traffic movements from the transport of dangerous goods to the site are provided below in **Table 50.**

Table 50 Dangerous Goods Vehicle Movements

Substance	Hazardous Class	Packaging Group	Loads per Week/Year	Threshold	SEPP 33 Threshold
Diesel Fuel	3	PGIII	2/104	>60/>1000	Under threshold

Based on the screening tests provided in **Table 50,** the proposed development is not considered a potentially hazardous industry and therefore no further consideration of SEPP 33 is required.

8.13.5 Mitigation and Management

While the PRS for the proposed facility has determined that the development is not considered a hazardous or offensive development, the following controls will still be implemented:

- All mobile plant and equipment will be fitted with fire extinguishers;
- An Emergency Response Plan will be prepared and implemented for the facility;
- All staff on site will be appropriately trained in the handling of dangerous goods; and
- Flammable and combustible liquids with be stored in accordance with *AS 1940-2004: The Storage and Handling of Flammable and Combustible Liquids.*

8.13.6 Conclusions

The SEPP 33 screenings for storage and transportation of dangerous goods indicates that the development is not considered a hazardous or offensive development in accordance with the guidelines. As such a Preliminary Hazard Assessment is not required.

8.14 Socio-Economic

8.14.1 Introduction

This section provides an assessment of the social and economic impacts of the proposed development, including identification of the socio-economic characteristics of the surrounding area and the wider Fairfield LGA.

To identify potential socio-economic impacts and/or issues as a result of the proposed development, the assessment is supported by background research including information reviews and an analysis of demographic profiles.

8.14.2 Existing Environment

The proposed development is to be located within an industrial precinct at 24 Davis Road, Wetherill Park NSW. The Project Area is approximately 10 kilometres north of Liverpool, 10 kilometres west of Parramatta, and 7 kilometres south of Blacktown. The site is wholly within the Fairfield LGA.

The Project Area is surrounded by existing manufacturing, processing, and heavy industry businesses, with the nearest residential dwellings located approximately 1.5 kilometres to the south-east on Maugham Crescent, off The Horsely Drive, refer to **Figure 2** in **Section 1** of this EIS.

Fairfield LGA is located in Sydney's south-west and is bounded by Blacktown, Holroyd, Parramatta, Bankstown, Liverpool and Penrith LGA's. The LGA has a total area of 102 square kilometres. Fairfield LGA is mainly residential but contains six industrial and business parks which include largescale industrial estates at Wetherill Park and Smithfield, as well as local industrial centres. Major commercial centres are located at Fairfield, Cabramatta, Bonnyrigg and Wetherill Park.

According to the Australian Bureau of Statistics (ABS), at the 2011 Census there were 187,766 people in the Fairfield LGA, of these 49.3% were male and 50.7% were female. Aboriginal and Torres Strait Islander people made up 0.7% of the population. The median age of people in the LGA was 36 years. Children aged 0 – 14 years made up 20.4% of the population and people aged 65 years and over made up 12.0% of the population. Of people in the area aged 15 years and over, 49.6% were married and 11.6% were either divorced or separated.

The median weekly personal income for people aged 15 years and over in Fairfield LGA was $369 compared to the NSW median of $561 and the Australian median of $577. The lower than state and national median weekly income is one of the factors that place the LGA in an area of social disadvantage.

In 2011 there were 75,951 people who reported being in the labour force in the week before Census night. Of these 58.8% were employed full time, 24.9% were employed part-time and 9.7% were unemployed. It is noted that unemployment in Fairfield LGA is higher than the Greater Sydney average (9.7% compared to 5.7%). The most common occupations in Fairfield LGA included Technicians and Trades Workers 15.8%, Clerical and Administrative Workers 15.2%, Labourers 14.8%, Professionals 13.0%, and Machinery Operators and Drivers 12.5%.

Key economic characteristics of the Fairfield LGA are as follows:

- Gross Regional product in 2012 was estimated at $8.351 billion. Fairfield LGA represents 7.40 % of Greater Western Sydney's GRP of $112.819 billion, 1.55 % of New South Wales' Gross State Product of $538.513 billion and 0.50 % of Australia's GRP of $1.655 trillion;
- Gross Regional product per capita in 2012 was $44,476; and
- Manufacturing was the largest industry by employment in 2011, employing 10,184 people.

In the 2011 Census, there were 6,026 people in Wetherill Park (State Suburb) of these 49.9% were male and 50.1% were female. Aboriginal and Torres Strait Islander people made up 0.6% of the population. The median weekly personal income for people aged 15 years and over in Wetherill Park was $452.

8.14.3 Impact Assessment

8.14.3.1 Construction Impacts

The key potential social impacts that may result from construction of the proposed development include:

- Employment – there is the potential for employment to be generated during construction (temporary); and

- Amenity – construction of the proposed development has potential to result in impacts to local amenity unless appropriate design and mitigation measures are adopted. In particular, there is the potential for air quality (dust), noise, traffic and visual impacts during the construction phase.

There are no community facilities near the site such as schools, churches, child care centres, open space or recreational facilities. The nearest residential properties are located to the east and south of the site at a distance greater than 1.5 km thus providing an adequate separation distance between the properties and the site.

The proposed development will have a positive employment impact during construction and is likely to create at least 40 to 50 positions during this period.

The potential for negative amenity impacts during construction will be significantly reduced by the implementation of appropriate environmental management controls guided by a construction environmental management plan as detailed in this EIS.

8.14.3.2 Operation Impacts

The key potential social impacts that may result from operation of the proposed development include:

- Employment – there is the potential for employment to be generated and operation (long term positions); and
- Amenity – operation of the proposed development has potential to result in impacts to local amenity unless appropriate design and mitigation measures are adopted. In particular, there is the potential for air quality (dust, odour), noise, traffic and visual impact.

The proposed development will have a positive employment impact during operation. Approximately 25 permanent positions are expected to be generated during operation providing jobs for the local community. The estimated capital cost including site development, building upgrades, infrastructure, air scrubbers plus associated plant and equipment is estimated to be $16 million. Associated supply businesses will also benefit from the operation of the site. When considering the estimated turnover for the proposed development, Bettergrow believes that this benefit could be in the order of $20 Million. Collectively the capital expenditure and associated economic spin offs will contribute to and strengthen the local and regional economy.

The proposed development is strategically located within a major industrial area away from residential areas. The potential for negative amenity impacts will be significantly reduced by the implementation of appropriate design features and environmental management controls guided by the operational environmental management plan.

The proposed development will increase the processing capacity for organic and commercial waste into recycled materials, thereby reducing the amount of waste going to landfill, and increasing availability of recycled products. Utilisation of recycled materials contributes to the conservation of natural resources and biodiversity, and is consistent with the principles of ESD.

Hence the proposed development will further assist the NSW government to achieve its goals to increase the diversion of waste from landfill disposal through the development of strategic recycling infrastructure and processing facilities, thus having a positive impact waste minimisation and resource recovery in the region.

In addition to these social and economic benefits, the facility will service the increasing demand for waste recycling infrastructure in the Sydney region.

8.14.4 Mitigation and Management

Implementation of measures to reduce the potential for amenity impacts during construction and operation, as identified in the relevant chapters of the EIS and Statement of Commitments in **Section 9**. No further mitigation measures are proposed with regard to socio-economic issues as it is considered that the proposed development will be of net benefit to the community, providing for decreased cost and increased social

efficiency associated with waste management and resource recovery within Fairfield LGA and the surrounding area in accordance with legislative requirements. Ongoing engagement will occur with the local community and other key stakeholders during construction and operation.

8.14.5 Conclusions

The construction and operation of the proposed development will be of net benefit to the community. The potential for negative amenity impacts during construction will be significantly reduced by the implementation of appropriate environmental management controls guided by a construction environmental management plan. Emphasis within the design of the proposed development has been applied to the management of potential noise and odour impacts to ensure compliance with relevant assessment criteria.

8.15 Waste Management

8.15.1 Introduction

This Waste Management Strategy (WMS) has been prepared to assess the potential waste streams generated from the Project, likely volumes of waste produced during construction and operations, and propose management measures to reduced wastes. A Waste Management Plan (WMP) has also been prepared as part of this Waste Management Strategy which is provided in **Appendix 20.**

The SEARs require the EIS to address the following aspects of waste management at the proposed facility:

- Identify and classify waste streams that would be transported to and from, stored, handled, processed and disposed of at the facility;
- Describe the proposed waste transport, storage, handling, processing, and disposal; and
- Describe the potential impacts and impact mitigation associated with transporting, storing, handling, processing and disposing of waste.

Waste transport, storage, handling, processing and disposal are addressed separately in **Section 3.4.**

A full summary of the SEARs requirements (including agency responses) are included within **Appendix 1**.

8.15.2 Methodology

8.15.2.1 Guidelines and Policies

The WMS has been prepared to satisfy the principles of the waste hierarchy as detailed in the *Waste Avoidance and Resource Recovery Act 2001*. The WMS focuses on the waste generated by the proposed development during the construction and operational phases. The waste recycling and recovery aspects of the proposed facility are discussed separately in **Section 3.4** of this EIS.

The following guidelines and policy documents were utilised in the development of the WMS to ensure consistency with the EPA's waste avoidance and resource recovery aims and objectives:

- EPA's Waste Avoidance and Resource Recovery (WARR) Strategy 2014-21;
- EPA's Waste Classification Guidelines (2014); and
- EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities (2012).

The specific aims and objectives of the WMS are to:

- Encourage the minimisation of waste production;
- Ensure maximisation of resource recovery;
- Minimise the amount of waste being disposed to landfill; and

- Reduce the amount of waste generated per capita.

The likely types and quantities of waste were identified for both the construction and operational phases of the Project, followed by measures to increase the recycling and re-use of materials, mitigation strategies, and roles and responsibilities for the workforce.

8.15.2.2 Waste Hierarchy

Waste management for construction and operations will be undertaken consistent with the waste management hierarchy in the following order of priority from most desirable to least desirable:

- Avoid: Waste avoidance by reducing the quantity of waste being generated. This is the simplest and most cost-effective way to minimise waste. It is the most preferred option in the waste management hierarchy.
- Re-use: Reuse occurs when a product is used again for the same or similar use with no reprocessing. Reusing a product more than once in its original form reduces the waste generated and the energy consumed, which would have been required to recycle.
- Recycle: Recycling involves processing waste into a similar non-waste product consuming less energy than production from raw materials. Recycling spares the environment from further degradation, saves landfill space and saves resources.
- Dispose: Removing waste from worksites and dumping on a licensed landfill site, or other appropriately licensed facility.

The Operator will be responsible for handling, segregating and temporarily storing wastes on the site. Designated waste storage area(s) will be established and maintained to ensure wastes are appropriated managed.

8.15.2.3 Waste Streams

Any wastes generated during project construction and operations will be classified in accordance with the NSW EPA Waste Classification Guidelines (2014), which classifies wastes into the following streams:

- Special waste (e.g. clinical and related waste, asbestos, waste tyres);
- Liquid waste (e.g. fuels, oils, chemicals and pesticides);
- Hazardous waste (e.g. lead-acid batteries and lead paint);
- Restricted solid waste (currently no wastes pre-classified as restricted by EPA);
- General solid waste (putrescible) (e.g. general litter and food waste); and
- General solid waste (non-putrescible) (e.g. glass, paper, plastic, building demolition waste, concrete).

8.15.2.4 Waste Classification

Waste that cannot be avoided, re-used or recycled will be classified in accordance with the *Waste Classification Guidelines* (EPA, 2014) and disposed of at appropriately licensed facilities. The guidelines detail how to assess and classify waste and management options for disposal of the classified waste. A summary of the waste classification steps are included below:

- Establish if the waste should be classified as special waste;
- If not special waste, establish whether the waste should be classified as liquid waste;
- If not special waste or liquid waste, establish whether the waste is of a type that has already been classified. Note EPA has ‘pre-classified’ a number of commonly generated wastes;
- If the waste is not special waste, liquid waste or pre-classified waste, establish if it has certain hazardous characteristics and can therefore be classified as hazardous waste;

- If the waste does not possess hazardous characteristics, it needs to be chemically assessed to determine what class of waste it is. If the waste is not chemically assessed, it should be treated as hazardous waste; and
- If the waste is chemically assessed as general solid waste, a further test is available to determine whether the waste is putrescible or non-putrescible. This test determines whether the waste is capable of significant biological transformation. If the waste is not tested, it should be managed as general solid waste (putrescibles).

8.15.3 Waste Sources

8.15.3.1 Construction

Major construction on the site will be limited to the two organics buildings on the upper level and drill mud plant and equipment on the lower level. All other buildings existing at the site will be utilised, hence there will be minimal demolition wastes to manage. Accordingly, construction activities are likely to generate the following types of waste:

- Minimal demolition wastes;
- Excavation material from new building footings;
- General construction wastes (including metals and timber);
- Machinery maintenance waste (including lubricants, greases, filters, and oily rags);
- Packaging waste (including shrink wrap and cardboard);
- Temporary ablutions waste;
- Waste water (pump out from existing sumps/drainage pits); and
- Asphalt and concrete removed from hardstand areas where re-surfacing is required.

Much of this waste can be reused on site or recycled at off-site facilities. As a result it is expected that more than 70% of the predicted construction waste arising from the proposed development can be diverted from landfill. The estimated amount of materials to be generated during site construction works is provided below in **Table 51.**

Table 51 Estimated Waste Volumes and Materials During Construction

Material	Waste Volume (m^3)	Conversion (uncompacted) (kg/m^3)	Amount (kg)	Percentage (%)
Concrete and Asphalt	500	700	350,000	84.71
Bricks/Tiles	20	828	16,560	4.01
Timber	30	156	4,680	1.13
Plasterboard	10	227	2,270	0.55
Metals	10	130	1,300	0.32
Plastic	25	72	1,800	0.44
Cardboard	40	55	2,200	0.53
General Waste	100	343	34,300	8.31
Total	**735**		**413,110**	**100**

Waste generated during construction would be separated with the use of dedicated skips for timber, plasterboard, concrete, bricks, steel and general waste. Dedicated stockpiles would be delineated on site and regular transfers to skip bins undertaken for sorting. Stockpiles would be sited to take into account slope and drainage factors to avoid erosion and contamination. The frequency of waste removal would depend on

volumes of material being generated. Skips would be checked every day and, if at or reaching capacity, removal would be organised within 24 hours.

8.15.3.2 Operations

The general operation of the facility would generate the following broad waste streams:

- Office wastes;
- Packaging wastes (ie cardboard, paper, plastic / shrink wrap, pallets);
- Amenity wastes; and
- Maintenance wastes.

Based on estimated commercial waste generation rates published in the EPA's Better Practice Guidelines for Waste and Recycling Management in Commercial and Industrial Facilities (2012), the amount of waste expected to be generated from the facility is detailed in **Table 52**.

Table 52 Estimated Waste Volumes and Materials During Operations

Material	Waste Volume (m^3)	Conversion (uncompacted) (kg/m^3)	Amount (kg)	Percentage (%)
Timber	10	156	1,560	0.05
Plastic	1,000	72	72,000	1.77
Cardboard	3,000	55	165,000	4.06
General Waste	8,000	343	2,744,000	67.51
Glass	2,000	411	822,000	20.22
Metal	2,000	130	260,000	6.39
Total	**16,010**		**4,064,560**	**100**

8.15.4 Mitigation and Management

The following mitigation and management measures will be applied during construction and operation of the facility:

- Plant and equipment will be regularly maintained;
- Ordering will be limited to only the required amount of materials;
- Materials will be segregated to maximise reuse and recycling;
- Routine checks would be undertaken of waste sorting and storage areas for cleanliness, hygiene and OH&S issues, and contaminated waste materials;
- Local commercial reuse opportunities will be investigated where reuse on-site is not practical;
- Separate skips and recycling bins will be provided for effective waste segregation and recycling purposes;
- Training and awareness of the requirements of the WMP and specific waste management strategies will be undertaken;
- Contaminated waste will be managed, transported, and disposed of in accordance with licensing requirements;
- Off-site waste disposal will be transported and disposed of in accordance with licensing requirements;
- Assessment of suspicious potentially contaminated materials, hazardous materials and liquid wastes will be undertaken; and

- Regular monitoring, inspection and reporting requirements will be undertaken and findings implemented.

Further to the above mitigation measures, a WMP has been prepared for the development which is attached in **Appendix 20**. The WMP will be implemented throughout the life of the operation and will be updated on a regular basis (e.g. annually) to ensure the document remains relevant and applicable.

8.15.5 Conclusions

Waste generated from the construction and operation of the proposed facility will be managed efficiently to ensure that the diversion of waste from landfill is maximised. The WMP attached as **Appendix 20** will be implemented to ensure that waste on site is suitably managed, and will be updated when there is an operational or process change.

8.16 Cumulative Impacts

The cumulative assessment considers the potential for the impacts from the development to combine with impacts from potential future developments in the vicinity of the site. This may lead to new or more significant impacts being identified compared to the development specific assessment, and where appropriate, additional mitigation measures recommended.

Potential future developments have been identified as:

- **Suez Resource Recovery Facility Expansion (SSD 7267)** – 20 Davis Road Wetherill Park. Suez are seeking to increase the approved capacity of their Wetherill Park Resource Recovery Facility from the existing 10,000 tpa of general solid waste (putrescible) to 140,000 tpa of general solid waste (putrescible). This would increase the total waste accepted at the site from 100,000 tpa to 230,000 tpa. The project is currently in the assessment phase with DP&E.
- **Resourceco Waste and Resource Management Facility (SSD 7256)** – 35 Frank Street Wetherill Park. Resourceco are proposing to develop a waste facility to receive and process 250,000 tpa of Commercial and Demolition (C&D) waste, Commercial and Industrial (C&I) waste, and pre-processed Municipal Solid Waste (MSW) for conversion into Processed Engineering Fuel (PEF). The project is currently in the assessment phase with DP&E with a request for further information pending.

The cumulative impacts of the development have been considered in relation to each of the issues identified in **Section 8.** Cumulative impacts of the development with other projects in the vicinity of the site have been considered in technical studies undertaken as part of the EIS, particularly in relation to odour, traffic and noise.

The mitigation measures proposed in each of the specialist assessments in **Section 8** have been designed to ameliorate potential impacts associated with the development in its own right as well as minimising overall cumulative impacts of the development when considered alongside other future developments.

Potential cumulative impacts of the development with the future developments identified above have been considered and are summarised in **Table 53**.

Table 53 Summary of Potential Cumulative Impacts

Issue	Potential Cumulative Impacts	Where Addressed in the EIS
Odour	The key potential odour emission sources are from the intake, handling and processing of organic wastes at the site. Results of the odour assessment for the facility suggest that the proposed mitigation measures and management strategies proposed for the operation of the facility will be sufficient to meet the regulatory criterion for odour at the boundary of 2 odour units. The management of air quality within the organics processing areas will be key to ensuring that potential fugitive emissions released during vehicle	**8.1.5**

Issue	Potential Cumulative Impacts	Where Addressed in the EIS
	movements into/out of the process buildings does not cause odour nuisance off-site. As modelled odour emissions are compliant at the boundary, it is considered that cumulative impacts will not be an issue with the proposed mitigation measures are adopted.	
Dust	Due to the types of wastes and resources intended to be received at the proposed facility, it is unlikely that environmental amenity will be impacted by dust (fine of particulate materials). As such a quantitative assessment against the assessment criteria contained within the *DECC Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* was not undertaken. Further, the activities are not anticipated to affect the background concentrations of total suspended particulate by any measurable degree due to the practices and process that will be adopted at the facility. Due to the low potential for the proposed waste facility to generate dust beyond the site boundary, the high moisture content of the wastes being handled, and the level of mitigation measures to be employed across the site, the development will most likely have negligible dust impacts on the surrounding areas. Based on the above, cumulative impacts from the facility would be negligible.	**8.3.4**
Noise and Vibration	The noise assessment includes an assessment against the amenity criteria as set out in the Industrial Noise Policy. The amenity assessment is based on noise criteria specific to the land use and associated activities. If existing noise levels from industry approach the criterion value, then noise levels from new industries need to be designed so that the cumulative effect does not produce noise levels that would significantly exceed the criterion. The assessment concluded that the development would not be expected to result in any material increase in cumulative industrial noise levels experienced by existing residents. Future development in the local area would be subject to the same assessment process as discussed within the noise assessment, thereby limiting the potential for industrial noise over time.	**8.2.6**
Traffic and Transport	The proposed development is located within a fully occupied industrial area which would most likely be operating at peak traffic flows. A cumulative assessment has been undertaken to assess the traffic impact on the local road network from the proposed development. Applying the cumulative traffic generation from the development to the performance of the two intersections concludes that there is no change to the Level of Service (LoS) at the two intersections, with LoS expected to remain well within acceptable limits. Accordingly, no road network upgrades are required to support future development with the industrial precinct, based on the outcomes of the Traffic Impact Assessment.	**8.4.5**
Visual Amenity	Cumulative visual impacts would be limited given the industrial nature of the immediate surrounding area, the distance to residential areas, and the existence of relevant planning controls.	**8.5.5**
Cultural Heritage	The assessment of indigenous heritage concluded that the development is not anticipated to have any impact on any items of indigenous heritage due to the disturbed nature of the site, the lack of any listed sites on the relevant heritage databases, and the results of the site inspection. Further consideration of cumulative impacts is not considered warranted.	**8.10.5**
Historic Heritage	The review of historic heritage concluded that the proposed development is not anticipated to have any impact on any items of historic heritage due to the disturbed nature of the site and the lack of any listed sites on the	**8.11.5**

Issue	Potential Cumulative Impacts	Where Addressed in the EIS
	relevant heritage databases. Further consideration of cumulative impacts is not considered warranted.	
Soils and Contamination	The assessment concluded that the potential for soil contamination and interaction with groundwater was low given the previous number of environmental assessments undertaken at the site. Given the overall low risk of impacts associated with ground conditions, and the ability to manage these through appropriate controls, further consideration of cumulative impacts is not warranted.	**8.8.5**
Surface Water	The waste facility is not anticipated to impact negatively on the surrounding surface water environment, flow regimes, quality, quantity, features, or local or regional hydrology. The proposal has considered suitable containment and treatment practices through the identification of potential pollution risks and has been designed to maximise onsite reuse. The implementation of rainwater harvesting measures at the proposed facility is predicted to reduce the amount of potable water usage by 65%-90% within the individual systems. Generated pollutant loads conveyed in stormwater runoff are to be mitigated via the proposed treatment train consisting of rainwater harvesting tanks, a sediment trap, and a proprietary hydrodynamic separator. Adoption of regular monitoring and maintenance practices will ensure the proposed devices within the stormwater management system function as designed. Wastewater leachate generated from received organics will be managed within a closed system, either applied to outgoing product or trucked from site for re-use or disposal at licenced facilities. A qualitative flood impact assessment has been undertaken which indicates that structures located within the PMF extent are expected to have a negligible impact on the flood behaviour. In terms of cumulative impacts, any future development in the Wetherill Park area with the potential to impact on the Prospect Creek catchment should implement similar surface water controls during construction and operation.	**8.6.5**
Groundwater	Overall, it is considered that the proposed waste facility poses a low risk of significantly impacting groundwater supply or quality. Groundwater in the Bringelly Shale is considered to be unsuitable for beneficial use in the area of the site. Groundwater in the Hawkesbury Sandstone is at a significant depth below the site, and surrounding registered bores do not show any current beneficial use in the area of the site. As there are no high priority GDE's within or near the site, the proposed development is not considered to present a potential risk to GDE's. The proposed development is not considered to present a potential risk to bores or natural drainage features. In terms of cumulative impacts, any future development in the Wetherill Park area with the potential to impact on groundwater resources will be required to undertake a ground water study. As the surrounding developments are generally industrial, any proposed industrial development should implement similar groundwater controls during construction and operation phases.	**8.7.5**
Flora and Fauna	The subject site is a highly modified area of land with small elements of the natural environment and original native vegetation remaining. While there is a patch of native vegetation mapped at the front of the site that conforms to the description of Cumberland Plain Woodland, a critically endangered ecological community, this vegetation will be fully avoided by the development. Accordingly, no impact is to occur to threatened species,	**8.9.5**

Issue	Potential Cumulative Impacts	Where Addressed in the EIS
	populations or communities as a result of the development. Development will be undertaken in an environmentally responsible manner, with appropriate mitigation measures applied to protect the surrounding environment.	
Greenhouse Gas	Australia's annual total emissions for the year to June 2016 were estimated to be 536.5 megatonnes of CO2-e (DEE, 2016c). A comparison of the project emissions with those of the waste sector suggests that the project will contribute an additional 0.031% to this sector and an additional 0.0007% to the annual national total (excluding land use, land use change and forestry). A number of energy efficiency measures will be implemented, and will be in accordance with the requirements of the National Code of Construction.	**8.12.4**
Hazard and Risk	The SEPP 33 screenings for storage and transportation of dangerous goods indicates that the development is below the SEPP thresholds and therefore is not considered a hazardous or offensive development in accordance with the guidelines.	**8.13.5**
Socio-economic	The socio-economic assessment considers the potential economic benefits of the development balanced with the potential amenity impacts on local residents. The amenity impacts, mainly related to air quality, noise, traffic and visual impacts have been described earlier. The proposed development will have a positive employment impact during operation. Approximately 25 permanent positions are expected to be generated during operation providing jobs for the local community. The estimated capital cost including site development, building upgrades, and infrastructure air scrubber plant and equipment is estimated to be $16 million. Associated supply businesses will also benefit from the operation of the site. When considering the estimated turnover for the proposed development, Bettergrow believes that this benefit could be in the order of $20 Million. Collectively the capital expenditure and associated economic spin offs will contribute to and strengthen the local and regional economy.	**8.14.4**
Waste Management	A WMP has been prepared for the proposed development and will be updated and implemented as required. Waste from construction and operation of the proposed development will be managed with the objective of maximising the diversion of waste from landfill, by reusing materials on site and transporting to off-site recycling facilities where possible. The facility, once operational, will provide critical waste management infrastructure which will be able to service existing and future waste management needs of businesses and Councils in western Sydney. It provides an improvement in waste management practices for the locality by reducing the distances required to transport waste and increasing the recycling potential.	**8.15.4**

9.0 Statement of Commitments

9.1 Introduction

This section summarises the mitigation measures to be implemented at the proposed development to reduce impacts to the surrounding environment.

9.2 Statement of Commitments

The mitigation measures, monitoring activities, and management strategies outlined in **Section 8** above will be implemented for all activities associated with the proposed facility. **Table 54** below details the key commitments proposed in this EIS to effectively mitigate and manage the potential environmental impacts of the development.

Table 54 Draft Statement of Commitments

Summary of Commitments	Where Addressed in the EIS
General	
A site-specific Environmental Management Plan (EMP) has been developed for the waste facility. The EMP ensures that the commitments made within the EIS are fully implemented and complied with. The EMP will establish the framework for managing and mitigating the potential environmental impacts of the development over the life of the operation. Areas of particular focus within the EMP are the management of noise, dust, odour, traffic, and surface Water. The EMP is attached as **Appendix 21.**	**3.15**
Odour	
The potential for odour-related impacts to off-site receptors will be managed through the adoption of the following odour reduction measures: ■ All incoming consignments will be unloaded within the food and garden organics building or the food de-packaging building; ■ No GO, FOGO or C&I organics will be stored outside the food and garden organics building or the food de-packaging building; ■ Any movement of processed C&I organics to the food and garden organics building for consolidation will be contained or covered so that fugitive emissions are not released during the transfer; ■ When receiving incoming GO, FOGO, or C&I organics, air extraction in the processing buildings will be in operation to direct odours to the designated high grade activated carbon filters; ■ When the doors of the processing buildings are opened misting sprays positioned above each door opening will be operated to suppress any fugitive volatile odour emissions; ■ All plant and equipment utilised for the processing of organic material will be regularly cleaned down to ensure they do not become a point source of pollution; ■ Proprietary inoculums will be utilised to deodorise equipment and process areas within the organics buildings; ■ Activated carbon filter media for 2 odour treatment units will be stored on site so as to allow for the immediate change of filters if required; ■ Spent filter media will be incorporated into the consignment of FOGO that is to be removed from the facility; ■ All stormwater improvement devices must be regularly maintained and serviced such that anaerobic conditions do not occur; and ■ All general waste generated at the facility must be contained in an appropriate waste receptacle and be removed from the site regularly.	**8.1.5**
Dust	
Whilst the proposed activities at the site have a low potential to generate particulate or fine dust, the following mitigation and management strategies will be applied to the construction and operational	**8.3.4**

Summary of Commitments	Where Addressed in the EIS
activities: ■ All incoming and outgoing loads of bulk landscaping materials will be effectively tarped such that dust or particulate is not released; ■ Onsite speed limit will be under 20km/hr to ensure minimal dust generation from vehicle movements; ■ Driveways and haulage paths will be regularly swept so that dust and or particulate is not re-entrained during windy periods; ■ Bulk landscaping supplies will be wetted so as to minimise the release of dust at the time of unloading or loading; ■ Material stockpiles will have moisture content maintained through the use sprinklers and sprays; ■ Dust on site will be visually monitored. Should there be adverse weather conditions and the potential for dust to leave site those activities will be reduced or ceased until dust levels return to acceptable levels; ■ Fogger units will be utilised within enclosed sheds to further reduce air quality impacts from the operations; and ■ Recycled water will be utilised across the operations to maintain hard surfaces and areas that have the potential to produce dust.	
Noise and Vibration	
As there would be no construction and operational noise impacts as a result of the development, no specific noise mitigation measures or monitoring is required. This reflects the location of the development within an industrial precinct and the enclosed nature of the facility including concrete push walls and rapid acting roller shutter doors which assist in containing noise within the process buildings.	**8.2.6**
Traffic and Transport	
As there would be no impact on the performance of the local road network, road upgrades are not required. While the traffic assessment concludes that the additional traffic generated by the facility will not adversely impact on road capacity. Bettergrow will, where possible, schedule its heavy vehicle movements to avoid the busy morning and afternoon peak hours. The performance capacity of the local road network and intersections is being further enhanced with a number of road upgrades in the vicinity of the proposed development.	**8.4.5**
Visual Amenity	
The following mitigation and management measures will be applied to the proposed development to reduce visual impacts, including: ■ The built form of the proposed buildings are of a similar scale to the surrounding industrial and commercial buildings; ■ Building materials selected will reduce colour contrast and blend any new and existing structures, as far as possible, into the surrounding landscape; ■ The existing buildings are being reused, which will reduce the visual impact during the construction phase; ■ The existing vegetation buffer along the southern boundary will be retained and supplementary planting incorporated where possible; ■ The retention of existing trees within the site to assist in fragmenting views of the proposed development; and ■ The use of native flora species, consistent with vegetation already on the site, which will create habitat for fauna.	**8.5.5**
Cultural Heritage	
Should any Aboriginal artefact be uncovered during construction or operation all works will cease in that locale and the OEH will be notified. Works will only recommence when an appropriate and approved management strategy has been agreed to by all of the relevant stakeholders.	**8.10.5**
Historical Heritage	

Summary of Commitments	Where Addressed in the EIS
If during the course of development works suspected historic heritage material is uncovered, work should cease in that area immediately. OEH will be notified and works only recommence when an approved management strategy has been developed.	**8.11.5**
Soils and Contamination	
The following mitigation measures will be implemented at the site to ensure that any contamination is suitably managed: ■ Any water seepage encountered during construction activities will be appropriately managed; ■ Erosion and sediment controls will be installed prior to the commencement of construction activities; ■ Groundwater monitoring will be undertaken at the site and continue for the life of the development; and ■ Should unexpected contamination be encountered, a suitably qualified environmental consultant will be engaged to assess the conditions in accordance with the site Unexpected Finds Protocol and implement remediation activities as required.	**8.8.5**
Surface Water	
The following mitigation and management items have been developed to ensure that the risk of sediment, nutrients, and leachate leaving the site is minimised. These include: ■ Pipes, pits and bunds to be regularly checked for the build-up of excessive sediment; ■ Site structures to be regularly checked for erosion and scouring; ■ Treatment areas and structures to be regularly checked for the build-up of litter material; ■ Inflow areas and pit grates are to be clear of litter and debris; ■ The sediment chamber of the Humeceptor is to be regularly checked and cleaned and any damaged covers replaced; ■ Ensure downpipe leaf eaters, first flush devices and litter screens are unblocked and are operating correctly; ■ Rainwater tanks to be regularly checked for any accumulation of litter, sediment or debris on or within the tanks; ■ Spill kits will be utilised at all process areas; and ■ Staff will be appropriately trained on spill containment and management.	**8.6.5**
Groundwater	
As with any activity of this type, the appropriate management of the site in accordance with the *Protection of the Environmental Operations Act 1997* is required. This will further mitigate the already low risk posed by the development on groundwater at the site. The following mitigation and management strategies will apply to manage impacts to groundwater: ■ Areas where liquid wastes or dangerous goods are to be handled will have appropriate containment measures to prevent leachate and contaminants from entering the ground (ie. proposed tip pit in the food de-packaging and process building); ■ The proposed tipping pit will be suitably tanked or lined; ■ If the pit is to be redesigned to reduce the potential for interference with groundwater, it is recommended that the excavation level (i.e. to the base of the sub-grade) be no lower than 44.5m AHD, i.e. at least 0.5m above the highest recorded groundwater level; ■ The tip pit will include an appropriate pressure relief system / valve installed to prevent high hydrostatic pressures developing below the base of the pit during any high groundwater events; ■ Should groundwater be encountered during the construction of foundations, standard construction and water management / disposal methods are to be employed; ■ Monitoring wells 101, 102, 103, and 104 are to be monitored at 6 monthly intervals over a period of two years to provide a reliable background dataset for the proposed development; ■ If a potentially contaminating substance is to be stored or used on the site, further groundwater monitoring will be undertaken if necessary, to provide data on the background concentrations (if any) of the substance in the groundwater; ■ In the event of a leakage or spillage of leachate or other potentially contaminating liquid,	**8.7.5**

Summary of Commitments	Where Addressed in the EIS
assessment of the impacts should be undertaken to determine the need for any clean up works. This may include soil and / or groundwater testing. In this event groundwater results should be assessed with respect to both the background data and relevant guideline thresholds; ■ Spill kits will be utilised at all process areas; and ■ Staff will be appropriately trained on spill containment and management.	
Flora and Fauna	
In addition to the impact avoidance approach adopted for the development, which has resulted in no direct impacts on Cumberland Plain Woodland CEEC and associated threatened species habitat, the following mitigation measures are to be implemented: ■ Perform, prior to construction, a weed management program to reduce weed cover within the patch of Cumberland Plain Woodland CEEC; ■ Supplement ground cover native plant species within the patch using a single application of native grass and herb seed mix. The seed mix is to contain no less than 10 species and must comprise at least 20% Kangaroo Grass (*Themeda triandra*); ■ Installation of perimeter sediment and erosion control fencing to prevent ingress of sediment laden water and weed propagules into the area of native vegetation; ■ Exclude all machinery and human activity from the patch of Cumberland Plain Woodland CEEC; and ■ Install a barrier suitable for operation in the post construction stage to separate site operations from the biodiversity values present within the patch.	**8.9.5**
Greenhouse Gas	
The following mitigation and management strategies will be considered to increase the energy efficiency of the proposed development and reduce GHG impacts: ■ Use of building materials for walls, floors, roofs, that provide insulation and aid in reduced energy costs; ■ Integration of energy efficient glazing and shading where possible; ■ Fully enclosed buildings to maintain internal climate; ■ Maximisation of natural ventilation and use of inverter air conditioning systems; ■ Use of natural lighting; ■ Potential future use of photovoltaic cells and battery storage to generate power onsite; ■ Use of light sensors to minimise lighting related electricity usage; ■ Use of high efficiency lighting; ■ Use of variable frequency drive motor controls on stationary equipment to minimise electricity consumption; ■ Waste transfer vehicles to leave site with full loads to reduce the number of traffic movements and diesel consumption; ■ All vehicles/plant and machinery will be turned off when not in use and regularly serviced to ensure efficient operation; and ■ Truck routes and loading capacity will be designed and optimised to reduce the distance and effort required by the vehicles.	**8.12.4**
Hazard and Risk	
While the PRS for the proposed facility has determined that the development is not considered a hazardous or offensive development, the following controls will still be implemented: ■ All mobile plant and equipment will be fitted with fire extinguishers; ■ An Emergency Response Plan will be prepared and implemented for the facility; ■ All staff on site will be appropriately trained in the handling of dangerous goods; and ■ Flammable and combustible liquids with be stored in accordance with *AS 1940-2004: The Storage and Handling of Flammable and Combustible Liquids.*	**8.13.5**
Socio-economic	

Summary of Commitments	Where Addressed in the EIS
No further mitigation measures are proposed with regard to socio-economic issues as it is considered that the proposed development will be of net benefit to the community, providing for decreased cost and increased social efficiency associated with waste management and resource recovery within Fairfield LGA and the surrounding area in accordance with legislative requirements. Ongoing engagement will occur with the local community and other key stakeholders during construction and operation.	**8.14.4**
Waste Management	
The following mitigation and management measures will be applied during construction and operation of the facility: ■ Plant and equipment will be regularly maintained; ■ Ordering will be limited to only the required amount of materials; ■ Materials will be segregated to maximise reuse and recycling; ■ Routine checks would be undertaken of waste sorting and storage areas for cleanliness, hygiene and OH&S issues, and contaminated waste materials; ■ Local commercial reuse opportunities will be investigated where reuse on-site is not practical; ■ Separate skips and recycling bins will be provided for effective waste segregation and recycling purposes; ■ Training and awareness of the requirements of the WMP and specific waste management strategies will be undertaken; ■ Contaminated waste will be managed, transported, and disposed of in accordance with licensing requirements; ■ Off-site waste disposal woill be transported and disposed of in accordance with licensing requirements; ■ Assessment of suspicious potentially contaminated materials, hazardous materials and liquid wastes will be undertaken; and ■ Regular monitoring, inspection and reporting requirements will be undertaken and findings implemented.	**8.15.4**

10.0 Justification and Conclusions

10.1 Ecologically Sustainable Development

Ecologically Sustainable Development (ESD) is a primary objective of environmental protection in NSW. The objectives of the EP&A Act include the encouragement of the principles of ESD. Supplementary to the EP&A Act objectives, section 7 (1(f)) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 requires a proponent to include in an EIS the reasons justifying the development, including the principles of ESD. Section 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 defines the principles of ESD as follows:

(a) *The **precautionary principle,** namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:*

(i) Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

(ii) An assessment of the risk-weighted consequences of various options.

(b) ***Inter-generational equity**, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*

(c) ***Conservation of biological diversity and ecological integrity,** namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration.*

(d) ***Improved valuation, pricing and incentive mechanisms,** namely, that environmental factors should be included in the valuation of assets and services, such as:*

(i) Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

10.1.1 Precautionary Principle

The Precautionary Principle states that if there are threats of serious or irreversible environmental damage, the lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The Development has been assessed for impacts relating to air quality and odour, noise, traffic and transport, visual amenity, water resources, flora and fauna, Aboriginal heritage, and non-indigenous heritage. This EIS, combined with the consultation undertaken with relevant government agencies, and local stakeholders, has provided an understanding of the potential implications of the development and subsequently confirm the mitigation measures required.

Through the adoption of an anticipatory approach, each potential issue arising from the Project has been identified, evaluated and mitigated through a series of design or management solutions.

10.1.2 Intergenerational Equity

Intergenerational Equity is centred on the concept that the present generation should ensure the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations. There is a moral obligation to ensure that today's economic progress, which would benefit current and future generations, is not offset by environmental deterioration.

Throughout the assessment, the type and extent of potential impacts caused by the Project have been analysed and mitigated. The assessment methodologies have adopted a risk-based and worst case scenario approach to ensure improved environmental, social and economic protection for current and future generations. The environmental management and mitigation measures have been developed to minimise the impact of the Project on the environment for future generations.

The management and mitigation measures proposed in Section 8 above would assist in ensuring that the development does not pose any significant impact or risk to the surrounding environment and safeguards the environment for future generations.

10.1.3 Conservation of Biological Diversity and Ecological Integrity

The principle of Conservation of Biological Diversity and Ecological Integrity holds that the conservation of biological diversity and ecological integrity should be a fundamental consideration for development proposals.

The Project site is located on filled land within a heavy industrial estate and has very limited biodiversity value. An ecological assessment has been undertaken by a qualified specialist to identify the extent of biological diversity on site and the surrounding area. It was determined that the development does not pose any significant threat to local biological diversity or ecological integrity. More over the proponent has committed to improving and safeguarding the small area of Cumberland Plain woodland on site.

10.1.4 Improved Valuation, Pricing and Incentive Mechanisms

The principle of Improved Valuation, Pricing and Incentive Mechanisms deems that environmental factors should be included in the valuation of assets and services. The cost associated with using or impacting upon an environmental resource is seen as a cost incurred to protect that resource.

Given that the development is not proposing to clear any vegetation, and would not have any impacts to waterways, environmental resources should not be significantly impacted.

The Project optimises the valuation and pricing of natural resources by encouraging diversion away from landfilling and encouraging recycling. Further justification in this regard is provided in **Section 4.1**.

10.2 Project Need

The proposed development involves the construction and operation of a resource recovery and recycling facility on an existing industrial site which, due to its previous use, would be unsuitable for many types of future development. Much of the existing infrastructure at the project site is be to be utilised as part of the proposed development. This represents an efficient use of existing infrastructure, particularly when compared with constructing the facility on a 'greenfield' site.

Bettergrow believes the proposed recycling and resource recovery facility will provide many benefits to businesses in the greater Sydney region and the surrounding community. The estimated capital cost including site development, building upgrades, infrastructure, air scrubbers plus associated plant and equipment is estimated to be $16 million.

When fully operational, Bettergrow will employ up to 25 staff at the site, which will provide jobs for the local community and surrounds. Associated supply businesses will also benefit from the operation of the site. When considering the estimated turnover for the proposal, Bettergrow believes that this could be in the order of $20 Million.

There is a signicant under supply of processing capacity for organic wastes and resource recovery in NSW, therefore the proposed faciltiy will provide additional processing capacity to ensure more wastes are recovered and re-used and less are diverted to landfill.

The proposed facility will further assist the NSW government to achieve its goals to increase the diversion of waste from landfill disposal through the development of strategic recycling infrastructure and processing facilities.

In addition to these social and economic benefits, the facility will service the increasing demand for waste recycling infrastructure in the Sydney region.

10.3 Conclusions

This Environmental Impact Statement (EIS) has been prepared to support a State Significant Development application for the Greenspot Resource Recovery and Recycling Facility at 24 Davis Road, Wetherill Park.

The proposed resource recovery and recycling facility will provide critical waste management infrastructure to meet the current and future waste demands of the Sydney Region and surrounds. The proposal is consistent with NSW waste strategies and policies in terms of providing additional capacity for the recovery, recycling, treatment, transport and processing of waste.

The proposed development has been shown to be consistent with the relevant local, State and Commonwealth government planning instruments.

A range of environmental issues were identified and assessed with appropriate mitigation and management measures proposed to be carried through to the construction and operational phase. Emphasis has been applied to the management of potential noise and odour impacts associated with the development through process and design modification to ensure compliance with assessment criteria.

The site's location in an established industrial precinct, close to the M4 and M7 motorways, and with access to B-Double approved routes, minimises the impacts of additional traffic on the capacity of the local road network and exposure to traffic related noise.

The flooding and surface water assessment for the development has determined that the proposal will not result in significant impacts downstream to Prospect Creek catchment.

The proposal provides enhanced social and economic benefits by increasing the processing capacity for organic and commercial waste into recycled materials, thereby reducing the amount of waste going to landfill, and increasing availability of recycled products. Utilisation of recycled materials contributes to the conservation of natural resources and biodiversity, and is consistent with the principles of ESD.

It has been demonstrated through this EIS that the proposal will not result in significant impacts to the environment through the implementation of management and mitigation strategies. Therefore the development is considered an appropriate use for the existing site, has positive social and resource recovery benefits for the local area, and is in the best interest of the public, environment, and sustainability.

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