VOLUME 1 - MAIN REPORT

PREFERRED PROJECT REPORT

MATERIALS RECYCLING FACILITY

LOTS 308, 309 & 310, DP 1118048
LOT 6, DP 1065574

NEWBRIDGE ROAD

MOOREBANK

15 August 2013

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TABLE OF CONTENTS

PART 4 STATEMENT OF COMMITMENTS

Part 1

INTRODUCTION AND BACKGROUND

1.1 Background

The Concrete Recyclers (Group) Pty Ltd (**Concrete Recyclers / Moorebank Recyclers**) seeks the approval of the Minister for Planning and Infrastructure to establish a Materials Recycling Facility on its land at Newbridge Road, Moorebank. The proposed development also includes access to and from Brickmakers Drive over Lots 308, 309 and 310, DP 1118048 which is in the ownership of Liverpool City Council. For the purposes of this report, all land the subject of the Part 3A application, except for Lot 310, is referred to generically as "the Site". Lot 308, DP 1118048 is Brickmakers Drive

Figure 1-1 shows the Site location.

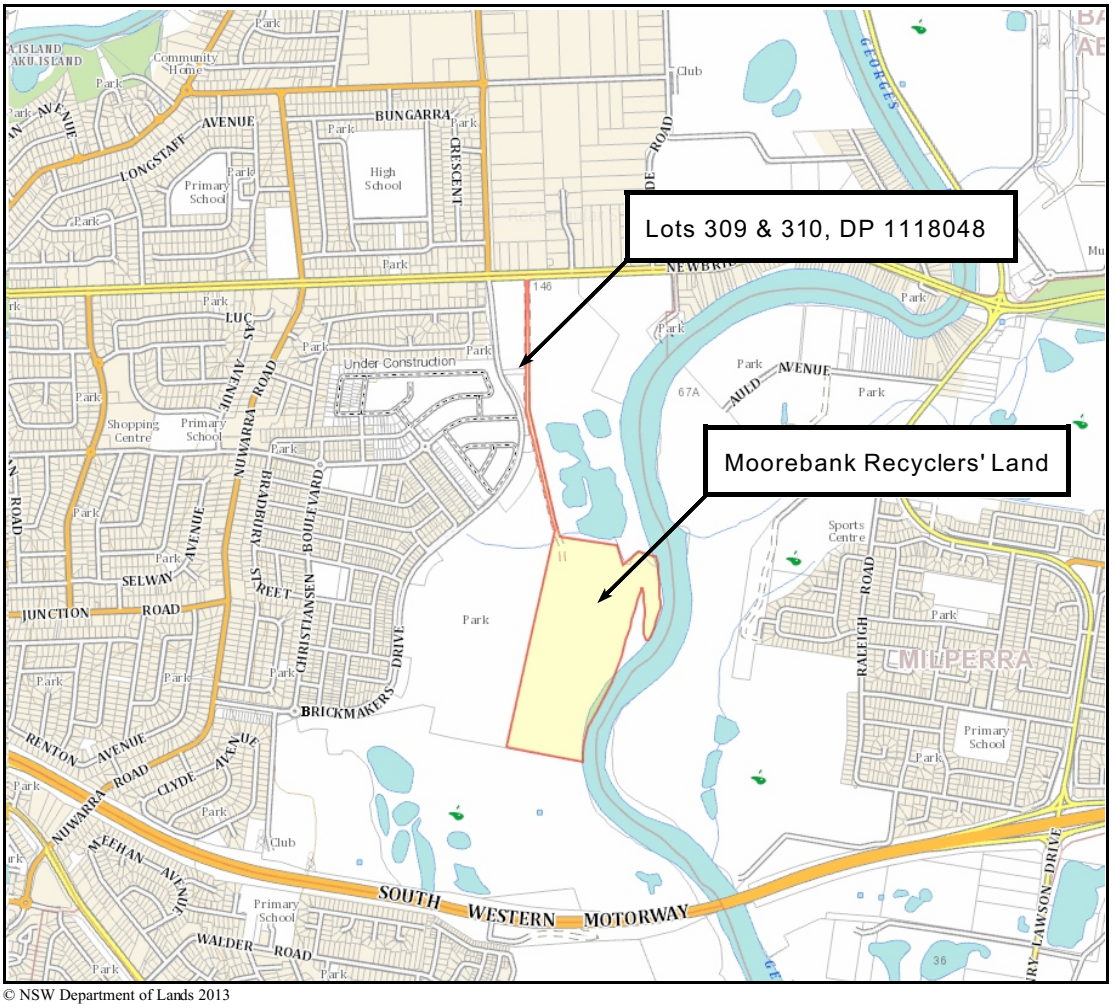


Figure 1-1: Site Location Map

The Site is located on the southern side of Newbridge Road to the east of the intersection of Newbridge Road with Governor Macquarie Drive/Brickmakers Drive.

The Moorebank Recyclers' land has frontage to Newbridge Road by way of an access handle which leads from Newbridge Road to the main body of the Site to the south.

Surrounding land includes:

- the Georges River to the east,
- Benedict Sand and Gravel to the north of the main body of the Site and to the east of the access handle to the Moorebank Recyclers' land,
- a large area of environmentally sensitive vegetation to the west of the main body of the Site which is owned by Liverpool City Council,
- a small section of the Georges Fair residential estate which is located on the former Boral quarry to the west of the access handle to the Moorebank Recyclers' land and the main section of the Georges Fair development which is to the west of the environmentally sensitive vegetation, and
- New Brighton Golf Club to the south of the Site.

The legal description of the Site is:

- Lot 6, DP 1065574 (the Moorebank Recyclers' land).
- Lot 309 & 310, DP 1118048 (the Liverpool City Council land).

The Moorebank Recyclers' land has an area of approximately 20.5 hectares and is situated on a broad, low lying flood plain of the Georges River.

1.2 Operational History of the Moorebank Recyclers' Land

The main section of the Moorebank Recyclers' land is a disused landfill which occupies approximately 75% of the Site.

Landfilling commenced in 1972 by Collex, following an approval from the then Metropolitan Waste Disposal Authority and the then State Pollution Control Commission. Landfilling continued until 1979.

The landfill was licensed to accept non-putrescible wastes which show little tendency to decompose such as document paper and builders rubble. Vegetation and other decomposable materials may have been accepted at the landfill as they were considered as non-putrescible at the time of landfilling.

No landfilling has taken place in the low lying area along the eastern boundary.

The filled areas are at an average height of about 5 metres AHD. The average depth of the fill is approximately 3 metres. The extent of the landfill is shown on **Figure 1-2** as Areas 1 to 4.

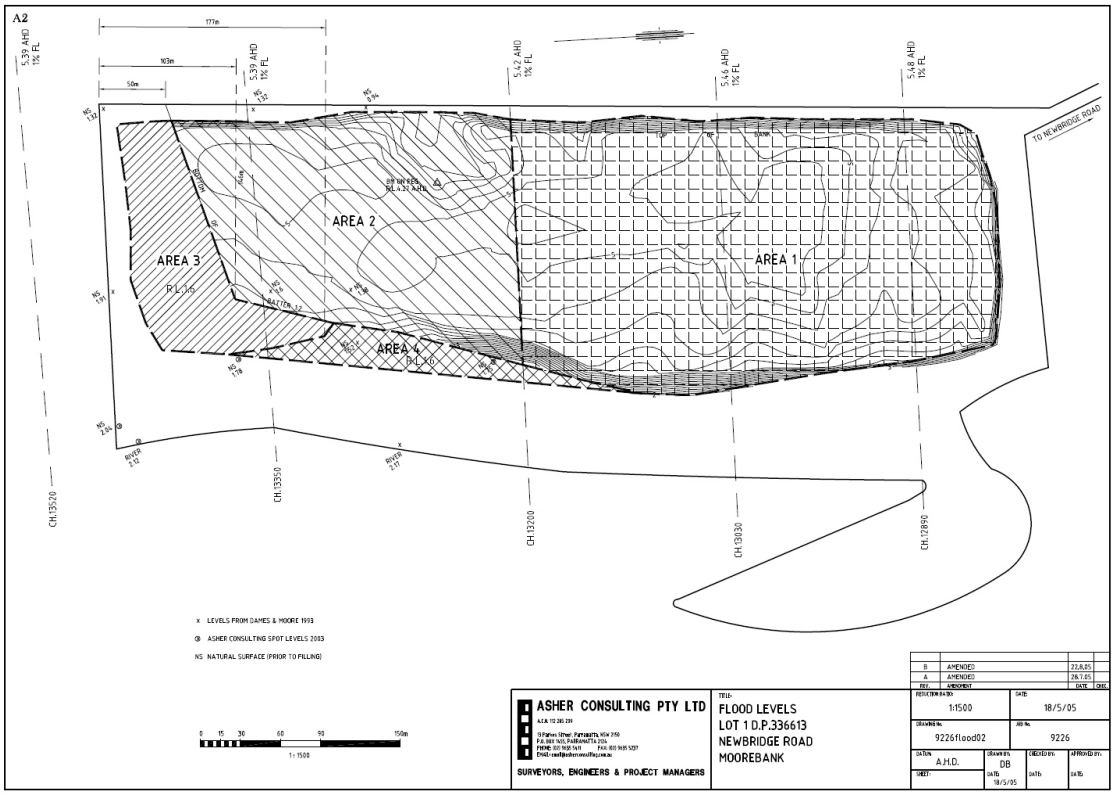


Figure 1-2: This figure shows the area which was subject to landfilling broken down into Areas 1 to 4. Development Consent No.1417/2005 was approved by Liverpool City Council to extract all landfill material located in Area 3 and to transport that material to Area 1 where it would be spread to raise Area 1 above the 1 in 100 year flood level.

As part of Development Consent No.1417/2005, a 4 metre high earth mound was also approved to be constructed around the filled area shown as Area 1 and Area 2.

1.3 Planning History of the Site

At its 25 February 2002 Ordinary Meeting, Liverpool City Council considered a Structure Planning Report dealing with the Boral Moorebank Precinct. The Boral Moorebank Precinct comprises:

- The then Boral quarry site (now the Georges Fair residential development and the environmentally sensitive land between that residential development and the Site),

- The Moorebank Recyclers' land,
- The Benedict Sands and Gravel land,
- Land owned by Flower Power, and
- The New Brighton Golf Club.

A copy of the Boral Moorebank Precinct Structure Plan is at **Figure 1-3**.

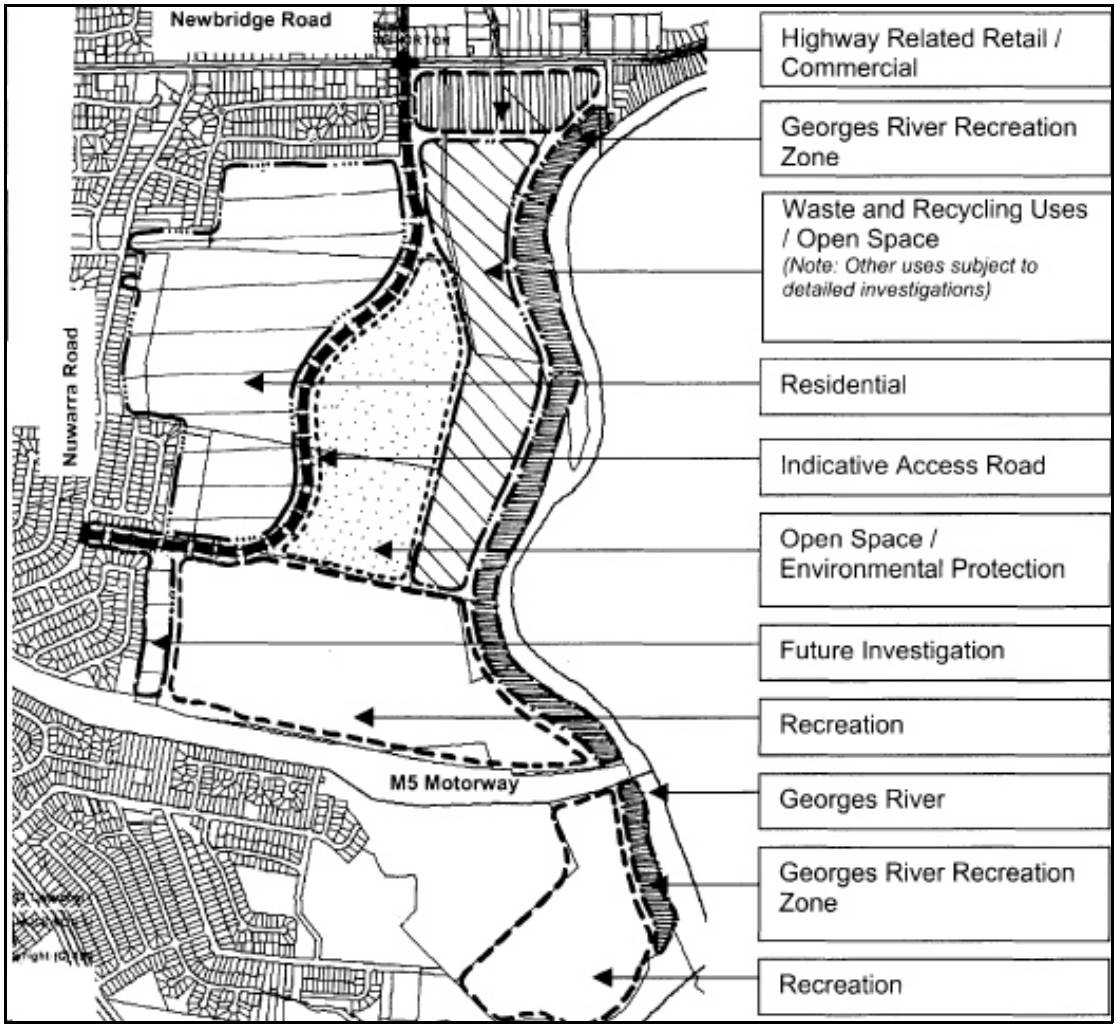


Figure 1-3: The Boral Moorebank Structure Plan adopted by Liverpool City Council in 2002.

The Council, following consideration of the Structure Planning Report, resolved to adopt the Boral Moorebank Structure Plan (the **Structure Plan**).

The Structure Plan provides for preservation of both the foreshore area of the Georges River and the environmentally sensitive land central to the precinct, while also accommodating the need to have highway related retail and commercial activity, and allowing the Boral quarry site to be rehabilitated and converted into a significant residential precinct.

The Structure Plan also recognises the suitability of the Moorebank Recyclers' land and part of the Benedict Sands land for use as a combination of Waste Recycling and Open Space, with other uses subject to detailed investigations.

The strategic planning approach adopted by the Council provided for the individual landowners within the precinct to prepare and submit a formal "pre-rezoning" submission, outlining their aspirations for the precinct. It is this step in the planning process which prompted the preparation, by Concrete Recyclers, of a Pre-rezoning Submission to the Council.

The Council subsequently resolved to prepare a draft Local Environmental Plan to rezoning the Moorebank Recyclers' land through an "enabling clause" to permit, with consent, the establishment of a "materials recycling yard" on the Moorebank Recyclers' land.

Amendment No.76 to the then Liverpool Local Environmental Plan 1987 was gazetted on 23 September 2005 by notice in Government Gazette No.118.

On 29 August 2008, Liverpool Local Environmental Plan 2008 was made (**LEP 2008**).

Pursuant to the provisions of LEP 2008, the Moorebank Recyclers' land, including the access handle, is zoned E2 Environmental Conservation. This land is also subject to clause 11 of Schedule 1 of LEP 2008 which provides that, with development consent, development for the purposes of a resource recovery facility is permitted on the land. Clause 11 is time limited and is repealed on 1 September 2018.

1.4 The Proposed Materials Recycling Facility

It is proposed to establish a Materials Recycling Facility with intended capacity of 500,000 tonnes per annum.

The objectives of the proposal are:

(a) To establish a commercially viable Materials Recycling Facility which is capable of recovering recyclable concrete, brick, asphalt, sandstone and sand from the waste stream for reuse.

(b) To assist the NSW State government in achieving its objectives for the recovery and recycling of waste as detailed in the *NSW Waste Avoidance and Resource Recovery Strategy 2007*.

(c) To establish an environmentally responsible and sustainable industry which would create employment.

(d) to provide development projects with high quality road base, aggregates and sand products. These are an alternative to quarried natural materials which are no

longer produced in Sydney and are imported from over 120 km away.

The proposed facility would receive concrete, brick, asphalt, sandstone and sand from the building and construction industry in the Sydney metropolitan area. No domestic loads would be received at the facility.

Materials received would be stockpiled and then processed by crushing the material into different sizes depending on the market demand for the end product.

Crushed material would be stockpiled according to size prior to transport to the marketplace.

The proposed facility would operate in accordance with an Environment Protection Licence obtained from the NSW Office of Environment and Heritage.

1.4.1 Project Design

The Materials Recycling Facility has been designed to accommodate the requirements of Concrete Recyclers while at the same time minimising the potential impacts to the surrounding environment. This has been achieved through the following design objectives:

- Provide a site layout which is efficient in its operation and located wholly on that part of the Site which has been filled as part of Development Consent No.1417/2005 which would ensure that all operations would be located on land above the 1 in 100 year flood level.
- Provide safe and efficient vehicular access to and from the Site and also within the Site.
- Provide a system whereby stormwater is collected on the Site for reuse in the processing system, dust suppression and firefighting.
- Provide an appropriate stormwater management system which would collect and treat any water which might be discharged from the Site.
- Provide a site layout which would protect significant vegetation.
- Provide a processing plant which controls dust emissions and noise levels to ensure there is no impact on the neighbouring properties.

1.4.2 Access and Circulation

The existing access to the Moorebank Recyclers' land is via a gravel road from

Newbridge Road.

The access crossing is on the southern side of Newbridge Road some 120 metres east of Brickmakers Drive.

The access road is located within the access handle and is 10.064 metres wide. The pavement width varies but is approximately 5 metres wide. The access handle from Newbridge Road to the main body of the Site is approximately 870 metres in length.

The NSW Roads and Maritime Services has advised that it would not grant its concurrence to the proposed development having its ingress and egress from/to Newbridge Road.

As part of the development of the Boral Moorebank Precinct Structure Plan, Liverpool City Council, as part of the rezoning of the former Boral quarry site for residential use, rezoned an 18 metre wide strip of land from the alignment of Brickmakers Drive to the access handle of the Site to provide for ingress to and egress from the Site.

The location of that 18 metre wide strip of land is shown in the extract from the Liverpool Local Environmental Plan 2008 (**LEP 2008**) zone map at **Figure 1-4**.

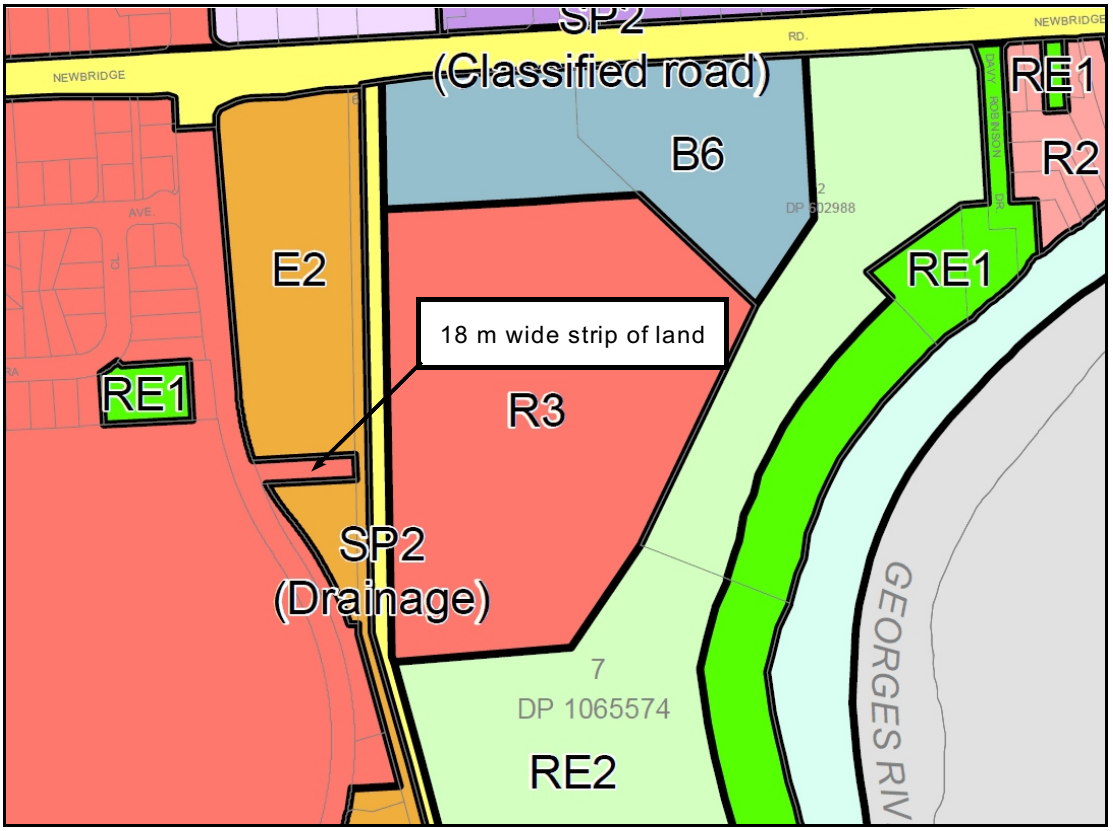


Figure 1-4: Extract from the LEP 2008 zone map which shows the location of the 18 metre wide strip of land for access to the Moorebank Recyclers' land.

The 18 metre wide strip of R3 zoned land connecting the access handle with Brickmakers

Drive is the location of the proposed access to the Materials Recycling Facility as described in Part 10 of the Environmental Assessment. As discussed in **Part 3.2.1** of this report, it is proposed to amended that access arrangement to incorporate some land either side of the 18 metre wide strip of land in accordance with an easement imposed by Justice Biscoe of the Land and Environment Court pursuant to the matter *Moorebank Recyclers Pty Ltd v Liverpool City Council (No 2) [2013] NSWLEC 93*.

1.4.3 Project Operation

The siting of the components of the proposed development have been designed to meet the requirements of Concrete Recyclers. An extract from the site layout plan for the main body of the Site as per the Environmental Assessment is at **Figure 1-5** below.

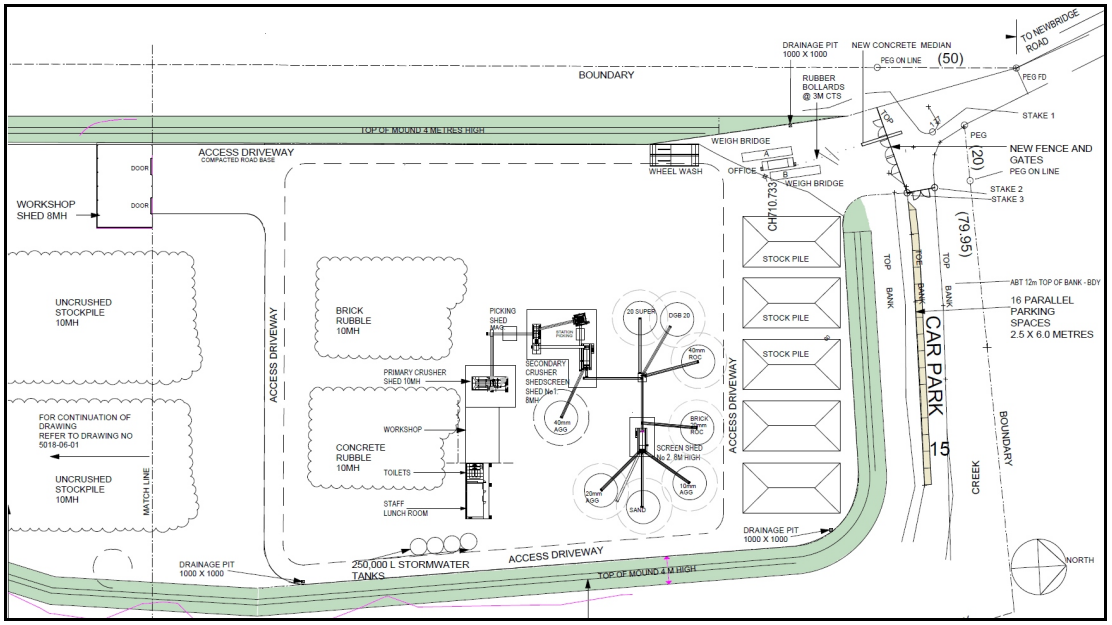


Figure 1-5: Extract from the Site Layout Plan for the Project as provided in the Environmental Assessment as exhibited.

As part of the preparation of this report, and in response to the proceedings before Justice Biscoe, the Site Layout Plan has been revised to provide for a more environmentally responsive layout.

An extract from the revised Site layout Plan is at **Figure 1-6**.

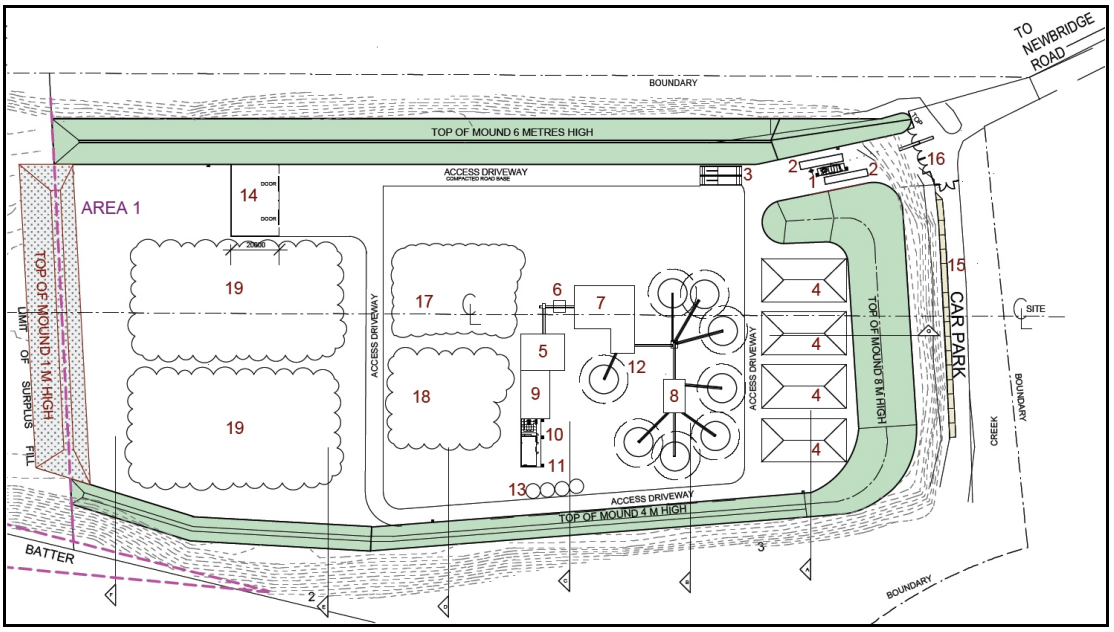


Figure 1-6: Extract from the revised Site Layout Plan. Numbers referred to in the plan are detailed below.

As discussed in **Part 3.2.2** of this report, it is now proposed to amend the Project such that the bunds surrounding the facility are as follows:

(a) The bund along the northern section of the facility has been altered in its shape to better accommodate the site layout and has been raised from the approved 4 metres height to 8 metres height.

(b) The bund along the western section of the facility has been raised from the approved 4 metres height to 6 metres height.

There is no proposed change to the eastern bund other than a transition from the approved 4 metres height to the 8 metres height of the amended northern bund.

Copies of the revised layout plans are at **Attachment 15**.

Plant, equipment and structures which are required to operate the proposed Materials Recycling Facility are described below. Numbers in the respective headings refer to the numbering on **Figure 1-6**.

Gates (16), Office (1) and Weighbridge (2)

New security fencing and gates would be established at the entrance of the main body of the Site. A concrete median strip would be established to separate traffic entering and leaving the Site.

A colorbond office would be established at the entrance.

Two weighbridges would be located on either side of the office. One weighbridge would be utilised for incoming vehicles and the other for outgoing vehicles.

A wheel wash facility (3 on Figure 1-6) would be established before the weighbridge for outgoing vehicles.

Stockpiles of Raw Materials (17, 18 & 19)

Trucks laden with uncrushed raw materials would be directed to the stockpiles at the southern end of the Site where they would be unloaded and materials separated into relevant stockpiles such as a brick stockpile and a concrete stockpile.

These stockpiles, as indicated in the **Figure 1-5**, were originally proposed to be a maximum of 10 metres in height. As discussed in **Part 3.1.3** of this report, and as shown in **Figure 1-6**, it is proposed to amend the Project such that stockpiles would have a maximum height of 7 metres.

Height markers will be installed to ensure that stockpile heights do not exceed nominated heights.

Primary Crusher (5)

Raw materials would be fed by front end loader into the primary crusher which would be located within a purpose built colorbond shed 10 metres in height.

At this point, the initial processing of material would occur where the raw material is crushed to a more manageable size and foreign material, such as metal, is loosened from the raw material.

Picking Shed (6)

Material crushed in the primary crusher is transported by conveyor to the picking shed where metal objects are removed using a purpose built magnet and other foreign materials are removed by hand.

All metal and foreign materials are deposited in bins which are transported from the Site to recycling facilities where appropriate or to landfill in the case of material which cannot be recycled.

Secondary Crusher and Primary Screen (7)

Material would be transported by conveyor from the picking shed to the secondary crusher which is located in a purpose built colorbond shed 8 metres in height.

In this stage of the process, material is crushed into smaller sizes, transported over a second picking station to recover any additional foreign material, then to the primary screening facility where crushed materials are separated into product sizes and stockpiled.

Any material which does not meet a required product size is transported by conveyor to the secondary screen shed which further separates the product materials.

The secondary screen would be located in a colorbond shed 8 metres in height (8 on Figure 1-6).

Product Stockpiles (4)

Crushed and screened product is transported by front end loader from the primary stockpiles to the permanent stockpiles located at the northern end of the facility from where the material is loaded to trucks for delivery to the marketplace.

Water sprinklers will be used on stockpiles to crust the surface which then stops the emission of dust. Material being loaded to trucks for delivery from the facility will be dampened prior to loading to ensure that dust is not generating in the process.

Height markers will be installed to ensure that stockpile heights do not exceed nominated heights.

Workshop (14)

A 20 metre x 12 metre colorbond shed would be constructed in the south western corner of the facility. The shed would be 8 metres in height and utilised for general maintenance of equipment and the storage of spares and the like.

The mobile fuel truck and water cart would be stored in the secured workshop overnight.

Hours of Operation

The proposed hours of operation would be:

Monday to Saturday 7:00 am to 6:00 pm.

Operation of the crushers would be restricted to 7:00 am to 5:30 pm.

Figure 1-7 shows the layout of the proposed development over an aerial photograph of the locality.

Figure 1-7: Site layout plan over aerial photograph of the locality.

1.5 Statutory Context

The proposed Materials Recycling Facility, including access via the 18 metre strip of E3 zoned land owned by the Council, the adjoining Lot 310, and Brickmakers Drive is a Project to which the transitional provisions consequent to the repeal of Part 3A of the Environmental Planning and Assessment Act 1979 (**the Act**) apply. The Project will continue to be assessed and determined under Part 3A, as in force immediately before its repeal.

An Environmental Assessment was prepared in accordance with Part 3A of the Act. The Environmental Assessment was placed on public exhibition from 28 February 2013 to 5 April 2013.

After exhibition of the Environmental Assessment, Section 75H(5) of the Act requires that a copy of the submissions received or a report of the issues raised in submissions be provided by the Director-General. The Department of Planning and Infrastructure provided the proponent with a copy of submissions received during the exhibition period.

Section 75H(6) of the Act provides that the Director-General may require the proponent to submit to the Director-General:

(a) a response to the issues raised in those submissions, and

(b) a preferred project report that outlines any proposed changes to the project to minimise its environmental impact, and

(c) any revised statement of commitments.

By letter dated 12 April 2013, the Director-General requested the report identified in Section 75H(6). This Submissions Report, Preferred Project Report and Revised Statement of Commitments is submitted to the Director-General of the Department of Planning and Infrastructure, thereby fulfilling the requirements of Section 75H(6) of the Act.

1.6 Structure of this Report

Part 2 A summary of the issues raised in submissions is provided together with the Proponent's response to issues raised in submissions.

Part 3 A Preferred Project Report is provided detailing proposed changes to the Project following review of submissions received.

Part 4 A revised Statement of Commitments is provided as a result of the Preferred Project Report described in Part 3.

Part 2

RESPONSE TO SUBMISSIONS

2.1 Respondents

1182 submissions were received during the exhibition period of the Environmental Assessment. Each submission was reviewed and the key issues identified.

Submissions comprised:

- 202 individual submissions from the public.
- 935 submissions from the public in the form of a standard letter v1, a copy of which is at **Attachment 1**.
- 4 submissions from the public in the form of a standard letter v2, a copy of which is at **Attachment 2**.
- 3 submissions from the public in the form of a standard letter v3, a copy of which is at **Attachment 3**.
- 9 submissions from the public in the form of a standard letter v4, a copy of which is at **Attachment 4**.
- 3 submissions from the public in the form of a standard letter v5, a copy of which is at **Attachment 5**.
- 4 submissions from the public in the form of a standard letter v6, a copy of which is at **Attachment 6**.
- 5 submissions from the public in the form of a standard letter v7, a copy of which is at **Attachment 7**.
- A petition containing 6 signatures.
- 4 submissions from special interests, being:
  - Benedict Industries Pty Ltd
  - Investa Land Pty Ltd
  - Boral Property Group
  - Melanie Gibbons MP

Seven (7) submissions from Government Agencies, being:

- Liverpool City Council
- NSW Office of Environment & Heritage
- NSW Rural Fire Service
- Sydney Water
- NSW Roads and Maritime Services
- NSW Environment Protection Authority
- NSW Department of Primary Industries.

The key issues raised in the submissions related to the following:

1. Whether appropriate access has been provided.
2. Traffic and safety with regard to the proposed use of Brickmakers Drive.
3. Air quality and the impact the proposed development might have with regard to dust and odour. The potential for asbestos to be processed on the Site. The existing air quality impacts from the Benedict Sand and Gravel operation.
4. Noise with regard to the impact the operation of the proposed development would have on the acoustic environment and, in particular, the impact noise from trucks might have on the residents of the locality.
5. Land use conflicts with both residential development in the locality and possible future residential development. Suitability of the Site for use as a waste facility having regard to the zoning of the Site and surrounding areas.
6. Impact on the flora and fauna of the locality.
7. Impact of the use of the Site on the disused landfill and, in particular, geotechnical issues.
8. Impact of the proposed development on the recreational use of the Georges River.
9. Impact of the use of the Site on the flooding regime of the Georges River.
10. Visual impact of the proposed development.
11. Bush fire.
12. Community consultation.

2.2 Site Access

2.2.1 Issue Description

The respondents raised the issue of access to and from the Site. The issue can best be summarised in statements made in the Liverpool City Council submission as follows:

- *The environmental assessment and traffic report (including plans) prepared by Lyle Marshall and associates show that the development would utilise Lot 309, DP 1118048 to access the proposed development, via an at grade road. This land is zoned R3 Medium Density Residential to provide access to the East Moorebank Precinct following rezoning of the former Boral quarry site.*

- *Given that the access solution in the environmental assessment cannot be realised, the applicant will be required to amend their application to include the ramps proposal. This will require Council to provide owners consent to the amendment of the application to include Lot 310. Given the resolution to deny access to this lot, it is highly unlikely that Council will grant consent to the amended application.*

- *This appears to leave the applicant in a situation where the proposal on exhibition (at grade road access) is not achievable and the potential amended proposal (bridge and ramps) cannot be lodged at this time due to the lack of owners consent.*

2.2.2 Response

It is assumed that reference to the *East Moorebank Precinct* refers to the land owned by Benedict Sand and Gravel, and land owned by Flower Power which is the subject of development controls contained in Part 2.10 - Moorebank East of the Liverpool Development Control Plan 2008.

Lot 309, DP 1118048 was created as part of the rezoning of the former Boral quarry site as part of the Boral Moorebank Precinct Structure Plan which was adopted by Liverpool City Council in 2002 to apply not only to the Benedict Sand and Gravel and Flower Power land but also to the new Brighton Golf Club and the Moorebank Recyclers' land. A copy of the Boral Moorebank Precinct Structure Plan is at **Figure 2-1** with an extract from Amendment No.75 to the then Liverpool Local Environmental Plan 1997 to rezone the Boral land at **Figure 2-2**.

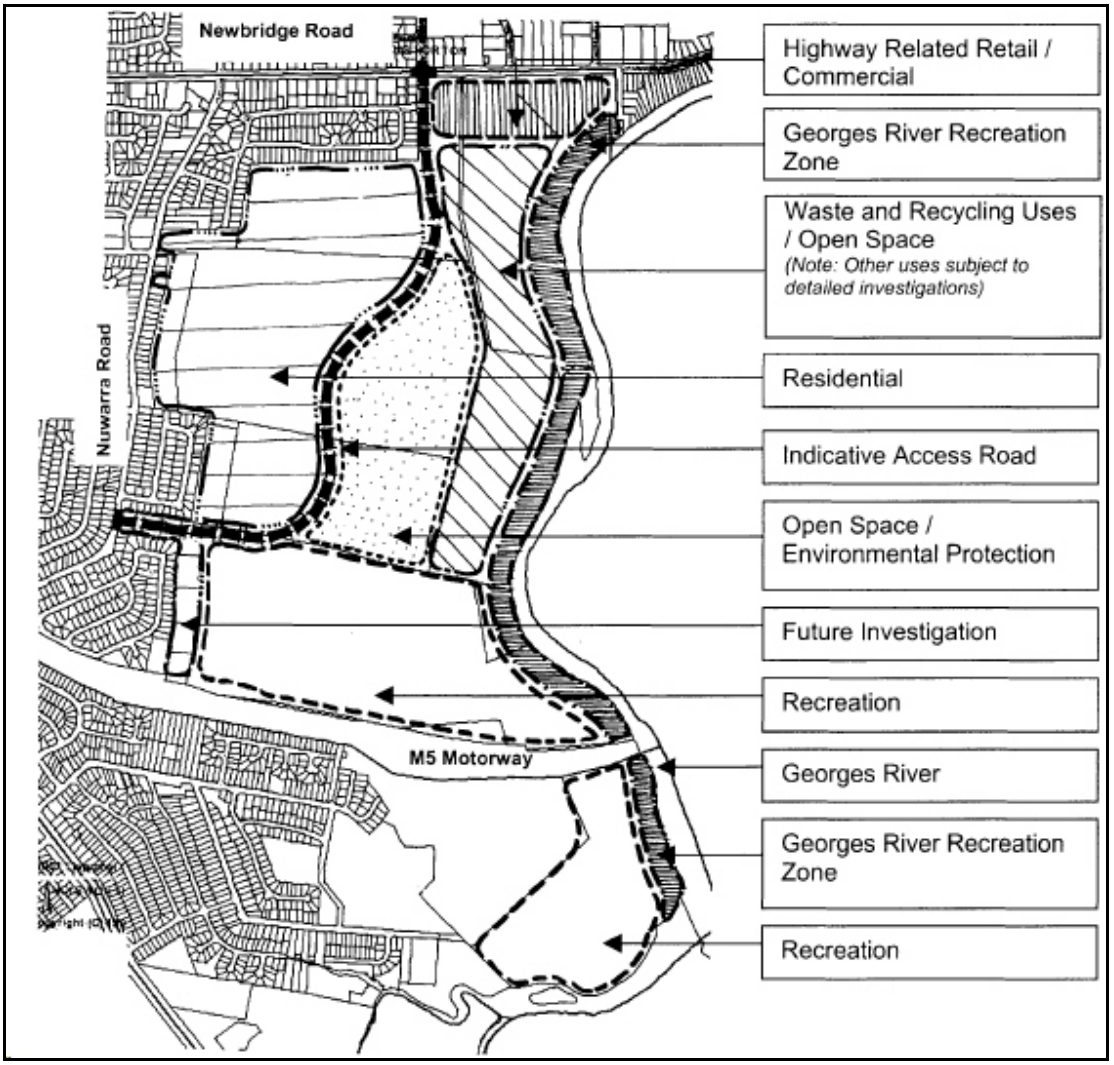


Figure 2-1: Boral Precinct Structure Plan adopted by Council on 25 February 2002.

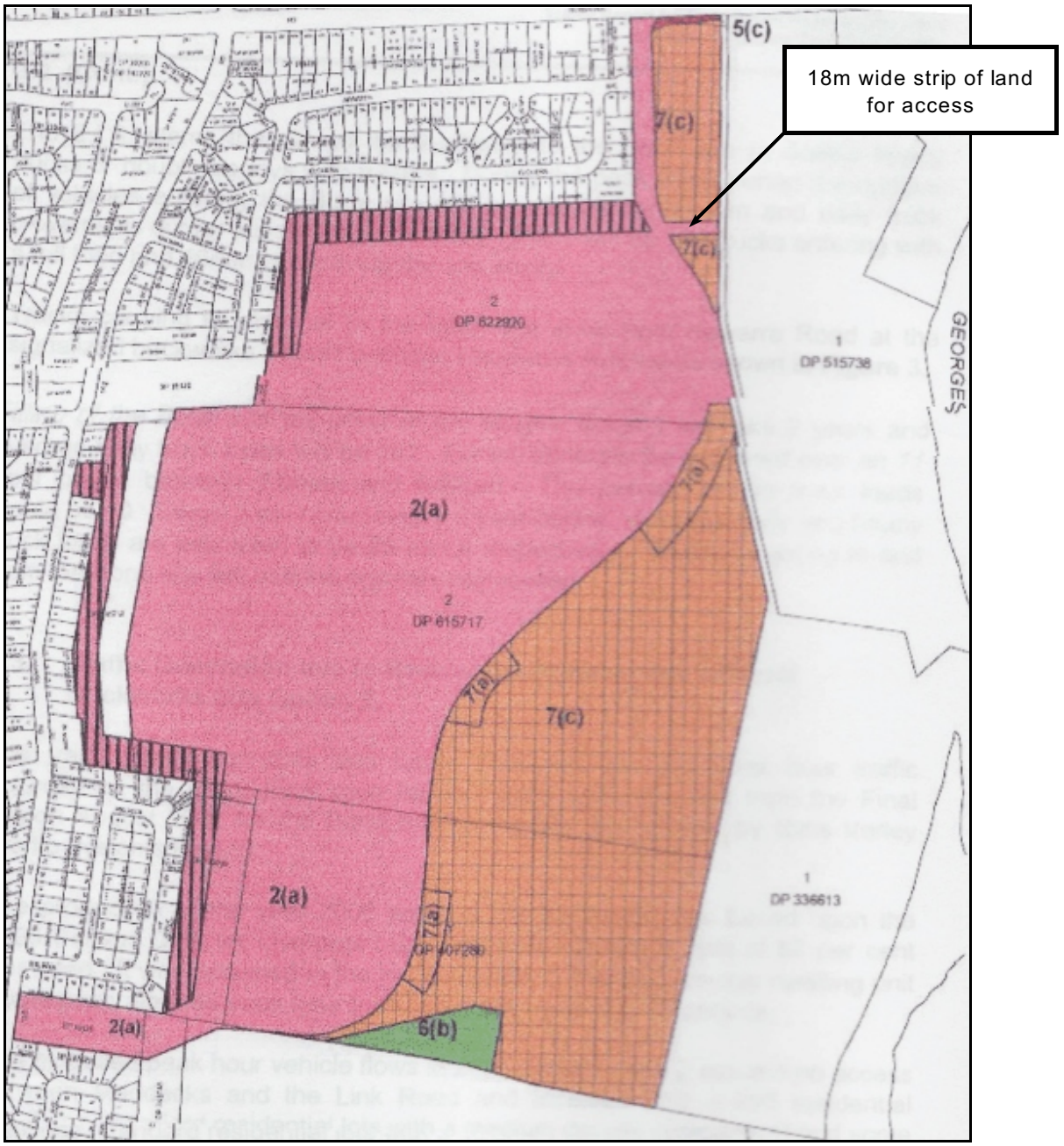


Figure 2-2: An extract from Amendment No.75 to LEP 1997 which rezoned the Boral land to allow residential development and also rezoned the 18 metre wide strip of land to gain access to the properties to the east of the Boral land as per the Structure Plan.

As such, the rezoning of the former Boral quarry site, which included an 18 metre wide strip of residential land (Lot 309, DP 1118048) also created an access to the Moorebank Recyclers' land.

As indicated in Appendix 3 of the Environmental Assessment:

> .... *Council grants consent for the lodgement of the Part 3A Project Application with the Minister for Planning in relation to the abovementioned Land* [Lot 308

> & 309 DP 1118048] *for access purposes to the proposed materials recycling yard.*

The bridge referred to by the Council is that which is the subject of Development Consent No.1552/2006 issued by the Council for an elevated road bridge over the following land:

(a) part Lot 7, DP 1065574 - land owned by Benedict Sand & Gravel (Tanlane).

(b) part of the access handle to Lot 6, DP 1065574 - land owned by Moorebank Recyclers.

(c) part Lot 309, DP 1118048 - land owned by Council.

The approved road bridge does not connect to Lot 308, DP 1118048 (Brickmakers Drive) and Development Consent No.1552/2006 does not permit the use of the approved road bridge.

The NSW Court of Appeal Judgement of 21 December 2012 referred to by the Council in its submission was a judgement in proceedings brought by Tanlane (Benedict Sand and Gravel) against Moorebank in the Supreme Court, the Court concluded that:

> *.... subject to an order providing for compensation under s 88K(4) being made, we would make an order in favour of Tanlane, imposing an easement ....*
>
> *... the easement should not be imposed until the compensation payable pursuant to s 88K(4) has been assessed.*

The easement stated above would be over part of the Moorebank Land at the location of the road bridge. The easement would allow for the construction, maintenance and repair of the road bridge. Without this easement, the part of the road bridge over the Moorebank Land cannot lawfully be constructed.

At time of writing, there has been no order providing for compensation under s.88K(4) of the Conveyancing Act 1919 and, as such, there is no certainty that an order imposing an easement would be made to permit access to the Tanlane Land from Brickmakers Drive.

Notwithstanding that the abovementioned easement has not been registered over the access handle to the Moorebank Recyclers' land, for the purposes of the Part 3A application, it is assumed that such an easement has been registered on the title of Lot 6, DP 1065574 and the approved road bridge would be constructed at some time in the future. As such, the at grade access proposed in the Part 3A application and detailed in the Environmental Assessment could not co-exist with the approved road bridge.

In order to establish an access to Lot 6, DP 1065574 for the proposed Materials Recycling Facility which would not prevent Tanlane from gaining access by way of the approved road bridge, it is now proposed to incorporate both an access ramp and an exit ramp within Lots 309 and 310, DP 1118048.

As noted in the Council submission, the Council, as landowner of both Lot 309 and Lot 310, DP 1118048 had indicated, by resolution, that it would not grant landowners consent to amend the Part 3A application to change the proposed access to the Materials Recycling Facility from the at grade access proposed in the Environmental Assessment, as exhibited, to a ramps proposal.

In response to the above, Moorebank Recyclers commenced proceedings pursuant to s.88K of the Conveyancing Act 1919 to, among other things, establish an easement over Lots 309 and 310, DP 1118048 which would permit, among other things, the use of that land for access ramps to and from the Moorebank Recyclers' land (refer *Moorebank Recyclers v Liverpool City Council*, Land and Environment Court Proceedings No.30141 of 2013).

With regard to the abovementioned s.88K proceedings, the Council states:

> *However as this matter is undetermined, the applicant at this time does not have owners consent to either lodge a development Application/Part 3A Application over Lot 310 not to access the property in any way.*

On 27 June 2013, Justice Biscoe of the Land and Environment Court handed down judgement in the above proceedings (refer *Moorebank Recyclers v Liverpool City Council (No 2)* [2013] NSWLEC 93). Justice Biscoe indicated that Orders would be issued to permit the easement sought by Moorebank Recyclers, including landowners consent to amend the Part 3A application as proposed. A copy of the judgement and subsequent 8 July 2013 Orders of the Court, as amended on 8 August 2013, are at **Attachment 9**.

By letter dated 12 July 2013, the Council has granted its consent to the lodgement of both the Part 3A application and its amendment over Lots 308, 309 and 310, DP 1118048. A copy of the 12 July 2013 letter is at **Attachment 10**.

The Ramps Proposal

It is proposed to amend the access arrangement for the Part 3A application from that which was exhibited with the Environmental Assessment to that provided for in plans prepared by Cardno, those plans being:

Drawing SK 1001, Revision L
Drawing SK 1003, Revision E
Drawing SK 1004, Revision E
Drawing SK 2001, Revision D
Drawing SK 2003, Revision A
Drawing SK 2004, Revision C

A reduced copy of the Cardno plans is at **Attachment 8**.

This amendment to the Project is discussed in more detail in **Part 3.1** of this report.

Traffic Management

This issue is discussed in more detail in **Part 2.3**.

Intersection Treatment of the Proposed Access/Brickmakers Drive

This issue is discussed in more detail in **Part 2.3**.

2.3 Traffic and Safety

2.3.1 Issue Description

- Failure to assess the project construction stage traffic impacts. The construction stage access is proposed to be along a substandard access track to Newbridge Road, but no details or assessment of the use of this access are provided.

- Failure to investigate either the existing or the likely future traffic conditions at the nearest major road intersection at Newbridge Road, Governor Macquarie Drive and Brickmakers Drive. Without this the actual traffic impacts of the project in the local area cannot be adequately quantified.

- The probable impacts are significantly underestimated because only the average daily and not the potential maximum daily site traffic movements have been assessed.

- Inadequate consideration of cumulative impacts. Specifically, no consideration of the effects of the Georges Fair residential development at the critical Brickmakers Drive/Newbridge Drive intersection which provides the only access to the major road network. Further, there has been no consideration of traffic from the proposed marina and likely residential development to the north of the subject site.

- Significant deficiencies in the design of the proposed road bridge which will not be adequate for the future combined use by the proposed use and other traffic or pedestrian access from the proposed Benedict Sands marina and likely residential development to the north of the subject site.

- The proposed right turn only traffic egress and left in only ingress restriction for the site truck traffic at Brickmakers Drive will become increasingly difficult to enforce with future predicted traffic congestion at the Newbridge Road intersection and likely queuing of traffic from the intersection.

- Deficiencies in the proposed link road bridge in regard to the functionality of 90 degree bends and the omission of the pedestrian access.

- The inclusion of reference to an alternative access with no provision of details and despite historical evidence that landowner's consent for an alternative access is highly unlikely.

- The likely safety conflicts between heavy vehicle traffic merging at acute angles and on-grade from the proposed access ramps with light vehicular traffic near the intersection of the road bridge access and Brickmakers Drive.

2.3.2 Response

2.3.2.1 Construction Traffic

Basic Components of Construction

(a) Clearing the area which would be utilised for permanent construction.

(b) Approach embankment with reinforced earth retaining wall.

(c) Concrete ramps.

(d) Roadway.

(e) Piled foundations to crushing and screen plant.

(f) Crusher foundations.

(g) Crushing and screening plants.

(h) Sheds.

(i) Weighbridges and wheel washers.

(j) Stormwater drainage and collection systems.

(k) Miscellaneous items.

Basic Materials

(a) Granular fill.

(b) Reinforced earth wall panels and straps.

(c) Piling, in-situ concrete.

(d) Concrete to piers, including formwork and reinforcing.

(e) Concreting, including formwork and reinforcement.

(f) Road materials, base course and surfacing.

(g) Shed building materials.

Estimated Construction Period

Ten (10) months with no work on Sundays. The construction period would be 8 to 10 hours per day such that the typical day would result in up to 5 vehicles per hour (3 in, 2 out), or 1 vehicle either entering or leaving the site every 12 minute, which is a low level of traffic generation. It is estimated that approximately 100 workers could be involved over the entire construction period, however, not all workers would be on site at any one time.

Construction traffic

(a) Delivery of earthmoving plant via low loader truck - excavators x 2, compactors x 2, watercart x 2, dozer, piling rig x 2, grader, mobile crusher/screen.

(b) Delivery of fill material for mound extra height.

(c) Delivery of fill material for ramps and elevated road.

(d) Delivery of concrete driven piles.

(e) Delivery of material for recycling to produce road base products.

(f) Delivery of concrete and reinforced steel for foundations, slabs, wheel wash, weighbridge etc.

(g) Delivery of structural steel and cladding for shed construction.

(h) Delivery of prefabricated sheds - office/weighbridge, toilet/lunch block.

(i) Delivery of permanent crushing, screening conveying plant with associated equipment.

(j) Mobile cranes.

(k) Concrete panels.

(l) Concrete pumping trucks.

(m) Small contractor/trade vehicles/equipment throughout the construction period.

Access

All construction traffic can access the work site via the existing access road from Newbridge Road.

Parking, holding and storage can be accommodated on the side of the existing access road, within the area of the future road bridge, or within the Moorebank site to the south of the bridge/ramps site.

The details of a low frequency event of construction related semi-trailers (Articulated Vehicles (**AV**) turning left off Newbridge Road is shown in **Figure 2-3** (AV in accordance with AS2890.2:2002).

The swept path of Small Rigid Vehicles (**SRV**) and Medium Rigid Vehicles (**MRV**) (typical 23 tonne rigid trucks) in accordance with AS2890.2:2002 is shown in **Figure 2-4** and **Figure 2-5** respectively.

It is evident that a MRV will need to turn from the middle lane of Newbridge Road which is acceptable under the Australian Road Rules. In relation to the AVs, these vehicles will be required to turn from the third lane of Newbridge Road under a two escort vehicle control traffic management plan, unless a driveway splay can be constructed as shown on **Figure 2-6** to assist the left turn entry movement. The two escort vehicles would drive at low speed in each of the inner lanes and the AV would travel in the third/central lane. The AVs would be time managed to only enter and leave the Site after weekday commuter peak periods, thus being directed to use Newbridge Road between the hours of 10:00 am to 3:00 pm on weekdays. As only one (1) AV is expected to arrive/depart the Site on weekdays, this is readily manageable.

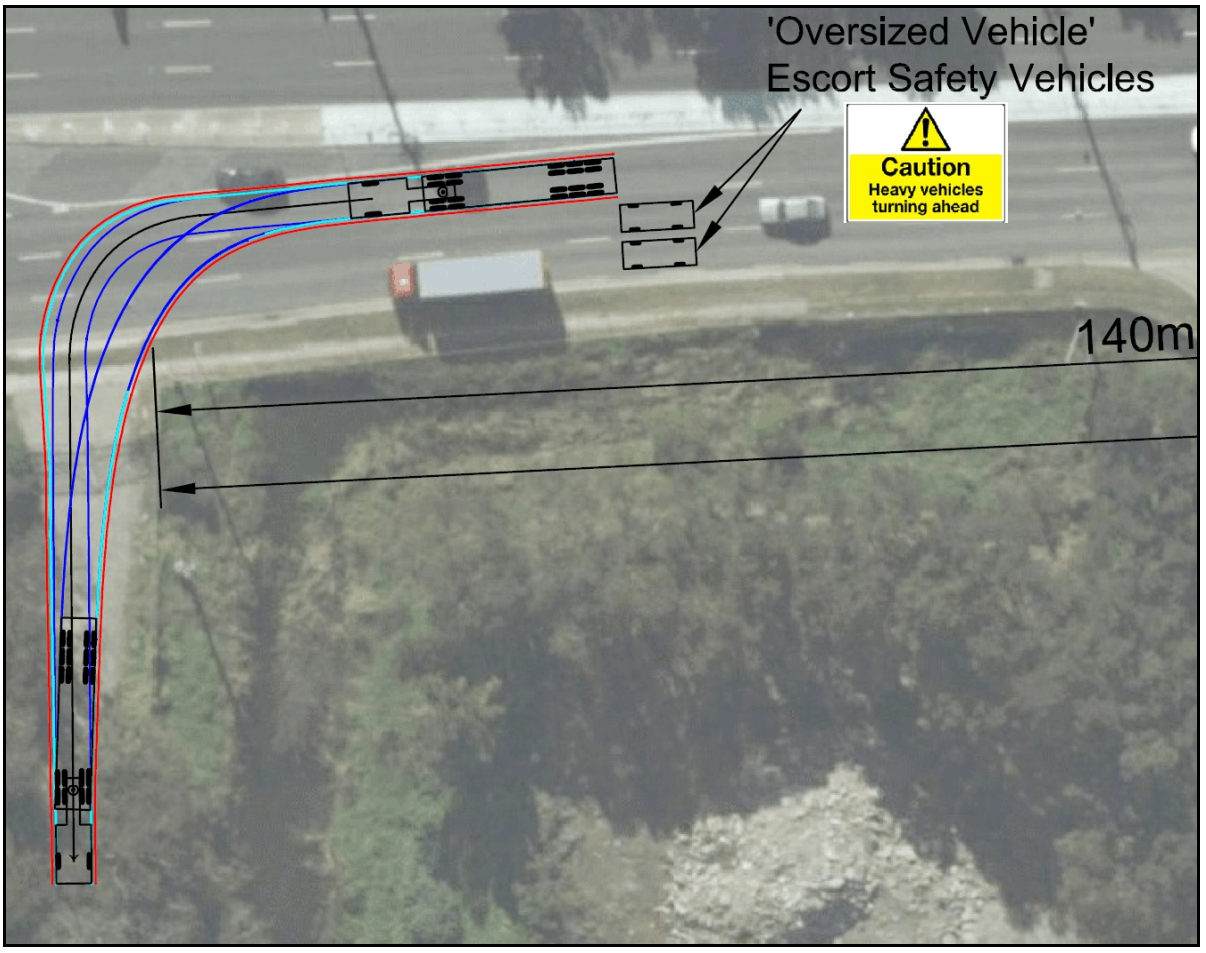


Figure 2-3: 19 metre Semi-Articulated vehicle left turn into driveway from median (third) lane tested at 10 km/h. Dark blue is the path of the tyres, light blue is the vehicle body and red is 300mm clearance.

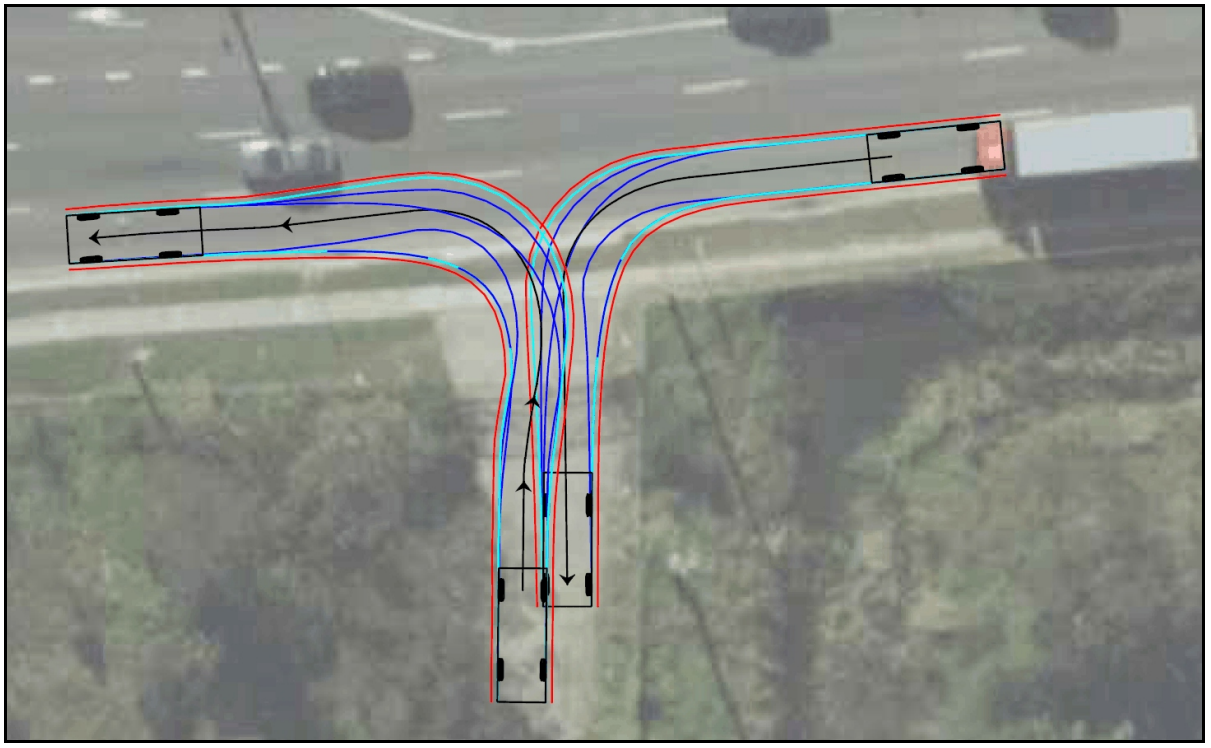


Figure 2-4: Swept path of a 6.6 metre SRV turning into and out of the Moorebank driveway. Dark blue is the path of the tyres, light blue is the vehicle body and red is 300mm clearance.

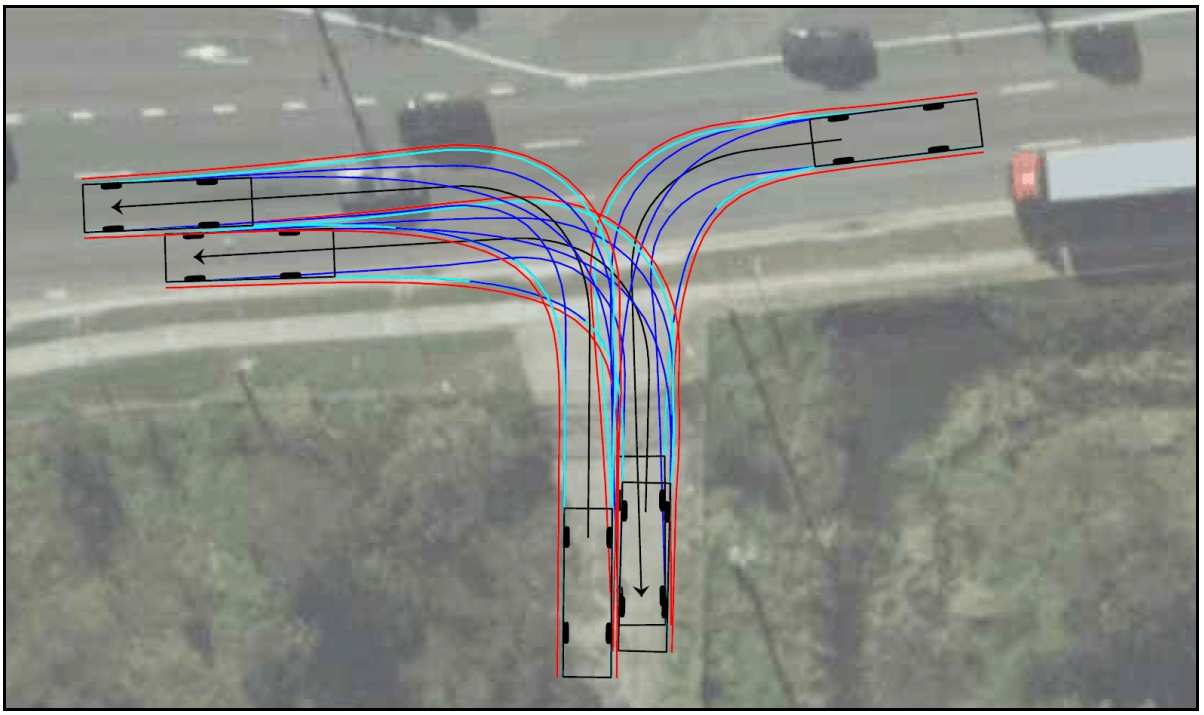


Figure 2-5: Swept path of a 8.8 metre MRV turning into and out of the Moorebank driveway. Dark blue is the path of the tyres, light blue is the vehicle body and red is 300 mm clearance.

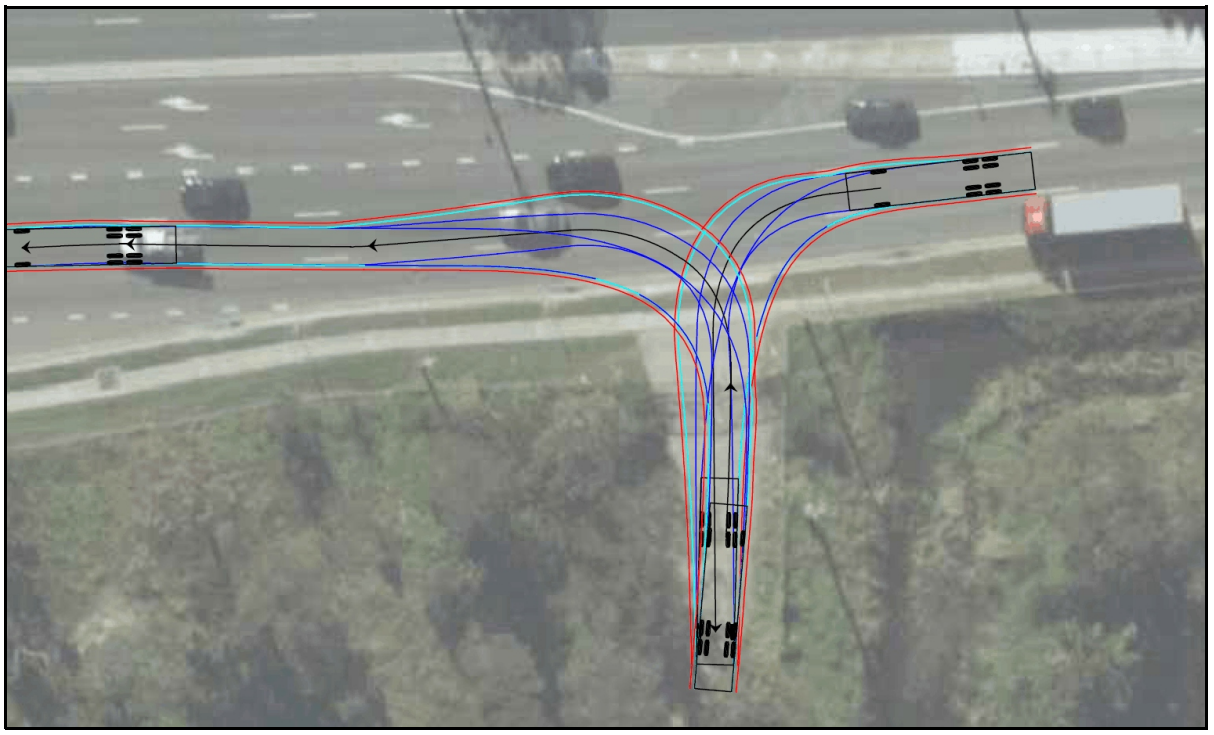


Figure 2-6: Swept path of a 12.5 metre HRV turning into and out of the Moorebank driveway. Dark blue is the path of the tyres, light blue is the vehicle body and red is 300mm clearance.

2.3.2.2 Response to RMS submission

- *Turning paths shown on plan 8318/09 sheet 1D of 8 do not comply with Austroads Guide.*

Comment: The abovementioned plans, as provided in the Environmental Assessment, are those prepared by Lyle Marshall & Associates. As discussion in **Part 2.2** above, following the December 2012 judgement of the NSW Court of Appeal, the access depicted on the Lyle Marshall & Associates plans is no longer feasible, and it is now proposed to provide access to the Materials Recycling Facility by way of ramps.

The details of the now proposed plans are provided in **Part 3.1.1** of this report (the **Cardno Plans**) with copies of those plans provided at **Attachment 8**.

The Cardno Plans comply with the Austroads Guide for the Brickmakers Drive / Link Road connection.

- *Swept path tests of the longest vehicle turning at the Nuwarra Road / Brickmakers Drive intersection are to be submitted to the RMS for review.*

Comment: No vehicles larger than Council's garbage collection vehicle (Medium Rigid Vehicle) associated with the Materials Recycling Facility would be travelling along the segment of Brickmakers Drive between Lot 309 and Nuwarra Road.

- *Consideration should be given to assess the cumulative traffic impact of the marina development proposal on vehicular access to Brickmakers Drive and the link road.*

Comment: The external traffic impact of the future redevelopment of the Boral Brickworks site for residential development was the subject of various traffic studies, as follows:

- *Transport Report for Proposed Redevelopment of Boral's Brickworks Site* (Colston Budd Hunt & Kafes, July 2002).

- *Boral Brickworks Site Moorebank, Redevelopment Traffic and Transport Modelling Report* (Sims Varley, August 2002).

- *Supplementary Transport Report for Proposed Redevelopment of Boral's Brickworks Site, Moorebank* (Colston Budd Hunt & Kafes, September 2003).

The external traffic impact of the future redevelopment of the Tanlane site for a residential subdivision plus some commercial uses was the subject of the following traffic study:

- *Traffic Report for Rezoning of Benedict Sands Land, Moorebank* (Colston Budd Hunt & Kafes, Dec 2005). [216 dwellings plus 5,700m^2 of commercial floor space].

The external traffic impact of the future redevelopment of part of the Benedict Sand and Gravel site for a marina plus a function centre with clubhouse & bar was the subject of the following traffic study:

- *Traffic Report for Proposed Georges Cove Marina, Moorebank* (Colston Budd Hunt & Kafes, July 2010). [250 wet berths, 188 wet berths, sales / showroom (1,605m^2) plus 4,938m^2 of function / clubhouse / bar / kiosks floor space].

The combined peak hourly traffic projections on the road bridge associated with residential/commercial/marina/function centres uses are:

Weekday Peak	Eastbound	Westbound	Total (Two Way)
8-9 am	184	58	**242**
5-6 pm	66	176	**242**

The volume of traffic generated by the proposed Materials Recycling Facility adds 38 trucks (19 in, 19 out) during the weekday 8:00 am - 9:00 am peak hour and 21 trucks (10 in, 11 out) during the 4:00 pm - 5:00 pm peak hour period (i.e. the hour preceding the commuter peak hour from 5:00 pm - 6:00 pm). Adding the truck numbers associated with the Materials Recycling Facility, under the worst case outcome when Materials Recycling Facility traffic occurs during the 4:00 pm - 5:00 pm commuter peak hour period, gives the numbers in the table below:

Weekday Peak	Eastbound	Westbound	Total (Two Way)
8-9 am	203	77	**280**
5-6 pm	76	187	**263**

As previously mentioned, the proposed Materials Recycling Facility adds, in terms of road network performance, a minor increase equivalent to 1 to 2 trucks either arriving or departing the site every 2 minutes, which is the approximate cycle time of nearby key intersections. This would not adversely affect road network performance.

The westbound traffic flow in the future condition during the PM peak will be some 187 vehicles. It should be noted that heavy vehicles generated from the development should be factored by 4 - 5 to establish equivalent light vehicle (cars) movements. This would raise the effective traffic flow to 220 vehicles in the westbound direction which triggers the signal warrants. It is, therefore, necessary to establish a signalised intersection to control this junction.

In the interim / short term period, where it is assumed that the Materials Recycling Facility is operational without future development east of its access handle to Newbridge Road (i.e. residential / commercial / marina uses on the Benedict Sand and Gravel site) being operational, then, whilst traffic warrants may not be met at that time, it is expected that on the basis of road safety considerations that traffic signals will be necessary for the Materials Recycling Facility. The intersection can, however, function in the short term under STOP sign control, subject to supplementary measures including signage and a convex mirror to overcome road safety concerns associated with generated heavy vehicle movements (19 metres long semi-trailers) with low acceleration rates (laden) and limited sight lines to the north from the Lot 309 bridge connection to Brickmakers Drive.

An interim / short term priority (Stop Sign) control plan of the Lot 309 / Brickmakers Drive junction is shown in **Figure 2-7** including convex mirror (opposite the junction) and advance truck turning warning signs on the Brickmakers Drive approaches (noting that no trucks associated with

the Materials Recycling Facility will be able to turn from or into the southern leg of Brickmakers Drive at this junction).

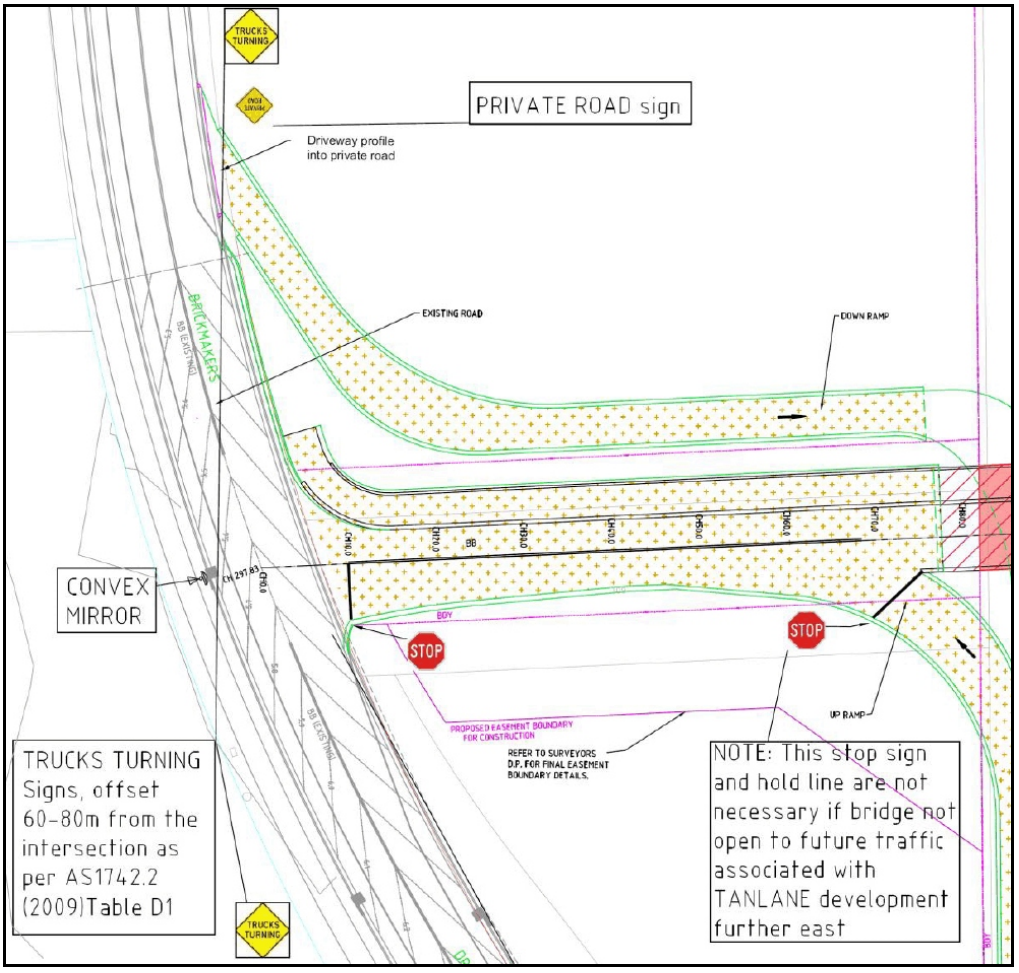


Figure 2-7: Interim Intersection Control.

- *A Construction Traffic Management Plan detailing construction vehicle routes, number of trucks, hours of operation, access arrangements and traffic control should be submitted to Council prior to the issue of a construction certificate.*

Comment: This matter is typically conditioned for development applications, however, the hours of operation proposed during construction phase would generally be controlled by acoustic considerations. It is expected that no work would occur on Sundays and public holidays, with the start time being 7:00 am on both weekdays and Saturdays, with work ceasing at 6:00 pm.

For the construction of the ramps, the construction traffic routes for AV & MRV trucks would be to approach and depart the site via Newbridge Road only via the existing access handle, under a traffic control plan. No use of Brickmakers Drive by construction trucks would occur. All vehicles would enter and leave the Site in a forward direction.

A construction compound would be provided within Lot 6, DP 1065574 and no disruption to the operation of Brickmakers Drive would occur.

For the construction of the Materials Recycling Facility, construction traffic would be directed to use the completed ramps with no direct access via Newbridge Road. The construction traffic routes for AV & MRV trucks would be to approach and depart the Site via Newbridge Road only via the segment of Brickmakers Drive between Newbridge Road and the proposed ramps under a traffic control plan.

2.3.2.3 Response to Submission of Liverpool City Council

Traffic Management

In relation to the estimated daily truck generation of 324 trucks per day, this is not excessive, particularly if consideration is given to the estimated peak hour number of trucks generated, which equates to some 38 trucks on average (19 in, 19 out), or 1 to 2 trucks either arriving or departing the Site every 2 minutes, which is the approximate cycle time of nearby key intersections.

Traffic impacts are usually based on peak hour impacts having regard to the surrounding street network, particularly:

- the residential streets and associated impacts during commuter peak hours,
- residential amenity, and
- pedestrian safety of the precinct.

It can be readily concluded that such low volumes of truck traffic would have a minimal impact on traffic flow efficiency (i.e. intersection performance), residential amenity and road safety performance level for the precinct. The number of trucks generated by the proposed Materials Recycling Facility would be well below normal fluctuations in peak hourly truck traffic in the precinct. Even if a 20% variation in peak hourly truck traffic generation occurs, the proposal would not be noticeable in terms of precinct performance.

The concern raised about the directional distribution of generated truck traffic is of no real significance. The concern appears to be based upon the use of Brickmakers Drive south of Lot 309, which is proposed to be controlled by both physical measures at the intersection of Brickmakers Drive/Lot 309 and by an Operational Traffic Management Plan.

Car Parking Provision

Council's submission states that the proposed parking provisions are not compliant with Council's Development Control Plan, however, on-site car parking does comply with the

Council's requirements. This aspect of the proposed development is discussed in more detail in **Part 2.18** of this report.

2.3.2.4 Response to Boral

Incomplete Analysis - Public Transport

With regard to the matter of public transport services in the region, whilst it could be detailed with respect to bus services and nearest bus stop, the number of workers associated with the proposed Materials Recycling Facility is low at some 45 persons, 20 of whom are truck drivers who use the trucks for transport and the residual 25 persons arrive by car or other means. Council requires 1 car parking space per 2 staff which leaves 12 to 13 persons who require transport. It is usual that some of these arrive as car passengers with other staff, typically 20% (i.e. 2 to 3 persons) and others are dropped off/picked up or use public transport. Therefore, up to 10 persons may need to use public transport services along Newbridge Road. This level of patronage is too low to justify detailed public transport analysis.

Ingress and egress to the Site

The intersection of Newbridge Road / Brickmakers Drive / Governor Macquarie Drive operates at a poor Level of Service F condition during the weekday AM & PM commuter peak hour periods (refer to pages 23, Table 5.1 of the EMM submission for Investa Land Pty Ltd), however, the peak traffic generation level associated with the proposed Materials Recycling Facility equates to 1 to 2 additional vehicles either entering or leaving the Site every two minutes, which is less than hourly fluctuations through the intersection which currently occurs during the AM & PM commuter peak hours over a typical week.

Accordingly, the subject intersection performance is not sensitive to the additional traffic loads generated by the proposed Materials Recycling Facility and would not be readily perceivable.

2.4 Air Quality

2.4.1 Issue Description

- The impact of odour arising from the Project has not been considered.
- Incorrect selection of future receptor locations within the Georges Fair development area and subsequent under prediction of maximum air quality impacts from the proposal.
- Exclusion of potential impacts of emissions from the existing Benedict Sand and Gravel facility in the assessment of cumulative impacts.
- Use of a meteorological dataset (2005) that does not represent worst case dispersion conditions for receptors in the Georges Fair development area.
- A number of uncertainties associated with the emission factors used in compiling the emissions inventory for the proposal.

2.4.2 Response

Part 6 of the Environmental Assessment deals with the impact the proposed Materials Recycling Facility would have on air quality. Appendix 10 of the Environmental Assessment is a report prepared by PAEHolmes titled *Air Quality Impact Access. Proposed Materials Recycling Yard at Moorebank*, dated 22 March 2010.

The issues raised above relate to Part 6 and Appendix 10 of the Environmental Assessment.

In order to address the issues raised, a revised Air Quality Assessment has been prepared by Pacific Environment Limited titled *Air Quality - Response to Submissions. Proposed Materials Recycling Yard At Moorebank. Moorebank Recyclers Pty Ltd.* ((the **PEL Report**), dated 19 June 2013, a copy of which is at **Attachment 11**.

The PEL Report states:

> *The original air quality assessment (AQA) for the proposed materials recycling yard at Moorebank was completed by Pacific Environment (formerly PAEHolmes) in late 2009/early 2010(PAEHolmes, 2010). Since this time there have been advances in dispersion model methodologies adopted in Australia, updates to the emission factors, and minor modifications to the proposed operations.*
>
> *Further to the public exhibition of the Environmental Assessment, a number of*

submissions were received regarding the AQA, including a technical review of the original AQA completed on behalf of Investa (EMM, 2013).

This report presents an update to the AQA using current dispersion modelling methodologies and emission factors and addresses the concerns raised through the public submission process. It also takes into account the reporting and conclusions of the Joint Meeting of Expert Witnesses which took place in May 2013 between Judith Cox of Pacific Environment and Scott Fishwick of Environ for the Land and Environment Court proceedings Moorebank Recyclers Pty Ltd v Liverpool City Council and Tanlane Pty Ltd (No. 30141 of 2013).

2.4.2.1 Sensitive Receiver Locations

Figure 2-8 below is an extract from Figure 1 of the PEL Report which shows the location of the sensitive receivers adopted for the PEL Report. The locations have been selected at the boundary of the Georges Fair residential development, the proposed marina development and potential future residences on the Benedict land.

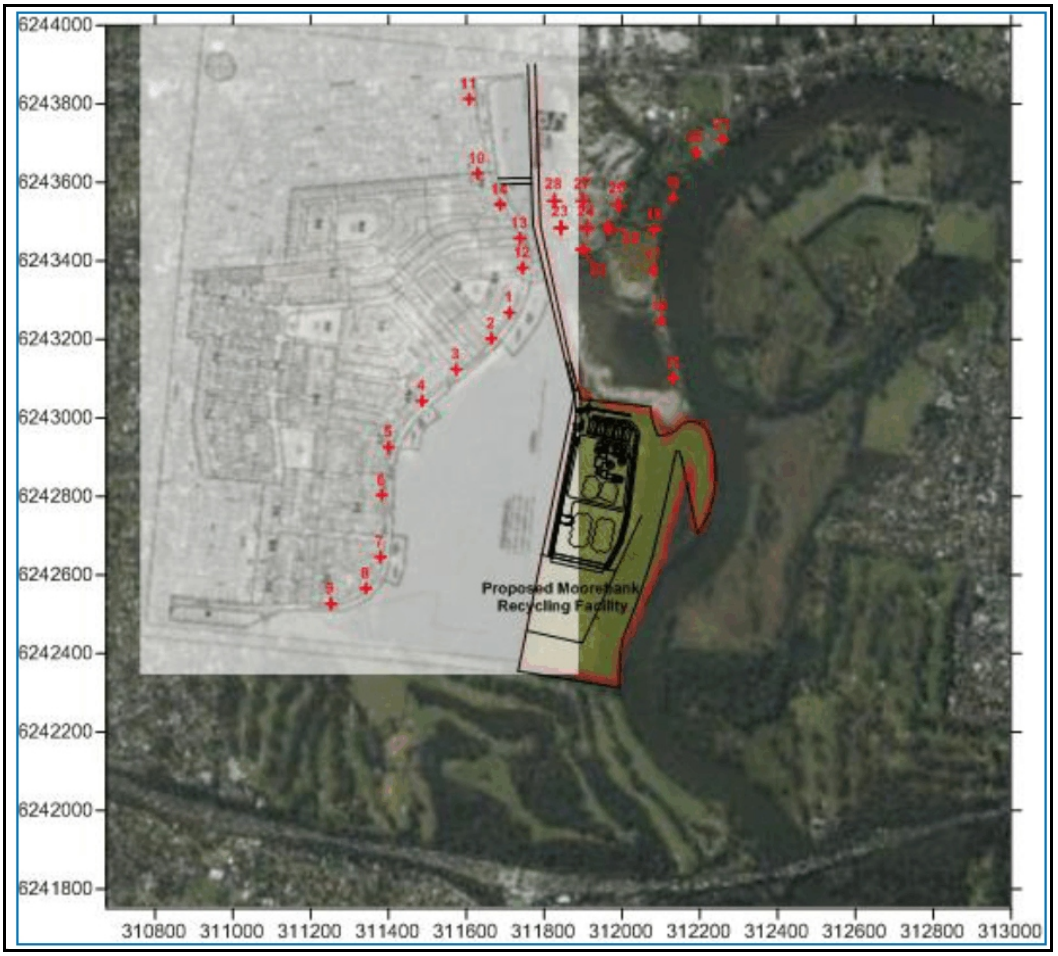


Figure 2-8: Extract from PEL Report showing location of sensitive receivers.

2.4.2.2 Existing Air Quality

In 2010, PAEHolmes used monitoring data collected at the NSW EPA monitoring station located at Rose Street, Liverpool to determine existing background levels. One submission suggested that these data may not be representative of the existing air quality in the area due to a tree obstruction. It has been confirmed with NSW EPA that the tree was removed in January 2013.

Table 1 of the PEL Report, an extract from which is at **Figure 2-9** below, compares the annual average PM_{10} concentrations recorded at the NSW EPA Liverpool site (located approximately 5km west of the Moorebank Recyclers' land) with data collected at Chullora (located approximately 9km north-east of the Moorebank Recyclers' land) and Earlwood (located 16km east of the Moorebank Recyclers' land). As these data show, the measured concentrations are very similar at all three sites. It has also been confirmed with NSW EPA that it has found no evidence that the tree removal has had any significant effect on the PM_{10} monitoring data.

Table 1: Annual average PM_{10} concentrations – EPA ambient monitors ($\mu g/m^3$)

Date	Liverpool	Chullora	Earlwood
2002	23.8	--	24.2
2003	21.7	24.0	21.8
2004	21.6	22.5	22.4
2005	21.5	22.2	22.6
2006	21.6	21.9	23.4
2007	19.0	19.5	20.5
2008	17.6	19.5	19.3
2009	25.9	26.1	27.1
2010	17.0	17.7	17.9
2011	(a)	19.9	18.1
2012	19.8	18.1	19.6
AVERAGE	**21.0**	**21.1**	**21.5**

Note:
a) Less than 75% data capture required to calculate the annual average

Figure 2-9: Extract from Table 1 of the PEL Report showing annual average PM_{10} concentrations.

The elevated concentrations in 2009 were widespread across the State due to the extended drought and a number of dust storms during the year. Conversely, the low annual concentrations measured in 2010 - 2012 are due to above average rainfall.

The existing annual average PM_{10} concentration was assumed to be 22 $\mu g/m^3$, based on long-term monitoring data. There are no TSP data collected in the area, but this parameter can be broadly estimated from the PM_{10} measurements by assuming that 40% of the TSP is PM_{10}. This relationship was obtained from data collected by co-located TSP and PM_{10} monitors operated for long periods of time in the Hunter Valley and is considered conservative when applied to an urban airshed. There are no such data available for Sydney. Use of this relationship on the adopted PM_{10} annual average of 22 $\mu g/m^3$ gives an existing annual average TSP concentration of approximately 55 $\mu g/m^3$. Existing dust deposition levels were assumed to be 2 g/m^2/month, which again is

considered conservative for the current study location.

In summary, for the purposes of assessing potential air quality impacts, the following existing air quality levels are assumed:

- Annual average PM_{10} concentration - 22 $\mu g/m^3$
- 24-hour average PM_{10} concentrations - daily varying
- Annual average TSP concentration - 55 $\mu g/m^3$
- Annual average dust deposition - 2 g/m^2/month.

2.4.2.3 Dispersion Meteorology

A review of the air assessment presented in the submission by Investa commented that the meteorological dataset (2005) used in the original AQA does not represent worst-case dispersion conditions for receptors in the Georges Fair development area.

Table 2 of the PEL Report, an extract from which is at **Figure 2-10**, presents a comparison of the percentage of winds from the south-eastern quadrant as presented in Table 4.1 of Investa submission and as calculated by Pacific Environment.

Table 2: Frequency of winds from the south-eastern quadrant

Year	% of hours (per Table 4.1 of EMM, 2013)	% of hours (per Pacific Environment)
2005	26	25
2006	30	28
2007	28	27
2008	27	24
2009	29	29
2010	25	25
2011	31	23

Figure 2-10: Frequency of winds from the south-eastern quadrant.

Whilst there are slight differences in the calculated values, other than 2009, 2006 has the highest percentage of winds from the south-eastern quadrant (as calculated by Pacific Environment).

While 2009 and 2006 show comparable winds from the south east, to explicitly address the contention made in the Investa submission, the 2006 data set has been adopted in this instance.

2.4.2.4 Emission Calculations

Moorebank Recyclers

The emission inventory for the proposed Moorebank Recycling Facility has been updated to explicitly address the comments raised in the Investa submission around uncertainties in the emission inventory. This updated emission inventory uses the most current emission factors available, and incorporates all relevant controls which are proposed to be applied at the Moorebank Recyclers' site.

The activities which would occur on the Moorebank Recyclers' site and relevant controls are summarised in Table 3 of the PEL Report, an extract from which is at **Figure 2-11**.

Table 3: Proposed operations and controls at Moorebank Recycling Facility

Year	Controls	% control assumed	Reference
Delivery trucks entering and leaving site on sealed access road	Tar sealed Regular water application Sweeping	Moderate silt loading assumed	US EPA, 2011
Delivery trucks entering and leaving site on unsealed internal roads	Cement sealed Regular water application	75	NPI, 2012
Vehicles unloading to tipping zone stockpiles	Water sprays/fog cannon	70	NPI, 2012
Pulverising of larger material	-	0	-
Excavators loading from stockpiles	-	0	-
Excavators unloading to crusher	-	0	-
Primary crushing	Wet suppression and indoors	85	NPI, 2012
Secondary crushing	Wet suppression and indoors	85	NPI, 2012
Screening	Wet suppression and indoors	85	NPI, 2012
Loading to product stockpiles	Water sprays	70	NPI, 2012
Loading from product stockpiles to trucks	Water sprays	70	NPI, 2012
Product trucks on paved surfaces entering/leaving site	Tar sealed Regular water application Sweeping	Moderate silt loading assumed	US EPA, 2011
Product trucks on unpaved surfaces entering/leaving site	Cement stabilised road base Regular water application	75	NPI, 2012
Vehicles exhausts/tyre & brake wear		0	
Wind erosion from tipping stockpiles	Water sprays/surface crusting	50	NPI, 2012
Wind erosion from product stockpiles	Water sprays/surface crusting	50	NPI, 2012
Wind erosion from open areas	Water sprays/surface crusting	50	NPI, 2012

Figure 2-11: Proposed operations and controls at Moorebank Recycling Facility.

Trucks entering and leaving the site on sealed roads

The emission estimate of wheel generated dust associated with hauling material to and from the Site on the sealed access road is based on the US EPA AP-42 emission equation for paved surfaces.

There is limited information available regarding the silt loading of paved roads at industrial facilities, and the AP-42 documentation does not provide any default numbers

for waste recycling facilities. As the access road would be tar sealed, regularly watered and swept, and there would be a wheel wash at the exit of the main body of the Site, it has been assumed to have a silt loading of 2 g/m^2. To provide some context, this is more than three times the silt loading of 0.6 g/m^2 provided in AP-42 for publically accessible roads carrying less than 500 vehicles per day.

The mean vehicle weight used in the emissions estimates is an average of the loaded and unloaded gross vehicle mass, to account for one empty trip and one loaded trip. The trucks which would be used would be on average, 42.5 tonne loaded, 21.3 tonne unloaded, resulting in a mean vehicle weight of 32 tonne, with an average load of 21.1 tonne.

Trucks entering and leaving the site on unsealed roads

The emission estimate of wheel generated dust associated with hauling material to and from the Site on unsealed roads is based on the US EPA AP-42 emission equation for unpaved surfaces at industrial sites.

The mean vehicle weight used in the emissions estimates is also an average of the loaded and unloaded gross vehicle mass, to account for one empty trip and one loaded trip. The trucks which would be used would be on average, 42.5 tonne loaded, 21.3 tonne unloaded, resulting in a mean vehicle weight of 32 tonne, with an average load of 21.1 tonne.

Vehicles exhausts/tyre & brake wear

As the emission equation for paved roads only accounts for emissions due to resuspended road surface material, emissions of PM_{10} from road vehicles (both 'hot' exhaust and non-exhaust) were calculated based on the method used in the NSW GMR 2008 emissions inventory. The method involves the use of fleet-weighted average-speed emission factors for various vehicle types, as supplied by the EPA. Five road types (residential, arterial, commercial arterial, commercial highway, highway/freeway) are also specified in the emissions inventory. In this study only the emission factors for articulated trucks on commercial arterial roads in 2016, in conjunction with an average speed of 25 km/h we used.

Vehicles unloading to tipping zone stockpiles/excavators loading and unloading

Each tonne of material loaded/unloaded will generate a quantity of particulate matter which will depend on the wind speed and the moisture content according to the US EPA emission factor equation. This equation was applied to the calculations for the following activities:

- Vehicles unloading to tipping zone stockpiles
- Excavators loading from stockpiles
- Excavators unloading to crusher

- Loading to product stockpiles
- Loading from product stockpiles to trucks.

Pulverising of larger material

There are no specific emission factors for pulverizing of materials and, as such, the emission factor of 0.0027 kg/t for tertiary crushing (uncontrolled) taken from the US EPA emission factors for Crushed Stone Processing and Pulverized Mineral Processing was used.

It was assumed that 10% of material received annually would require pulverising. i.e. 50,000 tpa.

Primary crushing/ Secondary crushing/Screening

The emission factors used for crushing and screening have been taken from the US EPA emission factors for Crushed Stone Processing and Pulverized Mineral Processing and are shown Table 4 of the EPL Report, an extract form which is at **Figure 2-12**.

Table 4: Crushing and Screening Emission Factors (kg/t)

Activity	TSP	PM_{10}
Primary and secondary crushing (uncontrolled)	0.0027	0.0012
Screening (uncontrolled)	0.0125	0.0043

Figure 2-12: Crushing and screening emission factors (kg/t).

There are no emission factors for primary or secondary crushing and tertiary crushing can be used as an upper limit for primary or secondary crushing.

Wind erosion from tipping stockpiles/ product stockpiles/ open areas

Section 13.2.5 (Industrial Wind Erosion) of AP-42 provides a refined method to calculate emissions from wind erosion, however, as none of the data required to apply this method are available, the emission factor for wind erosion has been taken from the US EPA emission factors for mining.

The annual emissions are calculated based on these emission rates but the hourly emissions applied in the dispersion modelling have been varied according to the cube of the hourly average wind speed.

Emissions were calculated for the proposed maximum capacity of 500,000 tpa. Based on the assumption that the Site would operate 292 days per year, this equates to a daily average of 1,712 t/day. It is acknowledged that there will be occasions when more than this quantity of material would be received and processed in a single day. Therefore, to ensure the worst-case 24 hour average PM_{10} concentrations at the sensitive receivers are appropriately predicted, an additional (maximum 24-hour) PM_{10} inventory was developed

based on the assumption that there would be a maximum of 3,000 t/day.

A summary of the annual emissions is presented in Table 5 of the PEL Report, and extract from which is at **Figure 2-13**.

ACTIVITY	Annual Emissions		Worst-case emissions for 24-hour average
	TSP emissions (kg/y)	PM_{10} emissions (kg/y)	PM_{10} emissions (kg/y)
	500, 000 tpa		3,000 t/day = 876,000 tpa
Delivery trucks on paved surfaces entering/leaving site	8,398	1,612	2,824
Delivery trucks on unpaved surfaces entering/leaving site	7,033	1,505	2,636
Vehicles unloading to tipping zones	426	202	353
Pulverising	135	60	105
Excavators loading from stockpile	1,421	672	1,177
Excavators unloading to crusher	1,421	672	1,177
Primary crushing	405	180	315
Secondary crushing	405	180	315
Screening	1,875	645	1,130
Loading to product stockpiles	426	202	353
Loading from product stockpiles to trucks	426	202	353
Product trucks on paved surfaces entering/leaving site	8,398	1,612	2,824
Product trucks on unpaved surfaces entering/leaving site	7,033	1,505	2,636
Vehicles exhausts/tyre & brake wear	130	130	130
Wind erosion from tipping stockpiles	514	257	257
Wind erosion from product stockpiles	238	119	119
Wind erosion from open areas	1,675	837	837
TOTAL	**40,358**	**10,590**	**17,544**

Figure 2-13: Annual Emissions - Moorebank Recyclers.

Benedict Sand and Gravel

Comment was made that the dispersion modelling in the original AQA had excluded the potential impacts of emissions from the existing Benedict Sand and Gravel facility in the assessment of cumulative impacts.

As far as can be ascertained, there is no publically available information on the precise operations which occur at the Benedict Sand and Gravel facility, no air quality impact assessment for the operations, or any measurement of ambient air quality in the immediate vicinity of the site.

The facility has two Environment Protection Licences (EPL 10490 and EPL 4612). Neither of these EPLs requires any ongoing air quality monitoring to be completed.

- EPL 10490 allows for the recovery and storage of general solid waste (non-putrescible) and waste tyres to a maximum of 100,000 tonnes per annum.

- EPL 4621 allows for land-based extractive activities and crushing and grinding to a maximum of 100,000 tonnes per annum.

On the basis of the EPLs, a high-level emission inventory was developed for the approved operations of 100,000 tonnes per annum. Due to the uncertainties surrounding the operations at Benedicts Sand and Gravel, an additional inventory for PM_{10} emissions was developed assuming 500,000 tonnes per annum of material is received and processed. This emission inventory was used for the determination of the worst-case 24-hour average PM_{10} concentrations from the facility.

It is assumed that standard dust control measures are employed at the Benedict Sand and Gravel site, including watering of access roads and wind erosion areas.

The activities assumed to be occurring at the Benedict Sand and Gravel facility are:

- Trucks entering and leaving the site on unsealed roads
  - It is assumed that water is applied to the road surface to minimise the generation of dust.
- Excavators loading material from stockpiles.
- Excavators unloading material to crushers/screens.
- Screening and crushing of sand.
- Wind erosion
  - It is assumed that the entire site (7 ha) is a source of wind erosion and that water is applied to the exposed areas to minimise the generation of dust.

Emission factors were applied to develop the emission inventory for the operations at the Benedict Sand and Gravel Facility. A summary of the annual emissions is presented as Table 7 of the PEL Report, an extract from which is provided as **Figure 2-14**.

ACTIVITY	TSP emissions (kg/y)	PM_{10} emissions (kg/y)	PM_{10} emissions (kg/y)
	100, 000 tpa		500,000 tpa
Trucks on unpaved surfaces entering/leaving site	2,675	687	3,437
Excavators loading from stockpile	284	134	672
Excavators unloading to crusher/screens	284	134	672
Sand Processing (crushing and screening)	1,520	550	550
Wind erosion	2,996	1,498	1,498
TOTAL (kg/y)	**7,760**	**3,004**	**6,829**

Figure 2-14: Annual Emissions - Benedict Sand and Gravel.

2.4.2.5 Dispersion Model Selection

The original AQA report (PAEHolmes 2010) used the AUSPLUME dispersion model which is a steady state Gaussian plume dispersion model developed by the Victorian EPA and frequently used in Australia for simple near-field applications. AUSPLUME is based on the US EPA Industrial Source Complex (**ISC**) model. Since December 2006, ISC has been replaced by AERMOD as the US EPA's recommended steady-state plume dispersion model for regulatory purposes as it provides more realistic results.

A significant feature of AERMOD is the Pasquill-Gifford stability based dispersion is replaced with a turbulence-based approach which uses the Monin-Obukhov length scale to account for the effects of atmospheric turbulence based dispersion.

The AERMOD system includes AERMET, used for the preparation of meteorological input files and AERMAP, used for the preparation of terrain data.

Terrain data was sourced from NASA's Shuttle Radar Topography Mission (**SRTM**) Data (3 arc-second (~90m) resolution) and processed within AERMAP to create the necessary input files.

AERMET requires surface and upper air meteorological data as input. Surface data, including cloud cover was sourced from the Bankstown Airport AWS. Where cloud cover data were missing, they were substituted with values generated by TAPM (The Air Pollution Model). Appropriate values for three surface characteristics are required for AERMET as follows:

- Surface roughness, which is the height at which the mean horizontal wind speed approaches zero, based on a logarithmic profile.
- Albedo, which is an indicator of reflectivity of the surface.
- Bowen ratio, which is an indicator of surface moisture.

Values of surface roughness, Bowen ratio and albedo were determined based on a review of aerial photography for a radius of 3 km centred on the Moorebank Land. Default values for urban where chosen for the entire area.

Annual average concentration

The predicted annual average ground-level concentrations and deposition rates at the sensitive receivers are presented in Table 8 (TSP annual average), Table 9 (PM_{10} annual average) and Table 10 (dust deposition annual average monthly deposition rates) of the PEL Report.

Contour plots of the indicative concentrations which could potentially be reached under the conditions modelled are presented in Figure 2 to Figure 7 of the PEL Report.

24-hour average concentrations

Incremental

The maximum predicted 24-hour average ground level concentrations (**glcs**) of PM_{10} at each sensitive receiver are presented in Table 11 of the PEL Report, an extract from which is at **Figure 2-15**. These have been predicted based on the worst-case activities at the proposed operations at Moorebank Recycling and Benedicts Sand and Gravel Processing.

Table 11: Predicted concentrations at sensitive receivers – maximum 24-hour average PM_{10} (µg/m³)

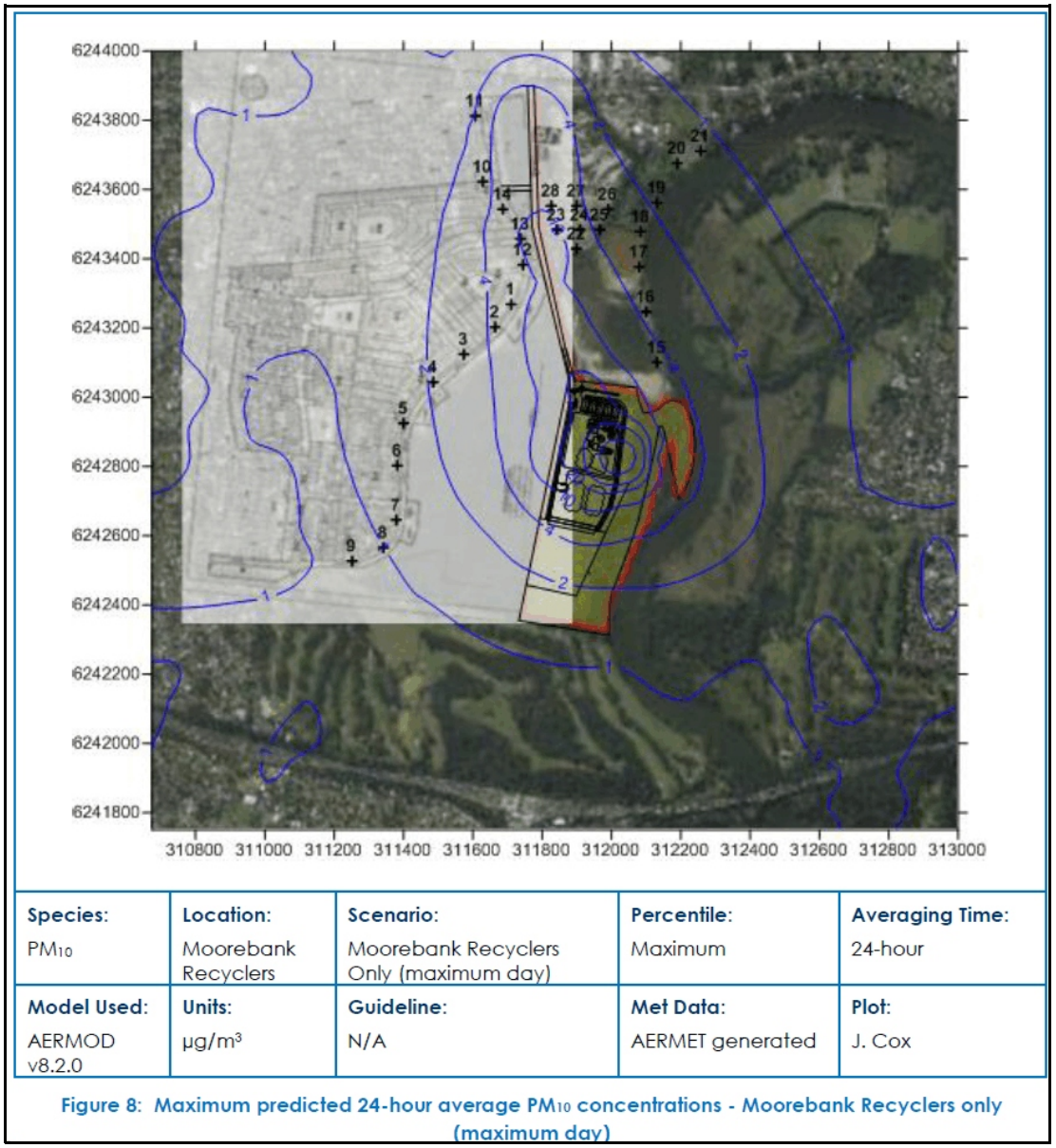
Location	ID	X (m) MGA Zone 56	Y (m) MGA Zone 56	Maximum 24-hour average PM_{10} concentrations (µg/m³) Project only *Impact Assessment Criteria* N/A	Benedicts Sand *Impact Assessment Criteria* N/A	Project + Benedicts *Impact Assessment Criteria* N/A
Georges Fair	1	311711	6243268	6.3	0.9	7.2
	2	311665	6243203	4.5	0.7	5.2
	3	311574	6243124	2.9	0.5	3.4
	4	311486	6243044	2.1	0.3	2.4
	5	311400	6242925	1.6	0.3	1.8
	6	311382	6242803	1.4	0.2	1.6
	7	311379	6242646	1.2	0.2	1.4
	8	311342	6242565	1.0	0.2	1.2
	9	311252	6242527	0.8	0.1	1.0
	10	311629	6243622	3.1	1.7	4.8
	11	311608	6243812	2.1	1.3	3.4
	12	311745	6243382	8.7	1.7	10.3
	13	311738	6243457	11.0	2.3	13.2
	14	311687	6243543	5.2	2.2	7.4
Proposed Marina	15	312131	6243101	4.9	0.6	5.4
	16	312100	6243246	3.7	1.0	4.6
	17	312080	6243376	3.0	1.8	4.7
	18	312084	6243479	2.5	2.7	4.9
	19	312131	6243561	1.9	2.6	4.3
	20	312190	6243675	1.4	1.8	3.1
	21	312257	6243711	1.1	1.3	2.3
Future residences on Benedicts Land	22	311899	6243429	6.0	Operations assumed to have ceased	6.0
	23	311843	6243484	9.8		9.8
	24	311910	6243484	5.0		5.0
	25	311966	6243484	3.7		3.7
	26	311991	6243542	3.0		3.0
	27	311899	6243553	4.6		4.6
	28	311826	6243553	9.3		9.3

Figure 2-15: Predicted concentrations at sensitive receivers - maximum 24 average PM_{10}.

It is important to note that the cumulative predicted glcs do not always equal the sum of the predicted glcs from each individual operation as the maximum predicted glc from the individual sites may occur on different days than the maximum cumulative glc.

A contour plot showing the maximum predicted 24-hour average concentrations from the

proposed operations at the Site is shown in Figure 8 of the PEL Report, an extract from which is at **Figure 2-16**.



Species:	Location:	Scenario:	Percentile:	Averaging Time:
PM_{10}	Moorebank Recyclers	Moorebank Recyclers Only (maximum day)	Maximum	24-hour
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
AERMOD v8.2.0	µg/m³	N/A	AERMET generated	J. Cox

Figure 8: Maximum predicted 24-hour average PM_{10} concentrations - Moorebank Recyclers only (maximum day)

Figure 2-16: Maximum predicted 24-hour average PM_{10} concentrations - Moorebank Recycling only (maximum day).

Cumulative 24-hour PM_{10} concentrations

It is difficult to accurately predict the cumulative 24-hour PM_{10} concentrations using dispersion modelling due to the difficulties in resolving (on a day to day basis) the varying intensity and duration of activities, the weather conditions at the time of the activity, or combination of activities. The difficulties in predicting cumulative 24-hour impacts are compounded by the day to day variability in ambient dust levels and the spatial and temporal variation in any other anthropogenic activity e.g. agricultural activity, bushfires etc., including mining in the future. Experience shows that the worst-

case 24-hour PM_{10} concentrations are often strongly influenced by other sources such as bushfires and dust storms, which are essentially unpredictable.

Due to the difficulties outlined above, cumulative 24-hour average concentrations have been evaluated using a statistical approach (Monte Carlo Simulation). This approach has been provided to achieve the objectives of a Level 2 Assessment (i.e. refined dispersion modelling technique using site-specific input data). The cumulative assessment focuses on the receptors predicted to be most impacted by the proposed operations at Moorebank Recycling, namely R1, R12 and R13. Pacific Environment has received feedback from EPA that if used appropriately, a Monte Carlo approach is an appropriate way to characterise cumulative 24-hour average concentrations and it has been applied in the assessment of a number of recent large-scale extractive operations, such as open-cut coal mines.

The Monte Carlo Simulation is a statistical approach which combines the frequency distribution of one data set (in this case background 24-hour average PM_{10} concentrations) with the frequency distribution of another data set (modelled concentrations at a given receptor). This is achieved by repeatedly randomly sampling and combining values within the two data sets to create a third, 'cumulative' data set and associated frequency distribution.

To generate greater confidence in the statistical robustness of the results, the Monte Carlo Simulation was repeated 250,000 times for each of the receptors. In other words, the same 1-year set of predicted (modelled) 24-hour PM_{10} concentrations due to the Project were added to 250,000 variations of the randomly selected background concentrations at each receptor (i.e. a different random background concentration is selected each time).

The background data used in the assessment were taken from the EPA monitoring stations at Liverpool, Chullora and Earlwood for the period January 2002 to 7 May 2013.

Individual 24-hour average glcs due to the proposed Moorebank Recycling Facility were then added to a random value from the above data set. This process is repeated 250,000 of times yielding the 'cumulative' data set, which is then presented as a frequency distribution. The same process was repeated with the sum of the 24-hour average glcs from the proposed Moorebank Recycling Facility and Benedicts Sand and Gravel.

The process assumes that a randomly selected background value would have a chance equal to that of any other background value from the data set of occurring on the given 'model day'. This is considered to be conservative as there is no consideration to prevailing wind directions, however, an analysis of the Monte Carlo method shows that, over sufficient repetitions, this yields a good statistical estimate of the combined and independent effects of varying background and Project contributions to total PM_{10}.

The results of this analysis are presented graphically in Figure 9 to Figure 11 of the PEL Report. The plots show the statistical probability of 24-hour average PM_{10} concentrations being above the EPA 24-hour average PM_{10} criterion of 50 $\mu g/m^3$.

It is noted that the actual number of exceedances per year due to cumulative impacts

cannot be predicted precisely and would depend on actual Project activities, other activities in the area, weather conditions, and background levels in the future.

Whilst the actual number of exceedances per year cannot be predicted with certainty, the analysis shows that when cumulative impacts are considered, the probability of exceeding the impact assessment criterion of 50 $\mu g/m^3$ is not much different than the probability of it already being exceeded under background conditions.

Conclusions

Updated dispersion modelling completed for the proposed operations has demonstrated that it can be appropriately managed so as to comply with all the relevant NSW EPA air quality impact assessment criteria and not adversely affect local air quality. These criteria have been set at a level designed to safeguard the health and amenity of the general public.

The incremental change to 24-hour average PM_{10} concentrations due the proposed operations, are minimal compared to the peak concentrations which result from natural events such as dust storms and bushfires.

2.4.2.6 Odour

The facility would only receive non-putrescible waste materials. Putrescible waste can be defined as organic material which is capable of being decomposed which often leads to the release of an offensive odour. Non-putrescible material is material which cannot be decomposed by microorganisms and, hence, would not generate this odour. The type of non-putrescible material likely to be received on-site may include concrete, bricks, asphalt, sandstone and sand from the building and construction industry. All loads would be inspected prior to entering the Site and if any putrescible waste is found, the load would be rejected.

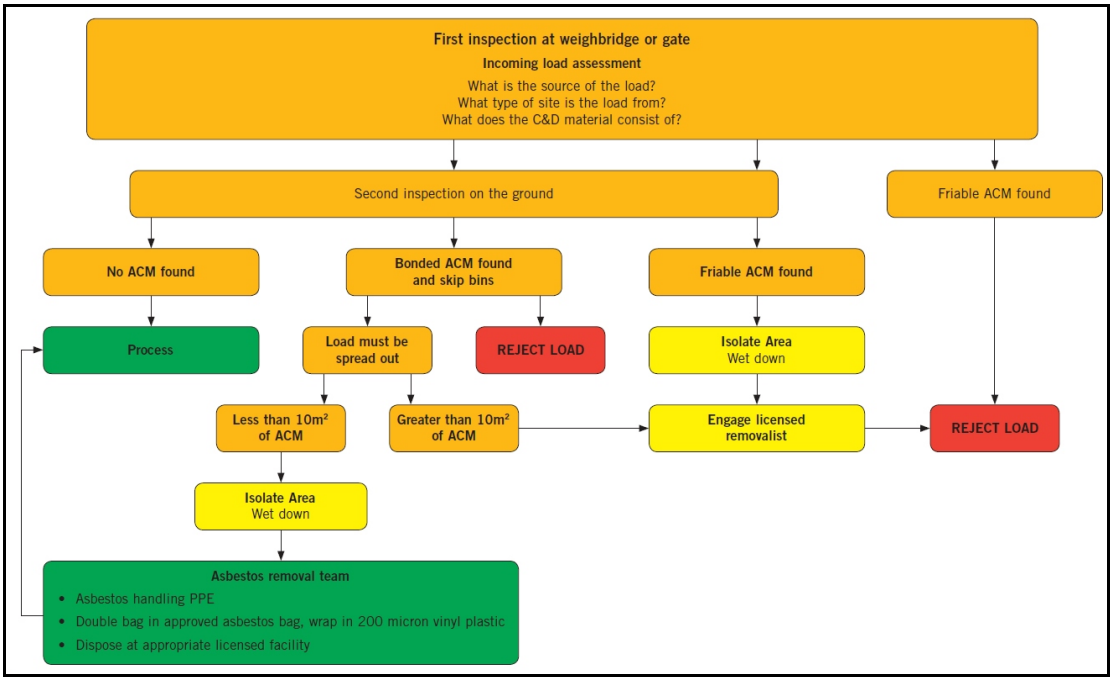
2.4.2.7 Asbestos

In accordance with the Workcover NSW guide *Management of asbestos in recycled construction and demolition waste*, the proposed Materials Recycling Facility would implement a waste screening and refusal procedure at weighbridge and the unloading area(s) to ensure only approved waste is accepted.

In addition to the multi-level inspection process shown in **Figure 2-17**, Moorebank Recyclers will:

- advise suppliers that asbestos and asbestos-containing material (ACM) will not be accepted.

- incorporate a 'no asbestos clause' in contracts.
- install highly visible signs indicating that NO ASBESTOS in C&D waste will be accepted.
- ensures that workers who receive and inspect C&D materials are trained and provided with suitable equipment to complete their tasks.
- have a site safety plan which documents a safe system of work.



Source: Workcover 2010

Figure 2-17: Asbestos-containing Material Inspection Process.

2.4.2.8 Silica

Extensive dust management measures will be applied at the Site to minimise the potential for any dust, including respirable crystalline silica, to reach the community.

It is also important to note, that whilst it is accepted there are a range of diseases which can be caused from workplace exposure to toxic dusts, in 2006, a Senate Inquiry on the subject stated:

> *... there have been no observances of silicosis arising from exposure to respirable crystalline silica in the community. This was not only the case in Australia, but overseas as well. Silicosis was seen as an industrial problem, not a community problem: any source of silica dust that is industrial is dissipated in terms of its intensity very rapidly by distance. So, although there is a theoretical possibility*

that somebody could be living next to a source of respirable silica dust, in practice nobody has ever found such a case.

This conclusion is agreeable with the statement made by the World Health Organisation that *... to date, there are no known adverse health effects associated with non-occupational exposure to quartz dust.*

2.4.2.9 Stockpile Management

Dust emissions from the stockpiles will be managed as summarised below:

- All aggregates will be kept damp.
- Uncrushed brick and concrete and sandstone:
  - Water sprays/foggers will be applied to the material as each load tips to the uncrushed/brick rubble/concrete rubble stockpiles.
  - Additional water will be sprayed over the stockpiles, a surface crust then forms which prevents dust emissions due to wind erosion.
  - Water sprays will be used when loading from the stockpiles to the primary crusher.
- Crushed road base (product):
  - The material will be moist when it exits the crusher and is loaded to the product stockpiles.
  - Due to the inherent moisture of the material, a surface crust then forms which prevents dust emissions due to wind erosion.
  - Irrigation-type water sprays/foggers will be used during the load-out process.

2.5 Noise

2.5.1 Issue Description

- The noise assessment relies upon data collected more than five years ago (February 2007) and it does not accurately depict current background noise levels in the vicinity of the Site.

- Background noise levels in the Georges Fair and proposed Benedict Sands residential areas are estimated to be substantially lower than those given in the Environmental Assessment, that is up to 8 - 11 dB lower.

- Without effective at source mitigation, exceedances of applicable noise criteria (as given in the INP) in residential locations is likely, ranging from marginal (2dB at Martin Crescent) to significant (6-11dB in future residential areas). The necessary mitigation measures are not provided in the Environmental Assessment.

- The site access (link road) is not consistently represented between the noise impact assessment and the site layout plans. The noise implications of this are that truck noise at the crossing (bridge) is not correctly estimated and will be higher than predicted.

- Noise data logger charts do not meet the requirements of the EPA that a minimum of seven valid days are needed to establish an appropriate baseline. In such instances the EPA recommends adoption of the lowest assessment background level (ABL) measured. The noise assessment does not present ABL data for each day.

- Derived noise criteria, particularly for future residential development on the Georges Fair and Benedict Sands sites, are not appropriate.

2.5.2 Response

Part 5 of the Environmental Assessment deals with the impact the proposed Materials Recycling Facility would have on the acoustic environment. Appendix 11 of the Environmental Assessment is a report prepared by Wilkinson Murray Pty Ltd titled *Moorebank Recycling Facility. Noise Impact Assessment.*

The issues raised above relate to Part 5 and Appendix 11 of the Environmental Assessment.

In order to address the issues raised, a revised Acoustic Impact Assessment has been prepared by Wilkinson Murray titled *Moorebank Recycling Facility. Noises Impact*

Assessment (the **Wilkinson Murray Report**), dated 5 August 2013, a copy of which is at **Attachment 12**.

With regard to the impact the proposed development would have on residential development in Georges Fair and on any future residential development on the Benedict Sand land, the Environment Protection Authority, in its submission to the exhibition of the Environment Assessment stated:

> *There do not appear to be residences to the immediate west of Brickmakers Drive in the area described as the "Boral" area or the Georges Fair residential development. However, the area is zoned R3 residential in the Liverpool LEP, some houses do already exist and housing construction appears to be progressing from the west of this area eastwards towards Brickmakers Drive. Assuming residential development across this entire site is already approved then there are limited options for adding noise mitigation measures, such as setbacks or roadside noise mounds or barriers. Therefore, it does appear reasonable and appropriate to consider the entire area west of Brickmakers Drive as residential.*
>
> *The area to the north of the proposed facility, described as "Tanlane" in the Noise Impact Assessment Appendix and elsewhere as the Benedict Sands site does not, however, have any residences existing or being constructed on it and appears currently to be still operating as an industrial activity. It too is zoned R3 Residential in the Liverpool LEP and the EPA understands that there is an eighteen month sunset clause on the existing industrial activity. However, if residential development is not yet approved for this site then it would be unreasonable for EPA to not support the proposed facility because approval for residential development is not guaranteed or may not occur for some time in the future. In addition, conceivable there are options, such as setbacks, roadside barriers or building layout and design measures that are still available for noise mitigation measures that could be incorporated in any residential development approval.*

In recent proceedings in the Land and Environment Court (refer *Moorebank Recyclers Pty Ltd v Liverpool City Council*, Land and Environment Court proceedings No.30141 of 2013), Moorebank Recyclers sought the imposition of an easement over the Council land (Lots 308, 309 & 310, DP 1118048) to provide access to the proposed Materials Recycling Facility. When dealing with the suitability of the Moorebank Land for the proposed Materials Recycling Facility and, indeed, whether that land use was compatible with surrounding development, Justice Biscoe concluded:

> *98 On the evidence of the acoustic experts, I am satisfied that the noise impacts from use of the bridge, ramps and access road can be managed by noise mitigation measures as conditions of any development approval. In May 2013 the Environment Protection Authority (EPA) made a submission to the Department, with which I agree, that "if residential development is not yet approved for the [Tanlane] site then it would be unreasonable for EPA to not support the proposed facility because approval for residential development is not guaranteed or may not occur*

for some time in the future" and that noise mitigation measures could be incorporated in any residential development approval. Such noise mitigation measures are expressly contemplated in DCP 2008.

Having regard to the above, the amended acoustic report has concentrated on the impact the proposed development would have on residential development in the Georges Fair residential area.

The Wilkinson Murray Report provides an assessment of potential noise impacts from:

- the proposed Materials Recycling Facility,
- associated haulage activities, and
- construction of mitigation measures,

using guidelines from the NSW Environment Protection Authority (**EPA**) including:

- the Industrial Noise Policy (**INP**),
- the Environmental Criteria for Road Traffic Noise (**ECRTN**), and
- the Environmental Noise Control Manual (**ENCM**).

Ameliorative measures are recommended where necessary to ensure that appropriate noise criteria would be met.

Noise during the temporary construction phase has also been assessed in accordance with the EPA Interim Construction Noise Guidelines (**ICNG**).

The Wilkinson Murray Report also addresses subsequent minor changes to the proposed Materials Recycling Facility including:

- Modification to bund at the Site entrance.
- Increase in bund height along northern perimeter to 8 metres.
- Increase in bund height along western perimeter to 6 metres.

Existing Noise Environment

Unattended Noise Monitoring

Ambient noise levels were monitored at three residences between Tuesday 20 February 2007 and Monday 5 March 2007. These monitoring locations are shown as red circles in Figure 3-1 of the Wilkinson Murray Report, an extract from which is at **Figure 2-18** below, as follows:

- Residence 1 - No.37 Malinya Crescent, Moorebank
- Residence 2 - No.26 Elouera Crescent, Moorebank, and
- Residence 3 - No.41 Martin Crescent, Milperra.

Subsequent ambient noise data has been collected between Wednesday 1 May 2013 and Thursday 9 May 2013 at three residences also shown as red in **Figure 2-18** as follows:

- Residence 4S - No.16 Bushview Lane, Georges Fair
- Residence 2 - No.28 Elouera Crescent, Moorebank, and
- Residence 8 - No.81 Bradbury Street, Georges Fair.

The purpose of these measurements was to repeat one of the previous locations to gauge any change in background noise levels and to monitor at existing residences (one fronting Brickmakers Drive and one representative of receivers set back from Brickmakers Drive).

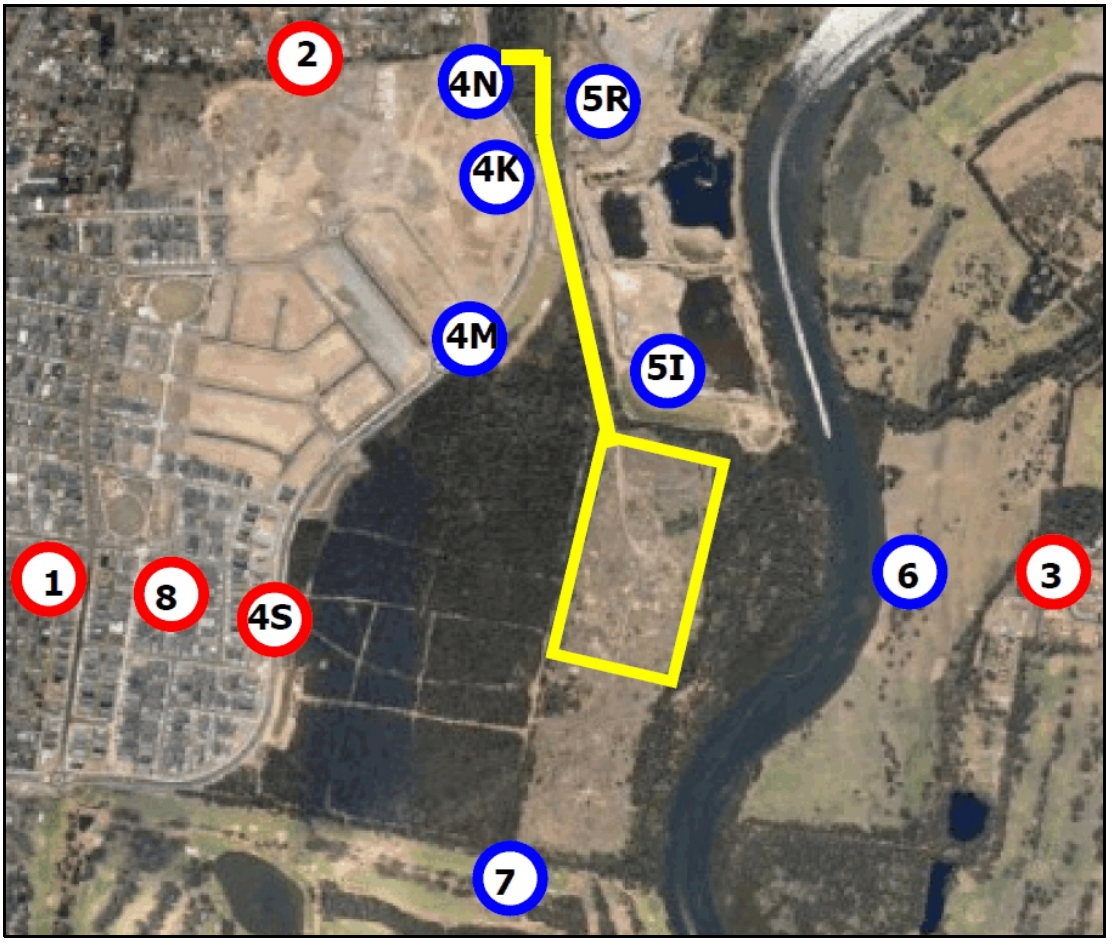


Figure 2-18: Unattended Noise Monitoring (Red) Locations & Prediction (Red and Blue) Locations.

Background noise levels may be expressed in terms of the Rating Background Level

(**RBL**), a standard measure of background noise which is used in the INP.

Measured values are provided in Table 3-1 of the Wilkinson Murray Report, and extract from which is at **Figure 2-19**.

Location	RBL (dBA)			$L_{Aeq,period}$ (dBA)		
	Day	Evening	Night	Day	Evening	Night
1 – Malinya	44	43	41	54	56	48
2 – Elouera (2007)	43	41	37	59	56	49
3 – Martin	43	39	36	56	59	47
4S – Bushview	47	44	37	62	59	57
2 – Elouera (2013)	42	40	35	53	48	45
8 – Bradbury	36	39	34	48	53	47
Note: 1. Daytime 7.00am-6.00pm, Evening 6.00pm-10.00pm, Night 10.00pm-7.00am.						

Figure 2-19: Measured RBL & $L_{Aeq,period}$ Values.

Noise levels were dominated by distant and local traffic and typical suburban noise. There was little existing industrial noise during site visits to install and collect the noise loggers.

At the proposed new residential receivers in the Georges Fair development (and Tanlane), future background noise levels will be affected by future traffic noise on Brickmakers Drive.

Predicted future traffic volumes on this road were originally provided by Lyle Marshall & Associates in 2011. The minimum future hourly daytime traffic volume was predicted to be 950 vehicles per hour, with 15% heavy vehicles at that time and a speed of 60 km/h.

Estimated daytime RBLs for each of the prediction locations are shown in Table 3-2 of the Wilkinson Murray Report, an extract from which is at **Figure 2-20** below.

Tanlane has been included for completeness even though the EPA has indicated in the absence of a development approval this receiver does not need to be considered.

The measured background noise levels from No.16 Bushview Lane (4S) which fronts Brickmakers Drive have been compared with the current hourly volumes (based on traffic counts north of Maddecks Avenue in October 2012) to understand the relationship between traffic volumes on Brickmakers Drive and background noise levels at existing residences which front Brickmakers Drive.

These data can then be used to determine future background noise levels at residences fronting Brickmakers Drive based on future projected traffic volumes.

Location	Daytime RBL (dBA)
1 – Malinya Cr	44
2 – Elouera Cr	43
3 – Martin St	43
4N – Georges Fair near Link Road (1)	48
4K – Georges Fair near kink in access road(1)	48
4M – Georges Fair Middle area(1)	48
4S – Georges Fair Southern area (Bushview Lane?) (1)	48
5R – Tanlane	46
8 – Bradbury St	37

Note: 1. At residences not shielded from Brickmakers Drive

Figure 2-20: Estimated Future Daytime RBL Values.

A traffic modelling report prepared by Road Delay Solutions in July 2010, (prepared for the Georges Fair development) indicates peak hour traffic volumes in 2011 were projected to be approximately 400-450 vehicles per hour, and by 2021 to be 1200-1500 per hour in the peak hours (depending on which section of Brickmakers Drive), with the higher numbers just south of the proposed new ramps to the access road.

Currently, during daytime hours, vehicle volumes range between approximately 250-750 per hour, with the lower volumes occurring between 10:00 am and 2:00 pm and the higher volumes in the am and pm peak periods. The existing traffic count data from 2012 shows the projected 2011 data (prepared by Road Delay Solutions) is already being exceeded.

Using Roads and Maritime Services (**RMS**) published economic assessment data (Appendix C of the Wilkinson Murray Report), it is possible to estimate traffic volumes in the non peak hour periods (the period of day between 10:00 am and 2:00 pm). Traffic volumes are likely to be between 53-70% of the average of the am and pm peak periods. The RMS expected percentage range is marginally high, based on the actual October 2012 hourly counts, which shows an average of peak hours of approximately 750 vehicles with a minimum of 250 vehicles (i.e. the non peak hours are approximately 33% rather than between 535 and 70%). On this basis, there is no reason to believe the current percentages of average am and pm flows would not remain in the future, such that during the middle of the day in 2021 the hourly volumes in non peak hours are a similar (33%) percentage of the projected future peak hour flows estimated as (1200-1500); 33% of 1200-1500 is estimated to be approximately 400-500 vehicles. These traffic volumes (400-500) are lower than those projected by Lyle Marshall and Associates in 2011. The Lyle Marshall data are more in line with the RMS percentage range of 53-70% of the average am and pm peak hour flows.

The current traffic flow data indicate vehicle volumes of 400-500 occur in the shoulder peak periods. Review of existing background data at Bushview Lane indicates peak hour and shoulder peak background levels between 7:00 am - 10:00 am and between 2:00 pm - 6:00 pm often at 50dBA or higher and mostly above 48dBA.

A review of the background noise data and traffic volumes, indicates a weekday RBL of 48dBA would apply to residences fronting Brickmakers Drive in the future when the Materials Recycling Facility has reached its maximum nominated capacity of 500,000 tonnes per annum, which is expected to be in 2018.

The weekday background noise levels away from Brickmakers Drive detailed in the Environmental Assessment were noted as "around 43/44dBA" based on data collected in 2007. It was this data, on which basis the EPA nominated a Project Specific Noise Level (**PSNL**) for this project of "around 48/49dBA" (43/44 + 5) in its submission letter of 3 April 2013.

Based on more recent background noise data from May 2013 in Bushview Lane, a more realistic background level of 48dBA has been adopted and the PSNL should, therefore, be higher (53dBA). It is recommended that updated background noise measurements should be carried out once the northern release areas (5D & 5E) of Georges Fair are occupied and PSNL limits set accordingly for both the weekday and Saturday as appropriate.

Operational Noise Criteria

The INP seeks to control noise from newly introduced industrial noise sources by means of its "intrusiveness" and "amenity" noise criteria.

The "intrusiveness" criterion requires that the $L_{Aeq,15min}$ noise level from any new source should not exceed the existing Rating Background Level (RBL) for that period by more than 5dBA.

Intrusiveness criterion values for potentially-affected residences follow directly from the RBL values in Table 3-2 of the Wilkinson Murray report.

These criteria apply to $L_{Aeq,15min}$ noise levels measured under specific meteorological conditions, determined as outlined in the INP, however, in general it has been accepted that an appropriate, and conservative, assessment procedure is to compare the intrusiveness criterion with the $L_{Aeq,15min}$ noise level which is exceeded for 10% of 15-minute periods during any season. This procedure has been adopted for this assessment.

The "amenity" criterion applies to the $L_{Aeq,period}$ noise level due to all industrial sources affecting a location. It sets an upper limit to the total noise level ($L_{Aeq,Period}$) in an area from all industrial noise (existing and future). The criterion depends on the time of the day, area classifications and the relationship of the total measured L_{Aeq} (and contribution from existing industrial noise) to determine the Acceptable Noise Level (**ANL**) for the development.

The potentially-affected areas are classified as "Suburban" by the INP. Given this, the acceptable and Maximum amenity levels ($L_{Aeq,Period}$) which apply over the whole day, evening and night period are as follows:

- Day (7:00 am - 6:00 pm) - 55-60dBA
- Evening (6:00 pm - 10:00 pm) - 45-50dBA
- Night (10:0 0pm - 7:00 am) - 40-45dBA

Table 4-1 (of the Wilkinson Murray Report), as reproduced as **Figure 2-21** below, summarises the noise criteria adopted for assessment of the Materials Recycling Facility. This also includes amenity criteria for active and passive recreation areas.

Location	Intrusive Criterion	Amenity Criterion
	Day (dBA)	
1 – Malinya	49	55-60
2 – Elouera	48	55-60
3 – Martin	48	55-60
4N – Georges Fair near Link Road	53	55-60
4K – Georges Fair near kink in access road	53	55-60
4M – Georges Fair Middle area	53	55-60
4S – Georges Fair Southern area (Bushview Lane)	53	55-60
5R – Future Tanlane (for information)	51	55-60
5I – Benedict Sand (industrial)	-	70-75
8 – Georges Fair Shielded (Bradbury)	42	55-60
Passive Recreation	-	50-55
Active Recreation	-	55-60

Figure 2-21: Summary of Intrusive and Amenity Noise Criteria (dBA).

Prediction Methodology

Measurements of existing similar equipment to be used on site were measured at an existing facility in Camellia operated by Concrete Recyclers. In response to clarification on Sound Power Levels (**SWL**) by the EPA, the measurements at Camellia were repeated and the data used previously was considered to be appropriate.

The model has been updated and the levels adopted are summarised in Table 5-2 of the Wilkinson Murray Report, an extract from which is at **Figure 2-22**.

Plant (Refer Figure 5-1 for location)	N°	SWL $L_{Aeq,15min}$ (dBA)
Front End Loader (FEL1 & FEL2)	2	110
Excavator (Exc) on top of 4 m stockpile to load crusher from southern facade	1	108
Primary Crusher (PC) Building (10m high) Internal facade level assumed as 98dBA with sheet metal construction with 10 m^2 opening on each façade in middle of building and 25m^2 opening on each façade at ground level. Building Sources split into 4 heights on each elevation at 1.5, 4, 6.5 & 9m,	1	98 internal
Secondary Crusher (SC) Building (8m high) Internal facade level assumed as 98dBA with sheet metal construction with 10 m^2 opening on each façade near top of building and 25 m^2 opening on each façade at ground level. Building Sources split into 4 heights on each elevation at 1, 3, 5 & 7m,	1	98 internal
Screen building (S) (8m high) Internal facade level assumed as 90dBA with sheet metal construction with 10 m^2 opening on each façade near top of building on 3 facades and 25 m^2 opening at ground level on southern façade. Building Sources split into 4 heights on each elevation at 1, 3, 5 & 7m,	1	90 internal
Trucks tipping (5 in 15 minutes)	-	104
Trucks over wash bay (10 in 15 minutes)	-	93
10 Trucks per 15 minutes on level access road	Line	78/m
5 Trucks per 15 minutes on down ramp from Brickmakers Drive	Line	75/m
5 Trucks per 15 minutes on up ramp to Brickmakers Drive	Line	81/m

Figure 2-22: Modelled Equipment and Sound Power Levels.

Noise modelling included the following assumptions:

- All front end loaders used on site would have an L_{Aeq} sound power emission of 110dBA.
- Ten truck movements within a 15 minute period (a truck entering and then leaving is counted as two single movements).
- Trucks would have a sound power level of not greater than 106dBA (at 25km/hr) based on measurements of 33 truck pass bys at this speed at Camellia. It is understood that similar trucks would be operating in the proposed development. For the short section of up ramp to Brickmakers Drive and the site entrance where the road is at a gradient the Sound Power Level is increased to 112dBA.

Predicted Operational Noise Levels

Figure 2-23 shows the operational noise levels predicted at potentially-affected residences, for the case where all equipment is working and for acoustically neutral

conditions. Calculations include the effect of shielding by the perimeter noise bunds and site buildings described above.

Receiver No.	Operational Noise Criterion, $L_{Aeq,15min}$ (dBA)	Predicted Operational Noise Level $L_{Aeq,15min}$ (dBA)	
		Neutral Conditions	Adverse Conditions
1 – Malinya	49	39	44
2 – Elouera	48	41	45
3 – Martin	48	44	48
4N – Georges Fair	53	53	54
4K – Georges Fair	53	53	54
4M – Georges Fair	53	48	51
4S – Georges Fair	53	44	48
5R – Tanlane (Future)	51	52	53
5I – Benedict	70-75 $L_{Aeq,period}$	57 (55 $L_{Aeq,period}$)	58 (56 $L_{Aeq,period}$)
6 – Vale of Ash	50-55 $L_{Aeq,period}$	48 (46 $L_{Aeq,period}$)	52 (50 $L_{Aeq,period}$)
7 – New Brighton GC	55-60 $L_{Aeq,period}$	44 (42 $L_{Aeq,period}$)	48 (46 $L_{Aeq,period}$)
8 – Bradbury St	42	30	34

Figure 2-23: Predicted L_{Aeq} Operational Noise Levels, dBA.

Whilst not required by the INP, for information purposes about the range of noise levels likely to occur at receivers, predicted noise levels are also shown for adverse meteorological conditions.

Whilst most receivers adopted are the worst case assessment locations in the various noise sensitive areas, an assessment point has been included at Receiver 8 (Bradbury Street) in a location representative of a rear garden shielded by the surrounding houses. This is to compare with the background noise levels and criterion established at this location.

The predicted noise levels meet the relevant criteria at all existing receivers for both adverse and neutral conditions. At all future receivers in Georges Fair the predicted levels meet the criteria for neutral meteorological conditions. Criteria are also predicted to be achieved at all receivers under adverse meteorological conditions with the exception of the future receivers between 4N and 4K opposite the northern end of the access road and ramps to Brickmakers Drive where a marginal 1dBA exceedance is predicted.

Based on measurements at No.16 Bushview Lane (4S), existing L_{Aeq} noise levels are typically 60 - 65dBA at daytime and this noise levels is expected to represent future ambient noise levels at receivers close to 4N. On this basis the potential impact of intermittent truck pass-bys during the daytime is not considered significant.

At the internal access road near the south west corner of the existing Benedict site, the

New Brighton Golf Course and the Vale of Ash reserve, noise levels are predicted to comply with the criteria since they relate to an $L_{Aeq,period}$ assessment and it is expected $L_{Aeq,period}$ would be 2 - 3dBA lower than the $L_{Aeq,15min}$ levels.

At the receiver location in the middle of the Georges Fair site (8), based on the rear garden of Bradbury Street, the predicted noise levels meet the criterion.

Whilst the facility is designed to process 500,000 tonnes of material per annum it is unlikely this volume will be reached for several years after the facility opens (estimated to be 2018 at the earliest). There is no certainty which areas of Georges Fair would be occupied at this time.

This assessment has shown compliance with the intrusiveness criterion, based on estimated future background noise levels of 48dBA at future residences fronting Brickmakers Drive within the Georges Fair development in release areas 5D and 5E. On this basis, mitigation measures along the access road are not necessary to achieve noise criteria even when the facility is operating at capacity.

It is possible, however, that if background noise levels do not increase between now and 2018, then intrusiveness criteria would be lower and predictions indicate they may be exceeded.

Even if noise levels from trucks on the access road / ramps do not meet a potentially lower intrusive criterion, a barrier alongside this access road / ramps will have minimal change to the overall acoustic environment at these future residences. This is because the ambient noise environment would be dominated by traffic on Brickmakers Drive which is closer to the residences and currently carrying traffic (including other heavy vehicles) at higher speeds. Whilst noise barriers may be "feasible" along the access road (if they were needed to meet an intrusive criterion) they would not normally be considered as "reasonable" given the overall traffic noise at these future residences.

Therefore, noise barriers on the eastern side of the access ramps to protect Georges Fair are not recommended as a reasonable mitigation measure for this project.

It is recommended that the EPA considers the following approach for this project:

- When Georges Fair is occupied in release areas 5D and 5E, background noise levels can be measured and appropriate intrusiveness limits (PSNL) established for weekdays and Saturdays.

- If lower background noise levels (and lower intrusive criteria) at Georges Fair indicate noise attenuation measures such as noise barriers are needed to control noise from truck movements then, subject to EPA requirements, noise barriers will be constructed at appropriate locations along the access road and ramps.

- Moorebank Recyclers can manage its hourly / daily truck movements to remain within the intrusiveness criteria at all residences until any barriers deemed necessary by the EPA are built.

At a future Tanlane residential development there is potential to exceed intrusiveness criterion, although, as indicated by the EPA, it would be expected that a future development would be able to mitigate potential impacts with appropriate set backs and perimeter shielding. In addition, future traffic on Brickmakers Drive is likely to generate similar L_{Aeq} noise levels to the proposed trucks on the access road / ramps.

Traffic Noise on Public Roads

Noise Criteria for Traffic on Future Public Roads

NSW Roads and Maritime Services (**RMS**) will not allow access from the Site directly onto Newbridge Road. Trucks would travel via the access handle and ramps onto Brickmakers Drive and then north to Newbridge Road.

In accordance with the definitions outlined in the ECRTN, Brickmakers Drive would be classified as a collector road and Newbridge Road an arterial road.

Truck movements would only occur during the daytime period. The relevant criterion for *"land use developments with potential to create additional traffic on collector road"* is that total traffic noise levels should not exceed 60dBA $L_{Aeq,1hr}$ during any daytime hour. Where existing traffic noise levels already exceed this value, the ECRTN states that:

> *Where feasible and reasonable, existing noise levels should be mitigated to meet the noise criteria. Examples of applicable strategies include appropriate location of private access roads; regulating times of use; using clustering; using 'quiet' vehicles; and using barriers and acoustic treatments.*
>
> *In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2dB.*

Prediction of Traffic Noise Levels

A traffic study was prepared by Lyle Marshall & Associates Pty Ltd which predicted future traffic generation by the Materials Recycling Facility based upon processing 500,000 tonnes of raw materials per annum. The assessment was based upon 292 working days per annum and an average truck load of 21.2 tonnes for raw materials coming into the Site and finished product out.

Assuming an 11 hour day, this equates to an average of 29.5 movements per hour, however, the traffic report indicates a range of hourly movements through a typical day.

For assessment purposes, it is considered that 38 movements would be representative of a typical busy hour in the daytime.

Figure 2-24 presents the estimated number of truck movements daily.

	Direction	No. of Trucks Movements
Raw Materials	In	81 loaded trucks
	Out	81 empty trucks
Finished Product	In	81 empty trucks
	Out	81 loaded trucks
Total No. of Daily Movements:		**324**

Figure 2-24: Summary of Estimated Number of Daily Truck Movements

Traffic volumes (24 hours) on Brickmakers Drive are currently approximately 7,500 vehicles, split approximately 6,600 per day and 900 at night time and 5 - 6% heavy vehicles overall.

These volumes are expected to increase in the future as a result of further residential development.

The residences to the north of Araluen Avenue would be affected by traffic noise from Newbridge Road as well as Brickmakers Drive. The increase in traffic noise levels as a result of the additional trucks would be higher at those residences south of Araluen Avenue.

Existing daytime traffic noise levels at the eastern end of Elouera Crescent (No.41) were predicted using the Calculation of Road Traffic Noise (**CORTN**) predictive procedure to be 52 - 55dBA $L_{Aeq,1hr}$ depending on the time of day. The proposed extra trucks per hour (up to 38) would result in an increase varying from 1.5dBA to 3.1dBA depending on the time of day. The predicted future noise levels of 55 - 56dBA comply with the daytime base criterion of 60dBA.

Newbridge Road and Nuwarra Road

Residences front Newbridge Road to the west of the intersection with Brickmakers Drive. Many of these receivers are set back 10 metres from the edge of the closest lane. Based upon information in the traffic report, the existing peak hours along Newbridge Road are 7:00 am - 9:00 am and 4:00 pm - 6:00 pm. The two way hourly volumes are typically 5,200 - 5,700 vehicles.

Given the existing high traffic volumes on Newbridge Road, existing noise levels are likely to exceed the ECRTN base criterion. The increased noise level due to traffic from the proposed recycling facility based on the 45% to the west and 55% to the east split at the intersection has been calculated to be less than 0.2dB, which meets the allowance criterion. Negligible impact is therefore expected.

Residences front Nuwarra Road to the south of the intersection with Newbridge Road. Most of these receivers are set back 15 - 20 metres from the edge of the closest lane. The existing peak hour volumes along Nuwarra Road are typically 1,000 - 1,500 vehicles.

Given the existing relatively high traffic volumes on Nuwarra Road, existing noise levels are likely to exceed the ECRTN base criterion. The increased noise level due to traffic from the proposed recycling facility based on the 20% of total movements using Nuwarra Road (64 per day and up to 8 per hour) has been calculated to be less than 0.3dB, which meets the allowance criterion. Negligible impact is therefore expected.

Noise from Construction Activities

Noise Criteria for Construction Activities

The NSW Interim Construction Noise Guideline (**ICNG**) presents the process to assess construction in NSW. The ICNG was developed by the Department of Environment Climate Change & Water (**DECCW**) taking into consideration that construction is temporary, noisy and difficult to ameliorate. As such, the ICNG was developed to focus on applying a range of work practices most suited to minimising construction noise impacts, rather than focussing only on achieving a numeric noise level.

The ICNG recommends that standard construction work hours should typically be as follows:

- Monday to Friday 7:00 am to 6:00 pm.
- Saturday 8:00 am to 1:00 pm.
- No work on Sundays or public holiday.

Additionally, it recommends quantitative management noise goals at residences as presented in **Figure 2-25**.

The ICNG presents the following noise management levels for non-residential premises:

- Active recreation areas (such as parks) external $L_{Aeq\ (15\ min)}$ 65dBA
- Passive Recreation areas external $_{LAeq\ (15\ min)}$ 60dBA
- Industrial premises: external $L_{Aeq\ (15\ min)}$ 75dBA
- Offices, retail outlets external $L_{Aeq\ (15\ min)}$ 70dBA
- Classrooms, hospitals, places of worship internal $_{LAeq\ (15\ min)}$ 45dBA

The construction noise management levels at all the existing residences surrounding the Site are shown in **Figure 2-25**. Future residences are also identified, although it is not clear at this stage which residences will be occupied at the time of construction. **Figure**

2-26 also shows the management levels at other receivers.

Time of Day	Management Level $L_{Aeq\ (15\ min)}$	How to Apply
Recommended standard hours: Monday to Friday 7am to 6pm Saturday 8am to 1pm No work on Sundays or public holidays	Noise affected RBL + 10dBA	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq\ (15\ min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the proponent should consider very carefully if there is any other feasible and reasonable way to reduce noise to below this level. If no quieter work method is feasible and reasonable, and the works proceed, the proponent should communicate with the impacted residents by clearly explaining the duration and noise level of the works, and by describing any respite periods that will be provided.
Outside recommended standard hours	Noise affected RBL + 5dBA	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community.

Figure 2-25: Construction Noise at Residences using Quantitative Assessment.

Location	Construction Noise Management Levels, L_{Aeq} (dBA)
Residence 1 – 37 Malinya Cr, Moorebank	54
Residence 2 – 26 Elouera Cr, Moorebank	53
Residence 3 – 41 Martin Cr, Milperra	53
4 (N,K,M) – Georges Fair (not fully developed during construction)	58
4S – Georges Fair existing	58
5R – Tanlane (unlikely to be developed during construction)	56
5I – Benedict	75
6 – Vale of Ash Reserve	60
7 – New Brighton GC	65

Figure 2-26: Construction Noise Criteria for Daytime Construction.

Predicted Construction Noise Levels

Construction of the earth mounds around the boundary of the Site would generate the highest noise levels from the main site area during the construction period. Short-term higher noise levels are expected during the works required for the access road and ramps.

Fill material for the Site will come from within the Site boundary. There will need to be importation of select material to construct the access road and ramps, so whilst overall there is not expected to be a need to import a large proportion of fill during the remaining construction, there will be short periods with up to 80 truck loads per day (160 movements). Most noise generation over the construction period will, therefore, occur from within the Site itself, with intermittent noise along the access road, plus works on the access road and ramps themselves.

Similar noise levels from the same construction plant would be generated during levelling of the Site. Other construction is considered to be the delivery and construction of the buildings to house conveyers and crushing plant which will require the use of cranes and power tools.

Road works, including drainage, will mainly require the use of excavator / grader / compactor and delivery of road base, plus asphalting plant. The ramps will require bored piling, plus concrete construction.

Construction plant assumed to be required for these works, and the total L_{Aeq} sound power level are presented in **Figure 2-27**.

Activity	Typical Equipment Used	Total $L_{Aeq,15min}$ Sound Power Level (dBA)
Earthworks	Dozer, Front end loader, Roller, Excavator and Truck	115
Roadworks / Ramps	Dozer, Grader, Trucks + Bored Piling Rig and Concrete Pours for ramps	113
Buildings and Conveyers	Cranes, Delivery trucks and Power Tools	110

Figure 2-27: Construction Plant Total Sound Power Level (SWL).

Figure 2-28 shows the predicted construction noise levels for the main phases.

Receiver No.	Construction Noise Management Level, $L_{Aeq,15min}$ (dBA)	Predicted Construction Noise Level $L_{Aeq,15min}$ (dBA)		
		Site Earthworks (+ Trucks)	Site Buildings	Roadworks & Drainage Works
1 – Malinya	54	49 (49)	43	47-53[1]
2 – Elouera	53	50 (51)	44	47-54[1]
3 – Martin	53	53 (53)	47	49
4N – Georges Fair	58	54 (56)	49	52-68[1]
4K– Georges Fair	58	55 (56)	50	55-72[1]
4M – Georges Fair	58	56 (56)	51	54-65[1]
4S – Georges Fair	58	55 (55)	49	53
5R – Tanlane (future)	56	55	49	53-73[1]
5I – Benedict	75	81 (82)	70	53-73[1]
6 – Vale of Ash	60	57 (57)	52	53
7 – New Brighton GC	65	55 (55)	47	51

Note: 1. For the roadworks and drainage works, for certain receivers the noise levels will vary depending on the proximity of the works along the driveway to the receiver.

Figure 2-28: Predicted Noise Levels from Construction.

Predicted noise levels at residences are expected to comply with criteria from works within the main site area, however, some exceedances of criteria are expected from works on the access road and ramps for the relatively short duration of time when they are closest to the "future" receivers in the northern part of the Georges Fair site (Release 5D & 5E) or in the future Tanlane residential area. These potential impacts are only realised if the residences have been constructed and are occupied.

There will be exceedance of construction noise limits at the southern boundary of the existing Benedict site, when construction of the northern mound is occurring. This boundary of the site is not occupied on a regular basis as we understand it is a pond used for dredging purposes. Within the site boundary at the location of internal access roads, the limit of 75dBA is complied with. Negligible impact is expected.

It is recommended that a further review of potential impacts on neighbouring properties can be conducted at the time the proposed construction commences. The predicted noise levels do not exceed the highly noise affected limit of 75dBA for residences and are proposed to only occur in standard daytime construction hours.

Beyond standard mitigation practices, to use modern well maintained plant there are no further mitigation measures which are considered feasible and reasonable for the proposed works.

2.6 Land Use Conflict and Suitability of the Site

2.6.1 Issue Description

- Major changes to policies and legislation which are relevant to the proposal have occurred.

- The character of the area has shifted away from industrial to residential and recreational in line with Liverpool Council's vision for the area. The vision is in fact now reality with homes being constructed and occupied within 500 metres of the Site.

- The proposed development is inconsistent with the E2 zoning of the land and would inhibit the cohesive preservation of the foreshore land.

- The Environmental Assessment is based on a series of technical studies, a number of which are between three and five years old. The original application itself was made seven years ago. Consequently, the proposal and Environmental Assessment does not reflect changes in relevant legislation and policy, recent and proposed development of surrounding land, nor how the character of the area has evolved significantly since the adoption of the Boral Moorebank Structure Plan and lodgement of the current application from industrial to residential and open space. The proposal is no longer a suitable use of the Site and is incompatible with current and proposed surrounding land uses.

- Given recent and proposed residential and open space development in the vicinity, the Site will no longer be isolated from sensitive land uses and following the cessation of Benedict Sands operations within the next 18 months, the Site will be the only industrial use within the area.

2.6.2 Response

There is no evidence presented which would lead to a conclusion that the Benedict Sand and Gravel operations will cease within the next 18 months.

The process to permit a resource recovery facility on the Moorebank Land was initiated in May 2002 when a pre-rezoning submission was submitted to Council following the resolution of the Council to adopt the Boral Moorebank Structure Plan which determined that the most appropriate use of the Moorebank Land was for waste and recycling uses/open space.

In this regard, Council resolved that individual landowners be encouraged to prepare rezoning submissions for their land holdings (either jointly or independently) in

accordance with the master plan for the precinct.

Subsequently, the Council notified Moorebank Recyclers that:

> *As a result of the Strategic Panel Meeting [12 December 2002] I would like to confirm the following:*
>
> *1. Generally, there was a view that the proposed use (environmental recycling facility) had merit and may be an appropriate use for the site (subject to further investigations).*
>
> *2. However, concerns were raised in regards to the level of noise that may be emitted from the enclosed facility, the height of the proposed facility, and access.*
>
> *3. While the information provide to the Councillors resolved some of the broader concerns, more detailed investigations would be required to address the noise, height and access matters. These matter would need to be addressed as part of a final rezoning submission to Council. The rezoning submission would also need to clearly demonstrate that any future land use would not impact on both the existing and future residents.*
>
> *4. The Councillors recognised that the pre-rezoning submission included a portion of land adjacent to the Georges River being rezoned for public recreation purposes. Councillors were strongly supportive of this component of the proposal.*
>
> *In view of the above, it is recommended that the owner submit a formal rezoning application to Council in accordance with Council's rezoning application form.*

A rezoning submission was prepared and submitted to the Council for consideration pursuant to the Boral Moorebank Precinct Structure Plan.

Subsequently, amendment No.76 to Liverpool LEP 1987 was gazetted on 23 September 2005, with no sunset clause, to permit, with consent, a materials recycling yard on part of the Moorebank Land.

Liverpool Local Environmental Plan 2008 amended the zoning of the Moorebank Land to E2 Environmental Conservation.

The Council, during the preparation of Liverpool LEP 2008, resolved to rezone both the Benedict Sand and Gravel Land and the Flower Power Land to a combination of recreation, residential and commercial zones in recognition of the likely future change in development of those lands.

In conjunction with the change of zone of the Benedict Sand and Gravel Land and Flower Power Land, the Council, pursuant to Clause 11 of Schedule 1 of LEP 2008, also

resolved:

> *11* ***Use of certain land at Moorebank in Zone E2***
>
> *(1) This clause applies to Lot 6, DP 1065574 in Zone E2 Environmental Conservation at Newbridge Road, Moorebank.*
>
> *(2) Development for the purposes of a resource recovery facility is permitted with consent.*
>
> *(3) This clause is repealed on 1 September 2018.*

In light of the above rezoning, it is clear that the Council, when it considered the location of a potential resource recovery facility on the Moorebank Land in conjunction with the rezoning of the Benedict Sand and Gravel Land and the Flower Power Land, maintained that the use of the Moorebank Land as proposed was not fundamentally incompatible with the residential and commercial development which might take place in the locality.

Indeed, the Council, when it considered the rezoning of the Boral land for residential purposes in accordance with the Structure Plan, resolved that residential development on the Boral land was not inconsistent with the use of the Moorebank Land for materials recycling.

In recent proceedings in the Land and Environment Court (refer *Moorebank Recyclers Pty Ltd v Liverpool City Council*, Land and Environment Court proceedings No.30141 of 2013), Moorebank Recyclers sought the imposition of an easement over the Council land (Lots 308, 309 & 310, DP 1118048) to provide access to the proposed Materials Recycling Facility. When dealing with the suitability of the Moorebank Land for the proposed Materials Recycling Facility and, indeed, whether that land use was compatible with surrounding development, Justice Biscoe concluded:

> *97 ..... I am satisfied that what is proposed (access by Lots 309 and 310) is practically possible, that it would be open to a consent authority to approve a development application for the ramps, and that such an application is not hopeless.*
>
> *98 On the evidence of the acoustic experts, I am satisfied that the noise impacts from use of the bridge, ramps and access road can be managed by noise mitigation measures as conditions of any development approval. In May 2013 the Environment Protection Authority (EPA) made a submission to the Department, with which I agree, that "if residential development is not yet approved for the [Tanlane] site then it would be unreasonable for EPA to not support the proposed facility because approval for residential development is not guaranteed or may not occur for some time in the future" and that noise mitigation measures could be incorporated in any residential development approval. Such noise mitigation measures are expressly contemplated in DCP 2008.*

99 The air quality experts agree that NSW air quality assessment criteria are unlikely to be exceeded. They agree that the MRF should implement air quality measures that could be made the subject of conditions of a development approval.

100 The evidence of the planners was largely directed to their interpretation of various planning documents, about which the Court can form its own view. Mr Mitchelll (Tanlane's planning expert) proffered opinions about problems he perceived that I think are outside his area of expertise, irrelevant or outweighed by the evidence of other experts in various disciplines that noise impacts may be managed by noise mitigation measures, traffic issues can be addressed, potential flooding impacts will be minor, disturbance of threatened species or plants is unlikely and can be managed, engineering issues to which he refers can be resolved, and direct emissions from the proposed facility appear to be at acceptable levels.

101 The respondents' planners opined that an MRF is no longer a development that is appropriate to the area. I disagree for reasons discussed later. They dwelt on Council documents in the mid 1990's and Moorebank communications in the mid 1990's and 2004 (to which I have referred) in connection with the rezoning application indicating that use of an MRF on the Moorebank land would be for a limited period. However, the fact is that the Moorebank land was rezoned in 2005, and confirmed in the LEP 2008, for an MRF without a sunset limitation on use. It is a matter for the approval authority, if it grants approval for an MRF, whether to impose a sunset condition on use.

114 I do not think that there is no chance of obtaining approval for the proposed MRF on the Moorebank land. On the contrary, if it is necessary to go further, I consider that Moorebank has a substantial prospect of obtaining such approval if appropriate access is provided. The Moorebank land is zoned to permit an MRF, the Minister has paved the way toward a Part 3A approval by recently making an amended Part 3A declaration, and the consent authority is not the Council but the PAC, which is not bound by Council policies including as those contained in the 2008 LEP or the Development Control Plan.

115 Planning witnesses for the respondents expressed an opinion that if development consent were granted for an MRF on the Moorebank land, it would only be for a short or medium period because of the reference to 2018 in cl 11 of Schedule 1 of the 2008 LEP. Apart from the fact that the Minister and PAC are not bound by the LEP in the Part 3A context, I disagree that cl 11 has anything to say about restricting the period of the use. The 2018 reference only means that development consent has to be obtained by then.

125 ... Council (supported by Tanlane) submits that an MRF is not an

"effective development" of the Moorebank land because it is not "appropriate to the area in which [the Moorebank] land is situated": Tanlane Case at [155]. Reliance is placed on the opinion of the respondents' planning experts that an MRF is inconsistent with the residential development of the area in accordance with Council's long term planning objectives.

126 As the respondents accept, access via the road bridge is necessary for any development of the Moorebank land and the proposed easements are reasonably necessary for "all reasonable uses" of the Moorebank land leaving aside whether reasonable uses include an MRF in order to permit access via ramps and the road bridge to Brickmakers Drive. And, as the Court of Appeal required in the Tanlane Case, Council also accepts that the road bridge and ramps should have the load capacity required to carry heavy trucks that would service the proposed MRF. This is consistent with Council's vision for a decade that access to all lands in the precinct east of Brickmakers Drive should be via the road bridge on Lot 309. In my opinion, that is sufficient to establish that the easements sought are reasonably necessary for the effective use and development of the Moorebank land.

128 Whether a development for which an easement is required is appropriate to the area calls for an evaluative judgment. The respondents' planners opined that an MRF is not appropriate for the area given its residential character and the potential impacts of the MRF. My evaluation is that an MRF is appropriate to the area at the present time having regard to the following:

(a) The Moorebank land was singled out in the area for rezoning as an MRF in 2005 and this was confirmed as recently as the LEP 2008 notwithstanding that the DCP providing for residential development of the Tanlane land was made at the same time.

(b) Until 2011 Council apparently regarded an MRF on the Moorebank land as appropriate to the area not only because of the introduction of the 2005 zoning and 2008 confirmation of the zoning, but also in other ways by -

(i) making it a condition of Tanlane's 2006 development consent for construction of the road bridge that it be designed to carry the load of heavy trucks required for the MRF; and

(ii) consenting in 2009 to access over Lots 308 and 309 for the purpose of Moorebank's Part 3A MRF application.

(c) The Moorebank land, which is the site of a former tip, is clearly compatible with the current industrial activities on the Tanlane

land, which it adjoins.

(d) The present residential development in the area is on the other side of Brickmakers Drive.

(e) the Moorebank land is screened by the existing vegetation, which has been protected through the Boral site rezoning.

(f) Any future development of the Moorebank site will need to take into consideration the environmental, traffic, drainage, acoustic and visual impacts.

(g) The Court does not look at the likelihood of the Part 3A MRF application being granted. However, the Court can determine whether there is no chance of it being granted and can consider whether an MRF is desirable compared with other possible uses. It is clear that it cannot be said that there is no chance of obtaining a Part 3A MRF approval. That makes it more difficult to say that an MRF is inappropriate to the area. I also think that an MRF is desirable compared with other possible uses under the zoning.

(h) in the Tanlane Case, the Court of Appeal provided for ramps for Moorebank's MFR without any suggestion that it was futile because an MRF was not appropriate for the area and therefore Moorebank could not obtain a s 88K easement.

129 Has anything much changed since the 2008 zoning of the Moorebank land for an MRF? Mr Mitchell, Tanlane's planning witness, proffered in evidence that three circumstances had changed since the 2008 LEP:

(a) There has been significant residential development in Georges Fair (the Boral land west of Brickmakers Drive). However, as Mr Kennan said, the zoning of Georges Fair for that purpose has existed since 2005 and the development is that which was then expected.

(b) Part of the golf course south of the Moorebank land has been zoned residential. However, as Mr Kennan said, if it was thought to be inconsistent with the MRF zoning for the Moorebank land, one would have expected the latter to be rezoned at the same time.

(c) A development application has recently been lodged for a marina on the Tanlane land. I do not think any conclusion of inconsistency should be drawn simply from that fact.

130 Council evidently did not think an MRF was inappropriate for the area until at least 2011 when it resolved to oppose it. The Court of Appeal in

> *the Tanlane Case noted that this was "prompted by agitation from local residents": at [48]. ..... The fact that Council was responsive to local agitation does not establish that objectively anything has changed such that the MRF has become inappropriate for the area. .....*

In light of the above comments of Justice Biscoe, it is considered that the use of the Moorebank Land for the proposed Materials Recycling Facility clearly remains a use which is consistent with the long term planning for the locality and is not in conflict with other land uses which are being developed or are likely to be developed on adjoining land.

2.7 Flora and Fauna

2.7.1 Issue Description

- The Protected Matters Search Tool database was not queried to develop a list of EPBC Act listed species that may occur at the Site.
- Since threatened microbats and owls are likely to forage on the edge of the cleared area and remnant vegetation in the proposed development site, field surveys should have included searches for these species.
- The Environmental Assessment does not assess any operational or indirect impacts such as increased noise or dust on areas of remnant native vegetation surrounding the proposed development footprint. These potential impacts are thus largely unknown.
- Impacts on the threatened Green and Golden Bell Frog were not adequately considered.
- Clarification of the vegetation affected and possible impacts from run-off on retained vegetation.

2.7.2 Response

During 2010, Aquila Ecological Surveys (**AES**) undertook a flora and fauna assessment (**FFA**) of the proposed Materials Recycling Facility. The FFA was included as Appendix 9 of the Environmental Assessment.

AES has prepared a supplementary report dated 1 July 2013 which addresses the submissions raised during the exhibition of the Environmental Assessment. A copy of the supplementary AES report (the **AES Report**) is at **Attachment 13**. The following responses have been extracted from the AES Report.

Green and Golden Bell Frog

In the FFA it was stated:

> *Depressions in the Cabbage Gum Open Forest may fill with rainwater and form small, ephemeral ponds suitable for habitat by some frog species. The Mosquito Fish (Gambusia affinis) was detected in local freshwater ponds, precluding the likelihood of the threatened Green and Golden Bell occurring.*

It could be argued that the presence of the Mosquito Fish reduces the likelihood of the

presence of the Green and Golden Bell Frog rather than precluding it. Therefore, assessments of likely impacts on this species are attached at Appendix 1 of the AES Report.

Having regard to the assessments contained in Appendix 1 of the AES Report, it is still considered that the proposed Materials Recycling Facility is unlikely to have a significant effect on the Green and Golden Bell Frog.

Nevertheless, the grassed depressions which run in a north-south direction along the eastern side of the Site could be enhanced as Green and Golden Bell Frog habitat by the placement of protective cover such as woody debris, rocks or even concrete to provide protective cover.

The Protected Matters Search Tool

The FFA did not include a review of those species listed on the EPBC Act which the Commonwealth's Protected Matters Search Tool (**PMST**) indicates may occur in the local area. To overcome this omission, AES has undertaken a review of those species the PMST indicated were known, may occur or may have habitat (refer to Appendix 2 of the AES Report).

It was found that the only species with any likelihood of occurring in the environs of the Site were the Green and Golden Bell Frog, White-bellied Sea-eagle, Great Egret and Cattle Egret. Assessments of the likely impacts on these species have found that there is unlikely to be a significant effect upon them. Therefore, it is found that the proposal is not a controlled action requiring referral to the Federal Minister for the Environment for approval.

The submission of Investa states that the Rufous Fantail, which is listed as migratory in the EPBC Act, was found on land to the west of the Site. Notwithstanding, it is considered unlikely that this species would be directly or indirectly affected by the proposed Materials Recycling Facility. The Rufous Fantale would not use the area directly affected by the proposal and would only occur on occasions in the Riverflat forest along the Georges River. In such circumstances, it is considered that there is no need for an assessment under the EPBC Act.

Level of Survey for Microbats and Owls

AES did not undertake a survey of microbats as the initial site inspection found that no critical habitat resources which these taxa rely on (i.e. tree hollows and caves) would be affected by the proposed Materials Recycling Facility.

Although the Site adjoins potential foraging areas for such species, the proposed development, which is confined to already cleared and modified areas, is unlikely to affect the quantity or quality of this potential foraging habitat. There is unlikely to be any indirect impact on adjacent habitat for such species. Therefore, it was considered that surveys for such taxa would be superfluous.

Operational and indirect impacts

Dust

In relation to the operational impacts and the generation of dust, Pacific Environment has found that:

> *... updated dispersion modelling completed for the proposed operations has demonstrated that it can be appropriately managed so as to comply with all the relevant NSW EPA air quality impact assessment criteria and not adversely affect local air quality. These criteria have been set at a level designed to safeguard the health and amenity of the general public.*

It is recognised that, due to their smaller size, most fauna species are likely to be more sensitive to air quality changes than humans, however, given the location of the Site in an area the size of Sydney, and its proximity to an airport and a motorway, any possible incremental change to air quality is likely to be insignificant. Similarly, impacts on flora in adjacent lands are likely to be negligible.

Noise

As discussed in the assessment of impacts on the White-bellied Sea-eagle (Appendix 1 of the AES Report), in the short-term, there may be some repulsion of birds from woodland habitat immediately adjacent to the Site due to the increased noise emanating from the Site, however, over time, this impact is likely to dissipate as fauna habituates to the disturbance regime. It should be noted that the Site is in an urban area with noise being generated by other industries and transport infrastructure such as the M2 Motorway and Bankstown Airport.

Impacts on Vegetation

As mentioned on Page 10 of the FFA:

> *... the proposed development would be confined to already cleared or modified areas of the site.*

The area of Ironbark Open Forest on the Site is located outside the area where the proposed Materials Recycling Facility would be located. The stand of Ironbark Open Forest would be retained.

Some native shrubs do occur within the cleared area on the Site, however, they only represent limited habitat for native fauna species as they are fragmented from larger intact areas of habitat.

There is unlikely to be any impact on the Cabbage Gum Open Forest (which is part of the TSC Act listed Endangered Ecological Community, Riverflat Eucalypt Forest on Coastal Floodplains). This vegetation is buffered from the proposed development by the intervening Wattle Scrub. Any sediment which may bypass the proposed sediment

control devices would settle in this vegetation before run-off enters the forest.

Conclusion

In summary, it is considered that there are unlikely to be any significant impacts on the ecology of the local area as a result of the proposal. In particular, there is unlikely to be a significant effect on threatened species, populations or communities listed in the TSC Act or Matters of National Environmental Significance listed in the EPBC Act.

Further impact assessment of the proposed amendment to the access to the Materials Recycling Facility is discussed in **Part 3.2.8** of this report.

2.8 Geotechnical Issues

2.8.1 Issue Description

- Former use of the Site as a waste disposal facility means there could be a risk of adverse off-site effects if clay capping is compromised.
- The existing site audit was undertaken in 2001 and does not take into account changes in relevant laws and guidelines nor changes in site conditions.

2.8.2 Response

The main section of the Site is a disused landfill which occupies approximately 75% of the Site.

Landfilling of the Site commenced in 1972 by Collex, following an approval from the then Metropolitan Waste Disposal Authority and the then State Pollution Control Commission. Landfilling continued until 1979.

The Site was licensed to accept non-putrescible wastes which show little tendency to decompose such as document paper and builders rubble. Vegetation and other decomposable materials may have been accepted at the landfill as they were considered as non-putrescible at the time of landfilling.

No landfilling has taken place in the low lying area along the eastern boundary.

Development Consent No.1417/2005 was approved by Liverpool City Council to extract all landfill material located in the southern section of the landfill and to transport that material to the northern section of the landfill where the proposed Materials Recycling Facility is to be located. The material would be spread to raise the northern section of the site above the 1 in 100 year flood level.

In 1998, a Remedial Action Plan for the Site was prepared by Enproc Pty Ltd entitled *Remedial Action Plan, Moorebank Landfill, Newbridge Road, Moorebank. 19 November, 1998*; that Remedial Action Plan being required as part of the remedial work required to maintain the landfill capping. A copy of the Remedial Action Plan was forwarded to Liverpool City Council in November 1998.

The remediation of the Site has taken place and an independent site audit has been undertaken by EGIS Consulting Australia. The EGIS Consulting Australia Site Audit Statement certifies that the Site is suitable for *commercial/industrial use, including concrete recycling facility*.

Notwithstanding the conclusions of the audit conducted as part of the State Environmental Planning Policy 55 assessment, there is potential for the proposed development to impact the integrity of the landfill and, in particular, the capping of that landfill.

As part of the approved bulk earthworks for the Site, the following issues would have been addressed by the Council:

- The control of groundwater/leachate from within the landfill during excavation at the southern end of the Site;
- The stabilisation of the temporary cut batter slope at the southern end of the Site;
- The potential for acid sulphate soil conditions within the fluvial soils;
- The control of groundwater/leachate prior to and following compaction at the northern end of the Site; and
- The reconstruction of the western bund wall at the northern end of the Site and, if necessary, the northern bund wall.

As a result of these works, a Materials Recycling Facility could be constructed subject to the issues summarised below being adequately addressed as part of the detailed design process.

On the basis of the assumptions noted above, the landfill capping would be adequate to support the proposed stockpiles, roadways and minor structures without loss of integrity. As long term monitoring of the Site will form part of the operating procedures, any loss of integrity could be quickly recognised and the operators' facilities would be available for remedial works. For example, stockpiling of materials may result in local settlements which adversely affect surface drainage. Correction of this would be part of the standard operating procedures.

Monitoring wells and surface drains would be sampled and tested routinely to identify any adverse environmental conditions which may develop.

As part of the detailed design works, an Operations Manual would be developed so that operators of the Site are fully aware of the need to maintain the integrity of the landfill and capping. Provided that the earthworks are satisfactorily completed, stockpiles of crushed recycled building materials may be supported on the landfill cap, provided that the stability of the perimeter bund walls is not compromised by surcharge loading. Analysis of safe set-backs etc would form part of the detailed design. If it were desired to place stockpiles close to the bund walls, then it would be a relatively straightforward exercise to install some piles behind the crest of the slope to improve stability. It would probably be necessary to raise the height of the stockpiles gradually over time to allow the underlying fill to consolidate and gain strength.

The overall thickness of the capping layer would gradually increase with time as the

landfill consolidates and design surface levels are maintained by adding to the cap. This would enhance the performance of the cap.

It is considered that the proposed development would enhance the integrity of the capping of the existing landfill and, indeed, constant monitoring would ensure that any remedial works which might be required would be performed as required.

2.9 Recreational Use of Georges River

2.9.1 Issue Description

- The former Boral site and the Benedict Sand and Gravel land are in the midst of contextual transition from extractive industry to urban land. Since the application was lodged, the area has undergone substantial change. This has been a positive aspect to the Moorebank locality and aims to return the Georges River and its foreshore to the community. The proposed development is inconsistent with the E2 zoning of the land and would inhibit the cohesive preservation of foreshore land.

- The proposed use of the Site would have an unacceptable impact on public amenity from the open space areas and also from the Georges River corridor.

2.9.2 Response

As part of the preparation of the Liverpool Local Environmental Plan 2008, the Council rezoned the Benedict Sand and Gravel land and the Flower Power land to a combination of the following zones:

- B6 Enterprise Corridor
- RE1 Public Recreation
- RE2 Private Recreation
- R3 Medium Density Residential

An extract from the Liverpool Local Environmental Plan 2008 Map reflecting the above zones is provided as **Figure 1-4** of this report.

As part of the rezoning of the Benedict land and the Flower Power land, both parties entered into Voluntary Planning Agreements with the Council, part of which was to dedicate the foreshore land of the Georges River to the Council for recreation purposes, that land generally being the land rezoned to RE1 Public Recreation. Extracts from the Voluntary Planning Agreements are provided as **Figure 2-30** and **Figure 2-31** below.

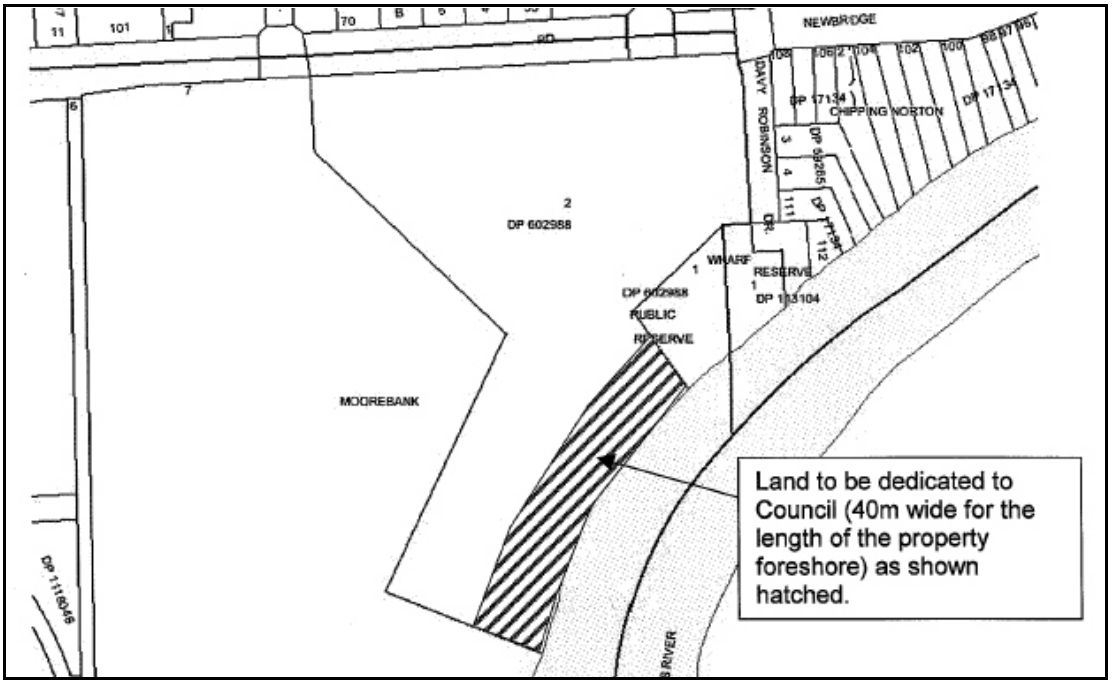


Figure 2-30: Extract from the Flower Power VPA showing dedication of foreshore land.

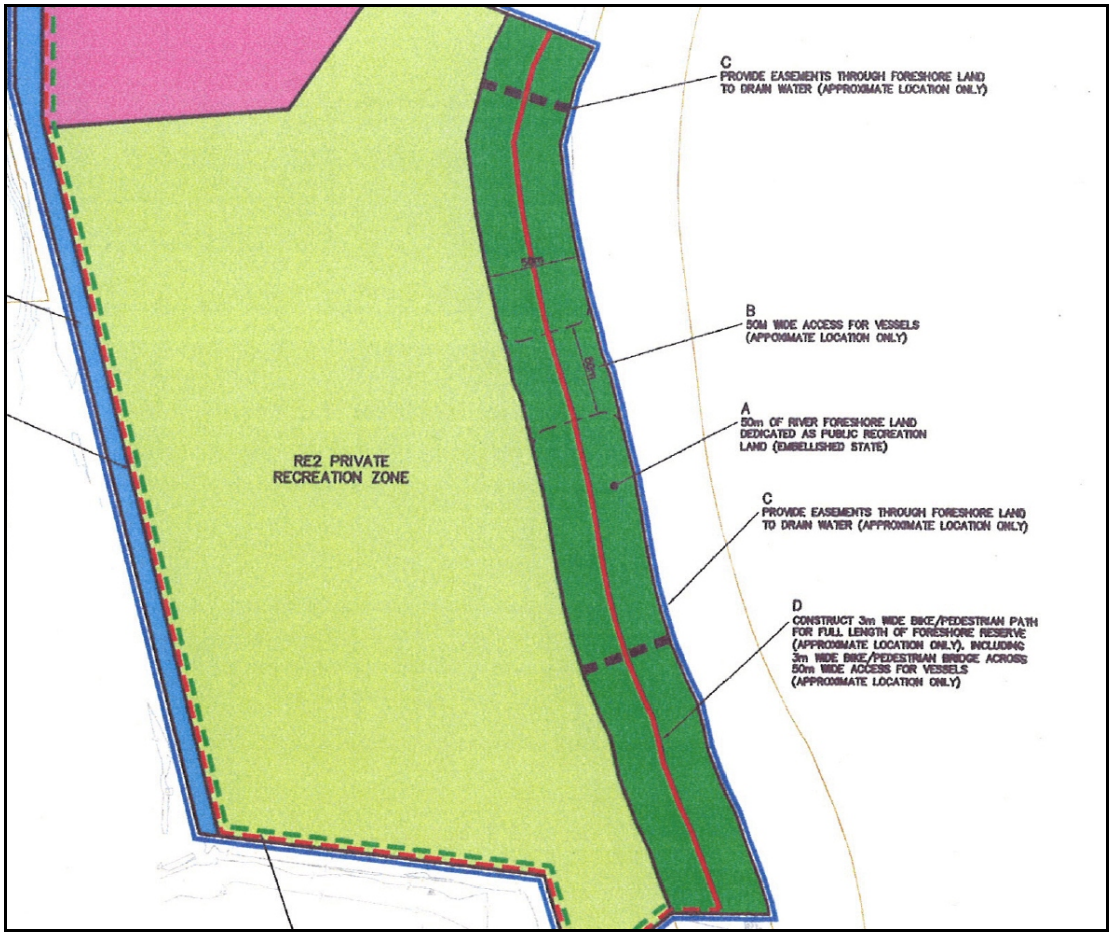


Figure 2-31: Extract from Benedict Sand VPA showing dedicated foreshore land.

The proposed Materials Recycling Facility would be located on that part of the Site which is the former landfill. The foreshore land would not be developed as part of the Project. As such, with the approval of the Part 3A Project, and the development of the Site as proposed, no impact would result to the use of the Georges River as a recreation facility.

2.10 Flooding

2.10.1 Issue Description

- Within the Environmental Assessment, reference is made to the flood analysis which supported DA 1417/2005, however, no copy of that is provided.

- With regard to DA 1417/2005, Council has no evidence of the site works commencing.

- Insufficient details have been supplied in the Environmental Assessment regarding the flood impacts of the proposal. The proposal is likely to considerably increase the impervious area on the Site and the built structure and unsecured storage mounds would substantially displace flood storage as well as create hazard and blockage during flood events.

- The proposal would have substantial negative impact on flood extents on neighbouring properties both upstream and downstream along the Georges River. The proposal to use bunding to excise the Site from flooding liability is unacceptable.

- The risk of debris being washed into the Georges River is particularly high given the depth and velocity of flooding in this area and could result in significant water quality issues.

- The roadworks associated with on/off ramps would require substantial civil works. The flood impacts arising from these works have not been properly assessed through flood studies.

2.10.2 Response

The flood analysis referred to as part of DA 1417/2005 was submitted to the Council as part of the documentation for that development application. The flood analysis was assessed by the Council as being adequate and the Council granted consent to the development application.

A revised report (to that which was submitted as Appendix 7 of the Environmental Assessment) has been prepared by Evans and Peck titled *Materials Recycling Facility, Newbridge Road, Moorebank* (the **Evans and Peck Report**). A copy of the Evans and Peck Report is at **Attachment 14**.

As described in Part 2.5 of the Evan and Peck report, a flood study prepared for the Bulk Earthworks DA 1417/2005 (Hughes Trueman, 2004) examined flood levels in the

vicinity of the Site and the effect of the proposed bulk earthworks on flood levels. **Figure 2-32** which has been extracted from the Flood Study, shows flood levels in the vicinity of the Site including the chainage locations marked on **Figure 1-2**.

Cross Section Chainage Location (m)	100 Year ARI Flood Level (m AHD)
12,620	5.56
12,890	5.48
13,030	5.45
13,200	5.42
13,350	5.39
13,520	5.35
13,820	5.26

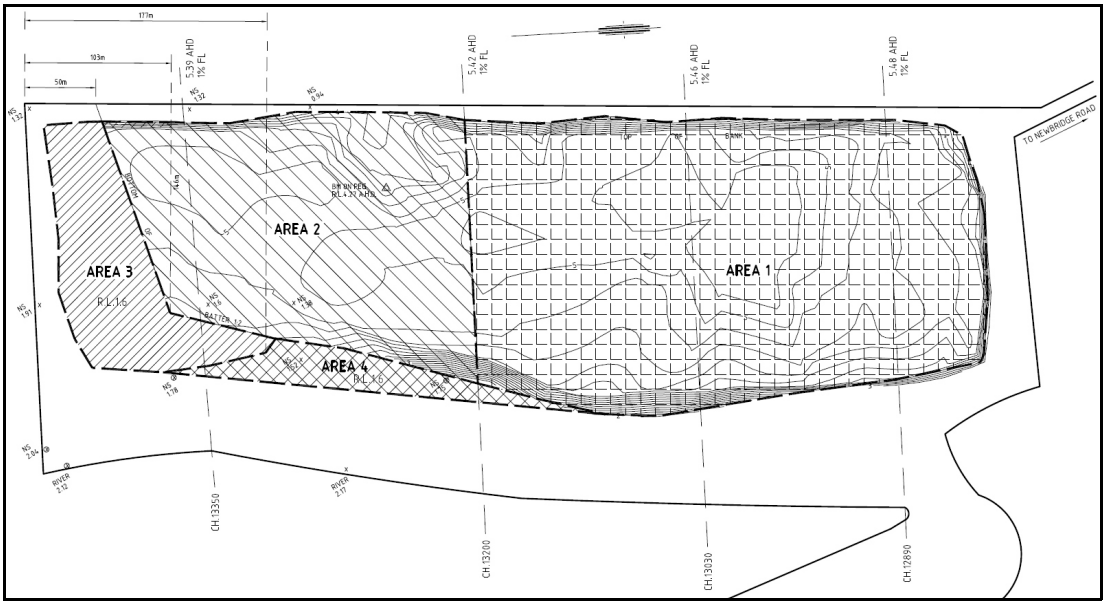
Figure 2-32: 100 Year ARI Georges River Flood Levels.

The data in **Figure 2-32** show that, in a 100 year ARI flood, there is a gradient from about 5.49 metres AHD at the northern boundary of the Site (approx. CH 12,900) to 5.39 metres AHD at the southern boundary (CH 13,350).

Figure 1-2 at page 1-3 of this report is a plan of the approved bulk earthworks which shows the locations of the flood levels identified in **Figure 2-32** above. The shaded areas on **Figure 1-2** indicate the cut and fill "Area 1" to "Area 4" which relate to the approved bulk earthworks. The approval states that:

> *Cut and fill on the site shall be in accordance with plans prepared by Asher McNeill & Partners Pty Ltd marked "Drawing No: 9226 flood 01, amendment B dated 22 August 2005" and supporting information provided by Evans & Peck dated 2 August 2005.*

An extract from **Figure 1-2** is reproduced below.



As demonstrated in the flood analysis which supported DA 1417/05 (Hughes Trueman 2004), the approved earthworks will have no adverse effect on flood levels in the Georges River. The modelling analysis undertaken by Patterson Britten using the MIKE-11 program to support the 2004 Letter Report indicated that if the operational area of the Site were filled to above the 100 year ARI flood level, the only changes to 100 year ARI flood levels either upstream or downstream of the Site would be very small reductions in flood level.

As demonstrated in the flood storage analysis which supported DA 1417/05 (Evans & Peck 2005), which is referenced in the Liverpool Council approval of DA 1417/05, the proposed earthworks would result in no loss of flood storage due to the large increase in flood storage volume provided by the lowering of "Area 3" and "Area 4", which offsets the exclusion of the 100 year ARI flood from "Area 1".

Once complete, the approved bulk earthworks will ensure all operational activities associated with the Materials Recycling Facility will be protected from flooding up to a 100 year ARI flood by means of perimeter mounds, site levels and a low mound at the southern end of "Area 1". The operational area of the Site would, therefore, be flood free in a 100 year ARI flood event.

It is clear from the Evans and Peck Report, that the flooding impact from the approved bulk earthworks is acceptable.

DA 1417/2005 has commenced. Documentation has been forwarded to the Department of Planning and Infrastructure to support the conclusion that the development application has commenced.

As described in **Part 1** of this report and in the Preferred Project Report at **Part 3**, it is proposed to amended the Part 3A application to ensure that access to the Site is provided such that it does no interfere with the approved road bridge access approved by the Council to access the adjoining land to the east of the Site. It is also proposed to raise the

height of the northern approved bund wall from 4 metres to 8 metres and the approved western bund wall from 4 metres to 6 metres.

The Evans and Peck Report provides an assessment of the impact the proposed amended access and raised bund walls would have on the flood regime.

With regard to the proposed raising of the approved bund walls, Figure 4.3 of the *Georges River Floodplain Risk Management Study and Plan (2004 - Volume 1)* shows a long section of the Georges River including the modelled Probable Maximum Flood (**PMF**) water levels. The PMF level adjacent to the Site is estimated to be approximately 10.3 metres AHD. This is well above the site levels approved under the bulk earthworks consent, and would overtop the perimeter mound on the eastern and southern sides of the Site. The tops of the northern and western mounds would, however, remain above flood level. In such an event, the flow velocity within the Site would potentially be higher than those events which remain below the perimeter mound level, however, extreme events with the potential to overtop perimeter mounds would be very rare.

Volume 2 - Planning Issues of the 2004 *Georges River Floodplain Management Study and Plan* includes a definition of flood planning precincts. It indicates that areas outside the 100 year ARI flood extent but within the PMF flood extent are in the low flood risk precinct where *"Risk of damages are low, Modifications to building structures are not cost effective"* and where there are *"No development controls on most uses"*. Given that the operational area will be largely protected from flows during most extreme floods by the perimeter mounds around much of the Site boundary, and that flood proofing measures for buildings will be incorporated as outlined above, further flood proofing of key infrastructure on Site is not warranted.

The potential for materials such as oil, fuels and oxyacetylene tanks to be washed off Site during extreme floods is addressed by the proposed storage measures for those materials:

(a) Waste oil will be kept in a 1,200 L tank, while clean oil will be kept in three 400-600 L aboveground tanks. These tanks will be secured to prevent their movement. Any oil kept in 200 L drums will be kept in a bunded area within the workshop (floor level 5.9 metres AHD or 0.4 metres above the 100 year ARI flood level). The workshop will be able to be closed and locked during flood events to prevent materials and equipment inside from being washed off site in an extreme flood.

(b) The mobile fuel truck (capacity 8,000 L) will be parked in the workshop building, which will be closed up and locked when flood warnings are received. A small fuel tank (capacity 2,000 L) will be located in the primary crushing shed within a bund.

(c) Oxyacetylene tanks would be kept in a locked cage at all times, which would prevent their movement off site in an extreme flood.

Full detail of the assessment of the amended access to the Site as far as its impact on the flood regime is concerned is discussed in details on **Part 3.2.1** of this report.

2.11 Visual Impact

2.11.1 Issue Description

- The visual impact assessment does not account for proposed residential development at New Brighton and Riverland golf courses.
- The analysis has not provided sufficient comfort that the stockpiles, plant and equipment, and heavy vehicles would be adequately screened.
- If the proposed marina development on Lot 7, DP 1065574 is approved, the proposed use of that land for private recreation would experience significant issues relating to loss of amenity and enjoyment of that land.
- The visual impact assessment was undertaken in 2010, since which time there have been a number of significant changes to the area, particularly in relation to progress at the Georges Fair development, and rezoning of land at New Brighton and Riverland golf courses. As such, the relevance of the 2010 visual impact assessment contained in the Environmental Assessment is questionable.

2.11.2 Response

At time of writing this response, there has been no rezoning of the Riverland golf course for residential purposes. Notwithstanding, the proposed development would not be visible from any such land.

With regard to the proposed residential development at New Brighton golf course, the recently gazetted Amendment No.25 to the Liverpool Local Environmental Plan 2008 has provided for that future residential development. **Figure 2-33** below is an extract from the Liverpool LEP 2008 Map which shows the location of the proposed residential development. The section of New Brighton Golf Course which has been rezoned has been zoned R1 General Residential.

The Gazette Notice which accompanied Amendment No.25 states that the total number of dwellings permitted on the land must not exceed 350.

As with the residential development located on the Georges Fair land, there would be no visual impact from the proposed development. All development on the Site would be located behind the significant vegetation cover afforded by the vegetation on the New Brighton Golf Course and the intervening vegetation located to the east of Brickmakers Drive.

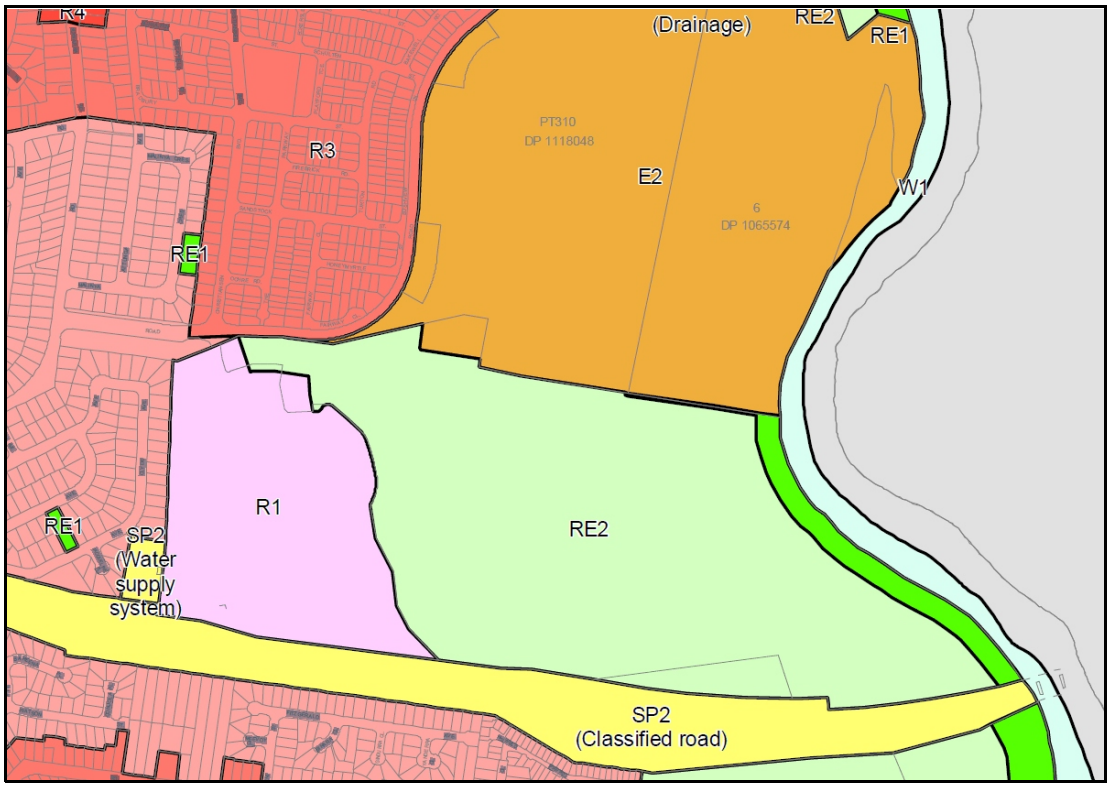


Figure 2-33: Extract from the LEP 2008 Amendment No.25 Map. The rezoned section of the New Brighton Golf Course is shown as R1 land which is to the south west of the proposed Materials Recycling Facility on Lot 6, DP 1065574.

Although it has been stated in the visual impact assessment that stockpiles would not be visible, Moorebank Recyclers has indicated that it would be prepared to ensure that the maximum height of any stockpile on the Site would be 7 metres compared to the 10 metres proposed in the Environmental Assessment. This would further assist in reducing any potential for visual impact from the stockpiles.

The buildings proposed for the Site would be colorbond, and would be of colour suitable to blend with the surrounding vegetation. As stated in the visual impact assessment, those buildings would not be visible from surrounding residential development.

Although there has been no approval of the proposed marina/function centre development, on the assumption that the marina/function centre development application is approved and, indeed, the development is constructed, there is potential for visual impact. The extent of impact is not certain, nor is it certain that there would be any impact. Notwithstanding, Moorebank Recyclers has indicated that it would be prepared to raise the height of the northern boundary mounding which was approved as part of the earthworks consent from the approved 4 metres to 8 metres. It is proposed, once the marina/function centre development has been approved, and construction levels obtained by way of a Construction Certificate, that the visual impact would be reassessed and, if required, the northern mound would be raised by way of an amendment pursuant to s.75W.

2.12 Bushfire

2.12.1 Issue Description

- Some residents of Georges Fair have had to pay a Fire Levy as they are in an area close to the vegetation which separates Georges Fair from the Site, which is marked as being in a Bushfire Zone Area.

- The Site is in a Bush Fire Zone Area and will be storing gas cylinders, grease and other possible inflammable materials which could cause catastrophic situations if a bush fire in the vegetation next to the Site.

- Bushfire impact assessment did not assess whether the proposed facility would exacerbate bushfire in the area between the Site and the Georges Fair residential area. It is not clear whether a fire would travel faster westward due to the presence of the recycling plant than it would naturally do under "no-development scenario. There is also potential that the construction or operation of the plant could trigger any bushfire event.

2.12.2 Response

Part 11 of the Environmental Assessment contains a report prepared by Advanced Bushfire Performance Solutions titled *Bushfire Assessment Report. Lot 6 DP 1065574, Newbridge Road, Moorebank NSW* (**the ABPS Report**). The ABPS Report states:

> *On 1 August 2002, the NSW Government enacted amendments to the Environmental Planning and Assessment Act 1979 and the Rural Fires Act 1997 to enhance bushfire protection through the development assessment process. The amendments:*
>
> - *Introduced Bushfire Prone Land Maps as a 'trigger' for the application of bushfire legislation and the application of Building Code of Australia standards.*
>
> - *Mandated Rural Fire Service concurrence for development applications subject to section 100B of the Rural Fires Act (Subdivisions and Special Fire Protection Purposes).*
>
> - *Required compliance with the provisions of Planning for Bush Fire Protection 2006.*
>
> *An application to develop the land may be subject to section 79BA of the Environmental Planning and Assessment Act 1979 and must comply with Planning for Bush Fire Protection 2006 (**PBP 2006**).*

PBP 2006 requires that all development applications be accompanied by a Bushfire Assessment Report which demonstrates compliance with the aims and objectives of the guidelines (PBP 2006, Appendix 4 A4.1).

The ABPS Report has assessed the proposed development in terms of the requirements of PBP 2006.

The Site is within bushfire prone land on the Liverpool LGA Bush Fire Prone Land Map and is identified as Buffer Zone. The Site, when developed, would be within 100 metres of Category 1 Vegetation to the east and west (**Figure 2-34**).

- *Category 1 vegetation is generally heavily wooded native vegetation.*
- *Category 2 vegetation is generally remnant vegetation, riparian corridors and rainforest.*
- *Buffer Zone is land in proximity to the most significant impacts of bushfire (within 100 metres of Category 1 or within 30 metres of Category 2).*

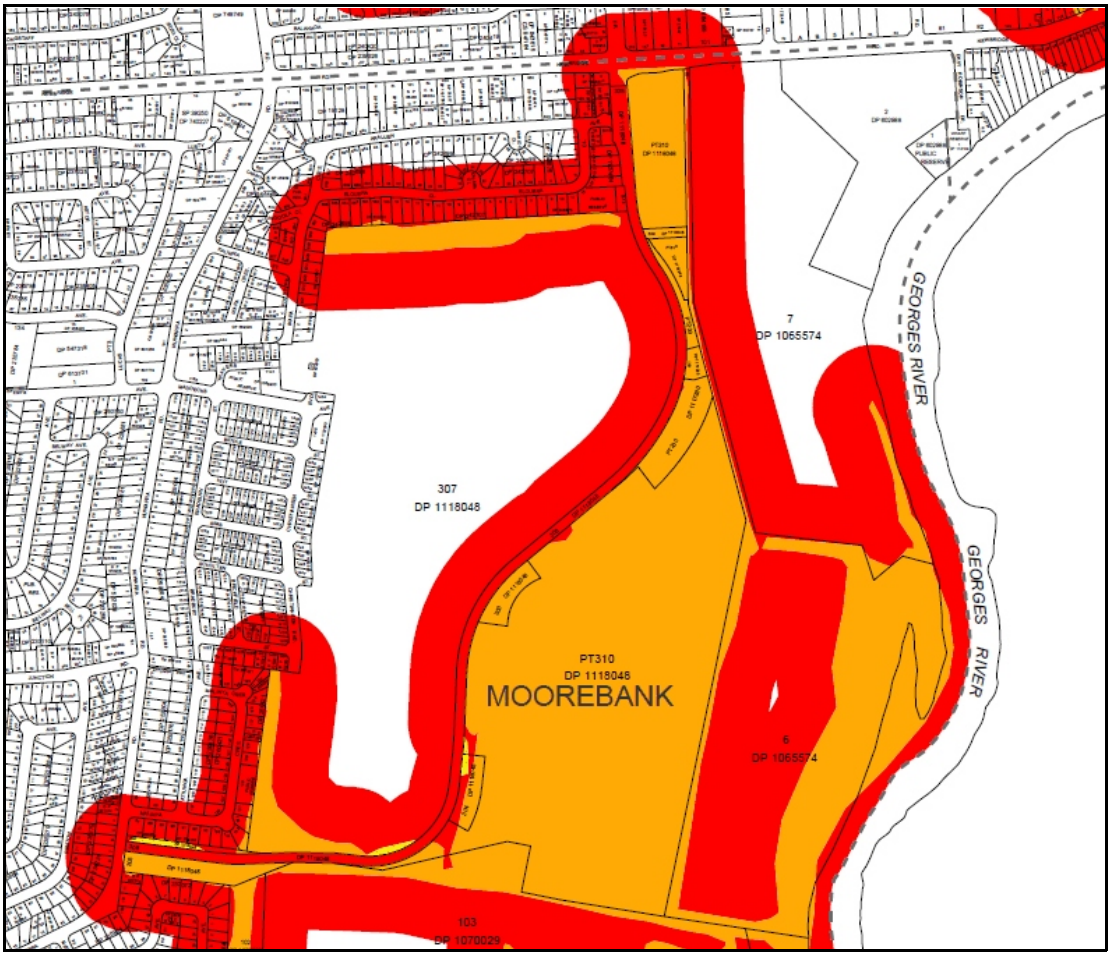


Figure 2-34 Extract from the Liverpool City Council Bushfire Prone Land Map showing the Site and surrounding areas.

The aim of PBP 2006 is to use the development assessment system to provide for the protection of human life (including firefighters) and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, on-site amenity, and protection of the environment. More specifically, the objectives are to:

- afford occupants of any building adequate protection from exposure to a bushfire;
- provide for a defendable space to be located around buildings;
- provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- ensure that safe operational access and egress for emergency service personnel and residents is available;
- provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ); and
- ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bushfire fighting).

The assessment at **Part 11** of the Environmental Assessment concluded:

> *The proposed development is required to meet the aims and objectives of PBP 2006 without necessarily complying with any of the specific planning provisions in the guideline.*
>
> *The Site is large and will accommodate suitable asset protection zones and defendable spaces for any buildings which may be occupied (office, staff rooms, store, workshop etc.). The National Construction Code 2011 will require high construction standards that should exceed the performance targets of AS3959-2009. Where vulnerabilities are identified then AS3959-2009 can be used as a guide to direct appropriate protection measures or construction solutions.*
>
> *The access to the Site will be designed to cater for heavy vehicles which will meet all the requirements for a Category 1 Tanker to safely access and egress the Site.*
>
> *The site should continue to be maintained in its current fuel free state to ensure that Asset Protection Zone maintenance levels are achieved for the life of the development.*
>
> *The Site is serviced by reticulated mains water but the distance to hydrants require the provision of an onsite water storage tank to ensure an available supply. Two separate 5000 L tanks will be provided near occupied buildings.*
>
> *These measures will ensure compliance with the aims and objectives as required by PBP 2006 for commercial development.*

By letter dated 12 March 2013, the NSW Rural Fire Service responded to the exhibition of the Environmental Assessment with no objection to the proposed development subject to certain conditions being placed on any approved development of the Site for the proposed Materials Recycling Facility.

The recommended conditions of the NSW Rural Fire Service have been incorporated into the revised Statement of Commitments at **Part 4** of this report.

2.13 Community Consultation

2.13.1 Issue Description

- A number of submissions raised the issue that insufficient public consultation has been provided as part of the Environmental Assessment process.

- Concern was raised that a number of residents in the Georges Fair residential development were not resident in the estate when the public meeting was conducted and, indeed, certain landowners who have purchased land in the estate are not yet resident and, hence, may be unaware of the proposed development.

2.13.2 Response

Part 4.2 and **Appendix 8** of the Environmental Assessment deal with the process of public consultation undertaken as part of the environmental assessment of the proposed Materials Recycling Facility.

It is, however, recognised that since the conduct of the public meeting, many new residents have established in the Georges Fair residential estate and that, indeed, there are a number of people who have purchased land who have not yet moved into the estate.

In an endeavour to provide sufficient details of the proposed Materials Recycling Facility to those people who did not have access to the public meeting, a number of measures were adopted during the exhibition of the Environmental Assessment to ensure that as many people as possible were aware of the exhibition process. In this regard, the following actions have been taken:

(a) On 9 March 2013, a letter and accompanying details of the proposed development were hand delivered to all houses which had been completed in the Georges Fair residential estate. Residents in Araluen Avenue, Elouera Crescent, Kalana Close and Karoo Close were also provided with the letter and summary.

(b) On 12 March 2013, a letter and project summary were emailed to Investa with a request that the information provided be uploaded to the Georges Fair website. Acknowledgement of that email was received from Investa on that same day.

(c) On 15 March 2013, letters were sent to the Mayor of Liverpool City Council and the Member for Menai requesting a meeting to outline the proposed development.

(d) On 26 March 2013, a meeting was held with the Mayor, General Manager and Senior Town Planning Staff at Liverpool City Council to discuss the proposed development and answer any questions which they might have.

(e) On 2 April 2013, a meeting with the Member for Menai was held in the office of the Member at which time details of the project were provided and discussed.

(f) On 13 May 2013, a site inspection at the Moorebank Recyclers' site was held with the Mayor of Liverpool City Council and the Member for Menai to discuss the proposed development.

Information referred to above is provided as **Attachment 18**.

It is considered that the above consultations, in additional to the notification of the project by Council and the Department of Planning and Infrastructure, are sufficient for anyone interested in making a submission during the exhibition of the Environmental Assessment to be sufficiently acquainted with the proposed development to make such a submission.

2.14 Land Values

2.14.1 Issue Description

- The establishment of the proposed Materials Recycling Facility in close proximity to the Georges Fair residential development would result in a significant decrease in land values in that residential estate.

2.14.2 Response

There has been no evidence provided to substantiate a claim that the proposed Materials Recycling Facility would result in a decrease in land values in the area.

Notwithstanding, the issue of whether land values would rise or fall as a result of a particular development proposal is not a matter for consideration in the assessment of the application.

2.15 Emergency Evacuation Plan

2.15.1 Issue Description

- The emergency evacuation route to Brickmakers Drive is depicted as utilising what is known as the Marshall Plan. This mode of access to Brickmakers Drive is not a viable option.

2.15.2 Response

Attachment 14 to this report contains the Evans and Peck Report which provides amended details relating to evacuation of the Site in the event of flooding having regard to the amended proposal for access depicted in the Cardno Plans.

The Site will be flood free up to a 100 year ARI flood, however, the access road has a minimum level of 1.96 metres AHD and would be subject to the depths of flooding shown in **Figure 2-35** for moderate frequency floods. Accordingly, a flood evacuation strategy has been developed for the Project.

The plan *Warning System and Site Emergency Response Flood Plan: Rev 1* is attached as Annexure D to the Evans and Peck report and reproduced as **Attachment 16** to this report. This plan is designed to ensure timely evacuation of the Site in the event of an impending flood without the need to call on the SES or other emergency services.

While the Flood Evacuation Plan at **Attachment 16** has been developed using the SES *Business FloodSafe Toolkit* as a guide, Section N7.2 of the *NSW Floodplain Development Manual (2005)* clearly states that the SES is opposed to proposals seeking endorsement of private flood plans from the SES. Accordingly the endorsement of the SES has not been sought.

Flood ARI (years)	Depth (m)
2	0
3	0.10
4	0.45
5	0.80

Figure 2-35: Maximum Depth of Floodwater over the Access Road.

2.16 Heritage

2.16.1 Issue Description

- An Aboriginal heritage assessment has not been carried out for the proposal.
- Recommended that the completion of two basic types of Aboriginal cultural heritage assessment be undertaken to inform the planning proposal as follows:
  - an archaeological assessment involving the identification and assessment of Aboriginal objects and their management based on archaeological criteria.
  - a cultural assessment involving consultation with Aboriginal stakeholders and can include historical and oral history assessment and broader values assessment.

2.16.2 Response

As stated in **Part 3.4.2** of the Environmental Assessment:

> *That part of the Site where the proposed development would be located is a disused landfill site. As such, any aboriginal archaeological significance would have been removed as part of the previous use of the Site as a landfill. Foreshore areas of the Site would not be used as part of the proposed development.*

In addition, as stated in the Environmental Assessment (**Part 1.2**):

> *By Notice of Determination dated 29 June 2006, Liverpool City Council notified Moorebank Recyclers Pty Ltd that it had granted consent for bulk earthworks on the Site (**Development Consent No.1417/2005**). Essentially, the consent permitted excavation of a section of the southern part of the landfill on the Site and the transfer of the excavated material to the northern part of the Site such that the northern part of the Site, where the Materials Recycling Facility is proposed to be located, is above the 1 in 100 year flood level. The bulk earthworks have been commenced and will be completed prior to the commencement of any works associated with the subject project.*

The historical use of the Site as a landfill and the approved earthworks dictate that any archaeological objects which might have been present on the Site have been removed or covered by the previous landfill. The approved earthworks would raise the level of the landfill on the Site to accommodate the proposed development. Capping of the landfill would need to be maintained as part of the on-going use of the Site.

2.17 Sewage Disposal

2.17.1 Issue Description

- The proposal seeks to place a septic tank on the Site which would have substantial environmental risks associated with it considering that the Site is entirely flood liable and that a large area of the Site is contaminated with fill and capped.

2.17.2 Response

As discussed in **Part 2.13** and **Part 3.4.2** of the Environmental Assessment, there would not be a septic tank system installed on the Site. Rather, a pump out system would be installed.

Wastewater will be held in a storage tank and periodically emptied by a licensed contractor as often as necessary. There would be no direct connection to the water table or the environment generally. The tank will be protected from flooding in a 100 year ARI flood event by having all inlets and outlets located above the 100 year ARI flood level. These measures will minimise the potential for any wastewater pollution from the wastewater holding system.

Geotechnical and engineering issues associated with the wastewater tank have been considered by Jefferey & Katauskas (see Annexure F of the Evans and Peck Report) who note that:

(a) The tank itself could be of fibreglass construction which would not be subject to chemical attack from any leachate within the landfill. These tanks are readily available as petroleum storage tanks which are commonly used at service stations.

(b) It would be a straightforward engineering detail to provide a tank installation which ensured no hydraulic connection through the landfill cap. For example a collar could be provided around the tank which sat within the cap and the immediate surround to the tank could be backfilled with bentonite and/or use made of self-sealing geo-composite materials such as Bentofix matting.

(c) The tank would have to be located such that it received effluent under normal gravity flow. It may be that the depth to which the tank could be installed would be limited by the presence of the water table but this issue could also be addressed in the same way that underground storage tanks are installed at service stations in similar circumstances by means of concrete dead-weights or screw-pile anchors.

(d) One-way valves could be installed in pipelines to prevent effluent escaping and, if necessary, to allow the holding tank to deliberately fill in the event of flooding to counteract buoyancy effects.

The design and operation of the wastewater storage tank will be in accordance with Liverpool City Council's on-site sewage management requirements. Liverpool City Council will be given the opportunity to conduct inspections in line with its obligations under the Local Government Act.

2.18 Car Parking Provision

2.18.1 Issue Description

- The Liverpool Development Control Plan 2008 requires parking provision for an industrial development at one space per 35m^2 of office space, one space per 75m^2 of factory area, or one space per two employees. The provision of 16 parking spaces for 25 employees equals one space per 1.56 employees. The parking provisions outlined in the Environmental Assessment are non compliant with the Council's Development Control Plan.

2.18.2 Response

As stated in **Part** of the Environmental Assessment:

There would be forty five (45) employees comprising:

- *Two (2) administrators.*
- *Two (2) weighbridge operators.*
- *Two (2) sales staff.*
- *One (1) foreman.*
- *Seven (7) mobile plant operators.*
- *Seven (7) labourers.*
- *Four (4) fitters.*
- *Twenty (20) contract drivers who would arrive at the Site in their trucks.*

Not all employees would be on the Site and any one time.

From the above figures, it is clear that a maximum of 25 employees requiring car parking could be on the Site at any one time. Having regard to the above car parking requirements of the Council Development Control Plan, this equates to a requirement of 12.5 car parking spaces. The proposal is to provide 16 dedicated car parking spaces. The above calculation of the Council is incorrect in that it equates to 1.56 space per employee, not one space per 1.56 employees.

While it is considered that 16 car parking spaces is sufficient to cater for the proposed

development, should it be determined that additional car parking spaces are required, a suitable condition of consent could be formulated to accommodate any increase in car parking spaces.

Part 3

PREFERRED PROJECT REPORT

3.1 Proposed Amendments

3.1.1 Site Access

As stated in **Part 2.2.2** of this report:

(a) It is assumed that the easement over the Moorebank Recyclers' access handle to enable the construction of the approved road bridge is registered. As such, the access proposed in the Environmental Assessment, as exhibited, could not co-exist with the approved road bridge.

(b) On 27 June 2013, Justice Biscoe of the Land and Environment Court handed down judgement in the proceedings *Moorebank Recyclers v Liverpool City Council (No 2) [2013] NSWLEC 93* indicating that an easement sought by Moorebank Recyclers over Lots 308, 309 and 310, DP 1118048, including landowners consent to amend the Part 3A application, would be granted. A copy of the 8 July 2013 Orders, as amended on 8 August 2013, are at **Attachment 9**.

(c) In order to establish an access to the proposed Materials Recycling Facility which would not prevent Tanlane from gaining access by way of the approved road bridge, it is now proposed to incorporate both an access ramp and an exit ramp within Lots 309 and 310, DP 1118048 to connect to Brickmakers Drive.

In order to accommodate the proposed amended access to the Materials Recycling Facility any future development on the Benedict Sand and Gravel site, the Flower Power Site, the amended design solution is provided for in the plans prepared by Cardno, those plans being:

Cardno Series 1000 Plans

Drawing SK 1001, Revision L (**Figure 3-1**)
Drawing SK 1003, Revision E (**Figure 3-2**)
Drawing SK 1004, Revision E (**Figure 3-3**)

Cardno Series 2000 Stage 1 Construction Plans

Drawing SK 2001, Revision D (**Figure 3-4**)
Drawing SK 2003, Revision A (**Figure 3-5**)
Drawing SK 2004, Revision C (**Figure 3-6**)

An A3 copy of the complete set of plans can be seen in **Appendix 8**.

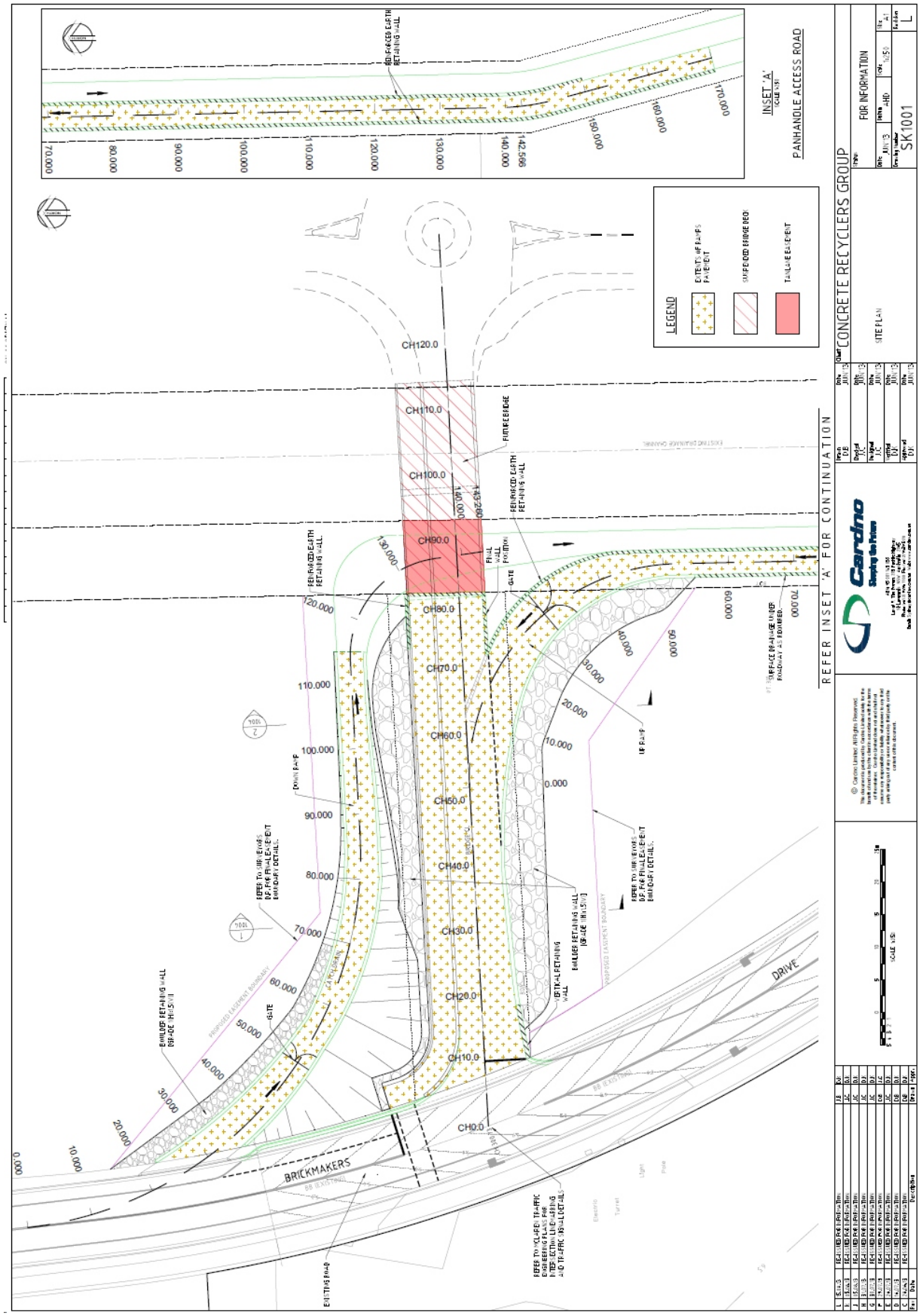


Figure 3-1: SK 1001 which shows the entire access arrangements to land east of Brickmakers Drive.

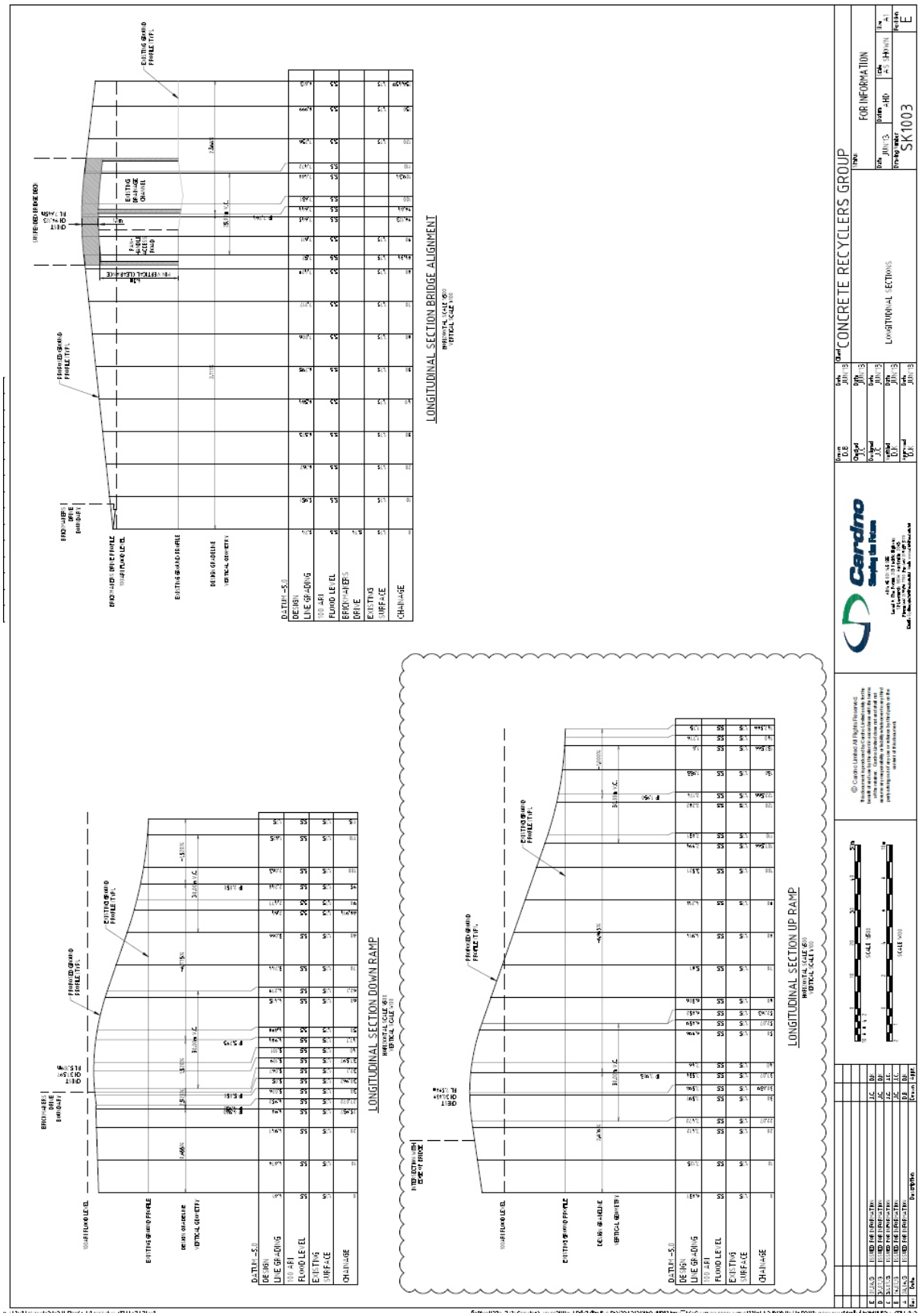


Figure 3-2: Longitudinal section of final access arrangements.

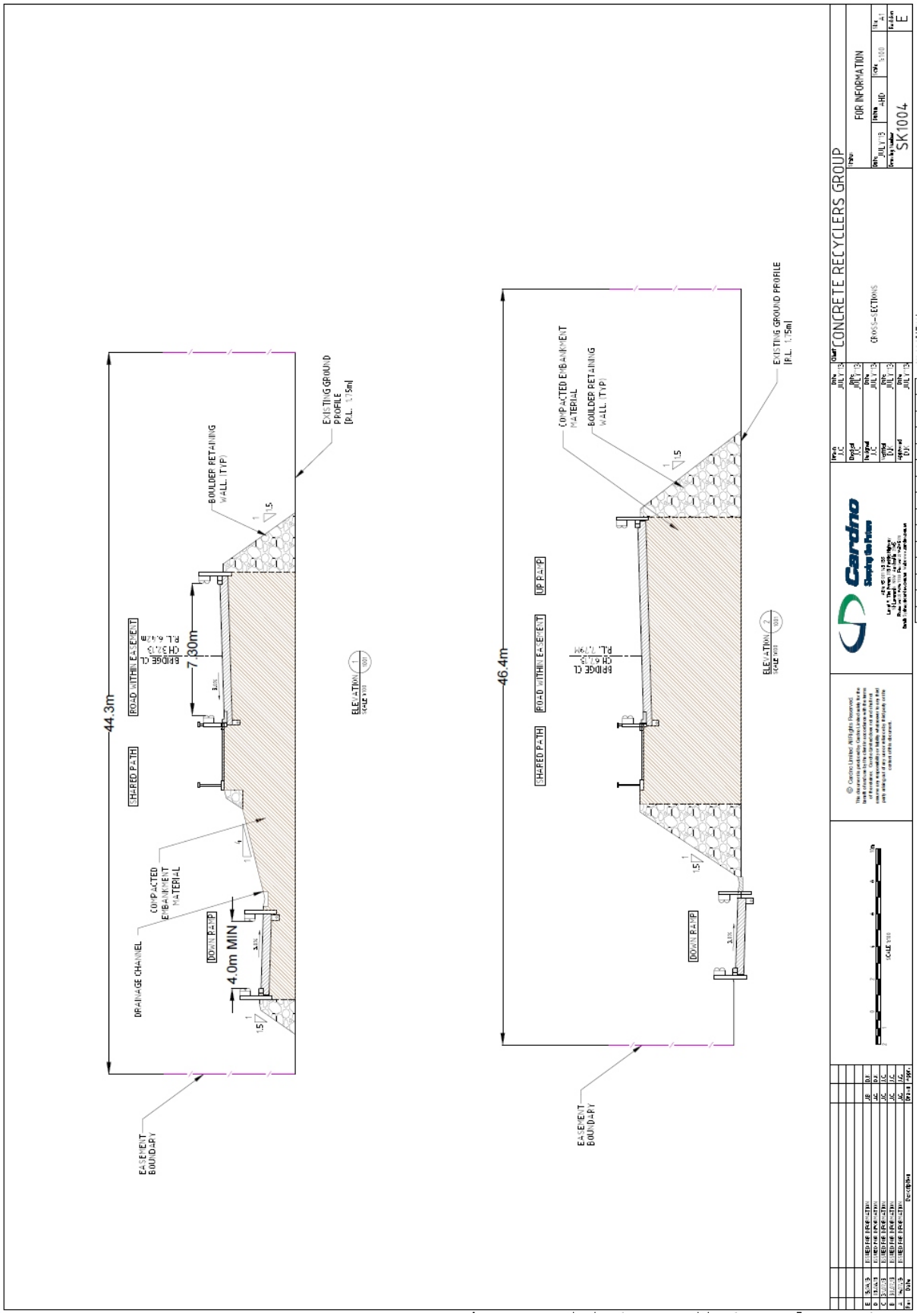


Figure 3-3: Cross sections of the final access arrangements.

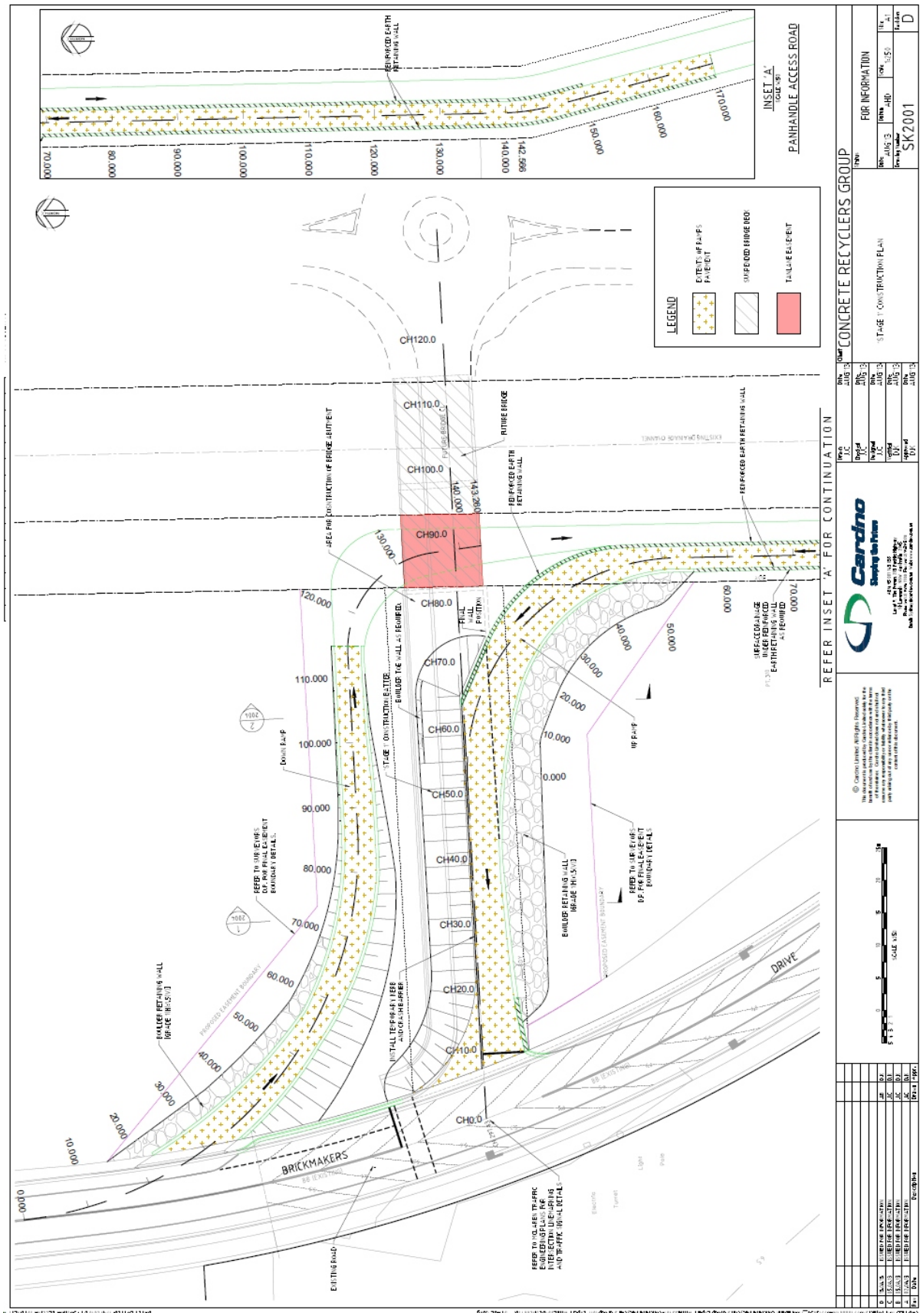


Figure 3-4: Plan of the Stage 1 construction works.

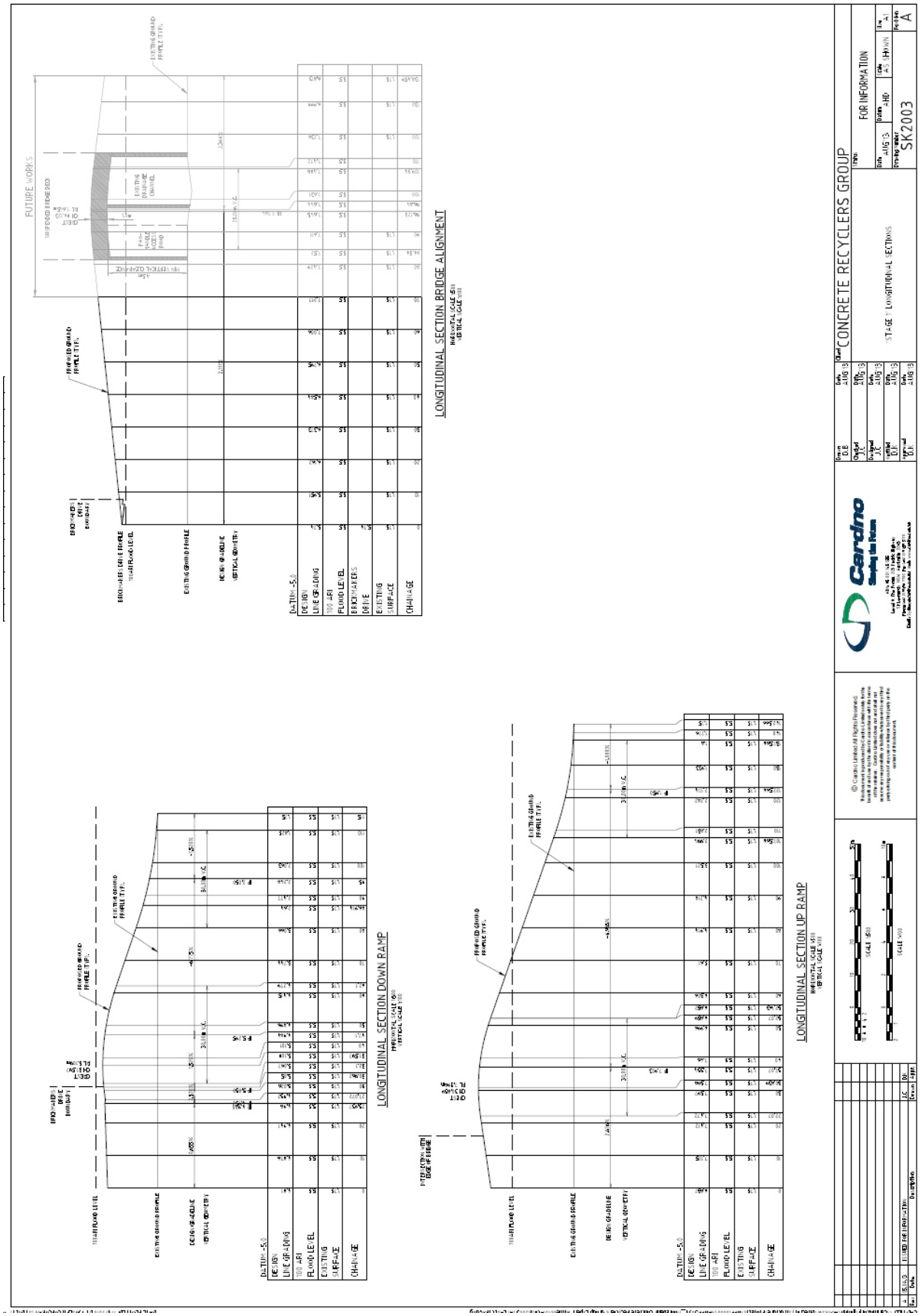


Figure 3-5: Longitudinal sections of the Stage 1 construction works.

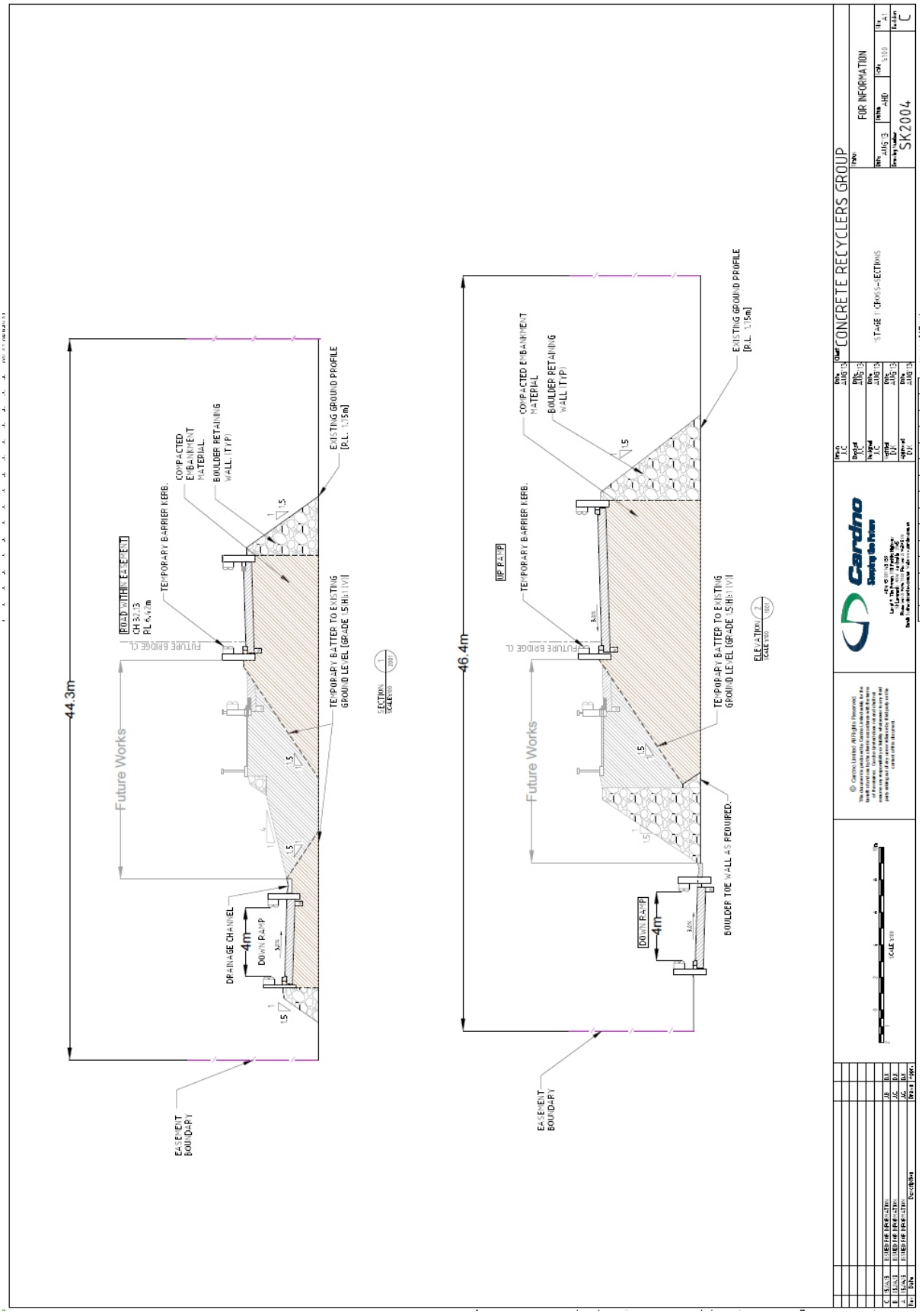


Figure 3-6: Cross sections of the Stage 1 construction works.

The amended access proposal has been designed to provide for access within the recently imposed easement over Lots 308, 309 and 310, DP 1118048 to accommodate access to the Moorebank Land while at the same time providing for a design which incorporates access to land to the east of the Moorebank pan handle.

Having regard to the Cardno plans, the following description of each plan is provided.

Drawing SK 1001, Revision L

This plan shows the proposed access arrangements from Brickmakers Drive to all land to the east of Brickmakers Drive, assuming that all proposed developments to the east of Brickmakers Drive have been developed.

The plan details the location of the approved road bridge, as modified, to gain access to the Benedict Sands and Gravel site and also to the Flower Power site as envisaged in the Liverpool Development Control Plan 2008. In addition, entry and exit ramps are shown which would provide private access to the proposed Materials Recycling Facility.

This plan also shows proposed security gates located at the entrance and exit ramps which would be closed and locked outside of operating hours.

Drawing SK 1003, Revision E

This plan shows longitudinal sections:

(a) along the down ramp from Brickmakers Drive to the pan handle of the Moorebank Recyclers' land.

(b) along the road bridge alignment.

(d) along the up ramp from the Moorebank Recyclers' pan handle to the road bridge and Brickmakers Drive.

Drawing SK 1004, Revision E

This plan shows cross sections 1 and 2 through the completed final access to all land east of Brickmakers Drive. It can be seen from this plan and SK 1001 that the proposed construction is a to be compacted embankment materials held in place by boulder retaining embankments.

Drawing SK 2001, Revision D

This plan shows the proposed Stage 1 construction works to be completed by Moorebank Recyclers to gain access to the proposed Materials Recycling Facility. The Stage 1 construction works would comprise:

(a) Construction of the entry or down ramp from Brickmakers Drive to connect to the pan handle of the Moorebank Recyclers' land.

(b) Construction of that part of the earth embankment along the alignment of the approved road bridge and the exit or up ramp from the Moorebank Recyclers' pan handle to the earth embankment and then to Brickmakers Drive. The Stage 1 construction works have been engineered to ensure that, at some time in the future, when access to the Tanlane land is required, the completion of the works shown in SK 1001 can be completed without significant impact to the operation of the Materials Recycling Facility.

Drawing SK 2003, Revision A

This plan shows the longitudinal sections for the proposed Stage 1 Construction works.

Drawing SK 2004, Revision C

This plan shows cross sections 1 and 2 through the Stage 1 access works. It can be seen from this plan and SK 2001 that the proposed Stage 1 construction is to be compacted embankment materials held in place by a combination of temporary construction batters and boulder retaining embankments.

3.1.2 Amended Perimeter Bund Walls

The siting of the components of the proposed development have been designed to meet the requirements of Concrete Recyclers. An extract from the site layout plan for the main body of the Site as per the Environmental Assessment is at **Figure 3-7** below.

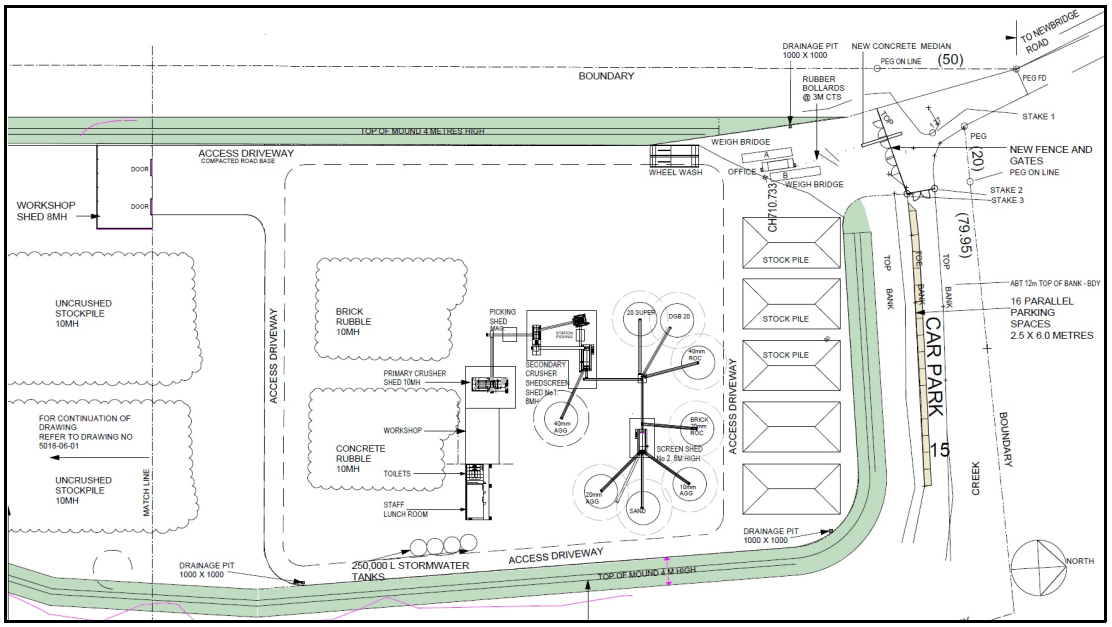


Figure 3-7: Extract from the Site Layout Plan for the Project as provided in the Environmental Assessment as exhibited.

As part of the preparation of the this report, and in response to the proceedings before Justice Biscoe, the Site Layout Plan has been revised to provide for a more environmentally responsive layout. An extract from the revised Site layout Plan is at **Figure 3-8**.

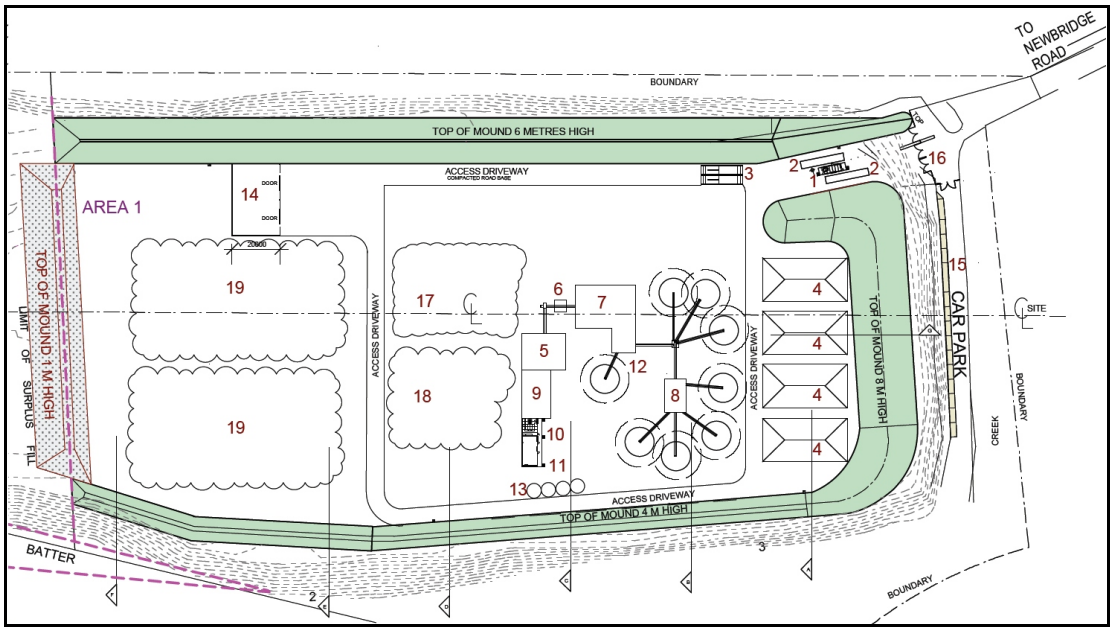


Figure 3-8: Extract from the revised Site Layout Plan. Numbers referred to in the plan are detailed in th discussion below.

It is now proposed to amend the Project such that the bunds surrounding the Site are as follows:

(a) The bund along the northern section of the Site has been altered in its shape to better accommodate the site layout and has been raised from the approved 4 metres height to 8 metres height.

(b) The bund along the western section of the Site has been raised from the approved 4 metres height to 6 metres height.

There is no proposed change to the eastern bund other than a transition from the approved 4 metres height to the 8 metres height of the amended northern bund.

Copies of the revised layout plans are at **Attachment 15**.

3.1.3 Amended Stockpile Heights

Stockpiles heights, as indicated in the **Figure 3-7**, were originally proposed to be a maximum of 10 metres in height. In order to mitigate any perceived visual impact from the stockpiles, as shown in **Figure 3-8**, it is proposed to amend the Project such that

stockpiles would have a maximum height of 7 metres.

3.2 Environmental Impact of the Amended Project

The proposed amendment to the Part 3A application has the potential to impact on the environment of the Site and its surroundings. In particular, the potential impacts relate to:

(a) The impact the amended access design would have on flooding, drainage, waste water, and the stormwater management regime of the locality.

(b) The impact the proposed new access arrangements would have on the flora and fauna of Lots 309 and 310, DP 1118048.

(c) The impact the proposed amended access design would have on traffic management.

3.2.1 Flooding

Protection of Operational Area of the Site

The operational layout of the Site, including the material stockpiling locations, associated handling facilities (crusher and screen facilities), workshop, site offices and the weighbridge etc. are shown in the plans at **Attachment 15**.

Once complete, the approved bulk earthworks will ensure all operational activities associated with the Materials Recycling Facility are protected from flooding up to a 100 year ARI flood by means of perimeter mounds, site levels and a low mound at the southern end of "Area 1" (refer **Figure 3-8**). The operational area of the Site would, therefore, be flood free in a 100 year ARI flood event.

The earthworks required to exclude the 100 year ARI flood from the operational area have been approved by Liverpool Council on the understanding that the approved earthworks do not reduce 100 year ARI flood storage and have no adverse impact on 100 year ARI flood levels.

The Flood Evacuation Plan for the Site includes a series of flood proofing actions, the majority of which involve establishing key elements of the on-site infrastructure (building/shed floor levels, electrical equipment, control panels etc.) between 0.5 - 1.5 metres above the 100 year ARI flood level. This will ensure that these key elements will be protected from damage during floods in excess of the 100 year ARI flood.

Floodwaters well in excess of the 100 year ARI flood level may enter the Site via the vehicle access point in the north-west corner, or over the low mound along the southern

edge of Area 1. As the flow of the Georges River is approximately north to south, these perimeter mounds will afford protection to the Site and prevent floodwaters in large floods from moving through the Site with any appreciable velocity.

The estimated Probable Maximum Flood (**PMF**) level at the Site is approximately 10.3 metres AHD. At this level, it is possible that floodwater would overtop some of the perimeter mounds, however, due to the additional height of the mounds along the northern and western boundaries of the Site, floodwater could only enter the Site at the Site entrance and over the southern and eastern perimeter mounds. In such an event, the flow velocity within the Site would potentially be higher than those events which remain below the perimeter mound level. Extreme events with the potential to overtop perimeter mounds would be very rare.

Volume 2-Planning Issues of the 2004 Georges River Floodplain Management Study and Plan includes a definition of flood planning precincts. It indicates that areas outside the 100 year ARI flood extent but within the PMF flood extent are in the low flood risk precinct where *"Risk of damages are low, modifications to building structures are not cost effective"* and where there are *"No development controls on most uses"*. Given that the operational area will be largely protected from flows during most extreme floods by the perimeter mounds around much of the Site boundary, and that flood proofing measures for buildings will be incorporated as outlined above, no further flood proofing of key infrastructure on site is warranted.

The potential for materials on Site such as oil, fuels and oxyacetylene tanks to be washed off site during extreme floods is addressed by the proposed storage measures for those materials:

(a) Waste oil will be kept in a 1,200 L tank, while clean oil will be kept in three 400-600 L aboveground tanks. These tanks will be secured to prevent their movement. Any oil kept in 200 L drums will be kept in a bunded area within the workshop (floor level 5.9 metres AHD or 0.4 metres above the 100 year ARI flood level). The workshop will be able to be closed and locked during flood events to prevent materials and equipment inside from being washed off site in an extreme flood.

(b) The mobile fuel truck (capacity 8,000 L) will be parked in the workshop building, which will be closed and locked when flood warnings are received. A small fuel tank (capacity 2,000 L) will be located in the primary crushing shed within a bund.

(c) Oxyacetylene tanks would be kept in a locked cage at all times, which would prevent their movement off site in an extreme flood.

Access Road

Vehicle access to the Site will be provided via an on-grade road which follows the alignment of the existing access road (pan handle) for a distance of about 500 metres north of the operational area, at which point ramps will be constructed to provide access

to Brickmakers Drive. The ramps will join Brickmakers Drive alongside the alignment of a previously approved road bridge to link Brickmakers Drive to the Site currently operated by Benedict Sand and Gravel. Engineering details of the access ramps and associated bridge are provided in **Appendix 8**.

Flood Storage Volume

The bulk earthworks proposed for the Site have previously been approved by Council. The development application for the bulk earthworks contained all relevant information on the flood storage balance for the earthworks and the impact on flood levels of the proposed earthworks, and demonstrated that the approved earthworks would result in no net loss of flood storage.

After allowing for the earthworks volume for the abutment for the previously approved bridge, the earthworks volume for the ramps to provide access to the Moorebank Recyclers' site is 5,100m^3.

The loss of flood storage resulting from the construction of the access ramps will be offset by the use of compaction rolling to lower the surface level of "Area 2" (an area of approximately 32,250m^2) by a minimum of 150mm (see advice from Jeffery & Katauskas dated 9 May 2013 being Annexure B of the Evans and Peck Report) to provide at least an additional 4,840m^3 of storage below the 100 year ARI flood level. Consequently, there would be minimal (260m^3) loss of floodplain storage as a result of the proposed access ramps.

Flood Level Impacts

The flood level impacts associated with the proposed ramps to provide access to the Moorebank Recyclers' site, as well as the possible future construction of a road bridge, have been assessed by means of a two dimensional hydraulic model which covers a 5 km section of the Georges River floodplain extending from 1 km upstream of Newbridge Road to 2 km downstream of the Site. Topographic details of the model area were derived from 1 metre spatial resolution LiDAR data for the whole area supplemented by cross section details of the river. Full details of the model configuration are provided in the Flood Impact Assessment contained as Annexure C of the Evans and Peck Report. The flood model was used to examine the following flood situations with and without the proposed road bridge and ramps:

(a) 100 year ARI flood in the Georges River.

(b) 100 year ARI flood from the local 75 ha catchment (mainly located north of Newbridge Road).

(c) 100 year ARI flood from the local catchment coinciding with the peak from the 20 year ARI flood in the Georges River.

In order to identify any effects of the proposed works, the "without project" conditions took account of:

(a) "As constructed" levels along Brickmakers Drive together with the stormwater treatment ponds and sewerage pumping station on the eastern side of the road.

(b) The embankment for the previously approved road bridge.

(c) The approved earthworks for the Moorebank Recyclers' site including exclusion of floodwater from the operational area and the lowering of the southern end of the Site ("Area 3" and "Area 4") to natural ground levels.

The flood modelling took account of the proposed offset for loss of flood storage attributable to the access ramps by impact rolling on "Area 2". The analysis showed that:

(a) For a 100 year ARI flood in the Georges River, the flood level at the Site of the proposed road bridge and ramps would be 5.5 metres AHD. The proposed road bridge embankment and ramps would cause a localised flood increase of 2 - 3mm which is well below the standard applied tolerance of 10mm, and, as such, can be considered to be no impact.

(b) The 100 year ARI flood level as a result of a flood from the local catchment would be 3.0 metres AHD (2.5 metres lower than the 100 year ARI flood in the Georges River). The proposed road bridge embankment and ramps would lead to a maximum flood level increase of 0.03 metres (30mm) immediately upstream of the road bridge. There would be no increase in flood level on Newbridge Road. The area affected by any increase would be confined between the elevated land on the Benedict Sand and Gravel site to the east and Brickmakers Drive to the west where land levels are in excess of 5 metres AHD. Because the flood level attributable to local flooding is 2.5 metres below the 100 year ARI flood level from the Georges River, which is the basis for setting floor levels, it would have no impact on any buildings in the vicinity.

(c) For the 100 year ARI level from the local catchment combined with the 20 year ARI flood in the Gorges River, the flood level at the site of the bridge and ramps would be 4.77 metres AHD (0.73 metres lower than the 100 year ARI flood in the Georges River). The proposed road bridge embankment and ramps would lead to a maximum flood level increase of 1.5mm immediately upstream of the bridge.

Even without taking account of the proposed compensatory flood storage by impact rolling on "Area 2", but taking account of the full effect of the road bridge abutment (not part of this proposal), the results of the flood modelling indicate that the effect of the proposed access works would be trivial and would be confined to the immediate vicinity of the works.

Flood Evacuation

The operational area of the Site will be flood free up to a 100 year ARI flood, however, the access road has a minimum level of 1.96 metres AHD and would be subject to the depths of flooding shown in **Figure 3-9** for moderate frequency floods. Accordingly, a flood evacuation strategy has been developed for the Project. The plan *"Warning System*

and Site Emergency Response Flood Plan: Rev 1" is attached as Annexure D to the Evans and Peck Report and reproduced at **Attachment 16**. This plan is designed to ensure timely evacuation of the Site in the event of an impending flood without the need to call on the State Emergency Service (**SES**) or other emergency services.

Flood ARI (years)	Depth (m)
2	0
3	0.10
4	0.45
5	0.80

Figure 3-9: Maximum Depth of Flood Water over the Access Road.

While the Flood Evacuation Plan has been developed using the SES Business FloodSafe Toolkit as a guide, Section N7.2 of the *NSW Floodplain Development Manual (2005)* clearly states that the SES is opposed to proposals seeking endorsement of private flood plans from the SES. Accordingly, the endorsement of the SES has not been sought.

3.2.2 Drainage and Stormwater Management

To ensure sediment laden runoff is controlled and potable water use for site operations is minimised, all runoff from the operational area will be collected at four appropriately sized collection sumps, from where it will be pumped to holding tanks for re-use. In addition to sediment retention, the design of the sumps provides for retention of any oil or other floatable material. All overflow from the sumps will flow along grass swales or a bio-retention swale for further retention of sediment prior to discharge from the property boundary. Figure 9 of the Evans and Peck Report (reproduced below as **Figure 3-10**) is a schematic diagram which illustrates the main features of the proposed water management system which are described in further detail below:

(a) The Site will be subdivided into four drainage catchments.

(b) Primary stormwater pollution control will be achieved by directing all site runoff to collection sumps from where it will be pumped to re-use holding tanks.

(c) Water in the re-use holding tanks will be utilised for dust suppression purposes throughout the Site.

(d) The collection sumps will provide for sediment settling and retention of any free

oil/fuel or floatable material.

(e) Overflow from the sumps will only occur when the combined capacity of the collection sumps and holding tanks is exceeded.

(f) Overflow from the sumps will discharge from the cleanest water near the surface of the ponded water.

(g) Outlet pipes will direct overflow from the sumps to a series of grass swales or a bio-retention swale which will provide a secondary means to reduce sediment concentrations before water leaves the Site boundary.

(h) The rate of overflow from the collections sumps will be controlled by the outlet pipe size, which will limit overflows to flow rates lower than the existing site peak runoff rates.

(i) Stormwater runoff from the car park will be directed to a bio-retention swale for treatment before discharge to the existing drainage channel which runs along the northern boundary of the Site before discharging to the Georges River.

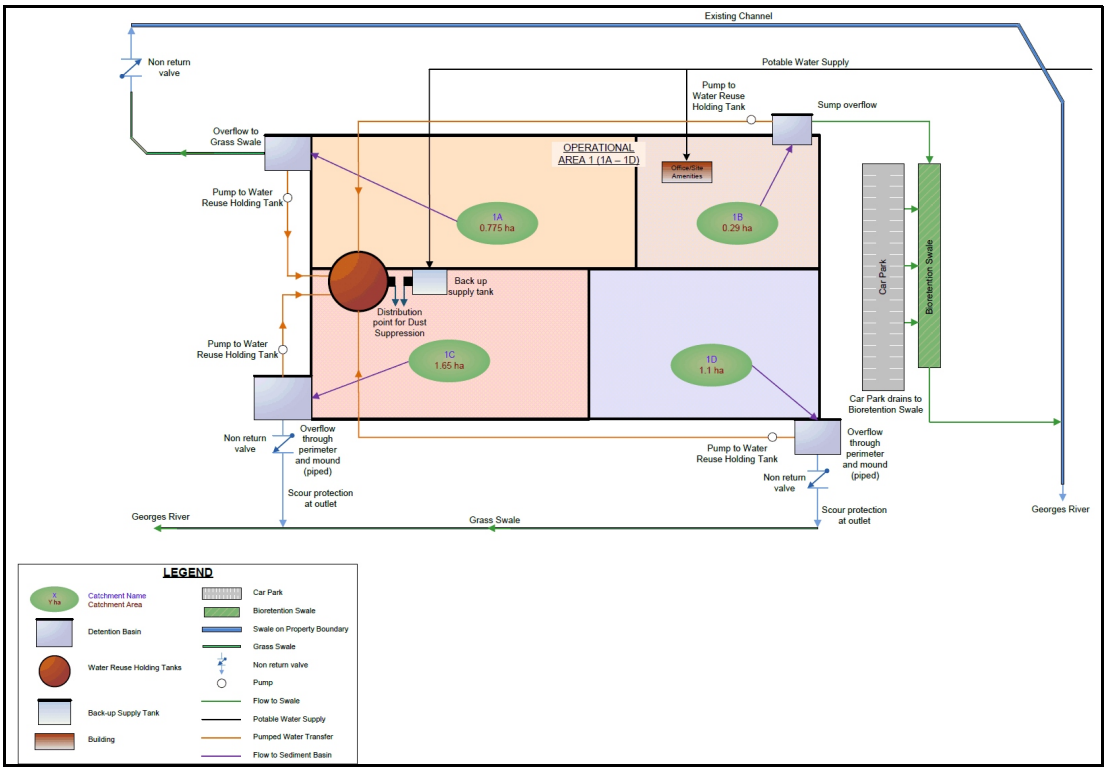


Figure 3-10: Materials Recycling Facility Water Balance

Collection Sumps

The sizing of the collection sumps and associated pumping capacity have been based on the criteria for sediment basin sizing and management set out in *Managing Urban*

Stormwater: Soils & Construction (Landcom 2004).

The types of recycled materials which will be produced at the Site can be categorised as coarse materials with low proportions of fines. Some of the main types of materials produced onsite will be DGB20 Road Base and Envirosand.

- DGB20 Road Base has approximately 8% of particles finer than 0.075mm and <5% finer than 0.0135mm, which indicates that 5 - 6% of particles are finer than 0.02mm.

- Envirosand contains only 10% of particles finer than 0.075mm, which means that well below 10% of particles would be finer than 0.02mm.

These materials would be classified as 'coarse' materials ("Type C" with less than 33% of particles finer than 0.02mm) by the definitions in *Managing Urban Stormwater: Soils & Construction (Landcom 2004)*.

Although the sediments derived from site operations are expected to conform to Type C classification, basin designs based on Type F sediments have been adopted for the sake of conservatism, because they are designed to retain both coarse and fine sediments.

For a site with an operational life in excess of three years which drains to a sensitive environment, Table 6.1 in *Managing Urban Stormwater, Soils and Construction, Volume 2E Mines and Quarries* (DECC, 2008) specifies that sediment basins for Type F sediments should be designed to retain all runoff from a 95th percentile storm of 2, 5, 10 or 20 days duration. For the Site, the collection sumps and pumps have been designed to achieve equivalent performance to basins designed and operated in accordance with this standard.

The collection sumps will operate in the following manner:

(a) Coarse sediment will be retained in the bottom of the sump. Accumulated sediment will be removed regularly.

(b) A float controlled pump will be set to operate as soon as any water drains into the sump. Water will be pumped to one of the holding tanks.

(c) Because of the nature of the operation, temporary ponding of water within the work area up to a depth of 200mm will not inhibit work activities and has been allowed for in the analysis.

(d) In the event that the volume of runoff exceeds the design storm volume and capacity of the transfer pump and holding tanks, overflow from the sump will discharge from the operational area via an outlet which ensures oil and any floatable material is retained within the sump. Any overflow would have benefited from treatment via sedimentation within the sump prior to overflow occurring.

(e) Overflow discharge from all sumps will be via non-return valves to ensure that external floodwater does not enter the operational area of the Site.

(f) All overflow from the collection sumps will be directed into a grass swale or a bio-retention swale for supplementary treatment before draining to the Georges River.

Figure 3-11 sets out the key features of the collection sumps for each of the catchments designated in **Figure 3-10** above based on the 95th percentile rainfall data for Bankstown and runoff coefficients set out in *Managing Urban Stormwater: Soils & Construction (Landcom 2004)*. The potential collection volume is based on the volume which can be pumped out of the sump over 48 hours and assumes that the sump is full at the end of the storm event. The potential collection volumes show that the proposed system provides over 100% of the runoff volume for the 95th percentile 2 day design storm.

Catchment	Area (ha)	2 Day 95th Percentile Runoff (m^3)	Sump Volume (m^3)	Minimum Pump Rate (L/s)	Potential Collection Volume over 2 Days (m^3)
1A	0.775	257	25	1.5	284
1B	0.29	96	25	0.5	111
1C	1.65	547	200	2.2	580
1D	1.1	365	35	2.2	415

Figure 3-11: Collection Sump Features.

Overflow Discharge from Collection Sumps

Figure 10 of the Evans and Peck report (reproduced as **Figure 3-12** below) illustrates the functioning of the collection sumps. In order to eliminate any risk of oil or other floatable material being discharged during an overflow, the collection sumps will be fitted with a custom designed baffle / riser outlet which will only discharge from below the water surface. The customised outlet is based on the standard RMS pollution control design which is configured to prevent any oily surface waters from being discharged. The discharge pipes will penetrate through the perimeter mound and will allow overflow from the collection sumps in the event of rainfall greater than design event. Any oil floating on the surface of the collection sump will be cleaned up after a storm.

As the pipe outlets will be below the level of the 100 year ARI flood, non-return valves will be placed on each outlet to ensure flood waters do not backflow into the collection sumps and the operational area. All overflows will be directed to a grass swale or a bio-retention swale with scour protection at the outlet.

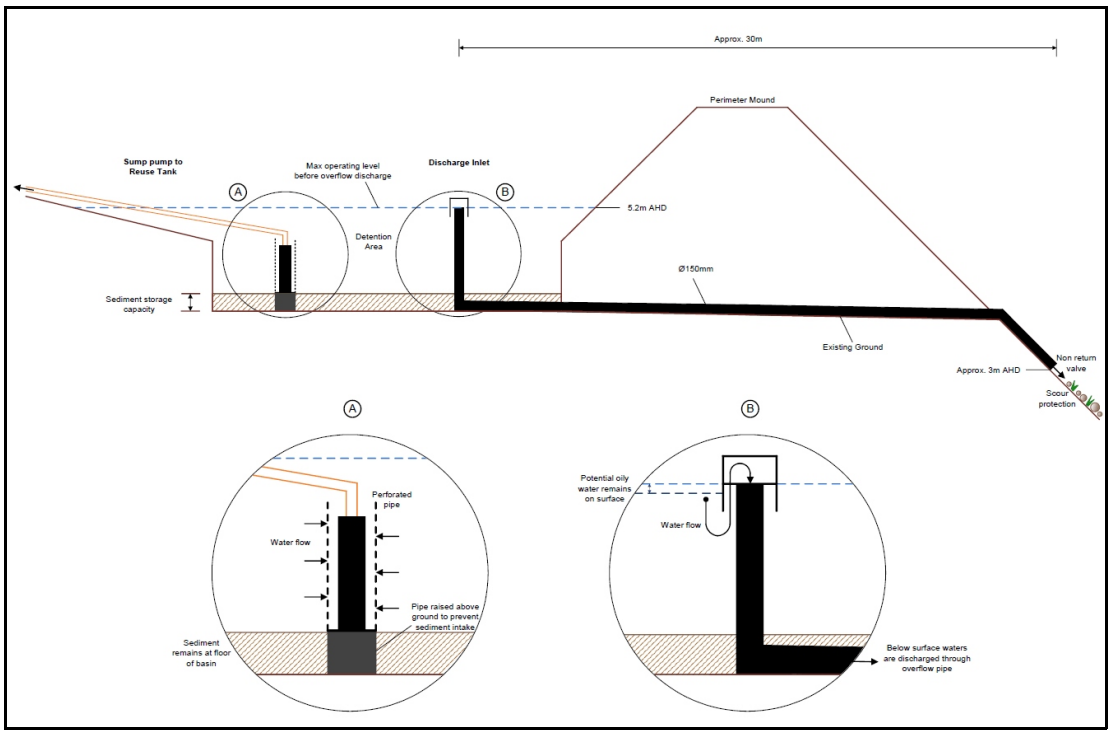


Figure 3-12 General Arrangement for Stormwater Collection Sumps.

Grass Swales

Overflow discharge from the collection sumps for Catchments 1C and 1D will be directed to a natural grassed depression within the Site which runs along the eastern side of the landfill mound. This natural drainage depression runs in a north-south direction along the foot of the landfill embankment and is separated from the Georges River by a natural terrace. The drainage depression, which is located between 60 metres and 100 metres from the banks of the Georges River, has a lateral grade of about 0.3% towards the south and would provide over 400 metres of swale length.

Overflow from the sumps for Catchments 1C and 1D will be piped to the foot of the embankment by means of 150mm diameter pipes which have been sized to regulate the flow rate from the collection sump. Analysis based on *Managing Urban Stormwater: Treatment Techniques* (DECC and Sydney Metro CMA, 2007) indicates that the nominated area of swale will provide further reduction of suspended solids in the range of 70-75% (see Annexure E of the Evans and Peck Report for more detail on pollutant reduction).

A 65 metre long by 6 metre wide grassed swale will be constructed to the south of the Large Workshop Shed. Overflow from the collection sump for Catchment 1A will be directed into this swale which will drain in a southerly direction. The grassed swale will provide an approximate 75% reduction in suspended solids concentration in the overflow from Catchment 1A. A pipe with a non-return valve will convey flow from the swale through the mound and into the existing drain on the western side of the fill area. This drain eventually joins the channel which runs to the Georges River along the northern

boundary of the Site.

Bio-retention Swale

Overflow from Catchment 1B will be directed to a bio-retention swale which will be located adjacent to the car park. Runoff from the car park will also be directed to the bio-retention swale which will discharge into the drainage line adjacent to the northern boundary of the Site. The swale will cover a surface area of approximately 220m^2. Analysis based on *Managing Urban Stormwater: Treatment Techniques (DECC and Sydney Metro CMA, 2007)*, indicates that the bio-retention swale has the capability to removing 75% of suspended solids from the runoff from Catchment 1B and the car park. **Figure 3-13** shows a typical cross section for a bio-retention swale.

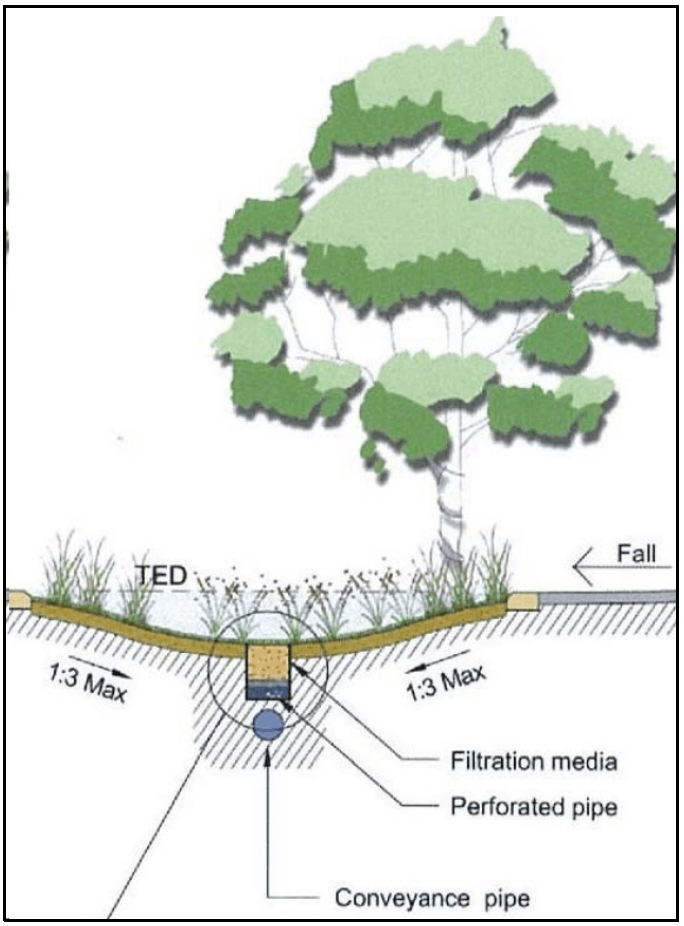


Figure 3-13: Typical Bio-retention Swale Cross Section.

Refuelling

A mobile fuel truck with a capacity of approximately 8,000 L will operate on the Site. All plant and equipment on the Site will be powered by diesel fuel, and will be refuelled by the mobile fuel truck.

When not in operation, the mobile fuel truck will be parked in the workshop building.

In addition, there will be a small fuel tank (approximately 2,000 L) in the primary crushing shed which will fuel the generator which drives the crushing plant. This small fuel tank will be located inside the shed (and, therefore, covered) and will be bunded with a bund capacity in excess of the tank capacity.

Spill kits will be kept in each main building on the Site where refuelling occurs, and adjacent to operating locations of large equipment. The configuration of the sumps will prevent any oil/fuel which does reach the sump from leaving the operational area.

Erosion and Sediment Control during Construction

Temporary erosion and sediment controls will be implemented prior to the construction of the facilities which comprise the water management system. A combination of localised controls including silt fencing and temporary sediment basins, etc. will be used.

Following project approval, a detailed Erosion and Sediment Control Plan will be prepared in accordance with the requirements of *Managing Urban Stormwater: Soils & Construction (Landcom, 2004)*.

3.2.3 Waste Water

Wastewater will be held in a storage tank and periodically emptied by a licensed contractor as often as necessary. There would be no direct connection to the water table or the environment generally. The tank will be protected from flooding in a 100 year ARI flood event by having all inlets and outlets located above the 100 year ARI flood level. These measures will minimise the potential for any wastewater pollution from the wastewater holding system.

Geotechnical and engineering issues associated with the wastewater tank have been considered by Jefferey & Katauskas (see Annexure F of the Evans and Peck Report) who note that:

(a) The tank itself could be of fibreglass construction which would not be subject to chemical attack from any leachate within the landfill. These tanks are readily available as petroleum storage tanks which are commonly used at service stations.

(b) It would be a straightforward engineering detail to provide a tank installation which ensured no hydraulic connection through the landfill cap. For example a collar could be provided around the tank which sat within the cap and the immediate surround to the tank could be backfilled with bentonite and/or use made of self-sealing geo-composite materials such as Bentofix matting.

(c) The tank would have to be located such that it received effluent under normal gravity flow. It may be that the depth to which the tank could be installed would be limited by the presence of the water table but this issue could also be addressed in the same way that underground storage tanks are installed at service stations

in similar circumstances by means of concrete dead-weights or screw-pile anchors.

(d) One-way valves could be installed in pipelines to prevent effluent escaping and, if necessary, to allow the holding tank to deliberately fill in the event of flooding to counteract buoyancy effects.

The design and operation of the wastewater storage tank will be in accordance with Liverpool City Council's on-site sewage management requirements. Liverpool City Council will be given the opportunity to conduct inspections in line with its obligations under the Local Government Act.

3.2.4 Water Balance and Sediment Discharge

The primary mechanism for stormwater pollution control will be by means of the capture and re-use of stormwater runoff from the Site.

MUSIC (Model for Urban Stormwater Improvement Conceptualisation) is widely used to assess the effectiveness of water sensitive urban designs and stormwater pollution control systems. The model is particularly useful for assessing the performance of proposed stormwater systems for residential land development projects, however, the model takes a simplistic approach to stormwater capture and reuse - which is a key aspect of this proposal. In particular, the MUSIC model does not adequately account for the variation in water demand for dust suppression which characterises the water usage on a materials recycling site. In view of the limitations of MUSIC, a site specific water balance model has been prepared to assess the portion of the site water requirements which would be met from on-site runoff and to quantify the volume and frequency of overflow discharge from the sediment sumps. This model is based on previous modelling undertaken to assess the performance characteristics of sediment basins as set out in Table 6.2 of *Managing Urban Stormwater: Soils and Construction, Volume 2E Mines and Quarries* (DECC, 2008).

The further reduction in sediment load which would be achieved with the proposed grass swales and bio-retention swale which has been assessed using the sediment capture relationships set out in *Managing Urban Stormwater: Treatment Techniques* (DECC and Sydney Metro CMA, 2007) (see Annexure E of the Evans and Peck report for details).

Based on experience at an existing recycling facility at Camellia, and allowing for differences in site area, a maximum of 130 kL/day of water will be required for dust suppression on stockpiles and internal work areas on dry windy days. Initially, water will also be required for establishing landscaping.

The site water balance model accounts for all the flows in the water management system on a daily basis using 33 years of local rainfall and evaporation data. The model accounts for:

(a) Areas of different surfaces (stockpiles, work area, roofs, landscaping, etc.) based on the Site layout.

(b) Runoff from different surfaces.

(c) Runoff held in the collection sumps is pumped to storage tanks.

(d) Water from the storage tanks is used on a daily basis and allowance is made for the variation of daily evaporation. The model assumes that, after accounting for rainfall and evaporation, sufficient water is required to maintain a moist surface on the working area and stockpiles, with a maximum daily requirement of 130 kL.

(e) Overflow from the collection sumps to the swales occurs as described above.

(f) Any shortfall of water from the stormwater runoff storage tanks is assumed to be supplied by reserve tanks which will be either filled using EPA approved industrial wastewater imported by tanker or, as a last resort, topped-up over-night from the mains supply.

The water balance model keeps account of:

(a) The volume of water which overflows because it cannot be retained in the storage tanks or sumps.

(b) The number of overflow events, where any occasion on which overflow occurs on consecutive days due to persistent rainfall is counted as a single event.

(c) The volume of supplementary supply required to meet the full water requirements for dust suppression on the Site.

The water balance model was first run for the proposed water management and re-use arrangements on the Site as set out in (a) to (c) above. For comparative purposes, a water balance analysis was also carried out for a hypothetical situation in which the Site drained to a series of sediment basins which were designed and operated in accordance with the requirements for "Type F" sediment basins which retained all runoff from a 2 day 95th percentile rainfall event as set out in Chapter 6 of *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004). This hypothetical water balance model assumes that the water retained in the basins would be treated and discharged within 2 days of the end of a runoff event, in accordance with the operational requirements. The hypothetical model assumes that any runoff in excess of the capacity of the sediment basins would overflow from the Site. An account is kept of the volume of overflow and the number of overflow events. The results of the hypothetical model enable comparison of the number of overflows between the hypothetical scenario and the proposed water management system.

The Site water balance model was run using alternative holding tank sizes to identify the optimal size of the holding tanks which would provide for cost-effective retention of

stormwater runoff while achieving overflow frequency which was comparable with the hypothetical scenario (that which would be achieved if the Site pollution control was based on treating all runoff from a 2 day 95th percentile storm). Key performance characteristics of the Site water management system based on 33 years of daily climate data for three different sizes of storage tank volume are set out in **Figure 3-14**.

Characteristic			
Runoff storage tank volume (m^3)	500	1,000	1,500
Percentage of runoff captured	67%	71%	75%
Percentage of demand met from runoff	51%	55%	58%
Percentage of demand met from external sources	49%	45%	42%
Total water usage (m^3/year)	25,446	25,446	25,446
Average annual site overflow (m^3)	5,663	4,862	4,308
Average annual overflow events	4.3	3.5	3.0
Average annual overflow events from basins designed to capture runoff from a 2 day 95th percentile storm (Hypothetical Scenario)	2.8	2.8	2.8

Figure 3-14: Performance of the Stormwater Capture and Re-use System

The water balance model results in **Figure 3.14** show that:

(a) For an increase in storage tank volume from 500m^3 to 1,500m^3 there is only a small increase in the percentage of runoff which could be captured and re-used. The marginal additional proportion of water provided by larger storage tanks does not warrant consideration of tanks of greater than 1,500m^3 capacity.

(b) Similarly, the average annual volume of overflow does not reduce significantly with the increase of storage tank size. This occurs because overflow occurs as a result of periods of persistent heavy rainfall over several days when large volumes of runoff occur.

(c) The range of tank storage sizes set out in **Figure 3-14** would provide for a frequency of overflow from the Site which is comparable to that which would be achieved if stormwater pollution was achieved by a system which relied only on sediment basins which were designed and operated in accordance with the requirements for a site with an operational life in excess of three years which drained to a sensitive environment.

On the basis of the modelling results in **Figure 3.14**, storage tanks with a total capacity of 1,000m^3 are proposed. This will provide a system that, on average, would have only fractionally more overflow events per year than if pollution control was provided by sediment basins (3.5 overflow events per year as compared to 2.8), however, the marginally elevated number of overflow events will be more than offset by the secondary

treatment systems comprising grass swales and a bio-retention swale which are proposed. These will provide significant additional reduction in the residual suspended solids concentrations before water leaves the boundary of the Site.

Additionally, the overflows from the operational area will be conveyed to the swales within the Site area, and a small proportion of which flow will infiltrate into the ground within the swales, meaning that not all of the 'overflow' volume will actually leave the Site.

The potential total suspended solids load within runoff from the developed site would be significantly reduced by the proposed water management system. The proposed system will capture 71% of runoff, which would effectively remove 71% of the suspended solid load in runoff from the Site. Additionally, within the 29% of runoff which overflows, a portion of the sediment load will be removed during its passage through the sediment basins (sumps), meaning that less than 29% of the total sediment load in runoff from the operational area would leave the Site boundary. As detailed previously, the proposed swale and bio-retention swale would remove 75% of the suspended solids in the runoff that overflows to those swales. In combination, this means that the water management system would remove over 93% of the suspended sediment load from runoff off the operational area. In general, for urban catchments a target reduction of 80% for suspended solids is set by local government.

The 1,000m^3 tanks would also ensure that about 55% of water required for site operations would be from stormwater runoff. This would equate to a potential saving of approximately 14,000m^3 of potable water annually.

3.2.5 Harvestable Rights

In response to the public exhibition of the Environmental Assessment for the proposed development, the Department of Primary Industries provided comments in relation to harvestable rights.

The Harvestable Right gives landholders the right to capture and use for any purpose 10% of the average annual runoff from their property. The Harvestable Right has been defined in terms of an equivalent dam capacity called the Maximum Harvestable Right Dam Capacity (MHRDC).

The MHRDC is determined by the area of the property (in hectares) and a site-specific run-off factor.

The rainfall runoff factor for this site is 0.08. Given the property size of 20.5 ha, the maximum harvestable right dam capacity for the Site is 1.6 ML.

The Water Management Act 2000 and associated regulations provide exemption from harvestable rights restrictions for certain classes of water storage structures. Schedule 1(3) of the NSW Water Management (General) Regulations 2004 states:

Dams solely for the capture, containment and recirculation of drainage and/or effluent, consistent with the best management practice or required by a public authority to prevent the contamination of a water source, provided such dams are located on a minor stream referred to in section 53 (3) (b) of the Act.

There are no restrictions on the use of water from dams which comply with this provision. These provisions are applicable to the sediment sumps which collect runoff from the site operational areas.

3.2.6 Impact of Site Discharge

As mentioned previously, 71% of site runoff will be captured and reused on site, which means that only 29% of runoff from the operational area will discharge from the Site via overflow of the sumps.

Any overflow discharge will have been subject to sediment capture within the sediment basins (prior to discharge) and swales as well as capture of any oil due to the sediment basin configuration before reaching local drainage channels and the Georges River. The potential impact of this overflow discharge on surrounding vegetation, local drainage channels and the Georges River is discussed below.

Impact on Local Drainage Channels

The majority of the drainage systems in the vicinity of the Site are constructed channels. In particular, constructed channels convey flow from the western side of the Site and from a fully developed catchment located to the north of Newbridge Road. In addition, the construction of Brickmakers Drive and the Georges Fair will significantly increase the proportion of impervious surfaces which drain (via a stormwater basin) towards the creek and channel which run along the northern boundary of the Site.

The runoff from the existing site can be expected to be only a minor contributor compared to the runoff from the Georges Fair development and the existing developed catchment to the north of Newbridge Road.

Because all stormwater discharge from the Site will be via 150mm diameter pipe outlets, the Site will act as a stormwater detention basin and will control the peak rate of discharge. This will reduce the peak discharge rate from the Site compared to the current uncontrolled conditions.

3.2.7 Impact on Vegetation

Discharge from the Site will continue to drain to the same locations as it does currently, but at reduced frequency and rate:

(a) On the western side of the Site, any stormwater overflow will be directed into an existing constructed channel which runs along the toe of the batter slope at the edge of the Site. This drain directs drainage in a northerly direction where it joins a channel which runs under the access road and eventually drains to the Georges River. This drainage water will be directed away from the area of Ironbark Open Forest and Woolybutt - Blue Box Open Forest located immediately to the west of the Site.

(b) On the eastern side of the Site stormwater overflow will be directed into a natural depression (flood runner) along the eastern boundary of the Site runs from north to south through a shallow depression of cleared wattle scrub immediately adjacent to the raised site area. The general alignment of this depression is located within the area defined as "Wattle Scrub" in the Flora and Fauna Assessment (Aquila Ecological Surveys, 2010).

Impact on Georges River

Pollutants which could potentially originate from the Materials Recycling Facility include suspended solids in site runoff, and oil or fuel used on the Site. All runoff from the operational area of the Site will be captured in sumps, and the sump design would prevent the escape of oils and fuels from the Site. The sumps also give the Site operator the opportunity to respond to any spills by preventing such spills flowing immediately off site. As such, the principal pollutant of concern to the Georges River is suspended solids.

The background water quality in the Georges River is poor, with turbidity outside the ANZECC range 65% of the time.

Over 93% of the suspended solid load within runoff from the operational area will be captured on the Site.

As a result of the above, it is not envisaged that the proposed development will have any adverse impact on water quality in the Georges River.

Monitoring Program

Ongoing environmental monitoring will be undertaken to assess the performance of the water management system during construction and operation of the Materials Recycling Facility. The following monitoring and inspections will be undertaken:

Construction

(a) Monitoring will include a daily site inspection of sediment controls and machinery.

(b) Samples of water retained in the sumps will be collected for analysis in line with the water quality monitoring during the operational phase.

Operation

(a) Water retained in the sumps will be collected for analysis four times per year. Water will be sent to a NATA registered laboratory for analysis of the parameters listed in Table 8 of the Evan and Peck Report as reproduced below as **Figure 3-15**.

(b) Inspections of collection sumps will be undertaken on a weekly basis and after storm events. Sediment will be removed from the sumps using readily available site equipment as necessary to maintain the water holding capacity.

(c) Weekly inspections will also be undertaken on the pumping system and holding tanks.

(d) Daily start-up inspections will be undertaken on all machinery for OH&S and environmental purposes (oil leaks etc).

Analyte	Units
pH	pH
EC	µs/cm
Total Suspended Solids	(mg/L)
Total Dissolved Solids	(mg/L)
Oil & Grease	(mg/L)

Figure 3-15: Water Quality Monitoring Parameters.

Continual Improvement Program

Results obtained during monitoring will be used to assess performance and refine the monitoring program and management measures as required. Formal reporting will occur annually as part of the requirements of the Environment Protection Licence.

3.2.8 Flora and Fauna

The Environmental Assessment, as exhibited, contained an impact assessment of the Materials Recycling Facility having regard to the flora and fauna of the operational area of the Site. A response to the submissions received with regard to that impact assessment is contained in **Part 2.7** of this report.

As detailed above, it is now proposed to amend the Part 3A application to include the

access to the Site as provided for in the Cardno plans.

To assess the impact of the amended access on the flora and fauna of the easement within which the proposed amended access would be located, Cumberland Ecology Pty Ltd has been commissions by Moorebank Recyclers. A report titled *Ecological Assessment of amended part 3a application for access for the Moorebank Recycling Facility* has been prepared (the **Cumberland Report**), a copy of which is at **Attachment 17**.

Methods and Key Documents

The flora and fauna of the study area is well known and has been the subject of a series of reports. Information to assess the ecological impacts of the proposed development was drawn from a suite of existing reports, including:

(a) Aquila Environmental Services (2010). Flora and Fauna Assessment. Proposed Materials Recycling Facility Lot 6 DP 1065574 Newbridge Road, Moorebank.

(b) Cumberland Ecology (2006). George's Fair, Moorebank Stage 2. Ecological Assessment for Urbex. Cumberland Ecology.

(c) Cumberland Ecology (2007). Moorebank Estate Vegetation Management Plan for Boral Pty Ltd. Cumberland Ecology.

(d) Cumberland Ecology (2009). George's Fair Vegetation Management Plan, for Moorebank Joint Venture. Cumberland Ecology.

(e) ERM (2002) Boral Moorebank Flora and Fauna Assessment Prepared for Boral Ltd. Environmental Resources Management Australia, Sydney.

(f) ERM (2004a) Boral Moorebank Master Plan Ecological Assessment Prepared for Urbex. Environmental Resources Management Australia, Sydney.

(g) Robertson D (2013) Expert' Joint Report - Ecology Issues (Proceedings No. 30141 of 2013).

(h) Robertson D & Ward S (2013); Expert' Joint Report - Ecology Issues (Proceedings No. 30141 of 2013).

(i) Ward, S (2013) Expert Opinion - Ecology. Eco Logical Australia Pty Ltd.

In addition to mapping provided in the above reports, further GIS mapping was conducted by Cumberland Ecology to identify areas to be impacted by the Easement Works.

Terrestrial Ecology of the Subject Land

All vegetation communities of Lot 309 and the northern portion of Lot 310 are Endangered Ecological Communities (**EECs**) which are listed under either the

Threatened Species Conservation Act 1995 (**TSC Act**) and/or the Environment Protection and Biodiversity Conservation Act 1999 (**EPBC Act**).

Vegetation integrity is variable, but in the northern extremity of Lot 310, it is in good condition, however, owing to the existence of a drain from existing suburban development to the west, parts of the low lying vegetation in the central part of Lot 310 (which includes all land which will be directly impacted by the Easement Works) were reported to be degraded and to an extent weed infested. This degraded vegetation was found to have improved in condition by 2013, as noted by Dr Robertson during a site inspection.

The Easement Works have the potential to impact on the EECs present on the Site, as well as on threatened flora and fauna species and fauna habitat as described below.

Endangered Ecological Communities

The land within Lot 309 and the northern portion of Lot 310 supports the following EECs:

(a) River Flat Eucalypt Forest on Coastal Floodplains (**RFEF**); and

(b) Cooks River Castlereagh Ironbark Forest (**CRCIF**).

Refined mapping of vegetation undertaken by Dr Ward (April 2013) indicates that all of the vegetation to be directly impacted within Lot 310 by the Easement Works is RFEF (Robertson and Ward 2013). Figure 1 of the Cumberland Report, an extract from which is at **Figure 3-16**, shows the areas of vegetation to be impacted by the Easement Works. The total area of RFEF to be directly impacted by the Easement Works is 0.27ha.

River Flat Eucalypt Forest on Coastal Floodplains

This vegetation community occurs over Lot 309 and the central portion of Lot 310 and so the footprint of the Easement Works is comprised entirely of this community.

This community has been mapped by NPWS (2002) as Map unit 11 Alluvial Woodland. Detailed inspections by ERM (2002) found that this community structure and composition corresponds with NPWS (2002) description of Map unit 12 Riparian Forest. This community is considered to be a form of RFEF and occurs on deep poorly drained clay soils.

Structure

The Projective Foliage Cover (**PFC**) of the canopy varies considerably from less than 5% to30%, while heights range from 8 to 15 metres. The canopy is dominated by Forest Red Gum (*Eucalyptus tereticornis*) and Ball Honeymyrtle (*Melaleuca nodosa*). Other canopy species include Swamp She-oak (*Casuarina glauca*), Cabbage Gum (*E. amplifolia*), Woollybutt (*E. longfolia*) and Blue Box (*E. bauerana*).

The shrub layer has a PFC of 5-20%, ranging from 1 to 4 metres in height and is dominated by Swamp She-oak, White Feather Honeymyrtle (*Melaleuca decora*) and Ball Honeymyrtle. In some places, the shrub layer has a PFC of up to 50% and is dominated by the exotic Pampas Grass (*Cortaderia selloana*) or Lantana (*Lantana camara*).

The ground layer has a PFC of between 80% and 100%, and is less than 2 metres in height. On drier ground, it is similar in composition to the ground layer in White Feather Honeymyrtle/Swamp She-Oak Forest. In large low-lying wetland areas which are poorly drained, the ground layer is dominated by Phragmites australis and Cumbungii (*Typha orientalis*).

RFEF within the footprint of the Easement Works is heavily impacted by the presence of an artificial drainage line. As a result the understorey is dominated by Phragmites and Cumbungii.

Waterlogging has prevented the growth of many understorey species, and has resulted in some dieback of mature trees.

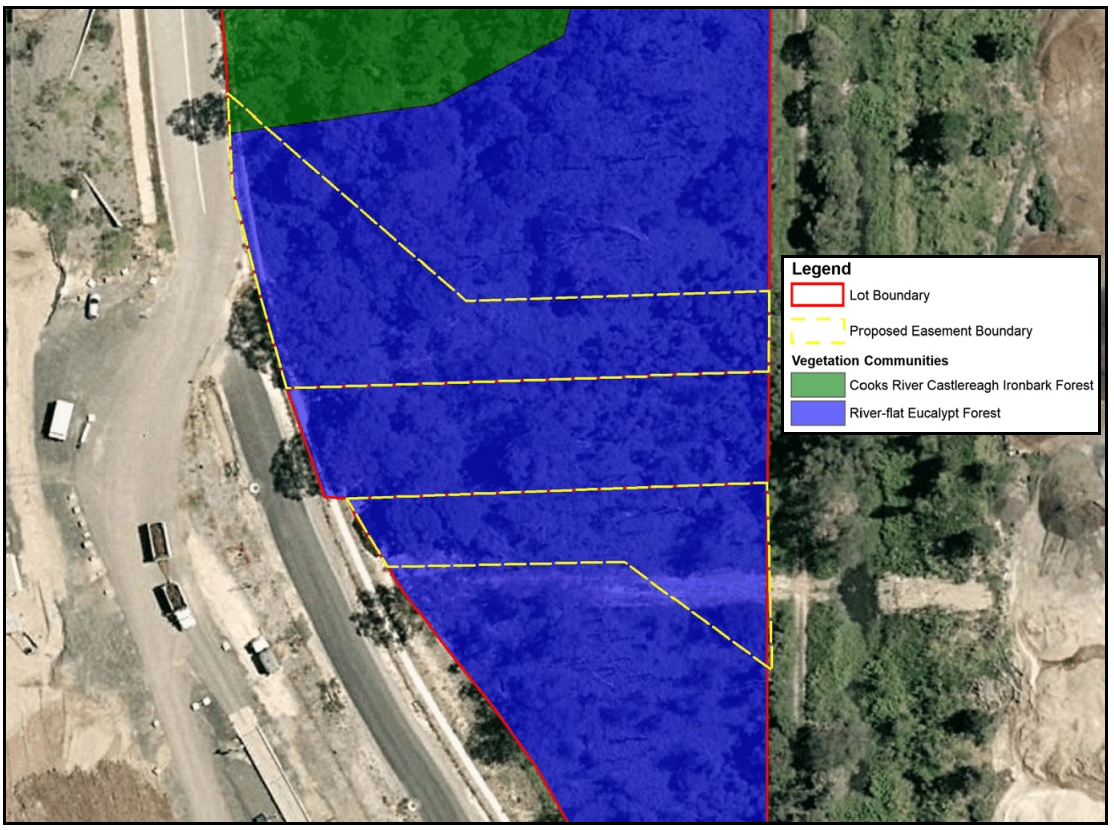


Figure 3-16: Impacted Vegetation Communities

Cooks River Castlereagh Ironbark Forest

This vegetation occurs in the northern end of Lot 310 and the Easement Works will not directly impact on this vegetation community.

CRCIF is an Endangered Ecological Community listed under the TSC Act and it has been mapped by NPWS (2002) as Map unit 3 Cooks River/Castlereagh Ironbark Forest. Detailed inspections by ERM (2002) indicated that the Broad-leaved Ironbark Woodland was less extensive than mapped by NPWS. Within the northern end of Lot 310, it occurs on deep, relatively poorly drained clay soils.

Structure

The canopy has a PFC of between 10% and 25%, ranging from 15 to 20 metres in height and is dominated by Broad-leaved Ironbark (*Eucalyptus fibrosa*) and Red Ironbark (*E. sideroxylon*).

Other canopy species include Woolybutt, Forest Red Gum, Grey Gum (*E. punctata*), White Stringybark (*E. globoidea*) and Grey Box (*E. moluccana*).

The uppermost shrub layer with a PFC of between 5% and 30%, reaching 10 metres in height and is dominated by White Feather Honeymyrtle and juvenile eucalyptus. The lower shrub layer has a PFC of 50%, reaching to 4 metres in height and is dominated by Ball Honeymyrtle, Blackthorn (*Bursaria spinosa*), Tick Bush (*Kunzea ambigua*), Bearded Heath (*Leucopogon juniperinus*), Everlasting (*Ozothamnus dismofolius*) and Rough Guinea Flower (*Hibbertia aspera*).

The ground layer has a PFC of 5% to a height of >1 metre and is dominated by Weeping Grass (*Microleana stipoides*), Mulga Fern (*Cheilanthes sieberi subsp. sieberi*) and *Lomandra multiflora sub sp. multiflora*.

This community has been disturbed by tracks, past clearing and logging, rubbish dumping and possible frequent fires. Introduced species dominate the edges of this community where it adjoins tracks and cleared or disturbed land; common weeds associated with these areas include Pampas Grass, Paddy's Lucerne (*Sida rhombifolia*), Plantago (*Plantago lanceolata*) and Purple Top (*Verbena bonariensis*).

Threatened Flora

Acacia pubescens is listed as Vulnerable under the TSC Act. A small number of individuals of this species (less than 10) were found to occur in CRCIF at the northern end of Lot 310. No individuals of this species have been recorded within the footprint of the Easement Works. This shrub grows in dry conditions and cannot grow in swampy vegetation of the RFEF. This species is therefore unlikely to be impacted by the Easement Works.

No other threatened flora species have been recorded within Lot 309 or Lot 310.

Fauna Habitat

The vegetation within Lot 309 and the northern portion of Lot 310 provides fauna habitat resources such as sheltering sites, dispersal routes, foraging and roosting sites, and potential breeding sites, however, the quality of these habitats has been reduced as a

result of land clearing and weed invasion.

Trees throughout the vegetation of Lot 309 and the northern portion of Lot 310 are relatively young and lack hollows, which currently limits their utility for a number of threatened species (e.g. tree roosting bats and birds).

Moderately dense shrubs provide good ground cover for ground-dwelling fauna species and foraging habitat for birds, bats and arboreal mammals. Hollow logs, fallen timber and leaf litter provide habitat for invertebrates, amphibians, reptiles and small ground-dwelling mammals as well as foraging habitat for ground foraging birds.

Threatened Fauna

Four threatened fauna species have been recorded by ERM (2002) within the E2 bushland of Lot 310. These are:

(a) Cumberland Plain Land Snail (*Meridolum corneovirens*).

(b) Grey-headed Flying Fox (*Pteropus poliocephalus*).

(c) Eastern Freetail Bat (*Mormopterus norfolkensis*).

(d) Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*).

The Cumberland Plain Land Snail was not found in the northern E2 land and is not considered likely to occur within land impacted by the Easement Works as the land is too wet to support habitat for this species.

The vegetation within the footprint of the Easement Works may provide occasional forage habitat for the threatened bats recorded from Lot 310, however, larger areas of forage habitat will remain in the E2 vegetation and in the locality for these highly mobile species. The vegetation within the Easement Works footprint does not provide significant shelter or breeding habitat for these species.

In addition to fauna recorded during previous surveys, a suite of threatened species may potentially occur in the locality of Lot 309 and Lot 310, including the following species:

(a) Green and Golden Bell Frog (*Litoria aurea*).

(b) Regent Honeyeater (*Anthochaera phrygia*).

(c) Little Eagle (*Hieraaetus morphnoides*).

(d) Swift Parrot (*Lathamus discolor*).

(e) Square-tailed Kite (*Lophoictinia isura*).

(f) Flame Robin (*Petroica phoenicea*).

(g) Barking Owl (*Ninox connivens*).

(h) Powerful Owl (*Ninox strenua*).

(i) Eastern False Pippistrelle (*Falsistrellus tasmaniensis*).

(j) Eastern Bentwing Bat (*Miniopterus schreibersii oceanensis*).

(k) Greater Broad-nosed Bat (*Scoteanax rueppellii*).

Of the above species, only the threatened bats are likely to utilise vegetation within the footprint of the Easement Works as forage habitat. Larger areas of suitable forage habitat for these species occurs in the remaining E2 vegetation and the surrounding area.

All other threatened fauna species are unlikely to occur or make significant use of habitat within the footprint of the Easement Works, given the small size, impacts of disturbance and fragmentation of habitat.

Ecological Impacts of Easement Works

The ecological impacts of the approved road bridge across Lot 309 have been described by Robertson (2013). Construction of the approved bridge will result in a narrow barrier to the corridor values of the E2 vegetation of Lot 310. This vegetation is currently in poor condition, and is surrounded by industrial and residential development. It is therefore unlikely that the approved Easement Works will result in any significant additional impacts to the ecological corridor values of E2 vegetation of Lot 310.

The Easement Works will require the removal of 0.27ha of RFEF. This vegetation community is in low condition within the footprint of the Easement Works. Despite this, offsets will be required to compensate for the ecological impacts of the removal of RFEF resulting from the Easement Works.

No threatened flora species have been recorded within the footprint of the Easement Works. It is unlikely that any of the threatened flora species known or predicted to occur in the locality would occur within the footprint of the Easement Works.

Four threatened fauna species are known from the locality of the Easement Works. The Cumberland Plain Land Snail is not predicted to occur within the footprint of the Easement Works. Threatened bat species may forage in habitats within Lot 309 and the northern portion of Lot 310, however, larger areas of suitable forage habitat for these species occurs in the remaining E2 vegetation and the surrounding area. Accordingly, it is considered unlikely that removal of vegetation from the footprint of the Easement Works will result in a significant loss of potential habitat for any these species.

Mitigation measures and Offsets

Mitigation measures

The following mitigation measures are proposed:

(a) Any area for storage of construction vehicles, fuel and other materials should be located such that runoff, sediment, oils, nutrients or rubbish will not flow directly into either the drainage channel or any retained native vegetation. This should include consideration of the potential for flood events.

(b) Any fill, tracks and work surfaces should incorporate appropriate sediment controls so that sediment will not flow into either the drainage channel or any retained native vegetation. This should include consideration of the potential for flood events. Rehabilitation and/or stabilisation of bare soil should commence as soon as practicable to minimise the risks of erosion.

(c) If a temporary raised access track is required for construction of pylons in the section to be crossed by the bridge spans, culverts should be installed in the track to allow water to flow.

(d) The boundary for all vegetation to be retained (i.e. clearing limits) should be fenced, signposted and protected in accordance with Australian Standard 4970 - 2009 Protection of Trees.

(e) Site specific environmental inductions should be conducted for all staff working on the project including (but not limited to):

- sensitivity of surrounding vegetation (particularly EECs)
- site environmental procedures (vegetation management, sediment and erosion control, protective fencing, weed control)
- what to do in case of emergency (chemical spills, fire, injured fauna)
- key contact in case of environmental emergency e.g. WIRES
- careful consideration should be given to the final site levels and interaction with hydrological changes, including consultation with an ecologist to advise on how the changed hydrology may affect the native vegetation.
- if draining the Site, a wetland dewatering relocation plan is required for any fauna including (but not limited to) amphibians, turtles, eels and fish.
- weed management should be undertaken on the Site, and any landscaping should consider the potential for incorporating locally native species.

Offsets

Two alternatives are available for offsetting the ecological impacts of the proposal. Purchase of BioBanking credits or the establishment of an on-site regeneration area as described below:

BioBanking

The Easement Works will require the removal of 0.27ha of RFEF. Offsetting for this loss of RFEF could be achieved by acquiring and retiring ecosystem credits under the

Biobanking scheme. It has been calculated that the area to be impacted by the Easement Works would require the retirement of approximately 9 ecosystem credits for "Forest Red Gum - Roughbarked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin" (the biometric vegetation type equivalent to RFEF) (Ward 2013).

Biobanking credits obtained and retired should seek to match the requirements of the Biobanking assessment, which are:

(a) Minimum percent native vegetation cover class: 11-30%, and

(b) Minimum adjacent remnant area class: 25-100 ha.

Retirement of ecosystem credits from any of the following biometric vegetation types would be appropriate to offset the impacts of the Easement Works:

(a) Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats on the Cumberland Plain, Sydney Basin (ME018).

(b) Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats on the Cumberland Plain, Sydney Basin (HN526).

(c) Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin (ME020).

(d) Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin (HN528).

Credits can be sourced from the following CMA subregions:

(a) Cumberland - Sydney Metro.

(b) Yengo - Hawkesbury/Nepean.

(c) Cumberland - Hawkesbury/Nepean.

On-site Vegetation Offset

An alternative to purchase and retirement of off-site credits which was discussed and agreed to in the Joint Statement or experts in the Land and Environment Court matter relating to the creating of the easement to allow the amended access was to restore vegetation on land already owned by Moorebank Recyclers.

The equivalent of 9 ecosystem credits may be achieved by rehabilitating and conserving approximately 1.4 ha of the southern portion of the Moorebank Recyclers' land.

This land would need to be permanently protected by an appropriate mechanism which would ensure the management of these lands for environmental outcomes to perpetuity.

Conclusion

The proposed works will require the removal of 0.27 ha of RFEF which is currently in low condition.

It is heavily impacted by weeds and runoff from adjacent residential development.

The Easement Works will not impact on Acacia pubescens or any other threatened flora species, as no threatened flora species occur in the footprint of the proposed Easement Works.

The Easement Works will remove 0.27 ha of low quality habitat for fauna species. Some threatened bat species may occasionally utilise this area as forage habitat, however, the remaining E2 vegetation provides a larger area of suitable forage habitat for these highly mobile species. No other threatened fauna are likely to occur here given the small size, impacts of disturbance and fragmentation of this habitat. The Easement Works will not result in any significant impacts on threatened fauna species.

The approved bridge construction on Lot 309 will have a minor impact on corridor values along the drainage line within the E2 area. The Easement Works will not contribute significantly to these impacts.

Impacts on RFEF are proposed to be offset under the Biobanking scheme by purchasing and retiring 9 ecosystem credits of the appropriate type.

With the implementation of the proposed mitigation and offset measures, no significant impact is predicted to occur to any threatened flora or fauna species, or EECs listed under either the EPBC Act or the TSC Act. No Species Impact Statement (SIS) is required, and no referral to the Commonwealth is necessary.

3.2.9 Traffic Management

In response to the concern over potential queueing of vehicles at the GIVEWAY, STOP or TRAFFIC SIGNAL control modes at the intersection of the amended access with Brickmakers Drive, this intersection is forecast to operate at a good level of service either under priority control modes if the required sight distance is provided or under traffic signalised control.

The forecast peak hour truck arrival from the Materials Recycling Facility to Brickmakers Drive is 19 to 23 (20% sensitivity factor), which equates to 1 arriving truck every 156 to 190 seconds (2.5 to 3 minutes) during the peak hour.

Traffic signal control at this location is likely to have a maximum cycle time of 60 seconds. Under priority control, these trucks seek a minimum 3 second gap for the simple left turn merge with future traffic from the marina / residential / commercial development on the Benedict land.

At the Brickmakers Drive junction, these trucks seek large gaps, generally in excess of 10 seconds, in order to turn right across the opposing two stream of traffic in Brickmakers Drive.

The potential for congestion emanating from the control mode adopted at Brickmakers Drive along the Lot 309 future bridge link and connecting up ramp from the Moorebank Land is low given the numbers expressed above. The traffic arrival rate from future development within the Benedict land will be random with gaps in excess of 3 seconds being predominant. The traffic arrival rate for traffic from Newbridge Road along Brickmakers Drive will arrive in platoons with small available gaps except between platoons. The availability of gaps within Brickmakers Drive from the gap survey shows that:

(a) The availability of 5 second gaps or more is very high, with little delay.

(b) The availability of 8 second gaps or more is moderately high, with some delay, however, this requires sight line clearing of vegetation.

Part 4

STATEMENT OF COMMITMENTS

4.1 Introduction

The Director-General's Requirements stipulate that the Environmental Assessment must contain:

> *A draft Statement of Commitments, outlining environmental management, mitigation and monitoring measures.*

Following is a Statement of Commitments which describes the management measures which Concrete Recyclers is prepared to implement with regard to the environmental management of the Site, and the mitigation and monitoring of potential environmental impacts associated with the operation of the proposed Materials Recycling Facility. The Statement of Commitments differs from that which was included as Part 13 of the Environmental Assessment as exhibited in that it accommodates the amended proposal for access to the Materials Recycling Facility as described in **Part 3** of this report.

Concrete Recyclers is committed to the following objectives:

- To provide a long term, fully licensed Materials Recycling Facility capable of recycling waste from the building and construction industry.

- To protect the health of site workers and the general public, and ensure business viability by compliance with relevant legislation, standards and regulating authorities.

- To ensure site operations do not significantly impact on potential environmental receptors and comply with the following environmental legislation:

  - the *Environmental Planning and Assessment Act 1979*, and

  - the *Protection of the Environment Operations Act 1997*.

- To ensure that new technologies are implemented in relation to resource recovery and environmental management of the Materials Recycling Facility throughout its life.

- To encourage and facilitate community participation in the recycling of building and construction waste.

- To protect the surrounding environment through the implementation and management of environmental controls and contingency measures.

- To operate the Materials Recycling Facility in a manner which is sympathetic to the amenity of the area in which it is located.

4.2 General Commitments

1. The Project will be undertaken in accordance with the Project Application and the Environmental Assessment prepared by Nexus Environmental Planning Pty Ltd, including accompanying appendices, as amended as detailed in the Preferred Project Report.

2. The Project will be undertaken in accordance with the following drawings:

   Lyle Marshall and Associates Pty Ltd

   Drawings 5018-13-01 to 21, Issue A, Dated 15 July 2013.

   Cardno Series 2000 Stage 1 Construction Plans

   Drawing SK 2001, Revision D
   Drawing SK 2003, Revision A
   Drawing SK 2004, Revision C

3. The Project will be conducted and operated in accordance with this Statement of Commitments.

4. Concrete Recyclers will develop a program of informing the NSW Department of Planning and Infrastructure, the NSW Office of Environment and Heritage, and Liverpool City Council of construction staging and operation of the Materials Recycling Facility throughout the development process.

5. Concrete Recyclers will obtain the necessary approvals and permits to undertake both construction and operation of the Materials Recycling Facility.

6. A copy of the approved and certified plans, specifications and documents, including conditions of approval will be kept on the Site at all times.

7. All building works will be carried out in accordance with the Building Code of Australia.

4.3 Environmental Management Plan

An Environmental Management Plan (**EMP**) will be developed for both the construction and operation stages of the Materials Recycling Facility.

The key principles of the EMP will be to provide:

- An environmental management tool for the construction and operation of the proposed Materials Recycling Facility.
- A means of identifying baselines for monitoring the impact of the Materials Recycling Facility.
- An outline of reporting requirements associated with the Materials Recycling Facility.
- The processes for interaction between Concrete Recyclers and the relevant government authorities.
- The means by which compliance with the Director-General's requirements and the requirements of the Environmental Protection Licence will be achieved.

The EMP will contain sub-sections which will provide details of the management of the Materials Recycling Facility to minimise potential impacts discussed in the Environmental Assessment and Preferred Project Report. Sub-sections of the EMP will include:

- Induction and Training.
- An Erosion and Sediment Control Plan which will cover both establishment and operation of the Materials Recycling Facility.
- A Construction and Operational Noise Management Plan which will detail measures to minimise acoustic impact during establishment and operation.
- An Air Quality Management Plan which will detail measures to be employed to minimise air quality impacts during both establishment and operation.
- A Waste Management Plan.
- A Stormwater Management Plan.
- A Traffic Management Plan.
- A Bushfire Control Plan
- A Complaints Management Plan.
- Hazard Reduction.

Following are drafts of the relevant sections of the EMP, refinement of which will be undertaken following receipt of consent for the proposed development.

TITLE	EMP 1 - INDUCTION AND TRAINING
Consent/Licence Ref.	Insert relevant Conditions of Consent. Insert relevant POEO Licence Conditions.
Objectives	To ensure all persons working on the site are aware of their environmental obligations, site environmental issues and control measures, as well as roles and responsibilities.
Procedures	1. Environmental induction for all employees and contractors before starting work. Induction to cover the following issues: (i) requirements of the EMP; (ii) specific environmental issues on the site and control measures; (iii) roles and responsibilities for environmental management, and (iv) environmental incident procedures. 2. Retraining sessions within one month of changes to relevant sections of the EMP. 3. Retraining sessions within one month to persons identified by *Complaints Register* as not conforming to procedures. 4. All truck drivers entering the site for the first time to be provided with the *Site Induction for Drivers* form.
Monitoring	Status of inductions to be checked monthly.
Reporting	Record of all inductions and retraining, including name and date provided, to be retained on site.
Responsible Person	Environmental Officer responsible for ensuring all persons working on the site are properly inducted and retraining provided as required.
Information/References	Insert relevant EMPs and Policies.

TITLE	EMP 2 - EROSION AND SEDIMENT CONTROL
Consent/Licence Ref.	Insert relevant Conditions of Consent. Insert relevant POEO Licence Conditions.
Objectives	To minimise and manage erosion and sedimentation on the site and ensure that sediment laden runoff is not discharged from the site.
Procedures	1. Construct all internal access tracks as per the Report of Evans and Peck as contained in Attachment 14 of the Preferred Project report and relevant EPA requirements. 2. Divert runoff to sediment basins, sediment traps and catch ponds as a primary means of sediment trapping before water is discharged to main tank storage. 3. Inspect drainage and sediment controls monthly and conduct maintenance as required to ensure effectiveness. Where erosion is observed to be occurring, implement rehabilitation/stabilisation measures. 4. Implement and maintain silt fence. Fence to be maintained along boundary.
Monitoring	Monthly inspection of all drainage and sediment controls on site, including water storage, pumps and pipes.
Reporting	As required by Conditions/Licence.
Responsible Person	Environmental Officer or person(s) authorised by Environmental Officer.
Information/References	Insert relevant EMPs and Policies.

TITLE	EMP 3 - NOISE MANAGEMENT PLAN
Consent/Licence Ref.	Insert relevant Conditions of Consent. Insert relevant POEO Licence Conditions.
Objectives	To ensure that construction and operation noise complies with EPA regulations. To minimise impact of noise on surrounding residents. To ensure employees are not subject to noise levels above those specified in the OH&S legislation.
Procedures	1. Consult with the industrial facility on the northern boundary in relation to higher noise levels near the boundary during the establishment phase of the development. 2. Minimise works near the northern boundary of the site wherever feasible. 3. Standard construction work hours will be as follows: • Monday to Friday 7:00am to 6:00pm. • Saturday 8:00am to 1:00pm. • No work on Sundays or public holiday. 4. Ensure mobile plant used is fitted with residential grade silencers. 5. At all times, but particularly prior to 7:00am, trucks should be loaded in a quiet manner by placing rather than dropping material into trucks. 6. Plant based at the site must incorporate "quacker" style reversing alarms. 7. Trucks with traditional "beep beep" alarms will not reverse on the site prior to 7:00am. 8. The approved bund on the northern boundary of the operational area of the site will be raised from the approved 4 metres to 8 metres. 9. The approved bund on the western boundary of the operational area of the site will be raised from the approved 4 metres to 6 metres. 10. When Georges Fair is occupied in release areas 5D and 5E, background noise levels will be measured and appropriate intrusiveness limits established for weekdays and Saturdays. 11. If lower background noise levels (and lower intrusive criteria) at Georges Fair indicate noise attenuation measures such as noise barriers are needed to control noise from truck movements then, subject to EPA requirements, noise barriers will be constructed at appropriate locations along the access road and ramps. 12. Moorebank Recyclers will manage its hourly / daily truck movements to remain within the intrusiveness criteria at all residences until any barriers deemed necessary by the EPA are built.
Monitoring	As required by Conditions/Licence.

Reporting	As required by Conditions/Licence.
Responsible Person	Environmental Officer to organise monitoring and reporting as required. Truck drivers responsible for required actions to reduce noise.
Information/References	Insert relevant EMPs and Policies.

TITLE	EMP 4 - AIR QUALITY MANAGEMENT PLAN
Consent/Licence Ref.	Insert relevant Conditions of Consent. Insert relevant POEO Licence Conditions.
Objectives	To minimise dust generation and air pollution to prevent impact on surrounding residences and comply with the following ambient goals: (i) dust deposition - 4g/m^2/month (annual average); (ii) PM_{10} - 50µg/m^3 (average for rolling 24 hour period) or 30µg/m^3 (annual average). To ensure employees are not subject to dust levels above those specified in the OH&S legislation.
Procedures	A proactive and reactive air quality management plan (AQMP) would be developed and implemented in accordance with Department of Planning and Infrastructure and NSW EPA requirements. The AQMP will detail the following: • The dust emission controls to be applied on site. • Dust monitoring to be undertaken. • Wind speed and wind direction triggers with associated mitigation measures to be implemented during adverse weather conditions. Dust emission controls which would be applied to operations at the site. In summary, the following controls would be used: • Delivery trucks entering and leaving site on sealed access road: - Tar sealed - Regular water application - Sweeping • Delivery trucks entering and leaving site on unsealed internal roads: - Cement stabilised road base - Regular water application to road surface • Vehicles unloading to tipping zone stockpiles: - Water sprays/fog canon • Primary crushing: - Wet suppression and indoors • Secondary crushing: - Wet suppression and indoors • Screening: - Wet suppression and indoors • Loading to product stockpiles from conveyors: - Water sprays • Loading from product stockpiles to trucks: - Material already high moisture content from processing/water sprays as required

	• Product trucks on paved surfaces entering/leaving site: - Tar sealed - Regular water application - Sweeping • Product trucks on unpaved surfaces entering/leaving site: - Cement stabilised road base - Regular water application to road surface • Wind erosion from tipping stockpiles: - Water sprays/surface crusting • Wind erosion from product stockpiles: - Water sprays/surface crusting • Wind erosion from open areas: - Water sprays/surface crusting • Maintain dust suppression devices to all processing equipment. • Maintain the sprinkler system including fine sprays on the conveyors of the processing plant and stockpile sprinklers. • Stockpiles used for visual and/or acoustic mitigation to be planted with a non-invasive vegetation cover. • 20 km/hr speed limit on internal, unsealed access tracks to minimise dust generation. • All loaded vehicles entering and leaving the site to be covered. • Regular maintenance of mobile and fixed equipment to minimise exhaust emissions. Asbestos Management Asbestos management would be undertaken in accordance with Workcover NSW guide *Management of asbestos in recycled construction and demolition waste*. In addition, Concrete Recyclers will: • advise suppliers that asbestos and asbestos-containing material will not be accepted. • incorporate a 'no asbestos' clause in contracts. • install highly visible signs indicating that NO ASBESTOS in C&D waste will be accepted. • ensures that workers who receive and inspect C&D materials are trained and provided with suitable equipment to complete their tasks. • have a site safety plan which documents a safe system of work.

	Stockpile Management Dust emissions from the stockpiles will be managed as summarised below: • All aggregates will be kept damp. • Uncrushed brick and concrete and sandstone: - Water sprays/foggers will be applied to the material as each load tips to the uncrushed/brick rubble/concrete rubble stockpiles. - Additional water will be sprayed over the stockpiles, a surface crust then forms which prevents dust emissions due to wind erosion. - Water sprays will be used when loading from the stockpiles to the primary crusher. • Crushed road base (product): - The material will be moist when it exits the crusher and is loaded to the product stockpiles. - Due to the inherent moisture of the material, a surface crust then forms which prevents dust emissions due to wind erosion. - Irrigation-type water sprays/foggers will be used during the load-out process. The facility would only receive non-putrescible waste materials. Putrescible waste can be defined as organic material which is capable of being decomposed which often leads to the release of an offensive odour. Non-putrescible material is material which cannot be decomposed by microorganisms and, hence, would not generate this odour. The type of non-putrescible material likely to be received on-site may include concrete, bricks, asphalt, sandstone and sand from the building and construction industry. All loads would be inspected prior to entering the Site and if any putrescible waste is found, the load would be rejected.
Monitoring	As required by Conditions/Licence. It is envisaged that the monitoring would include the following: • On-site meteorological station. • Real-time monitoring of PM_{10} concentrations air quality in the vicinity of the residences predicted to be most impacted by the operations. An additional monitor would also be located to the south of the site. Analysis of the data from these two monitoring locations, in combination with meteorological data, will enable the Project contribution to measured concentrations to be determined. It is proposed that the real-time monitoring would be completed for a limited period of time to demonstrate that the Project is not adversely impacting the local air quality.
Reporting	As required by Conditions/Licence.
Responsible Person	1. Drivers responsible for adherence to speed limits, covering loads, regular vehicle maintenance. 2. Site supervisor responsible for ensuring processing plant operator(s) maintain dust suppression equipment on the plant.

	3. Environmental Officer or person(s) authorised by Environmental Officer responsible for dust and air quality monitoring and reporting, implementation of dust suppression controls.
Information/References	Insert relevant EMPs and Policies.

TITLE	EMP 5 - WASTE MANAGEMENT PLAN
Consent/Licence Ref.	Insert relevant Conditions of Consent. Insert relevant POEO Licence Conditions.
Objectives	To minimise waste generated, maximise reuse and recycling, and ensure wastes are managed effectively to minimise impact on the environment.
Procedures	1. Maintain separate receptacles for paper, aluminium, glass, plastic and general domestic waste. 2. Recyclables (paper, aluminium, glass and plastic) to be collected and taken to a recycling depot. 3. Non-recyclable waste to be disposed of at registered landfill. 4. No putrescible material to be disposed of on site. 5. No waste generated outside site to be stored, treated, processed, or disposed on site except as permitted by a licence. 6. Maintain on-site sewage storage facility. 7. Encouragement of employees to adopt waste-reducing practices. 8. Apart from visual inspections of waste as it arrives at the site, it is a requirement of the EPA that all material leaving the site complies with the POEO (Waste) Regulation 2005 - General Exemption Under Part 6, Clause 51 and 51A *"The Recovered Aggregate Exemption 2010"* or *"The Excavated Natural Material Exemption 2008"*. These exemptions detail both the processes which must be adhered to and the chemical testing program required to allow the material leaving the site to be applied to land. These exemptions are to be utilised and complied with as part of the operation of the facility.
Monitoring	Monthly inspection of on-site sorting and storage of recyclables.
Reporting	As required by Conditions/Licence.
Responsible Person	All staff are responsible for correct management and disposal of waste. Environmental Officer to educate new staff of waste minimisation procedures.
Information/References	Insert relevant EMPs and Policies.

TITLE	EMP 6 - STORMWATER MANAGEMENT PLAN
Consent/Licence Ref.	Insert relevant Conditions of Consent. Insert relevant POEO Licence Conditions.
Objectives	To ensure discharge of stormwater from the site is clear of sediment, downstream ecosystems are protected, on-site re-use of water is maximised.
Procedures	1. Install and maintain water management structures as per **Attachment 14** of the Preferred Project Report to contain and treat all rainfall and runoff. 2. Erosion and sediment control works to be implemented in accordance with EMP 2. 3. Minimise the area of disturbance. 4. Install tank farm to store stormwater collected on the site for re-use in dust mitigation. 5. Testing of stormwater discharge after completion of the site preparation to confirm that the pH is within acceptable limits.
Monitoring	As required by Conditions/Licence.
Reporting	As required by Conditions/Licence.
Responsible Person	Environmental Officer or person(s) authorised by Environmental Officer.
Information/References	Insert relevant EMPs and Policies.

TITLE	EMP 7 - TRAFFIC MANAGEMENT PLAN
Consent/Licence Ref.	Insert relevant Conditions of Consent. Insert relevant POEO Licence Conditions.
Objectives	To minimise the impact of trucks on the local road network and local residents, and to comply with approved access and vehicle movements.
Procedures	1. All new truck drivers to be provided with *Site Induction for Drivers* form at the site entrance. 2. Drivers provided with Site Traffic Management Policy. 3. All loads must be fully covered prior to leaving the site. 4. 20 km/hr speed limit on internal road. 5. All vehicles are to enter and leave the site in a forward direction.
Monitoring	1. All loads to be inspected at site entrance to make sure they are covered. 2. Complaints register to be used to record traffic management complaints.
Reporting	As required by Conditions/Licence.
Responsible Person	1. Environmental Officer responsible for weekly inspections of site entrance for sand/clay accumulation, monthly inspections of road pavements for damage condition. 2. Truck drivers responsible to comply with permitted hours of operation.
Information/References	Insert relevant EMPs and Policies.

TITLE	EMP 8 - BUSHFIRE CONTROL
Consent/Licence Ref.	Insert relevant Conditions of Consent. Insert relevant POEO Licence Conditions.
Objectives	To: • afford occupants of any building adequate protection from exposure to a bush fire; • provide for a defendable space to be located around buildings; • provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition; • ensure that safe operational access and egress for emergency service personnel and residents is available; • provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ); and • ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bush fire fighting).
Procedures	The following measures will be employed for bushfire fighting purposes: 1. Two onsite water storage tanks will be provided, each with a maintained capacity of 5000L. One shall be located near the weighbridge offices and another near the staff lunch rooms and workshop. 2. Where an on-site water supply is provided, a suitable connection for firefighting purposes will be made available and located within the inner protection area (IPA) and away from the building. An Rural Fire Service standard 65mm metal Storz outlet with a gate or ball valve will be provided. The gate or ball valve, pipes and tank penetration are adequate for full 50mm inner diameter water flow through the Storz fitting and are metal rather than plastic. 3. Exposed, above ground tanks will be manufactured of concrete or metal and raised tanks will have their stands protected. 4. A Pump will be provided to supply water for fire suppression activities and be a minimum 5hp or 3kW (petrol or diesel powered). 5. Pumps for the water tank will be adequately shielded from potential bush fire threat. 6. All above ground water and gas service pipes/outlets/fittings external to the building will be metal, including and up to any taps. 7. Electrical transmission lines will be located underground.

	8. Overhead electrical transmission lines will be installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and no part of a tree is to be closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia. 9. Reticulated or bottled gas will be installed and maintained in accordance with Australian Standard AS/NZS 1596:2002: 'The storage and handling of LP gas' and the requirements of relevant authorities. Gas cylinders kept close to the building shall have release valves directed away from the building and be located at least 2 metres away from any combustible material. Connections to and from gas cylinders are to be metal. 10. At the commencement of building works and in perpetuity the property around the proposed buildings to a distance of 25 metres or to the boundary where insufficient, will be maintained as an inner protection area as outlined in Section 4.1.3 of Appendix 5 of *Planning for Bush Fire Protection 2006* and the NSW Rural Fire Service's document *Standards for asset protection zones*. 11. Water, electricity and gas supplies will to comply with sections 4.1.3 of *Planning for Bush Fire Protection 2006*. 12. The proposed building would be protected from ember attack by enclosing all openings (excluding roof tile spaces) or covering openings with a non-corrosive metal screen. Where applicable this includes sub floor area, openable windows, doors, vents, weepholes and eaves.
Monitoring	Status of bushfire fighting equipment to be checked monthly.
Reporting	Record of all incidents of bushfire.
Responsible Person	Environmental Officer responsible for ensuring all persons working on the site are properly inducted and retraining provided as required.
Information/References	Insert relevant EMPs and Policies.

TITLE	EMP 9 - COMPLAINTS MANAGEMENT
Consent/Licence Ref.	Insert relevant Conditions of Consent. Insert relevant POEO Licence Conditions.
Objectives	To ensure any site problems brought to the attention of Concrete Recyclers by the local community and/or relevant authorities are documented and acted upon to avoid re-occurrence.
Procedures	1. Complaints telephone number signposted at front gate. Telephone number, along with postal and email address for complaints advertised on website. 2. All complaints/concerns raised by local community/relevant authorities to be recorded on *Complaints Register* by Environmental Officer. *Complaints register* to be retained on site. 3. All complaints to be bought to the attention of the Environmental Officer immediately. 4. Environmental Officer to identify and initiate appropriate action in response to complaint and follow-up contact with complainant. 5. Any complaints received to be reviewed to ascertain if site management requires amendment.
Monitoring	1. All complaints to be recorded on *Complaints Register*. 2. *Complaints Register* to be checked monthly.
Reporting	Summary of complaints to the EPA as part of Annual Return for Licence.
Responsible Person	1. All persons who receive telephone complaints are responsible for completing the *Complaints Register* and notifying the Environmental Officer within 24 hours. 2. Environmental Officer responsible for initiating follow-up action and contact with complainant.
Information/References	Insert relevant EMPs and Policies.

TITLE	EMP 10 - HAZARD REDUCTION
Consent/Licence Ref.	Insert relevant Conditions of Consent. Insert relevant POEO Licence Conditions.
Objectives	To ensure any potential hazards are mitigated.
Procedures	1. Spill kits in the storage shed and adjacent to the diesel fuel tanks will be installed. 2. Staff will be trained in spill cleanup procedures and use of the spill kits at the Site. 3. A dry powder fire extinguisher will be installed in the shed and adjacent to the diesel fuel tanks. 4. Staff at the Site will be trained in the use of first attack fire fighting. 5. A procedure for the refuelling of mobile plant will be developed and refuelling operations will be performed no closer than 12 metres to the Site boundary. 6. Operational plant will be located no closer than 25 metres to the Site boundary.
Monitoring	1. All incidents will be recorded detailing measures taken to mitigate impact. 2. Spill kits and firefighting equipment to be checked monthly.
Reporting	Summary of incidents to the EPA as part of Annual Return for Licence.
Responsible Person	1. Environmental Officer responsible for initiating follow-up action and monitoring of equipment.
Information/References	Insert relevant EMPs and Policies.

4.4 Monitoring and Reporting

During both the construction and operational stages of the development, environmental reporting is essential to ensure that the facility operates within the parameters set down in both the consent for the development and the relevant legislation and licences which guide the operation of the facility.

Reporting will include details of:

- The parties who are responsible for the on-site Management Plan at the Site.
- The methods of communication with regard to matters contained in the EMP.

- Contact details of those responsible for the operation of the EMP.
- Compliance reports.
- Remedial action taken as a result of the reporting on an incident.
- Details of auditing carried on in compliance of consent and licence conditions.
- Details of any monitoring such as air quality, acoustic monitoring and groundwater monitoring.