Bulk Recovery Solutions
A.C.N. 148698784
16 Kerr Road
Ingleburn, NSW 2565
Phone: 87173366

SSD 8593- Ingleburn Resource Recovery Facility
16 Kerr Road Ingleburn NSW 2565

Response to DPIE Request for Additional Information dated 19 February 2021

Prepared for: Department of planning, Industry and Environment

Prepared by: Tim Baillie, Managing Director BRS
Nicolas Israel, Director ERA

Reviewed by: John O'Grady, Director JOGUP

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1 - Introduction

Following several attempts of obtaining a Development Consent through the Department of Planning, Industry and Environment (DPIE) to increase the processing capacity of the facility to 225,000 tonnes per year of both solid and liquid wastes, the DPIE has advised BRS that it will only accept an amended application for the liquid waste component only and by removing from the liquid waste the Asbestos Containing Liquid stream.

The existing approved solid waste types and streams as well as quantities will remain unchanged at 19,000 tonnes per year. The amended DA is for an increase of liquid wastes from 11,000 to 125,000 tonnes per year. The concrete batching plant production will remain unchanged at 50,000 tonnes per year, but some equipment will be upgraded to keep up with changes in technology.

The Asbestos Containing Liquid is excluded from this application and no asbestos of any form will be accepted on site.

To enable BRS to provide responses to DPIE submission presented in **Attachment 1**, its management sought and received advice from the following consultants:

1) John O'Grady – John O'Grady Urban Planner - Urban Town Planner
2) Mathew McNamara – DRB Consulting Engineers Pty Ltd - Civil Engineer
3) Peter Gangemi – Pulse White Noise Acoustics - Acoustic Engineer
4) Jeff Garry - Intersect Traffic Pty Ltd - Traffic Engineer
5) Tony Armstrong – Armstrong Design Creative Practical Solutions - Architect
6) Nicolas Israel – Environmental Risk Assessors Pty Ltd - Environmental Engineer

2 - Amended Development Description

Development consent under Part 4 of the *Environmental Planning and Assessment Act, 1979* (EPA Act) is being sought for the proposed expansion of the resource recovery facility at 16 Kerr Road, Ingleburn New South Wales.

BRS currently operate a resource recovery facility (RRF) at the site with an approved processing capacity of 30,000 tonnes per year of solid and liquid waste and storage of up to 5,000 tonnes at any one time. BRS is proposing to:

- Increase the quantity of liquid wastes that can be processed on site from 11,000 to 125,000 tonnes per year. Estimated proposed (including approved) quantities of liquid wastes for each type/stream are presented in **Table 1** below,
- There is no increase in the quantity of solid wastes that can be processed on site,
- Store up to 7,000 tonnes (3,500 tonnes of solid wastes and 3,500 tonnes of liquid wastes) of both liquid and solid wastes and/or wastes for transfer at any one time,
- Vary the liquid waste types and streams that can be accepted on site in accordance with **Table 2** below,
- Solid waste processing includes sorting, screening and crushing,
- Liquid waste processing includes a variety of streams such as oily water, sewer silt and debris,
- Solid and liquid waste transfer,
- 24-hour operation of liquid and drill mud waste processes,
- Existing and proposed operating hours for all activities on site are presented in **Table 3** below,
- Vacuum trucks (12 t trucks) delivering liquid waste would need to access the site on a 24/7 basis. Delivery of liquid waste at night would occur on an irregular and unpredictable schedule,

depending on client needs (e.g. Sydney Water sewer clog pump out emergency). However, this is limited to only 1 liquid waste truck per hour between 10.00 pm and 7.00 am for irregular and unexpected events,

- Extended operation of concrete batching plant from 3.00 am,
- New concrete batching structure and equipment for existing concrete production. However, the approved quantity of concrete batching will remain as previously approved at 50,000 tonnes per year,
- Removal of residuals from liquid waste processing (using 20 t trucks) would occur during day and evening time periods only.
- All trucks accessing the site are required to pre-book a time slot, including those occurring at night,
- Trucks accessing the site will be spread out evenly across the day-time operating hours,
- Only one liquid waste truck will operate in the main building at any one time,
- All liquid waste processing will occur internally or under the existing north-eastern and south-eastern awnings,
- No asbestos of any form will be accepted and processed on site,
- All tanks and stored chemicals will be appropriately bunded,
- Liquid waste processing will be fully sealed to prevent the release of odours,
- All liquid tanks will be sealed and fitted with carbon filters to minimise the emission of odours during filling, storage and processing,
- Overhead collection hood fitted with charcoal filters will be installed on the DAF to collect odourous emissions,
- No mobile plant would operate externally at night and only one forklift will operate internally.

The amended Development Application (DA) includes also the removal of Storage Bays SB7 and SB8 and converting SB15 to a “Tip & Spread Area” only as well as removing Storage Pit P10 which was proposed for treatment of Asbestos Containing Liquid.

Table 1: Approximate Quantities for Total Proposed Liquid Waste Streams

Liquid Waste Stream	Estimated quantity per annum @125,000 tpa processing capacity	Estimated Percentage @ 125,000 tpa processing capacity	IN/OUT
Drilling Mud	17,500	14%	IN
NDD	56,250	45%	IN
Stormwater	11,250	9%	IN
Concrete slurry	6,250	5%	IN
Oily water	6,250	5%	IN
Industrial wastewater	5,000	4%	IN
Sewage sludge	5,000	4%	IN
Groundwater	5,000	4%	IN
Leachate	3,750	3%	IN
Firewater	8,750	7%	IN
Discharge to sewer	15,500	12.4%	OUT
Water reuse on site	90,000	72%	OUT
Concrete block (part of)	15,000	12%	OUT
Transported off site as solids	4,500	3.6%	OUT
TOTAL Input	**125,000**	**100%**	
TOTAL Output	**125,000**	**100%**	

Note 1: The above quantities are estimates only and they may vary depending on projects and market.
Note 2: The materials transported off site which has been included in the assessments (I, e. noise and traffic) have been increased significantly to ensure that the worst-case scenario has been considered in the assessments. This means that in the case that the processed materials cannot be re-used on site, there are provisions for that material to be transported off site.

Table 2: List of Approved and Proposed Activities and Wastes types and streams

Existing Approved Activities (i.e. Development Consent, L&E Court Decisions, EPA licence)	**Proposed Additional Activities**
➢ Waste processing (non-thermal treatment) ➢ Resource recovery ➢ Waste storage ➢ Concrete batching ➢ Concrete works/Masonry plant	Nil
Existing Approved Wastes (i.e. Development Consent, L&E Court Decisions, EPA licence)	**Proposed Additional Wastes**
Liquid Waste: • Drilling mud, • Non-destructive digging waste, • Stormwater contaminated with gross pollutants Concrete: • Concrete washout from concrete batch plants, • Residual batch concrete from agitator trucks Building and demolition waste: • As defined in Schedule 1 of the POEO Act, as in force from time to time General solid waste (non-putrescible): • Municipal waste, being waste consisting of household domestic recycling waste that is set aside for kerb side collection or delivered by the householder directly to the waste facility (e.g. glass, plastic, cardboard, paper, aluminium, steel), or commercial waste of the same nature General or Specific exempted waste (not resource recovery): • Being treated drilling mud, • Processed foundry sand, • Basalt fines, • Reclaimed asphalt pavement, • Excavated public road materials, • Recovered aggregate, • Recovered fines (continuous and batch), • Recovered glass sand, • Recovered railway ballast, • Slag (blast -furnace, electric arc furnace, electric arc furnace ladle, electric arc welding, steel furnace) Soils (not resource recovery): • Soil that meets the General Solid Waste Classification (assessed against the CT1 thresholds, Table 1) of the Waste Classification Guidelines as in force from time to time with exception of the maximum	Liquid waste (Waste processing (non-thermal treatment), Resource recovery and Waste storage): • Oily water, • Industrial wastewater, • Sewage sludge and residues, • Leachate, • Groundwater, • Firewater **No additional solid waste types, streams or quantities are proposed.**

threshold values for contaminants specified in the "Other Limits" column Virgin excavated natural materials (not resource recovery): • As defined in Schedule of the POEO Act, as in force from time to time Soils (Waste storage only): Soil that meets the Restricted Solid Waste Classification (assessed against the CT2 thresholds, Table 1) of the Waste Classification Guidelines as in force from time to time	

Following are responses to each request for information made by the Department. Numbers in the response correspond to those in the RFI.

3 - General Aspects

1. Updated site plans (**BRS-Site-002C and SITE02 revision S**) that accurately show all elements of the amended development are presented in **Attachment 2**.

2. An equipment and plant list of all plant that would be used to process liquid wastes are presented in **Attachment 3**.

3. Updated liquid waste processing flow diagrams are presented in **Attachment 4**. These flow diagrams include the plant and equipment that would be used to process the liquid wastes.
   For completeness a copy of the updated BRS-Sydney Water Consent, for wastewater discharge into the sewer, is included in **Attachment 4** as well.

4. The following plant and equipment will be used during the night-time period (10.00pm-7.00am):

   i. Liquid waste plant,
   ii. 1 forklift internally only,
   iii. Vacuum liquid waste truck at a rate of 1 delivery per hour (total of 9 during that period)

In addition to the above but only between the hours of 3.00am-7.00am, the following plant and equipment will be used:

   i. Concrete batching plant
   ii. 1 agitator per hour transporting concrete off site

5. An updated Site Matrix is presented in **Attachment 5**.

6. An updated general site plan titled "***Storage Capacities – BRS-Site-001C***" includes storage capacities of all liquid and solid waste storage structures. In addition, an updated table with all storage capacities and waste quantities that can be stored in relevant storage structures has been amended to reflect the amended Development Application. Both documents are presented in **Attachment 6**.

7. Current and proposed operating hours are included in **Table 3** below.

Table 3: Current and Proposed Operating Hours at BRS site

Existing Operating Hours	Proposed Operating Hours

Monday to Friday 7.00am – 10.00pm Saturday 7.00am – 6.00pm Sunday 7.00am – 6.00pm Public Holidays Closed Drum filters at the mud plant and one forklift operate 24 hours, 7 days per week.	**Solid Waste Processing and Waste Delivery/Pickup:** Monday to Friday 7.00am-10.00pm Saturday 7.00am – 6.00pm Sunday 7.00am – 6.00pm Public Holidays Closed **Liquid and Mud Waste Processing Only:** 24 hours 7 days per week 1 Vac truck per hour delivery of liquid waste between 10.00pm-7.00am **Concrete Batching Operations**: Monday to Friday 3.00am – 10.00pm Saturday 7.00am – 6.00pm Sunday 7.00am – 6.00pm Public Holidays Closed

8. In relation to the laboratory, this is so called for the internal use of BRS staff only. This is an approved office like several other offices in that building. BRS management decided to refer to that office as "***Laboratory***" to ensure that staff can distinguish the normal offices from this specific office. Copies of relevant plans **(BRS–Site–006C and BRS–Site–008)** showing the location of the "***Laboratory*****"** are provided in **Attachment 7** along with some other amended plans.

9. Based on the new Noise Impact Assessment (NIA) undertaken by Pulse White Noise Acoustics (**Attachment 10**), no additional noise barrier is required. Therefore, the construction of the noise barrier is optional and will be determined by BRS management at a later stage.

10. A description of the booking system was presented in the EIS which was based mostly on the Traffic Stacking and Queuing Procedure. A copy of the revised "*Traffic Queuing and Stacking Procedure - Version 3*" is included in **Attachment 11**. This procedure includes details about the pre-booking process used by BRS' operations office to ensure that no queuing is occurring on site or off site near BRS site.

11. The list of management and mitigation measures is included in **Attachment 8**.

4 - Air Related Aspects

Some of the matters raised by DPIE were addressed previously by Todoroski Air Sciences in their Response to Submission dated 16 December 2019 which was submitted to DPIE on two (2) occasions as part of the RTS dated January 2020 and RTS dated October 2020. It was confirmed at that time by both the EPA and DPIE that the response was acceptable with the inclusion of relevant conditions in the Development Consent. A copy of this document is presented in **Attachment 9**.

Notwithstanding the above, we provide the comments outlined below to ensure that DPIE are confident with the proposed air emission management on site.

12. The statement made in the Air Quality Impact Assessment about biological treatment is incorrect. This should have been picked-up and amended by the previous consultancy KDC. BRS does not undertake any biological treatment and there is no proposed biological treatment on site as part of this development.

We confirm that encapsulating processed sludge material in concrete is still occurring and it has been

referred to previously, especially when calculating the materials that are re-used on site in the concrete blocks as well as the quantity of materials transported off site.

13. In relation to sewage sludge and J120 liquid waste that are unloaded outside but undercover, the odour emissions from these activities were included in the AQIA as outlined in the same response referred to above. The following were included in the response:

- *"The liquid wastes will be transported to site in vacuum sealed trucks and pumped directly from the trucks into sealed vacuum storage tanks located within the building enclosure for processing. The vacuum storage tanks will be fitted with carbon filters to treat the air ventilated during the filling of the tanks, and any such release occurs indoors. Overall, as the liquid wastes are not directly exposed to the air, and any emissions are treated with a carbon filter, there is no potential for significant odour emissions to arise."*
- *The odour assessment incorporates conservative assumptions regarding the potential odour sources fromthe Project, such as modelling of the odour sources out in the open rather than within a building enclosure,and also not including any potential mitigation measures for the modelled odour sources. The ventilation extraction system for the DAF would include a hooded ventilation system discharging through charcoal filters before being released. However in the model the odour generated from the DAF is assumed to be untreatedsludge odour. Hence the predicted impact of the process is likely overestimated*
- *The modelling assumes the sources emit odour at a constant rate out in the open and not within a building enclosure as would actually occur. The potential odour emissions generated at the Project would of course vary depending on the demand and waste material received at the Project and there would be no odour generated for a significant portion of the time."*

Based on the above and the results of the computer modelling undertaken as part of the AQIA, it is clearly evident that the above odour sources have been assumed to be in the open which is a very conservative approach and provides an overestimation of the impact at the receivers. Furthermore, the fact that the unloading of these wastes is in fact undertaken undercover (open from one side only and enclosed from the other four sides), further reductions of the predicted values are expected.

It should be noted that all liquid waste tanks are bunded, fully sealed and have carbon filters installed. Referring to vacuum sealed tanks may not be the correct engineering terminology to be used as all tanks are simply fully sealed.

5 - Noise Related Aspects

A new Noise Impact Assessment (NIA) has been completed by a different Acoustic Consultancy since the previous Acoustic Consultancy had previously refused to undertake any other amendments to the NI associated with this development. Their last revision of the NIA dated December 2019 could not be used or amended since there are several clarifications and changes as sought by DPIE. Therefore, it was considered more professional to undertake a new NIA to capture DPIE comments as well as the amended development. A copy of this NIA prepared by Pulse White Noise Acoustics is presented **Attachment 10**.

Based on the new NIA, we provide the comments outlined below.

14. It is confirmed by a third-party independent Acoustics Engineer that the correct Amenity Noise Levels were considered in the Noise Impact Assessment. Furthermore, based on Tables 2.2 and 2.3 of the EPA's *"Noise Policy for Industry"*, it is clearly evident that the **Urban residential receiver category is the applicable category for the noise assessment.** An extract of Table 2.3 is provided below to demonstrate and confirm that the use of the Urban rather than the Suburban category is the

most appropriate.

Table 2.3: Determining which of the residential receiver categories applies.

Receiver category	Typical planning zoning – standard instrument*	Typical existing background noise levels	Description
Rural residential	RU1 – primary production RU2 – rural landscape RU4 – primary production small lots R5 – large lot residential E4 – environmental living	Daytime RBL <40 dB(A) Evening RBL <35 dB(A) Night RBL <30 dB(A)	**Rural** – an area with an acoustical environment that is dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels. Settlement patterns would be typically sparse. Note: Where background noise levels are higher than those presented in column 3 due to existing industry or intensive agricultural activities, the selection of a higher noise amenity area should be considered.
Suburban residential	RU5 – village RU6 – transition R2 – low density residential R3 – medium density residential E2 – environmental conservation E3 – environmental management	Daytime RBL<45 dB(A) Evening RBL<40 dB(A) Night RBL <35dB(A)	**Suburban** – an area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has the following characteristic: evening ambient noise levels defined by the natural environment and human activity.
Urban residential	R1 – general residential R4 – high density residential B1 – neighbourhood centre (boarding houses and shop-top housing) B2 – local centre (boarding houses) B4 – mixed use	Daytime RBL> 45 dB(A) Evening RBL> 40 dB(A) Night RBL >35 dB(A)	**Urban** – an area with an acoustical environment that: • is dominated by 'urban hum' or industrial source noise, where urban hum means the aggregate sound of many unidentifiable, mostly traffic and/or industrial related sound sources • has through-traffic with characteristically heavy and continuous traffic flows during peak periods • is near commercial districts or industrial districts • has any combination of the above.

Notes: *As cited in Standard Instrument – Principal Local Environmental Plan, New South Wales Government, Version 15 August 2014. RBL = rating background noise level.

15. For the new Noise Impact Assessment (NIA), real-time on-site noise measurements of all plant & equipment that operates (and will continue to operate) on site were undertaken during normal operations. These measurements were used to determine the Sound Power Levels of all those plant and equipment. Similar methodology was followed by the newly appointed Acoustics Consultancy to measure the noise levels of all vehicles entering and/or leaving the site during the noise testing session to determine their Sound Power Levels which were used in the noise computer modelling.

Furthermore, despite the fact that only 4 vehicles per hour will be entering the site, the NIA included a more conservative number of vehicles to be present on site at any one time to ensure that:

- Worst case scenario is included in the computer modelling of noise predictions,
- In case of delays due to breakdowns or other unexpected events, more vehicles could still be

present on site,

- The highest potential noise impact on nearby premises is predicted.

The NIA assesses the potential operational noise impacts of the development on the nearby receivers. The following noise control recommendations are contained within this report.

- Equipment during the day and evening periods is to be limited to the following:
  - 1 x Crushing/screening plant, located indoors
  - 1 x Excavator, located indoors
  - 1 x Front end loader, located outdoors in the crushing yard
  - 2 x Truck and dogs, located outdoors in the main yard
  - 1 x Concrete batching plant, located indoors
  - 1 x Slump stand, located indoors
  - 1 x Concrete agitator, located outdoors in the main yard
  - 1 x Flocculant plant, located undercover outdoors
  - 2 x Liquid plant, located undercover outdoors
  - 3 x Vacuum trucks, located outdoors
  - 1 x Forklift, located outdoors 20% and indoors 80%

- Noise generating equipment during the night periods is to be limited to the following:
  - 1 x Concrete batching plant, located indoors
  - 1 x Slump stand, located indoors
  - 1 x Concrete agitator, located outdoors in the main yard
  - 1 x Flocculant plant, located undercover outdoors
  - 2 x Liquid plant, located undercover outdoors
  - 1 x Vacuum trucks, located outdoors
  - 1 x Forklift, located outdoors 20% and indoors 80%

- The doors are to be fully closed when the crusher and screens are operational
- When truck and dogs are being loaded or at a waiting bay, they are to be turned off
- When vacuum waste trucks are being loaded or at a waiting bay, they are to be turned off
- Permanent on-site mobile equipment such as the excavator, front end loader and the forklift are to have anon-tonal reversing alarm
- In the crusher yard, the existing 6.5 wall along the southeast boundary is to be retained. Additionally, an awning is proposed from the top of the noise wall to cover the storage bays and all activities outside the crushing plant. Note that both ends of the covered area are open air and not enclosed

Based on the findings from this Acoustic Report, should the assumptions in this report be carried out, the noise impacts from the proposed increase in capacity are predicted to comply with the recommended noise criteria at the surrounding receivers.

Furthermore, based on the outcomes of the assessment presented in the NIA, no additional mitigation measures are required than what is included. However, BRS might consider the installation of an additional noise barrier at the southwestern corner, closing off the southwestern open end under the awning, in future to provide higher confidence to all stakeholders including community, nearby industries and Government agencies. It is noted that this additional noise barrier is not a mandatory requirement but rather an optional decision for BRS management to make.

6 - Traffic Related Aspects

The Traffic Impact Assessment (TIA) has been amended by the Traffic Engineer to reflect the amended development and taking into consideration DPIE's latest comments. A copy of the amended TIA is presented in **Attachment 11**.

As previously advised on more than one occasion, the initial TIA was based on incorrect advice given by the previous consultancy to the Traffic Engineer in relation to the quantities of liquid wastes transported of site after processing.

The following assumptions were used in the TIA to calculate the hourly number of vehicles entering and leaving the site as well as the number of vehicles that would be present on site at any one time:

- Waste delivery is 125,000 tonnes per annum of liquid waste and 19,000 tonnes per annum of solid waste.
- Waste removal based on 7,000 tonnes of storage on site (3,500 tonnes solid waste and 3,500 tonnes liquid waste) i.e. 15,500 tonnes of solid waste and 24,300 tonnes of liquid waste per annum.
- Each vehicle load (delivery and removal) represents an inbound and outbound trip that willoccur in the same hour.
- Most of the liquid waste is removed either through the local sewer under licence or recycled on-site through the wheel washes, concrete blocks, concrete batching plant and landscaping, or (only 20% is removed off site)
- For solid waste delivery and pick-up, the Operating Hours are 15 hours per day – weekdaysand 11 hours on Saturdays and Sundays. The Operating Hours for liquid waste processingare 24 hours / 7 days a week. Between 10.00 pm - 7.00 am a maximum 1 vacuum truck perhour will occur.
- Concrete batching plant operates 3.00am - 10.00pm (19 hours) weekdays and 7.00am - 6.00pm (11 hours) weekends.
- Facility is open 50 weeks (350 days) of the year (Closed Christmas Day, New Year's Day & Easter)
- Waste delivery provided in different sized trucks nominated in the calculations below.
- Solid waste removal undertaken using truck and dog combinations or semi-trailers with anaverage haulage load of 28 tonnes operated by contractors.
- Staff numbers assumed to be 15 staff including drivers.
- Concrete Agi-trucks carry 15 tonnes of concrete per load (6 m^3 capacity).

In addition to the above, BRS will commit to accept a Driver Code of Conduct condition in the consent similar to those used at quarries and many other facilities across NSW. The Code requires all drivers entering the site to read the rules and sign a document that they have read it. BRS can then enforce compliance and using the *"three strikes and you are out"* principal, will advise some drivers who disregard the rules that BRS will not accept their trucks in future. This approach has been used successfully in many other facilities across NSW.

Below are specific responses to specific matters raised by DPIE.

16. Based on the revised TIA the cumulative traffic generation calculations are:

a) Solid Waste delivery – 19,000 tonnes per annum / 350 working days / 13.86 average hoursper day / 28 tonnes per vehicle x 2 trips per vehicle = approximately 1 (0.28) vehicle trips per hour. **1 truck load per hour or 2 movements per peak hour**,

b) Liquid Waste and Muddy Waste Delivery – 125,000 tonnes per annum / 350 working daysper annum / 24 average hours per day / average 12 tonnes per vehicle x 2 trips per vehicle =approximately average 2.48 vehicle trips per hour **with 3 truck loads per hour between 7.00am – 10.00pm and 1 truck load per hour between 10.00pm - 7.00am**

c) Solid waste removal – 15,500 tonnes per annum / 350 working days per annum / 13.86 average hours per day / 28 tonnes per vehicle x 2 trips per vehicle = **approximately 1 (0.23)vehicle trips per hour.**

d) Liquid waste removal - 24,300 tonnes per annum / 350 working days per annum / 13.86 average hours per day / 12 tonnes per vehicle x 2 trips per vehicle = **approximately 1 (0.83)vehicle trip per hour or 6 truck loads per day**

e) Staff trips – Peak Hour considered to be arrival at work (AM) **all inbound trips – 15 vtph and departure from work (PM) all outbound trips – 15 vtph.**

f) Concrete trucks – Peak hour – 50,000 tonnes/year/ 350 working days per annum / 19 hrs per day / 15 tonnes per load = 0.49 deliveries per hour maximum i.e. 1 inbound and 1 outbound trip. Assume maximum material delivery of 1 per day maximum in non-peak periods. **9.5 truck loads per day (assume 10)**

Therefore, Peak Hour Trips can be calculated as follows:

AM Peak hour = 1 inbound trip and 1 outbond trip (Solid waste delivery)1inbound trip (waste deliveryand removal) + 15 inbound (staff)+ 1 inbound and 1 outbound (concrete batching plant) = 20 vtph(17 inbound and 3 outbound). Therefore the Operational AM Peak Hour trips excluding staff will be 5.

PM Peak hour = 1outbound and 1 inbound trip (Solid waste delivery) + 1 outbound trips (waste delivery and removal) + 15 outbound trips (staff) + 1 inbound + 1 outbound (concrete batching plant) = 20 vtph (3 inbound and 17 outbound). Therefore the Operational PM Peak Hour trips excluding staff will be 5.

17. As stated above, the number of liquid waste vehicles arriving at irregular hours - between the hours of 10.00pm and 7.00am - is limited to one (1) vehicle per hour which is equivalent to 9 per day and 3,150 vehicles per year based on 350 working days per year. These vehicle movements have been taken into consideration in the calculations of vehicle movements of all liquid and solid wastes entering and leaving the site.

18. The updated traffic modelling results are included in section 3 of the TIA. Relevant extracts from the TIA are presented below.

The additional traffic from the proposed development would increase these traffic volumes as follows;

- *Brooks Road – 6 vtph in both the AM and PM peak hour;*
- *Williamson Road – 11 vtph in both the AM and PM peak hour;*
- *Henderson Road – 11 vtph in both the AM and PM peak hour*
- *Lancaster Street – 14 vtph in both the AM and PM peak hour; and*
- *Aero Road – 14 vtph in both the AM and PM peak hour.*

*Therefore, in terms of mid-block road network capacity the following assessment as shown in **Table 1** below has been determined by adopting a background traffic growth of 2 % per annum forthe next 10 years.*

Table 1 – Two-way mid-block capacity assessment

Road	Section	2018		2028		Road Capacity	Development Traffic	
		AM (vtph)	PM (vtph)	AM (vtph)	PM (vtph)		AM	PM
Brooks Road	West of Williamson Road	2054	2191	2503	2670	3000	2	3
Williamson Road	North of Brooks Road	2050	2188	2498	2666	3000	5	5
Henderson Road	east of Williamson Road	2491	2609	3035	3179	3000	5	5
Lancaster Street	south of Henderson Road	1104	1195	1344	1455	1800	7	7
Aero Road	west of Kerr Road	335	346	407	420	1200	7	7

It is noted from a review of the above table that post development the mid-block traffic volumes onthe local road network will remain at a LoS C or D therefore the proposal does not adversely impact on the local road network. However with background traffic growth only Henderson Road will just exceed the capacity threshold of a LoS C and therefore will be operating mid-block with LoS D. In recent times road authorities have accepted that for major sub-arterial, collector and local roads a LoS D is still an acceptable level of service on the road network. Therefore it is concluded that the proposed development does not adversely impact on the mid-block traffic volumes on the local road network. Subject to continued satisfactory intersection performance thedevelopment can therefore be supported from a traffic impact perspective.

The results of the modelling are summarised in ***Tables 2 - 6*** *below for 'all vehicles'. The Sidra Movement Summary Tables are provided in* ***Attachment C.***

Table 2 – Brooks Road / Williamson Road roundabout - Sidra Modelling Results Summary

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2018 AM + development	0.815	10.2	A	10.7
2018 PM + development	0.693	12.0	A	8.8
2028 AM + development	0.934	13.8	A	19.9
2028 PM + development	0.825	16.4	B	14.5

Table 3 – Williamson Road / MacDonald Road roundabout - Sidra Modelling Results Summary

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2018 AM + development	0.558	7.5	A	5.9
2018 PM + development	0.558	7.5	A	4.9
2028 AM + development	0.804	9.6	A	8.2
2028 PM + development	0.679	8.5	A	6.8

Table 4 – Williamson Road / Henderson Road roundabout - Sidra Modelling Results Summary

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2018 AM + development	0.666	7.7	A	7.4
2018 PM + development	0.761	7.0	A	10.6
2028 AM + development	0.745	8.0	A	9.4
2028 PM + development	0.845	7.2	A	15.3

Table 5 – Henderson Road / Lancaster Street roundabout - Sidra Modelling Results Summary

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2018 AM + development	0.560	6.8	A	4.5
2018 PM + development	0.616	8.3	A	5.6

2028 AM + development	*0.624*	*7.4*	*A*	*5.6*
2028 PM + development	*0.705*	*9.4*	*A*	*7.9*

Table 6 – Lancaster Street / Aero Road roundabout - Sidra Modelling Results Summary

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
2018AM + development	*0.406*	*6.0*	*A*	*3.0*
2018 PM + development	*0.429*	*7.3*	*A*	*3.0*
2028 AM + development	*0.447*	*6.1*	*A*	*3.5*
2028 PM + development	*0.484*	*7.6*	*A*	*3.6*

This modelling shows the development has little impact on the operation of the major intersectionsin the adjoining road network with all intersections continuing to operate satisfactorily postdevelopment through to at least 2028. Average delays, LoS and queue lengths remain within theacceptable criteria set by NSW RMS. Therefore, the development does not adversely impact on the efficiency and effectiveness of the local road network.

It should also be noted this assessment is likely to be very conservative as it has not allowed for existing traffic generated by the development. It would be appropriate to discount the additional traffic generated by the new development by the existing traffic generated by the site however ignoring existing traffic results in a robust traffic impact assessment.

The conclusions of the TIA are included in Section 4 of the same report and they are presented below.

- *The proposed development is likely to generate in the order of an additional 7 vtph (including staff trips) during the AM and PM peak hour traffic periods.*
- *There is sufficient two-way mid-block capacity within the local road network to cater for the additional traffic generated by this development.*
- *SIDRA INTERSECTION modelling has shown that all the major intersections along the likely haulage routes to the Hume Motorway and local areas have sufficient spare capacityto cater for the proposal noting they will continue to operate satisfactorily post developmentthrough to at least 2028. Therefore, the development will not adversely impact on the localroad network and no road upgrading is considered warranted.*
- *The existing vehicular access is satisfactory for the proposed development and would be compliant with Australian Standard AS2890.1-2004 Parking facilities – Part 1 - Off-street car parking and Australian Standard AS2890.2-2002 Parking facilities – Part 2 - Off-street commercial vehicle facilities. The access would also comply with the Campbelltown (Sustainable City) Development Control Plan (2015)*
- *It is noted from the TfNSW restricted vehicle access maps that the haulage routes to the site are already approved for 25/B26 metre B-Double heavy vehicles though Aero Road and Kerr Road are approved routes with travel conditions while the Lancaster Street / AeroRoad roundabout is a restricted intersection with conditional approval for B-Doubles. If thesite were to generate B-Double vehicle movements, future consultation with Campbelltown City Council's Traffic Committee will be required.*
- *Overall it is concluded that the local road network has sufficient spare capacity to cater forthe development and the proposal will not adversely impact on the local and state road network.*
- *Sufficient and suitable on-site car parking can be provided on-site to meet the operational requirements of the development as well as Campbelltown (Sustainable City) DevelopmentControl Plan (2015) and Australian Standards.*
- *Suitable loading arrangements and queuing areas for heavy vehicles exist within the site tocater for the expected arrival rate of heavy vehicles during peak operational periods (4 heavy vehicles*

on site at any one time plus a maximum 2 vehicles queuing in dedicated strategic locations, if required). Therefore no queuing of heavy vehicles onto the local roadnetwork will occur due to the increased production on site.

- *The proposed development will not increase use of the existing public transport service significantly therefore there would be no nexus from this development for the provision of additional infrastructure or changes to the existing service resulting from this development.*
- *The development is unlikely to significantly increase pedestrian and cycle traffic on the localroad network therefore no nexus exists for the provision of additional external pedestrian orcycle way infrastructure.*

19. Based on the revised TIA the cumulative traffic generation calculations are:

g) Solid Waste delivery – 19,000 tonnes per annum / 350 working days / 13.86 average hoursper day / 28 tonnes per vehicle x 2 trips per vehicle = approximately 1 (0.28) vehicle trips per hour. 1 truck load per hour or 2 movements per peak hour,
h) Liquid Waste and Muddy Waste Delivery – 125,000 tonnes per annum / 350 working daysper annum / 24 average hours per day / average 12 tonnes per vehicle x 2 trips per vehicle =approximately average 2.48 vehicle trips per hour with 3 truck loads per hour between 7.00am – 10.00pm and 1 truck load per hour between 10.00pm - 7.00am
i) Solid waste removal – 15,500 tonnes per annum / 350 working days per annum / 13.86 average hours per day / 28 tonnes per vehicle x 2 trips per vehicle = approximately 1 (0.23)vehicle trips per hour.
j) Liquid waste removal - 24,300 tonnes per annum / 350 working days per annum / 13.86 average hours per day / 12 tonnes per vehicle x 2 trips per vehicle = approximately 1 (0.83)vehicle trip per hour or 6 truck loads per day
k) Staff trips – Peak Hour considered to be arrival at work (AM) all inbound trips – 15 vtph anddeparture from work (PM) all outbound trips – 15 vtph.
l) Concrete trucks – Peak hour – 50,000 tonnes/year/ 350 working days per annum / 19 hrs per day / 15 tonnes per load = 0.49 deliveries per hour maximum i.e. 1 inbound and 1 outbound trip. Assume maximum material delivery of 1 per day maximum in non-peak periods. 9.5 truck loads per day (assume 10)

Therefore, Daily Trips can be calculated as follows:

Weekday Daily Vehicle Trips including staff = (1 + 3 + 1 + 1) x 13.86 + (1 + 1) x 19 + 15 x 2 = **152vtpd or 122vtpd excluding staff** which results in 61 trucks per weekday.

Despite all the above conservative assumptions, rounding up of all values and overestimation, no more than 4 vehicles per hour will be entering and leaving the site.

20. An updated Time Step Analysis for the 2-hourly Peak Operations is presented in **Attachment 12**.

21. It is common industry practice that vehicles transporting wastes from a Resource Recovery Facility will be at full capacity to reduce transport costs since the transport cost does not take into consideration whether the vehicle is full or half full but rather the distances travelled and/or time taken to transport the wastes from A to B.

In relation to the incoming wastes, this will depend greatly on the materials and the project. For example for the majority of the solid wastes, the vehicles will be very close to the full capacity which

is 32 tonnes for a Truck & Dog and 20 tonnes for an HRV. This is the main reason for including the following two (2) main parameters in the traffic calculations:

- The averaging of truck loads to cover a wide range of load weights. As an example Truck & Dog load was assumed to be 28 tonnes which is a very good value even if you had a mix of loads between 24 and 32 tonnes, and
- The rounding up rather than down of all calculated number of vehicles per day and per hour. As an example for solid waste transported into the site by truck & dogs, the calculations provide 0.14 load of solid waste per hour or 2 truck & dogs per day. This has been taken as 1 truck movement rather than 0.14 of a truck movement. The total daily number of vehicles was calculated at 2 (1.94) vehicles. However, it was assumed that the number of vehicles per hour to be 1 rather than 0.14. This gives ample tolerances (overestimation) of the number of daily and hourly vehicles for all waste types.

A simpler way to understand the calculations associated with number of trucks against the quantity of waste transported to and from the site is to consider as an example the truck & dog scenario against the solid waste quantity.

The maximum quantity of solid waste to be transported to the site is 19,000 tonnes per year. Assuming 350 working days. The daily quantity to be transported to the site would be 19,000/350=54.3 tonnes. This is equivalent to 2 truck & dogs per day. This means that any truck & dog that transport to the site 3.92 (28X0.14=3.92) tonnes and above is considered a truck movement. This means that the number of truck & dogs on an hourly basis is significantly overestimated by a factor of 7.5.

Similar principles have been used for all materials transported from and to the BRS site.