

## Memorandum

To	Matt Davies	Page	1
CC			
Subject	Origin Energy Ash Recycling Facilities - Traffic Study		
From	Martin Mallia		
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### 1.0 Introduction

In 2021, Origin Energy prepared a modification request for the Eraring Power Station (EPS) Ash Dam (the Project) operations, which proposed to increase the current ash recycling rates above pre-existing levels and towards the 80% reuse or recycling goal set out by Condition 4A.1 of Project Approval 07\_0084. The proposed modification would involve changes to the ash recycling activities currently carried out under this approval, which in turn would increase the number of heavy vehicle movements to and from the existing site, located off Rocky Point Road within the Lake Macquarie City Council (Council) local government area.

In December 2021, Council prepared a response to NSW Department of Planning, Industry and Environment in relation to a haulage levy for the Project. The full response is attached in Appendix A. Council is of the opinion that an annual levy would be appropriate for the Project, and a condition could be provided with a fee calculated in accordance with Council's haulage levy which as applied to other catchments. The condition would provide a figure determined by the pre and post development Equivalent Standard Axle % increase to the road.

This traffic study will present the predevelopment heavy vehicle volumes (with vehicle classification) accessing / egressing the site and provide the distribution volumes via the on / off ramps to Wangi Road.

### 2.0 Existing conditions

#### 2.1 Vehicle traffic volumes

Automatic Traffic Counters (ATC) were installed on Rocky Point Road to the east of the entrance to the Eraring Power Station via Construction Road to count vehicle volumes, identify direction of travel and classify vehicle type. The ATC were installed on Monday 10 January 2022 and collected data for a full seven-day period. The daily total number of vehicles for each direction is presented in Table 1. A location plan and site photographs are illustrated in Figure 1. The full survey results attached in Appendix B.

Figure 1 ATC Location



Table 1 Vehicle Volumes on Rocky Point Road

	Tue 11 Jan	Wed 12 Jan	Thu 13 Jan	Fri 14 Jan	Sat 15 Jan	Sun 16 Jan	Mon 17 Jan
Eastbound (outbound)	509	566	513	494	114	80	510
Westbound (inbound)	494	546	509	494	112	79	500
<b>Total</b>	<b>1003</b>	<b>1032</b>	<b>1022</b>	<b>988</b>	<b>226</b>	<b>159</b>	<b>1010</b>

It is noted that at present Rocky Point Road is the only access into and out of EPS, so inbound and outbound vehicle movements should be the same, within expected error margins (+/-5%), which was found to be the case for total vehicle numbers.

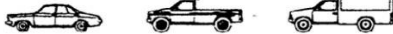











However, some discrepancies in the vehicle classifications were identified in the split of heavy and light vehicles on the inbound and outbound routes, where the total vehicle count on each day did not equal one another (within expected error margins). This could have occurred for a range of reasons in particular some inaccurate axle counting of outbound vehicles turning left from Construction Road over the ATCs on Rocky Point Road. As such the analysis to follow uses the inbound traffic count and vehicle classification to assess pre and post development (Project) vehicle movements.

As shown above, there are two access points off Rocky Point Road at EPS, 1) via a right turn onto Construction Road and 2) straight through on Rocky Pint Road to the EPS main entrance. All ash recycling trucks (existing and future) use access 1) Construction Road.

## 2.2 Heavy vehicle classification

The ATC also collected information on the vehicle classification. Austroads provide a Vehicle Classification System (VCS) to identify different vehicle types on the roads. The VCS classifies 12 different vehicle types, as illustrated in Figure 2. It should be noted that the survey provides a 13th classification, which calculates all vehicles that cannot be classified (generally motorbikes, cycles and other vehicles).

**Figure 2 Austroads Vehicle Classification System**

Level 1	Level 2	Level 3	AUSTROADS Classification				
Length (indicative)	Axles and Axle Groups		Vehicle Type				
Type	Axes	Groups	Typical Description	Class	Parameters	Typical Configuration	
Short up to 5.5m		1 or 2	<b>Short</b> Sedan, Wagon, 4WD, Utility, Light Van, Bicycle, Motorcycle, etc	1	$d(1) \leq 3.2m$ and axles = 2		
	3, 4 or 5	3	<b>Short - Towing</b> Trailer, Caravan, Boat, etc	2	groups = 3 $d(1) \geq 2.1m$ , $d(1) \leq 3.2m$ , $d(2) \geq 2.1m$ and axles = 3, 4 or 5		
Medium 5.5m to 14.5m			<b>HEAVY VEHICLES</b>				
	2	2	<b>Two Axle Truck or Bus</b>	3	$d(1) > 3.2m$ and axles = 2		
	3	2	<b>Three Axle Truck or Bus</b>	4	axles = 3 and groups = 2		
	> 3	2	<b>Four Axle Truck</b>	5	axles > 3 and groups = 2		
Long 11.5m to 19.0m	3	3	<b>Three Axle Articulated</b> Three axle articulated vehicle, or Rigid vehicle and trailer	6	$d(1) > 3.2m$ , axles = 3 and groups = 3		
	4	> 2	<b>Four Axle Articulated</b> Four axle articulated vehicle, or Rigid vehicle and trailer	7	$d(2) < 2.1m$ or $d(1) < 2.1m$ or $d(1) > 3.2m$ axles = 4 and groups > 2		
	5	> 2	<b>Five Axle Articulated</b> Five axle articulated vehicle, or Rigid vehicle and trailer	8	$d(2) < 2.1m$ or $d(1) < 2.1m$ or $d(1) > 3.2m$ axles = 5 and groups > 2		
	$\geq 6$	> 2	<b>Six Axle Articulated</b> Six axle articulated vehicle, or Rigid vehicle and trailer	9	axles = 6 and groups > 2 or axles > 6 and groups = 3		
Medium Combination 17.5m to 36.5m	> 6	4	<b>B Double</b> B Double, or Heavy truck and trailer	10	groups = 4 and axles > 6		
	> 6	5 or 6	<b>Double Road Train</b> Double road train, or Medium articulated vehicle and one dog trailer (M.A.D.)	11	groups = 5 or 6 and axles > 6		
Large Combination Over 33.0m	> 6	> 6	<b>Triple Road Train</b> Triple road train, or Heavy truck and three trailers	12	groups > 6 and axles > 6		

**Definitions:** Group: Axle group, where adjacent axles are less than 2.1m apart  
Groups: Number of axle groups  
Axes: Number of axles (maximum axle spacing of 10.0m)

$d(1)$ : Distance between first and second axle  
 $d(2)$ : Distance between second and third axle

Source: Austroads, 2022.

Table 3 and Table 4 presents the daily vehicle classification numbers and percentage for inbound vehicles. The same applies for outbound vehicles. The fly ash recycling trucks that are the subject of the Project are class 9 and 10 vehicles.



**Table 3 Inbound Daily Vehicle Classification**

VCS	1	2	3	4	5	6	7	8	9	10	11	12
Tue	281	0	96	44	11	1	3	4	9	18	0	0
Wed	296	1	124	58	9	0	0	4	10	11	0	0
Thu	291	2	114	39	10	1	1	5	12	8	0	0
Fri	292	1	115	38	6	1	0	1	6	11	0	0
Sat	69	0	16	11	1	0	0	2	3	1	0	0
Sun	57	0	16	2	0	0	0	0	1	0	0	0
Mon	282	0	113	39	7	1	2	1	13	5	1	0
<b>Ave</b>	<b>224</b>	<b>1</b>	<b>85</b>	<b>33</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>8</b>	<b>8</b>	<b>0</b>	<b>0</b>

**Table 4 Inbound Daily Vehicle Classification %**

VCS	1	2	3	4	5	6	7	8	9	10	11	12
Tue	57%	0%	19%	9%	2%	0%	1%	1%	2%	4%	0%	0%
Wed	54%	0%	23%	11%	2%	0%	0%	1%	2%	2%	0%	0%
Thu	57%	0%	22%	8%	2%	0%	0%	1%	2%	2%	0%	0%
Fri	59%	0%	23%	8%	1%	0%	0%	0%	1%	2%	0%	0%
Sat	62%	0%	14%	10%	1%	0%	0%	2%	3%	1%	0%	0%
Sun	72%	0%	20%	3%	0%	0%	0%	0%	1%	0%	0%	0%
Mon	56%	0%	23%	8%	1%	0%	0%	0%	3%	1%	0%	0%
<b>Ave</b>	<b>57%</b>	<b>0%</b>	<b>22%</b>	<b>8%</b>	<b>2%</b>	<b>0%</b>	<b>0%</b>	<b>1%</b>	<b>2%</b>	<b>2%</b>	<b>0%</b>	<b>0%</b>

## 2.3 Heavy vehicle origin / destination

The Traffic Impact Assessment that accompanied the Development application assumed that all heavy vehicle traffic accessing / egressing the site would be split with 50% of traffic having an origin / destination to the north, and 50% of traffic having an origin / destination to the south. All traffic would use the Wangi Road on / off ramps to access the site.

To validate this assumption, historic traffic turning count surveys were used to assign access / egress percentages from the four on / off ramps to Wangi Road. The surveys were undertaken for use for a Project at the same site in 2018 and covered the four on / off ramps to Wangi Road where they intersect Rocky Point Road. The surveys were undertaken on Thursday 5 April 2018 between 07:00 – 10:00 and 16:00 – 19:00, with the weekday representing the peak vehicle demand for the site as identified in Section 2.1. The results of these surveys are presented in Appendix C.

The heavy vehicle turning volumes at each of these intersections were used for each of the survey periods to provide origin / destination percentages for the heavy vehicles accessing / egressing the site. This provides the number of heavy vehicles using each ramp for Wangi Road. The distribution percentages are presented in Table 5.

**Table 5 Heavy Vehicle Distributions**

Direction	Thursday AM %	Thursday PM %
<b>Inbound</b>		
North	53%	11%
South	47%	89%
<b>Outbound</b>		
North	44%	47%
South	56%	53%

As shown in Table 5, the heavy vehicle distribution during the weekdays is generally in line with the assumptions made in the Traffic Impact Assessment, except for the Thursday PM peak period. On occasion, there may be anomalies in the distribution percentages due to infrequent excess demand for ash for a particular project, which may skew the results. It is expected that this is what happened during the Thursday PM peak period for inbound vehicles. Therefore, it is proposed to adopt the 50/50 north/south split for vehicles associated with the site.

### 3.0 Future conditions with Project

Based on the analysis undertaken in Section 2.0, application of these principals to the proposed uplift in heavy vehicle volumes because of the Project will enable forecasts to be made for heavy vehicle volumes, classification, and distribution to be made.

#### 3.1 Future daily heavy vehicle traffic volumes

The Project at a maximum proposes to generate a net peak increase of an additional 223 daily inbound and 223 daily outbound class 9 and 10 heavy vehicle movements over existing conditions. As per the existing situation there will be the same number of inbound and outbound traffic movements and it is assumed 50% of trucks access and leave the site to the north and the other 50% to the south.

Table 6 presents the breakdown of vehicle classification in and outbound and north and south for the existing situation per traffic counts in the week 11 to 17 January 2021.

**Table 6 Vehicle Classification for 11 January – 17 January**

VCS	1	2	3	4	5	6	7	8	9	10	11	12
Outbound (North)	112	0	42	17	3	0	0	1	4	4	0	0
Outbound (South)	112	0	42	17	3	0	0	1	4	4	0	0
Inbound (North)	112	0	42	17	3	0	0	1	4	4	0	0
Inbound (South)	112	0	42	17	3	0	0	1	4	4	0	0

Table 7 presents the breakdown of vehicle classification in and outbound and north and south for the future project situation which assumes an increase in 223 inbound and 223 outbound ash truck movements per day.

**Table 7 Vehicle Classification for 11 Proposed Project**

VCS	1	2	3	4	5	6	7	8	9	10	11	12
Outbound (North)	112	0	42	17	3	0	0	1	116	116	0	0
Outbound (South)	112	0	42	17	3	0	0	1	116	116	0	0
Inbound (North)	112	0	42	17	3	0	0	1	116	116	0	0
Inbound (South)	112	0	42	17	3	0	0	1	116	116	0	0

It is important to note that when reviewing the existing and Project impacted traffic numbers, the existing situation is per the traffic counts in the week of 11 to 17 January 2021, where there was on average only 16 inbound and 16 outbound class 9 and 10 ash trucks per day, whereas average numbers, based on historic ash recycling rates is 128 inbound and 128 outbound per day. That is in the week of the traffic survey, ash recycling, which is market driven, was well below average.



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