



Our Ref: 1646/PJ/FD/161215

16 December 2015

Howard Reed
Director Resource Assessments
Department of Planning & Environment
23-33 Bridge Street
GPO Box 39
SYDNEY NSW 2001

Attention: Colin Phillips

Dear Howard

Re: Mackas Sand – PA08_142 Mod 2 Response to RMS Submission

Mackas Sand has requested that Umwelt (Australia) Pty Limited (Umwelt) responds on its behalf to Roads & Maritime Services (RMS) letter submission to DP&E of 10 December 2015 regarding PA 08_142.

Mackas Sand notes that in its letter of 10 December 2015, RMS maintains objection to any increase in truck movements during the AM peak period of 6 am to 9 am Monday to Friday due to the volume of southbound traffic and the limited opportunity for safe merge movements. RMS states that it would consider an increase in truck movements between 5 am and 6 am Monday to Friday up to 48 total movements per hour (i.e. in and out).

In the Response to Submissions (Umwelt October 2015) Mackas Sand set out the changes to truck movements that were being sought. Since the Response to Submissions was prepared Mackas Sand has had further discussions with RMS. RMS initially indicated that it would consider up to 24 truck movements in and 24 truck movements out between 5 am and 7 am Monday to Friday with truck movements being restricted to eight truck movements in and eight truck movements out per hour between 7 am and 9 am.

In addition, since the Response to Submissions was prepared, Mackas Sand has undertaken further client and market analysis which was summarised in the letter to RMS of 15 November 2015. As set out in the letter to RMS, this analysis shows that there is a significant demand for sand being delivered between 7.00 am and 10.00 am to a broad range of industries and customers in Sydney and the Hunter.

This analysis also indicates that Mackas Sand operations at Lot 218 are one of the few that can provide the quality and quantity of sand required by these markets and, as a consequence, there is a significant number of industries and major infrastructure projects that are reliant on delivery first thing in the morning of fine sand from Mackas Sand operations on Lot 218 to enable them to meet client and production demands for the day.

The outcomes of the analysis undertaken by Mackas Sand can be grouped into four main reasons why being able to truck sand from Mackas Sand quarry at Lot 218, Williamstown between 5 am and 7 am in particular is important for construction industry, transport industry and drivers.

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Newcastle

75 York Street
Teralba NSW 2284

Ph. 02 4950 5322

Perth

PO Box 8177
Subiaco East WA 6008
33 Ventnor Avenue
West Perth WA 6005

Ph. 08 6260 0700

Canberra

PO Box 6135
56 Bluebell Street
O'Connor ACT 2602

Ph. 02 6262 9484

Sydney

Level 3
50 York Street
Sydney, NSW, 2000

Ph. 1300 793 267

Brisbane

GPO Box 459,
Brisbane, QLD, 4001

Ph. 1300 793 267

www.umwelt.com.au

These reasons can be summarised as:

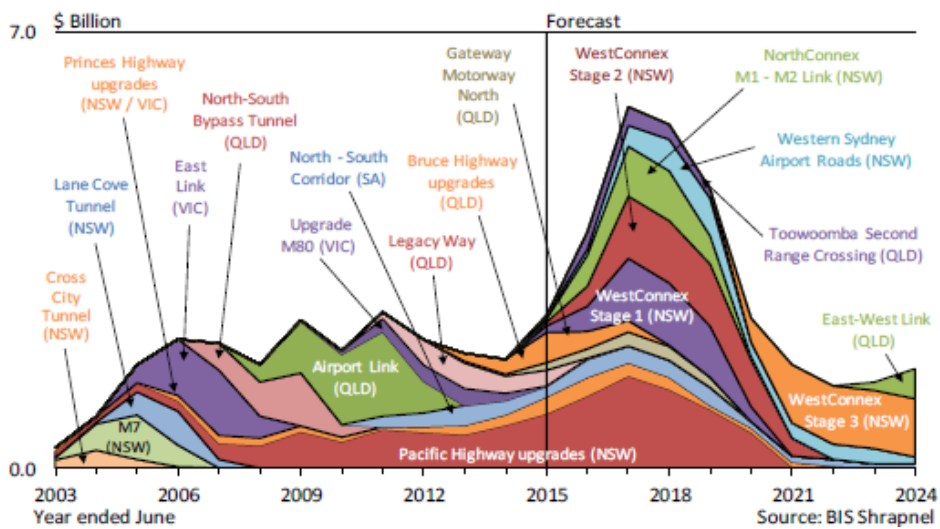
- Shortage of alternate supplies of quality fine sand particularly for the Sydney market mean that greater access to fine sand at Lot 218 is important. Sydney is currently using approximately 2 million tonnes of fine sand per year in concrete production alone. With the current level of housing development and the number of major infrastructure projects that have been commenced or are soon to commence, this demand is expected to continue and increase over the foreseeable future (at least the next decade). This demand cannot be met using manufactured sand due to size and grading requirements. Penrith Lakes Scheme which has historically been one of the major sources of fine sand to the Sydney market closes in December 2015 and sand from Kurnell has limited supplies of sand that has deteriorated in quality of the last few years. Sydney Wide Building Material states that Mackas Sand and Soil has proven to be the only option for fine sand.
- Concrete batching plants and landscape supplies need sand delivered before 7 am to enable them to meet market demands from the start of the day. These facilities have limited space and limited stockpiling capacity and hence need sand delivered early so that they can ensure they can meet the product demands of their clients. Many building sites require concrete to be delivered from 7 am onwards. The efficiency of the construction industry relies on concrete and sand being reliably available from 7 am onwards. One of the major concrete producers in Sydney estimates that its operations require approximately 1500 tonnes of fine sand per day with approximately 40% of this being required between 7 am and 10 am meaning that for this client alone approximately 19 trucks of sand will need to leave the sand quarry at Lot 218 between 5 am and 7.30 am to enable it to meet the concrete demands of its construction industry clients alone. To meet the current Sydney demands for fine sand used in concrete alone, approximately 4 to 5 times this many trucks would be required over the same period (i.e. 7 am to 10 am). Supply of fine sand for other construction activities, landscape supplies and markets outside Sydney (i.e. Newcastle, Central Coast, Hunter Valley) require additional deliveries to this during this same time period.
- If trucks leave the quarry later than approximately 7.00 am to supply the Sydney market, they get caught in peak hour traffic which:
 - adds to the congestion in Sydney traffic
 - adds to the time it takes drivers to deliver their loads
 - increases stress, frustration and fatigue levels for drivers and commuters alike
 - increases fuel and operating costs and greenhouse gas emissions
 - generally adds to reduced efficiency in the overall transport system.

If trucks leave the quarry at around 5 am they can have the sand delivered to destinations in Sydney before peak hour. This enables them to get back to the quarry and collect and deliver their second load of sand and be off the road before afternoon peak hour.

- For the trucks to be economically viable they need to be able to do two trips to Sydney per day or more trips to local markets. Driver's hours are controlled. In simple terms, drivers are allowed to drive 12 hours per day in a 24 hour period. If they undertake special fatigue training they can drive up to 14 hours per day if they have a set break. If trucks delivering to Sydney get caught in peak hour traffic it increases travel time per round trip from approximately 5 hours to approximately 6.5 hours. As a result, leaving the site much after 5 am and getting caught in Sydney peak hour can increase the length of the work day for the driver from approximately 11 hours to approximately 14+ hours. This has a significant impact on driver fatigue and on the family lives of the drivers who also need to be able to establish a work/life balance. It also contributes to congestion on Sydney roads, and risk and fatigue of other drivers and commuters.

As stated above, Sydney's fine sand demand alone is currently estimated to be approximately 2 million tonnes per year. This is expected to continue to grow over the next few years to meet construction requirements of

the major infrastructure that is planned. An indication of this demand is shown on the graph prepared by BIS Shrapnel below which is extracted from Roads & Maritime Services Major Project 2020 Forum (July 2015).



As stated in the Response to Submissions, Mackas Sand is seeking modification of PA08_0142 to allow an increase in the truck movements from Lot 218 during the 5.00 am to 7.00 am shoulder period Monday to Friday to 14 trucks in and 14 trucks out (i.e. an increase from 5 to 14 laden trucks) and an increase to 24 laden truck movements out per hour, plus 24 truck movements in per hour, 7.00 am and 10.00 pm Monday to Friday and 7.00 am and 4.00 pm Saturdays. An increase from 5 to 9 trucks in per hour and 5 to 9 trucks out per hour is also sought during the 6.00 am to 7.00 am shoulder period on Saturdays.

It is not proposed to alter truck movements on Sundays and Public Holidays or during the 5.00 am to 6.00 am shoulder period on Saturdays, or alter the truck movements from Lot 220 from those currently permitted. Further, no change is being sought to the maximum annual tonnage of sand that is allowed to be extracted from Lot 218 or Lot 220. Approved and proposed truck movements and times are provided in **Table 1**.

Table 1 – Approved and Proposed Truck Movements from Lot 218

Transportation Period	Approved Truck Movements per hour (in plus out)	Proposed Truck Movements per hour (in plus out)
Monday to Friday Shoulder (5.00 am to 7.00 am)	10	28
Saturday Shoulder (5.00 am to 6.00 am)	10	No change
Saturday Shoulder (6.00 am to 7.00 am)	10	18
Monday to Friday 7.00 am to 10.00 pm)	16	48
Saturday (7.00 am to 4.00 pm)	16	48
Sundays and Public Holidays	10 ¹	No change

Note 1: Combined 10 truck movements (in plus out) from Lot 218 and Lot 220 (i.e. total of 10 truck movements (in plus out) per hour).

VISSIM traffic flow modelling of Nelson Bay Road at the intersection with the access to the quarry on Lot 218 was undertaken by GHD on behalf of Mackas Sand. The modelling used actual truck performance characteristics and traffic flows recorded on Nelson Bay Road in May 2015 increased to 120% of actual southbound traffic flow. The simulation undertaken used an average of 24 trucks per hour leaving the quarry over the 3 hour peak am period (i.e. 6 am to 9 am) with an average of 24 trucks per hour entering the quarry.

The modelling showed that trucks could readily merge with southbound traffic on Nelson Bay Road during the morning peak hour. A video of the VISSIM simulation modelling was provided to RMS. The duration of the video for this simulation is 10 minutes (7.25 am to 7.35 am) with 6 trucks leaving and 5 trucks entering the quarry over this period. This is the equivalent of 36 trucks leaving and 30 trucks entering the quarry per hour. In the first 1.5 minutes of the video 4 trucks leave the quarry. This is the equivalent of 160 trucks per hour leaving the quarry. The simulation demonstrates that there is adequate capacity in the road network to accommodate 24 quarry trucks per hour merging with southbound traffic on Nelson Bay Road during the weekday morning peak traffic period between 6 am and 9 am.

VISSIM modelling undertaken by GHD demonstrated that the Level of Service for Pauls Roundabout and Nelson Bay Road at the intersection with the Lot 218 quarry haul road stayed at Level A for additional quarry traffic both for current conditions and in 2030.

As a sensitivity analysis, VISSIM modelling was undertaken using double the number of proposed trucks leaving the quarry (i.e. 48 trucks per hour average leaving the quarry and 48 trucks per hour entering the quarry). The analysis showed that 48 trucks an hour could readily merge with southbound traffic on Nelson Bay Road during morning peak period. The duration of the video for this simulation is 10 minutes (8.00 am to 8.10 am) with 11 trucks leaving and 5 trucks entering the quarry over this period. This is the equivalent of 66 trucks leaving and 30 trucks entering the quarry per hour during peak traffic times.

Videos of the modelled traffic and truck movements for both scenarios were provided to RMS.

Further traffic counts were collected for Nelson Bay Road immediately east of the Lot 218 quarry access intersection for the period 24 November 2015 to 2 December 2015. This information was also provided to RMS. A summary of daily traffic and peak traffic numbers on the south bound lane of Nelson Bay Road is provided **Table 2**.

Table 2 – South Bound Traffic Nelson Bay Road (24 November 2015 to 2 December 2015)

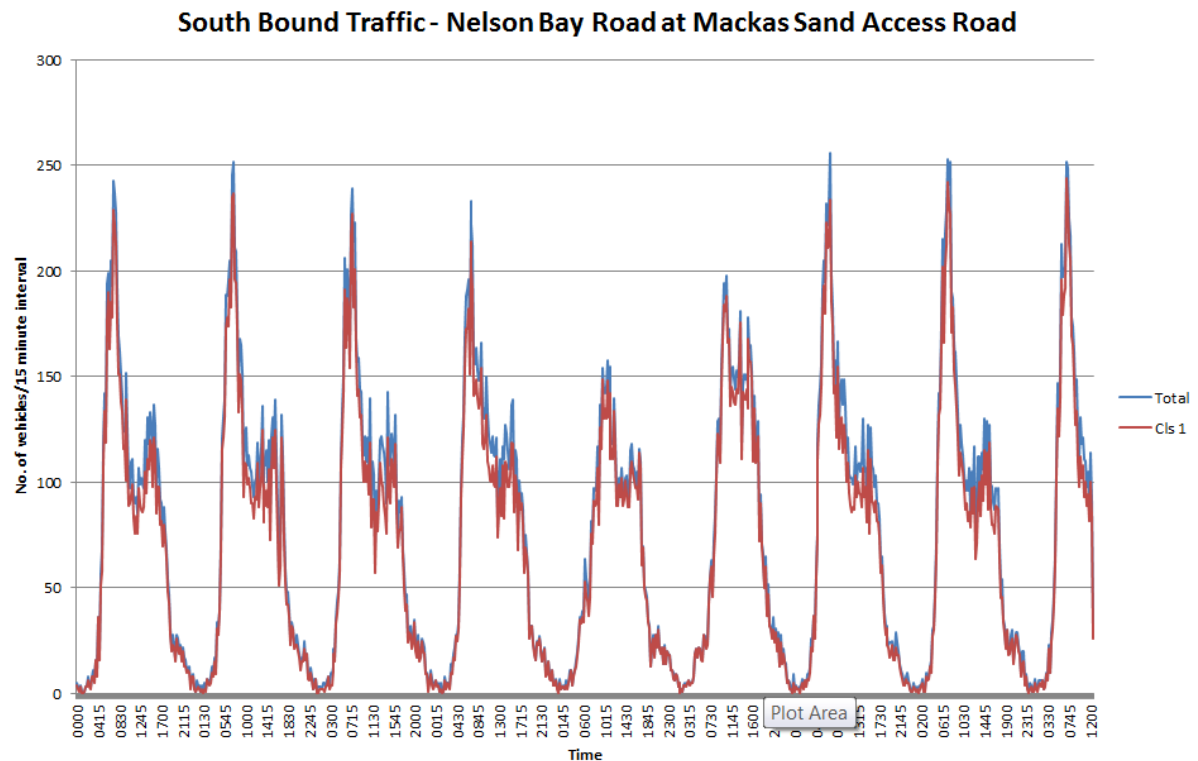
Date	Total Traffic (vehicles/day)	Peak Traffic (6am – 9am)	Average Vehicles per hour	Average Vehicles/minute	Average Gap between vehicles (Seconds)	Average Separation Distance between vehicles at 80 km/h	Average Separation Distance between vehicles at 70 km/h
24/11/15	7461	2346	782	13.0	4.6	102.3	89.5
25/12/15	7587	2382	794	13.2	4.5	100.8	88.2
26/11/15	7462	2332	777	13.0	4.6	102.9	90.1
27/11/15	7697	2203	734	12.2	4.9	108.9	95.3
28/11/15	5910	870	290	4.8	12.4	275.9	241.4
29/11/15	6838	593	198	3.3	18.2	404.7	354.1
30/11/15	7707	2379	793	13.2	4.5	100.9	88.3
1/12/15	7524	2466	822	13.7	4.4	97.3	85.2
2/12/15*		2422	807	13.5	4.5	99.1	86.7
Average Weekdays	7573	2351	784	13.1	4.6	102	89

Traffic counters removed at noon on 2/12/15

As can be seen from **Table 2**, for the period of record on average there was approximately 7573 vehicles per weekday southbound on Nelson Bay Road with little variation in vehicle numbers (7461 to 7707). Average number of peak weekday southbound vehicle movements per hour was 784. Average hourly southbound tube count data that was collected in May 2015 and used by GHD for the VISSIM modelling was 795 vehicles per hour indicating that peak traffic flows in May 2015 were very similar to those recorded in November 2015. Average hourly modelled demand total for the peak morning period adopted by GHD for the VISSIM modelling was 1884 vehicles per hour indicating that the modelling undertaken by GHD based on the May 2015 traffic data if anything over estimated southbound traffic volumes on Nelson Bay Road.

Approximately 31% (2351 vehicles per day) of the weekday daily traffic uses Nelson Bay Road between 6 am and 9 am with again little variance in vehicle numbers (2332 to 2466). This indicates that the majority of weekday drivers on Nelson Bay Road travel the road regularly and would become very familiar with traffic conditions including trucks entering from access road from Mackas Sand quarry on Lot 218.

Total southbound traffic volumes for the period 24 November 2015 to 2 December 2015 are shown on **Graph 1**.



Graph 1 – Southbound traffic flows on Nelson Bay Road at Mackas Sand Quarry intersection

Graph 1 shows southbound traffic flows from Tuesday 24 November 2015 to Wednesday 2 December 2015. As shown traffic flows for each weekday have a similar pattern. Peak weekday southbound traffic is approximately 250 vehicles per 15 minute period and this occurs typically between 7.15 am and 7.30 am. Weekday traffic is typically greater than 150 vehicles per 15 minutes between 6 am and 9 am.

If required, the capacity to accommodate the proposed increased truck movements could be further enhanced by placing speed restrictions on Nelson Bay Road (i.e. reducing the speed limit from 80 km/h to 70 km/h) between Pauls Corner roundabout and the roundabout at Medowie Road. Reducing the speed limit on this section of Nelson Bay Road was recommended due to the large number of entrances along this stretch of road in the Traffic Audit prepared as part of the development consent requirements for PA08_142. Reduction in traffic speed would enable trucks to merge with slower moving traffic further reducing the potential for conflict with vehicles travelling south on Nelson Bay Road. As set out in **Table 2**, reduction of the traffic speed from 80 km/h to 70 km/h would reduce the average peak hour separation distance between southbound vehicles on Nelson Bay Road from 102 metres to 89 metres indicating that the impact on the capacity of the road network would not be significant.

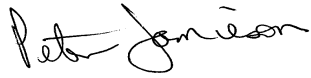
Reducing the speed environment along this stretch of road would also assist in reducing traffic conflicts at Banksia Grove Village Retirement Community as was raised in community meeting and submissions to the EIS.

RMS states in the second last paragraph of its letter of 10 December that a Corridor Strategy for Nelson Bay Road is being developed and is planned to be finalised by mid-2016. Our understanding from discussions with RMS staff is that no works are likely along this section of Nelson Bay Road for many years and well beyond the infrastructure demand timeframes set out in the graph prepared by BIS Shrapnel provided above.

Mackas Sand seeks to increase truck movements as set out in **Table 1** to enable the needs of Sydney infrastructure and the future Hunter City to be met in an efficient manner that minimises impact on traffic congestion, truck drivers and other road users.

If you have any questions or require further information, please do not hesitate to contact me on 4950 5322.

Yours sincerely

A handwritten signature in black ink that reads "Peter Jamieson". The signature is written in a cursive style with a large initial "P" and a long, sweeping underline.

Peter Jamieson
Director

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