

TO:	Quadro Australia – Attention Michael Skinn
CC:	Director Infrastructure Planning – Bill Ellison
SUBJECT:	Transport Review (Stapleton Transportation and Planning) for proposed Macs Reef Waste Transfer Station
DATE:	14 December 2010

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Thank you for forwarding us the “Transport Review” of December 2010 prepared by Stapleton Transportation & Planning. Below we will address the individual items dealt with under the heading “Preliminary Issues”.

- **The growth potential of the waste stream, which (based on traffic flows) has grown at a significant rate over the 4 years of available data, and certainly at a rate far in excess of the growth estimates provided to Quadro by Council for the CO Report. This would in term contradict the potential lifetime of the current Landfill operations, and then require a revision of the future WTS demands.**

Council provided Quadro with a growth estimate of 1% p.a. This figure was not solely deduced from historical data, but was an estimate taking into account more complex factors such as;

- The effect of waste minimization programs over the design period.
- The slowing of growth of the Wamboin/Bywong area due to the depletion of the supply of developable land.

It needs also to be noted that Quadro did not base their design exclusively on vehicle counts. Table 7.10 uses essentially three methods:

- a) Vehicle counts with DECCW factors
- b) Historical per capita waste generation data
- c) Historical per property waste generation data

Conservatively deductions based on a) should carry a weighting of no more than 0.5 in the overall facility sizing process.

Quadro estimates (based on Pryor data) that less than 40% of the current waste stream will be deposited at the new MR WTS. The other 60% will be re-directed to the much larger Bungendore WTS. However it also follows that mixed loads of say 50% green waste and 50% household waste will post- MR WTS construction all end up in Bungendore. The current methodology has no way of evaluating this inevitable effect. Conversations with our landfill attendants indicate that mixed loads may account for up to 30% of trailer/ute deliveries. As the waste stream is going to be increasingly shared with Bungendore, any deduction of long-term trends from historical data needs to look at the combined trends of the two facilities. We have plotted these with their polynomial trend-lines on the accompanying Chart 1. The Y-axis is t/open-day calculated using DECCW factors.

Please note the following:

- An apparent shift of usage from Bungendore to MR. This trend can expect to be counteracted as explained in the paragraph above.

- The distinct correlation between waste generation and rainfall, with the maximum and minimum cycles of waste generation corresponding with maxima and minima of rainfall. This can only be due to the influence of green waste. Post-MR WTS construction, almost all green waste will go to Bungendore. The MR WTS will no longer be subject to these variations. Quadro (based on Pryor) estimated that only 10% of the waste stream was garden green waste. Currently our attendants estimate this to be 20% and 35% for MR and Bungendore respectively.
- The sudden increase of t/open-day to MR in late 09/early 10 also corresponds with a change in personnel at the landfill. We suspect that vehicle counts have been more diligently kept since this change, and that there may be a measure of under-reporting by previous personnel.
- The 1% p.a. growth is a reasonable approximation of the historical growth rate when extrapolated over the design life of the MR WTS and taking into account the diminishing development potential in the area.

We will now address the matter of the specific sizing of the WTS by Quadro assuming that there was under-reporting of vehicle numbers using MR tip prior to 2009. The bin capacity required was determined using “Representative 4-day period tonnage” as outlined in Table 7.11. Chart 2 shows the 4-day period tonnages for July 09 to September 2010 derived from the vehicle counts and DECCW factors. The design peak 4-day period tonnages (135 peak period and 111 off-peak period) are plotted against these.

Please note the following:

- The very distinct Dec/Jan peak is no longer evident
- The difference between peak and off-peak periods is not as large

Quadro Table 7.11 is reproduced below

Period	Representative 4-day period	
	Peak 4-day period	Average 4-day period
Peak period	135	107
Off-peak period	111	62

Section 7.4 estimates the total tonnage p.a. as 3450T

This equates to 5 peak 4-day periods and 47 off-peak 4-day periods.

The equivalent figures derived from the data on Chart 2 are tabulated below

Period	Representative 4-day period	
	Peak 4-day period	Average 4-day period
Peak period	144	139
Off-peak period	122	91

The estimate of annual tonnage from these figures = $(5 \times 139) + (47 \times 91) = 4972T$

It was previously noted that the derivation of tonnages from vehicle counts was only one of the methods used by Quadro to arrive at the 3450T p.a. figure. Per capita and per property factors were also used. The following conservative weighting calculation is proposed:

Data Type	Per Capita	Per Property	Vehicle Count (DECCW factors)
Weighting	0.25	0.25	0.5
Tonnage p.a.	3300	3250	4972
Weighted T p.a.	825	813	2486

Weighted tonnage p.a. = 4124

Adjusted 4-day peak and averages

Period	Representative 4-day period	
	Peak 4-day period	Average 4-day period
Peak period	119	114.5
Off-peak period	101	75.5

These peak 4-day period tonnages are less than those used by Quadro in their sizing of the facility. The reason for this unexpected result is that, although the averages derived from the recent data are higher than those previously used; the difference between the peaks and the averages is significantly less. The sizing thus remains adequate for the same design life projections.

Our conclusion is that the design proposed by Quadro (four 30m³ bins emptied weekly) is adequate. The additional tonnage is accommodated by the bins on the average being fuller during the 47 non-peak 4-day periods.

It should further be noted that:

- The increased 2010 tonnages are partly due to the green waste proportion being significantly higher than that used by Quadro as derived from Pryor's drought period analysis. The MR WTS will not be subject to green waste generated spikes. Conservatively, no adjustment has been made for this.
 - Most rural Councils believe that the DECCW factors are very conservative, as they were apparently derived from metropolitan tips where drop-off facilities supplement kerbside collection. Palarang has communicated this with DECCW, and SERRROC has informed us that these factors are currently being revised. Indeed the community survey (Appendix I question 11) indicates average loads of "household rubbish" of less than 60KG per trip – much less than the DECCW factors. This suggests another element of conservatism.
- **The growth potential of traffic generation, which based on surveys at the Site has grown at a significant rate over the 4 years of available data; indeed, the surveys show that traffic has almost tripled at the Site over that period. To summarise, the data provided by Council shows: -**
 - **2007/8 approximately 9,500 vehicles per year**
 - **2008/9 approximately 12,000 vehicles per year**
 - **2009/10 approximately 19,000 vehicles per year**
 - **2010/11 approximately 26,000 vehicles per year**

This level of growth may (or may not) continue for some time into the future; the factors behind this level of growth need further assessment. STAP notes that the WTS would generally generate more vehicles per waste tonnage as larger vehicles would be excluded from the WTS; at the same time, the WTS would accept less waste than the current landfill. Again, these issues must be further detailed.

We assume that this comment is relating to the design of the traffic facilities, in particular the intersection with Macs Reef Road. The Quadro report recommends a AU treatment for the intersection. Please note the following:

Maximum vehicles per hour along Macs Reef Road:

- 818 counted at 12h00 on Saturday May 8, 2010. This was part of an extreme peak lasting several hours. Nothing even approaching this volume re-occurs during the survey period and is evidently due to some extraordinary circumstance.

- 494 counted 08h00 on Thursday October 14, 2010. This would be a realistic peak to use. There are several other occurrences of plus 400 v.p.h. counts during the survey period also defining a conspicuous weekday morning peak.

Maximum vehicles per day into Macs Reef Tip:

- 221 counted on Sunday June 6, 2010.

AADT for Macs Reef Tip (Oct 2009 to Oct 2010)

- 112 v.p.d.

Assumed peak hourly turning volume (15% AADT) = 17 v.p.h

Even conservatively assuming that 100% of the traffic along Macs Reef Road during the hourly peak is travelling in one direction, AU treatment should be satisfactory judged by both RTA and AUSTROADS criteria (see attached RTA Fig 4.5.12).

The use of this survey data is highly conservative, as 40% of the waste stream will be re-directed to Bungendore post-WTS construction.

- **The growth potential in Macs Reef Road; ADT data provided by Council shows a sudden and unexplained rise in traffic volumes in Macs Reef Road around the middle of September 2010, with flows almost doubling from around 1,900vpd to 3,700vpd. A summary is provided below: -**

Macs Reef Road ADT Counter (east of Highway)							Macs Reef Landfill Traffic Survey Data					
Day	Date	ADT	AM Hour	%	PM Hour	%	Cars	Utes	Trucks	Total	Trips	% ADT
Friday	27/8/10	2357	148	6%	284	12%	48	79	3	130	260	11%
Saturday	28/8/10	1854	152	8%	181	10%	74	82	2	158	316	17%
Sunday	29/8/10	1522	146	10%	149	10%	77	122	0	199	398	26%
Monday	30/8/10	1717	113	7%	265	15%	81	114	2	197	394	23%
Tuesday	31/8/10	1701	103	6%	264	16%						
Wednesday	1/9/10	1793	102	6%	260	15%						
Thursday	2/9/10	1821	100	5%	269	15%						
Friday	3/9/10	2407	124	5%	338	14%	31	53	21	105	210	9%
Saturday	4/9/10	2135	206	10%	197	9%	18	26	0	44	88	4%
Sunday	5/9/10	1340	137	10%	138	10%	33	52	0	85	170	13%
Monday	6/9/10	1767	102	6%	274	16%	44	58	0	102	204	12%
Tuesday	7/9/10	1716	95	6%	261	15%						
Wednesday	8/9/10	1791	96	5%	298	17%						
Thursday	9/9/10	1894	96	5%	265	14%						
Friday	10/9/10	2233	109	5%	304	14%	9	24	0	33	66	3%
Saturday	11/9/10	1863	173	9%	159	9%	67	93	0	160	320	17%
Sunday	12/9/10	1531	152	10%	151	10%	84	133	0	217	434	28%
Monday	13/9/10	1690	91	5%	284	17%	58	84	9	151	302	18%
Tuesday	14/9/10	2387	140	6%	363	15%						
7 day average		1869	126	7%	248	13%	Average per open day				264	14%
Weekday Average		1944	109	6%	287	15%						
Macs Reef Road ADT Counter (east of Highway)							Macs Reef Landfill Traffic Survey Data					
Day	Date	ADT	AM Hour	%	PM Hour	%	Cars	Utes	Trucks	Total	Trips	% ADT
Wednesday	15/9/10	3421	476	14%	380	11%						
Thursday	16/9/10	3535	451	13%	407	12%						
Friday	17/9/10	4307	458	11%	475	11%	33	50	3	86	172	4%
Saturday	18/9/10	3406	315	9%	281	8%	55	90	1	146	292	9%
Sunday	19/9/10	3558	314	9%	392	11%	39	88	10	137	274	8%
Monday	20/9/10	3533	483	14%	414	12%	33	38	10	81	162	5%
Tuesday	21/9/10	3382	450	13%	397	12%						
Wednesday	22/9/10	3509	447	13%	374	11%						
Thursday	23/9/10	3588	417	12%	363	10%						
Friday	24/9/10	4345	421	10%	467	11%	38	62	2	102	204	5%
Saturday	25/9/10	3688	396	11%	320	9%	53	84	1	138	276	7%
Sunday	26/9/10	3592	322	9%	343	10%	68	107	4	179	358	10%
Monday	27/9/10	4070	338	8%	441	11%	47	84	4	135	270	7%
Tuesday	28/9/10	3519	390	11%	368	10%						
Wednesday	29/9/10	3439	354	10%	361	10%						
7 day average		3659	402	11%	386	11%	Average per open day				251	7%
Weekday Average		3695	426	12%	404	11%						

Additional flow data for select period from late 2009 through June was also provided by Council. While there was evidence of significant variations in daily flows (from lows of less than 2,000vpd to highs of over 6,500vpd) our opinion is that the ADT reported for the later weeks in the table above – i.e. an ADT of approximately 3,500 – 4,000vpd – is an accurate reflection of flows (and is we note the figure used in the CO Report for assessment). Notwithstanding, the significant variations must be explained to confirm this opinion.

Our Technical Officer responsible for traffic counts has informed us that the data within the red shading was collected from malfunctioning equipment. Tubes had been damaged so that traffic in only one direction was being counted.

- **The lack of any correlation between the traffic flow increases in Macs Reef Road and the traffic generation at the Site, as illustrated in the table above; STAP acknowledges that not all vehicles travelling to the Site would necessarily travel past the counter position.**

Station 115 is located close to the junction with the Federal Highway. Very little of the traffic generated from the MR landfill tributary area would pass over this station in the course of a trip solely to visit the site. It would count commuters travelling to Canberra from the tributary area who drop off their waste to the landfill en route. However the presence or otherwise of the facility would have little impact on these figures.

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