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Ref: B19041
16 August 2023

Subject:	**Newcombe Road Sand Quarry – Section 92 Response**
Issued via:	**Christian@kineticenv.co.nz**

Dear Christian

This letter addresses the transportation aspects of a Section 92 (S92) Request for Additional Information from Waipa District Council (WDC) in relation to the proposed sand quarry located at Newcombe Road east of Cambridge. CKL prepared the Integrated Transportation Assessment (ITA) that accompanied the consent application. WDC engaged BBO to review the ITA on their behalf. The transport-related requests from BBO are provided in italics, with numbering used to match that within the request, and a response is provided below each item.

It is also noted that turnaround areas have been added to SH1 south of the Tirau interchange since the original ITA and S92 were prepared. The turnaround area creates an alternative route for northbound trucks and this has been considered in the S92 responses.

It may also be helpful to note that customers collecting sand are external operators to the quarry and can be general members of the public. It is therefore not possible for the quarry to definitively state the number of customers that would arrive on site or which routes they would take to or from the site. This is a similar concept to how customers to a supermarket are also general members of the public and therefore the supermarket operator cannot be explicitly state how many customers there would be or what they would to travel to from their site.

> *2.a)6.1.1 – AEE Table 2 identifies approximately 300,000 total sand tonnes extracted per year on average. What is the basis for 400,00 as an upper limit? Ie, is this operationally constrained or unconstrained?*

The 300,000 tonnes per year is a market estimate for the amount of sand that is likely to be purchased from the site. The market estimate is also based on the demands from other quarries operated by the applicant. The transportation assessment therefore adopted a rate of 400,000 tonnes per year, a 33% increase, to ensure that the assessment was robust and allowed for some variation to the expected market demands.

> *2.a)6.2.1 – Significant residential growth in Cambridge is identified as major market for the sand. House pads are typically delivered by single truck units. Typically, only large road construction or industrial building pads involve truck and trailer load.*

This sentence in the ITA is incorrect and should be ignored. The subsequent paragraph 6.2.2. from the ITA outlined how consideration was given to both truck and trailer as well as smaller rigid units would be used to transport material from the site. These calculations were factored up to allow for 400,000 tonnes of material to delivered from the site which as noted above is a conservative estimate.

2.a)6.2.2 – Appears to contradict 6.2.1. Provide basis behind this "expected" split please

As noted above, the sentence from 6.2.1 should be ignored. The calculations in 6.2.2 are also based on the expected market split and the operations of other quarry sites operated by the applicant. In general, demand for sand closer to the proposed quarry are likely to be smaller trucks while sites further away or for larger sites are more likely to be truck and trailer units. It is also noted that there are existing quarries closing in Bay of Plenty and South Waikato and therefore the site is likely to serve these regions. This accounts for the demand for larger trucks to the site.

2.a)6.2.3 – Basis for determining 200 truckloads per day as the maximum?

Based on the conservative extraction rate of 400,000 tonnes per year, the average number of trucks per day was calculated as being 78 trucks (156 movements). The assumption of 200 trucks per day (400 movements) as a maximum represents more than double the average daily movements and was therefore considered to be an appropriate estimate for assessment traffic effects.

However, it is expected that if there is a busier day then other days would be less than average to result in an overall average of 78 trucks per year. It is reiterated that this already considers a 33% increase in the annual rate of material extracted from the site. The calculations are therefore compounding in terms of the level of conservatism to account for changes in demand.

2.a)6.2.4 – Basis for these two assumptions?

As above, the typical peak hour of trucks from the site was calculated to be 8 trucks per hour (16 movements) and this was increased by more than double to ensure that the assessment was robust. Also as above, the calculations are compounding when considering that this already increases annual extraction rates by 33%.

It is also noted that 20 trucks per hour represents a truck being filled every three minutes. This is considered to be at the quicker end of how long it would take for a truck to arrive on-site, be filled and then depart to make space for the next truck.

The assumption that a busy day of this magnitude would only occur once every couple of months is based on the fact that a busy day would likely be balanced by reduced demand in other times. The peak day calculated here represents approximately 2.5 average days. As noted above, it is also unlikely that the quarry would be able to fill more than 20 trucks per hour.

2.b)A) – Please explain the basis for deriving the distributional split shown in Figure 5.

The basis for this distribution is based on the market research relating to where demand for product from the proposed quarry is likely to be. It is note that the distribution has changed following the completion of turn arounds areas on SH1. Further discussion is provided in response to items below.

2.b)B) – Please provide sensitivity assessments for the assumed distributional split to stress test the urban network constraints within Cambridge (capacity, safety, amenity) and then provide an assessment of the likelihood of the various scenarios (and associated effects) occurring.

Section 7.5 of the ITA included three additional sensitivity tests to assess effects on the network by shifting the focus of where demand for sand may be located. An additional sensitivity test of the Newcombe Intersection to Tirau Road was provided in section 12.1.7 when testing the suitability of the existing right turn bay. The sensitivity scenarios were based on feedback from WDC and Waka Kotahi and demonstrated that the road network is able to accommodate the additional traffic demands. The scenarios also all tested the conservative extraction rate of 400,000 tonnes per year.

However, since the ITA was prepared, new turnaround facilities on SH1 have been constructed that create an alternative feasible option for northbound trucks that avoid the town centre. While this route increases travel distance by approximately 7km, the road is generally flat and straight with no driveways or other intersection to disrupt traffic flow. In contrast the route through the town centre is slow with frequent intersections and there is also a notable gradient up Queen Street which would have a noticeable effect on trucks. The route through the town centre can also be congested at peak times. Therefore, the route via SH1 is considered to be more attractive for trips heading north from the site. The only exception may be trucks delivering product to sites close to the town centre such as at the southern end of the C2 growth cell. To allow for some trucks to use this route, 5% of trucks have still been conservatively estimated as travelling through the town centre with all other trips north using the turnaround facility on SH1. The revised distribution is shown in Figure 1 below. The HVIF calculations have been updated to reflect the change in distribution and also incorporate other feedback.

Based on the revised distribution, it is estimated that up to eight truck movements an hour would pass through the town centre. An increase of this magnitude is unlikely to be noticed by other road users through the town.
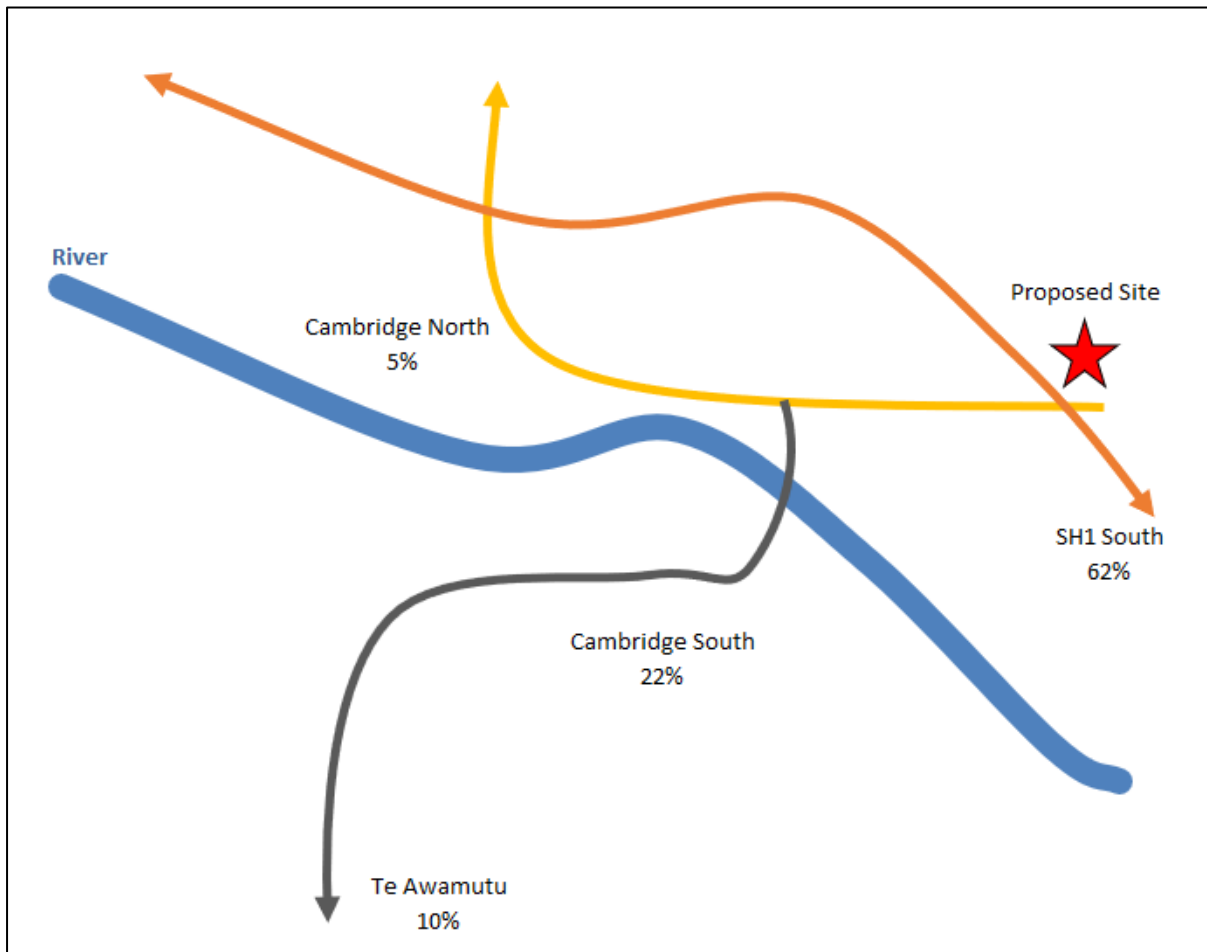
Figure 1: Redistribution of Trucks

3. With respect to the above requested sensitivity testing, please provide an assessment of the potential risks and likelihood of impacts to safety and amenity for walking, cycling and other active modes both within Queen Street, Albert Street, Victoria Street and through Leamington via Shakespeare Street (south of Cook Street).

As noted above, there is an expected to be up to 8 truck movements per hour through the town centre area. This equates to a truck approximately every 7-8 minutes. An increase in traffic movements of this magnitude is unlikely to have a material effect on pedestrians or cyclists within the town centre.

It is also noted that the road mentioned above are all reported as carrying at least 994 vehicles per hour. The addition of up to 8 extra vehicles on these roads represents less than 1% of existing volumes and therefore would likely be within the daily fluctuations of traffic volumes on these roads.

4a) Please provide further assessment for a northbound on-ramp scenario and the consultation had with Waka Kotahi to explore this potential solution from Newcombe Road to the expressway (without a southbound off-ramp or need for new grade-separation). Council seeks supporting detail if the applicant, after consulting with Waka Kotahi still considers this option to be unfeasible.

Waka Kotahi was quite clear through the original consultation that they would not support additional ramps at the Tirau Road interchange. The feedback received stated that Waka Kotahi *"do not have the appetite to investigate an option of slip lane/s or other direct accesses to the north of this interchange further"*.

However, turnaround facilities have now been completed on SH1 south of Tirau Road which provide an alternative route for trucks that avoids the Cambridge Town Centre. As addressed previously, this has changed the likely routes used by trucks delivering material from the site. The turn around location means that ramps would not be necessary while still minimising the amount of traffic using Waipa District Roads.

4b) Please explore the option of using these turn-around facilities to keep the majority of quarry related heavy traffic on SH1.

At the time of preparing the ITA, no turnaround facilities on SH1 were confirmed. However, a turnaround facility on SH1 at Hydro Road approximately 3.5km south of Tirau Road has been completed.

5a) Please consider and provide the applicants proposal for treating this intersection area to make sure it is robust to withstand high turning stresses while also meeting texture requirements for an intersection with a state highway. Note: The solution should minimise maintenance requirements over the 25 year quarry life to minimise disruption to road users and avoid additional cost to Council.

The HVIF calculation and fee charged is intended to cover the costs associated with wear and tear from the trucks associated with the proposed quarry. It is also reasonable to expect that Waka Kotahi would have constructed the intersection near the interchange to accommodate high volumes of heavy vehicles movements given the proximity to the interchange. No additional treatment is therefore considered necessary. Note that an updated HVIF calculation is included at the end of this S92 response.

6a) Accordingly, please update the HVIF calculations reflecting these actual costs for the various road environments represented in the distribution assessment.

Based on the information included within the S92 request by BBO, the latest cost for a rehabilitation was $1,580,000/km. This value has been adopted and the calculations have been updated. Similarly, the revised HVIF has considered more trips using SH1 to travel north as discussed throughout this response. The calculations have also already removed the component associated with the Newcombe Road section which would be maintained and reconstructed by the quarry in accordance with the proposed consent condition outlined in 14.1.2 of the ITA. See calculations included at the end of this S92 response.

6b) Please provide a sensitivity test of the HVIF calculation as part of the testing of trip generation assumptions.

The sensitivity tests in Section 7.5 of the ITA included a 5% change in demand to the north, south and west to test whether a change in direction would have an effect on the HVIF calculations. The sensitivity tests showed that increasing demands west towards the Te Awamutu would have the greatest increasing in HVIF values. However, this scenario was not considered by WDC as they noted that there were other quarries in that direction more likely to provide material in that area. There was a negligible difference when increasing demands to the north while there was a reduction when increasing demands to the south via SH1.

However, following the completion of the SH1 turnaround facility, the expected distribution of trucks has been revised to reflect that users travelling north are likely to use these facilities rather than having to travel through the town centre.

It is noted that the HVIF calculations also include the 33% increase in traffic volumes associated with the proposed quarry. This provides additional sensitivity in the overall calculations and associated effects.

6c) Please provide the calculated HVIF to three decimal places as every $0.005 represents a significant sum when multiplied by 7M tonnes of resource.

The figure at the end of this S92 response updates the HVIF calculation by incorporating both by increasing the rehabilitation rate to $1,580,000/km and calculating the levy per tonne to three decimal places as requested. Overall, the revised levy per cube is $0.114 and the levy per tonne is $0.065. This rounds to $0.11 per cube and $0.07 per tonne.

We trust this meets your requirements. Please do not hesitate to contact us if you have any questions or require any additional information.

Michael Hall
Transportation Engineering Manager

CKL

Road Section	Existing Traffic											Proposed Traffic											
	Current Volume (vpd)	% HCV	Base HCV HCV/day	Length (km)	Direction Factor	Life (yrs)	HVs lane HCV/lane/yr	ESAs/HVAG	NHVAG	ESA/veh	DESA	HCV/day	%Using Route	HCV/day	Direction Factor	Duration (Years)	HVs lane HCV/lane/yr	ESA/HVAG	NHVAG	ESA/veh	DESA	Cost/Km	Financial Cont.
Newcombe Road	21	11%	2	0.65	0.5	40	396	0.6	2.4	1.4	22,812	156	100%	156	0.5	25	19,968	1	3.13	3.13	1,542,054	$1,027,000	$0
Tirau Road	6,238	12%	749	1.9	0.5	40	136,608	0.6	2.4	1.4	7,868,635	156	38%	59	0.5	25	7,545	1	3.13	3.13	582,641	$3,002,000	$206,961
Achilles Ave	14,409	7%	951	0.378	0.5	40	173,560	0.6	2.4	1.4	9,997,083	156	5%	8	0.5	25	998	1	3.13	3.13	77,103	$597,240	$4,571
Albert St	16,759	7%	1,106	0.384	0.5	40	201,857	0.6	2.4	1.4	11,626,966	156	5%	8	0.5	25	998	1	3.13	3.13	77,103	$606,720	$3,997
Queen St	10,065	8%	795	0.647	0.5	40	145,116	0.6	2.4	1.4	8,358,684	156	5%	8	0.5	25	998	1	3.13	3.13	77,103	$1,022,260	$9,343
Victoria St (south)	20,529	5%	1,026	1.8	0.5	40	187,325	0.6	2.4	1.4	10,789,900	156	5%	8	0.5	25	998	1	3.13	3.13	77,103	$2,844,000	$20,179
Victoria St (north)	10,835	6%	639	0.7	0.5	40	116,664	0.6	2.4	1.4	6,719,860	156	0%	0	0.5	25	0	1	3.13	3.13	0	$1,106,000	$0
Shakespeare (north	14,975	9%	1,378	0.75	0.5	40	251,453	0.6	2.4	1.4	14,483,684	156	33%	51	0.5	25	6,546	1	3.13	3.13	505,538	$1,185,000	$39,966
Shakespeare (south	10,161	7%	711	2.5	0.5	40	129,801	0.6	2.4	1.4	7,476,551	156	22%	35	0.5	25	4,456	1	3.13	3.13	344,102	$3,950,000	$173,796
Pope	8,657	14%	1,216	2.9	0.5	40	221,864	0.6	2.4	1.4	12,779,390	156	10%	16	0.5	25	2,090	1	3.13	3.13	161,436	$4,582,000	$57,160
Cambridge Rd	6,890	14%	996	19.4	0.5	40	181,853	0.6	2.4	1.4	10,474,727	156	10%	16	0.5	25	2,090	1	3.13	3.13	161,436	$30,652,000	$465,238

$1,580,000

FAR	51%
WDC share (49%	$480,794
Levy per cube	$0.114
Levy per tonne	$0.065
	$500,418

$981,212