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Memorandum

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Subject	**Community questions**	**Project Name**	Fulton Hogan Mobile Asphalt Plant, Paekākāriki

Fulton Hogan Limited, a subcontractor to the Transmission Gully project, is proposing to operate a mobile asphalt plant at an existing project site located between Paekākāriki and Mackays crossing (525 State Highway 1 (Part Lot 4 DP714)). The plant will supply asphalt for paving works at the northern end of the Transmission Gully motorway.

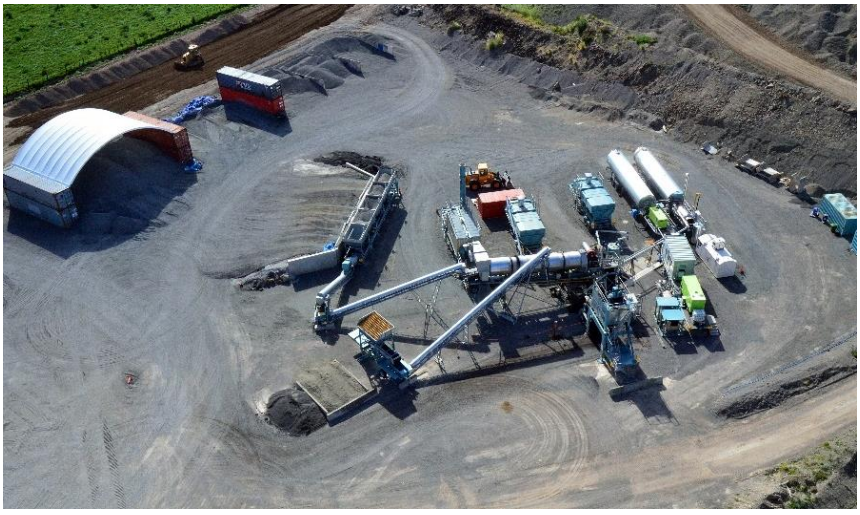
Fulton Hogan has engaged Jacobs New Zealand Limited to undertake technical assessments and planning services for the mobile asphalt plant. The information below is a summary of some of those technical assessments, along with other information requested by representatives of the Paekākāriki community.

An outline of the proposed changes to separate trucks travelling to and from the asphalt plant from State Highway traffic can be found here: https://www.nzta.govt.nz/assets/projects/transmission-gully-motorway/docs/TG-upcoming-traffic-changes-202011-202109.pdf

Other locations in the region where mobile asphalt plants operate

Fulton Hogan Limited operates a fixed asphalt plant at Winstone Quarry, Belmont and has previously operated a mobile asphalt plant at Wellington International Airport when the runway was re-surfaced in 2009. Downer operates a fixed asphalt plant at Kiwi Point Quarry, Ngauranga. Higgins has operated mobile asphalt plants at Otaihanga Transfer Station and at the Winstone Quarry in Ōtaki.

A photograph of the Fulton Hogan mobile asphalt plant in a different location is provided below.



Discharges to air

Fulton Hogan's Marini mobile asphalt plant is a parallel-flow drum mix plant, which is a common type of asphalt plant operated in New Zealand. This type of plant operates on a continuous basis with the drum used to both dry and heat aggregate and to mix liquid bitumen with hot aggregate to produce hot mix asphalt. The mobile asphalt plant will run at an average production rate of 140 tonnes per hour (tph) and a maximum production rate of 180 tph.

The main source of air contaminants from the process is the mixing drum. A large fan at one end of the mixing drum extracts air from the drum (sucks the air out), which ensures fresh air is being brought into the drum. This provides an oxygen source to the burner and minimises the emission of dust and contaminants from the mixing drum through creating a vacuum. The extracted air is passed through a baghouse filter system to remove dust and other particulate matter from the air before it is discharged to the environment via a 10-metre-high stack/chimney. In addition, a small boiler is used to keep bitumen in a fluid state, and also has a small stack chimney.

The key contaminants to air from the mobile asphalt plant will be:

Source	Contaminants
Burner drum baghouse filter	• Particulate matter (including PM_{10} and $PM_{2.5}$) • Oxides of nitrogen (NO_x) • Sulphur oxides (SO_x)[1] • Carbon monoxide (CO) • Benzene
Hot boiler stack	• NO_x • SO_x • CO
Filler lime silo filter	• PM_{10}

Limited dust is expected as a result of truck and machinery movements during dry weather, and from the receipt and storage of aggregates. With control measures in place as detailed below, dust is not expected to extend beyond the site boundary.

Jacobs provided an air quality assessment to Greater Wellington Regional Council that used computer dispersion modelling. The modelling incorporated local topographical information sourced from the Kāpiti Coast District Council and the meteorological conditions sourced from the station at Paraparaumu Airport. A summary of the modelling and the results of the expected concentrations of contaminants at key sensitive receivers (residential dwellings) is provided in **Attachment 1.**

The predicted concentrations were evaluated by comparing the results against National and Regional air quality assessment standards and guidelines. The assessment found that cumulative PM_{10}, $PM_{2.5}$, NO_2, CO, SO_2 and benzene concentrations (i.e. background plus contributions from the mobile asphalt plant) would

[1] Note: SO_x emissions would depend on the sulphur content of the operating fuel

be 'acceptable' (i.e. between 33% and 66% of National Air Quality Guidance Values) or better under the Natural Resources Plan (Appeals Version).

Odour concentrations were evaluated against guidance presented in the "Good Practice Guide for Assessing and Managing Odour", (Ministry for the Environment, 2016), and it was similarly determined that odour from the operation of the mobile asphalt plant would remain at acceptable levels at surrounding sensitive receivers.

Air control and monitoring measures

Mobile Asphalt Plant: Operations (including the pressure in the baghouse filter unit) are automatically controlled by a computerised control system and continuously monitored by a trained plant operator. A drop in pressure will indicate an issue with the drum and baghouse filter. The plant will be shut down and inspected if any temperature or pressure values are exceeded.

Fulton Hogan will install an onsite anemometer to continuously monitor the wind direction and wind speed at the site. This, combined with the automatically recorded readings from the plant, will enable close control of emissions to air and the prompt investigation of any complaints if received.

Plant equipment is checked daily. Fulton Hogan takes a preventative approach to plant maintenance and will replace or repair items as soon as issues are noticed, to ensure that the emission of contaminants into air is minimised.

Dust from aggregates: Aggregate/gravel chip will be sourced from the Manawatu region, while dust and sand will be sourced from Kiwi Point in Wellington. Storage of coarse aggregate has low dust potential when dry even during strong winds; but unless well washed, it can be dusty when being moved when dry. All materials will be delivered to the site in 30 tonne loads via covered trucks.

- A site speed limit of 20 km/h to minimize dust from vehicle movements.
- Bulk coarse aggregates and crusher dust is stored in semi-contained enclosures to control moisture content and to avoid mobilisation by wind.
- Drop distances are minimised to less than 1.5 metres from an existing surface.
- Crusher dust, which has a high fines content (and to a lesser degree sand), is received damp and kept damp while in storage to prevent dust generation while unloading, while being stored, and during transfer by front-end loader from the storage bin to the cold feed bins.
- Regular site visual and olfactory observations are made by the site operators during the course of their shift. If dust is observed not to be settling in 10 seconds, additional dampening will be employed.

Fulton Hogan has developed a comprehensive set of operating procedures for the Marini Mobile Plant and a Site Management Plan that covers in more detail the control and monitoring of odour and particulate discharges as outlined above. The Site Management Plan is publicly available and able to be provided if additional detail is sought.

Protection of wetland/waterways

Hazardous substances: All hazardous substances, including asphalt that is to be recycled in the process, are kept in covered containers that are engineered for the purpose. There will be no discharges of hazardous substances into the environment (except the unlikely event of accidental spills).

Stormwater: The surfacing on the site is flat gravel that has been packed down to form an impervious surface. The mobile asphalt plant will be placed on the existing surface and will not result in any increase to the impervious area on the site.

The site is surrounded by an earth bund that will contain all stormwater on the site in the general course. During heavy rainfall events there may be some excess stormwater, which is directed toward the south where there is permeable sand areas. Any stormwater that discharges to ground through the sand is likely to contain very low amounts of trace suspended solids. Sand is a very effective filter for contaminants, and the nearest bore indicated a depth to groundwater of 14.8 metres below ground level.

Stormwater that exceeds the capacity of the sand area is directed southward via a drain to a sediment/stormwater retention pond that is designed for a maximum catchment area of 4.8 ha, including the mobile asphalt plant site area. The pond has capacity for 1005 m^3 of water.

Given that there will be no habitat destruction, no untreated stormwater or sediment-laden water entering the wetland, no water take or damming that might impact the wetland's hydrology, and discharges of contaminants to air that are well below the existing guideline values, there is nothing to indicate any level of risk to the health of wetland ecology from the proposed mobile asphalt plant. There are no other surface waterbodies in the immediate vicinity of the site.

Treatment pond

The sediment/stormwater retention pond is managed by Transmission Gully. The sediment forebay is cleared periodically on an as-needed basis. The pond is tested for pH and turbidity following heavy rainfall events. If thresholds are exceeded, TG must conduct an investigation as to the cause and demonstrate improvement. An ecologist is involved in inspections.

Spill protection and response

All fuels, chemicals and other potentially environmentally harmful materials are located in bunded areas to prevent land or water pollution.

All staff on the site are trained in an Accidental Spill Response Procedure. Spill kits are labelled and kept in the control room or laboratory and the plant loader. Kits include absorbents and PPE appropriate to the specific materials used in each location. In addition, bulk sand is available on site and can be delivered anywhere via the asphalt plant loader.

All staff must inform the Site Supervisor of any spills and other instances involving hazardous substances immediately, regardless of size. The Supervisor will assess the spill and will notify Greater Wellington Regional Council as specified in the resource consent conditions.

- Minor spills (<5L) may be cleaned up using a spill kit, shovel and plastic bag
- Major spills (>5L) must be controlled and cleaned up in accordance with the Accidental Spill Response Procedure.

All spills and near misses are recorded and investigated. If improvements to site design or operating practices are required, these will be enacted promptly.

Hours of operation

The plant will operate from 6am – 6pm seven days per week, with night work (up to 10 hours overnight) undertaken as demanded by the construction schedule. There will be no deliveries of aggregates during night-time hours.

Light

When night time operation of the mobile asphalt plant is required, additional lighting will be required to illuminate the site area. The lights will be downwards-facing LEDs on 3-metre-high stands, oriented onto the specific parts of the plant that require illumination. Lighting will be located within the bunded area, directly adjacent the plant. Light spill outside of the bunded site area will not occur.

Noise

The noise from all components of the mobile asphalt plant has been modelled based on similar noise impact assessments for mobile asphalt plants operated in New Zealand and Australia and based on the manufacturer's specifications that the batch plant would produce a sound pressure level of less than 65 dB at 100 metres distance. The highest predicted noise level at a sensitive receiver was 43.5 dB(A) at 528 State Highway 1. This level is below the most stringent noise criteria level the plant could be subjected to which is 45dB(A).

The Noise Assessment is publicly available and is able to be provided if additional detail is sought.

Attachment 1: Summary of Air Quality Modelling Results

Jacobs provided an air quality assessment to Greater Wellington Regional Council that used computer dispersion modelling. Dispersion models take into account a number of factors including the emission rate of the contaminant(s), the height of the discharge, building downwash effects, local topography, and meteorology. The modelling conservatively used the maximum throughput rate of 180 tonnes per hour for 24 hours per day, seven days per week. The modelling incorporated local topographical information sourced from the Kāpiti Coast District Council and the meteorological conditions sourced from the station at Paraparaumu Airport.

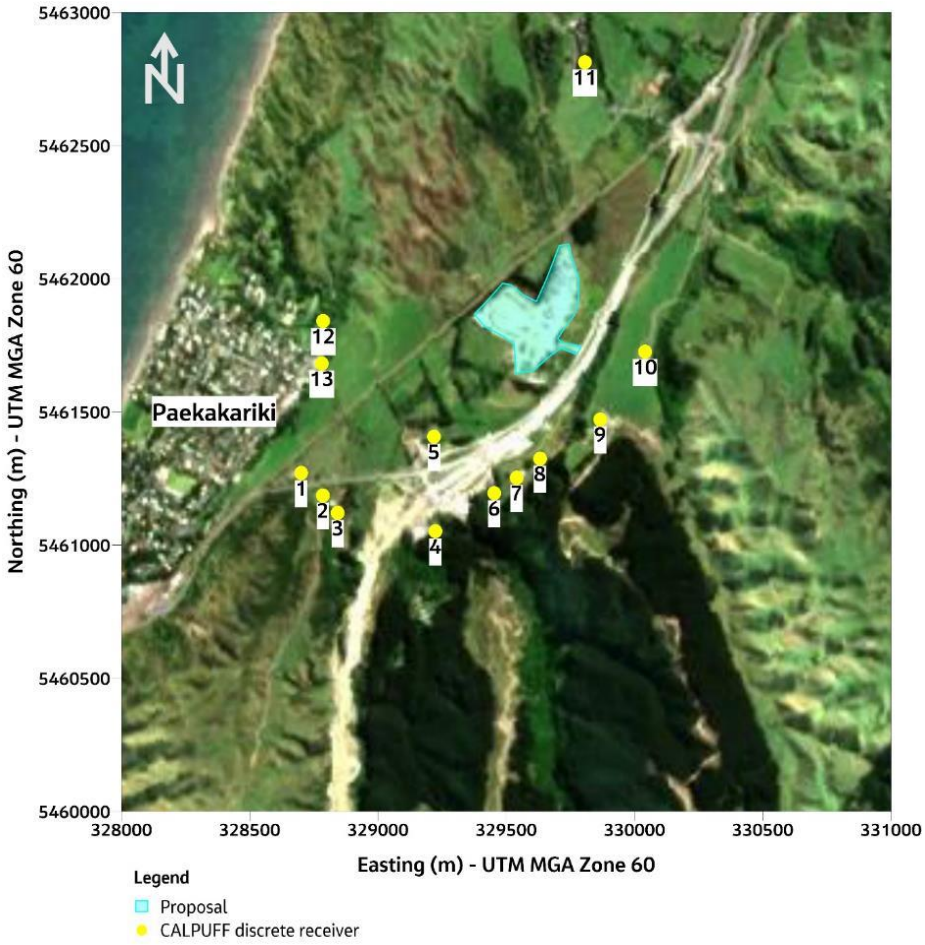
The main meteorological aspects considered in modelling are wind speed and direction, ambient temperature, atmospheric mixing height and atmospheric stability. The Greater Wellington Regional Council also provided estimates of the background ambient air quality in the area which served as a baseline for assessment.

The modelling results were assessed against:

- The provisions of the Natural Resources Plan (Appeals Version 2019), including the regional ambient air quality targets;
- Ministry for the Environment Ambient Air Quality Guidelines 2002; and
- Ministry for the Environment Good Practice Guide for Assessing and Managing Odour 2016.

An Air Quality modelling assessment is unavoidably technical, but the most salient details have been summarised in the tables below. The full assessment is publicly available and able to be provided if additional detail is sought.

The assessment paid particular attention to the nearest sensitive receivers, indicated in the image below.



The concentrations of the substances that will be discharged from the proposed mobile asphalt plant (MAP) are presented in the tables below, relative to existing background concentrations (where relevant) and the criterion values from the Natural Resources Plan, Ambient Air Quality Guidelines 2002 or Guidelines for Assessing and Managing Odour 2016.

The tables list the *highest* concentration expected at any sensitive receiver (and indicate the location of that receiver), as well as the concentrations expected at the eastern-most edge of Paekākāriki township.

- **Particulate matter as PM_{10}**

	Predicted concentrations from MAP	Existing background concentration	Cumulative value (background + MAP)	Criterion value (value where risks to human health are identified in the Natural Resources Plan or other relevant guidelines)
Predicted 24-hour PM_{10} concentrations ($\mu g/m^3$)				
Highest concentration at **R5** (former market gardens)	1.4	24	25.4	50
Concentration at **R13** (eastern-most point of Paekākāriki township)	0.3	24	24.3	
Predicted annual PM_{10} concentrations ($\mu g/m^3$)				
Highest concentration at **R5** (former market gardens)	0.3	10	10.3	20
Concentration at **R13** (eastern-most point of Paekākāriki township)	<0.05	10	<10.05	

- **Particulate matter as $PM_{2.5}$**

	Predicted concentrations from MAP	Existing background concentration	Cumulative value (background + MAP)	Criterion value (value where risks to human health are identified in the Natural Resources Plan or other relevant guidelines)
Predicted 100th percentile 24-hour $PM_{2.5}$ concentrations (µg/m^3)				
Highest concentration at **R5** (former market gardens)	1.4	12	13.4	25
Concentration at **R13** (eastern-most point of Paekākāriki township)	0.3	12	12.3	
Predicted annual $PM_{2.5}$ concentrations (µg/m^3)				
Highest concentration at **R5** (former market gardens)	0.2	5	5.2	10
Concentration at **R13** (eastern-most point of Paekākāriki township)	<0.05	5	<5.05	

- **Nitrogen dioxide (NO_2)**

	Predicted concentrations from MAP	Existing background concentration	Cumulative value (background + MAP)	Criterion value (value where risks to human health are identified in the Natural Resources Plan or other relevant guidelines)
Predicted 99.9th percentile 1-hour NO_2 (as 100% of NO_x) concentrations ($\mu g/m^3$)[2]				
Highest concentration at **R9** (398 State Highway 1)	63.1	67	130.1	200
Concentration at **R13** (eastern-most point of Paekākāriki township)	33.2	67	100.2	
Predicted 99.9th percentile 24-hour NO_2 (as 100% of NO_x) concentrations ($\mu g/m^3$)				
Highest concentration at **R5** (former market gardens)	18.3	42	60.3	100
Concentration at **R13** (eastern-most point of Paekākāriki township)	3.9	42	45.9	

[2] Nitrogen dioxide has been conservatively modelled as 100% of NO_x. However, Nitric oxide (NO) usually makes up around 95 per cet (by volume) of the total NO_x in combustion discharges from asphalt plant burners, with the remaining 5 per cent being nitrogen dioxide. The values of NO_2 in the tables will actually be five per cent of what is shown when measured at the sensitive receivers. With respect to human health, nitrogen dioxide is the pollutant of most concern.

- **Carbon monoxide (CO)**

	Predicted concentrations from MAP	Existing background concentration	Cumulative value (background + MAP)	Criterion value (value where risks to human health are identified in the Natural Resources Plan or other relevant guidelines)
Predicted 100th percentile 1-hour CO concentrations (mg/m^3)				
Highest concentration at **all receivers**	0.1	4	4.1	30
Predicted 100th percentile 8-hour CO concentrations (mg/m^3)				
Highest concentration at **R5 and R10** (former market gardens and 528 State Highway 1)	0.1	2.9	3	10
Concentration at **R13** (eastern-most point of Paekākāriki township)	<0.1	2.9	<3	

- **Sulphur oxides (SO_2)**

	Predicted concentrations from MAP	Existing background concentration	Cumulative value (background + MAP)	Criterion value (value where risks to human health are identified in the Natural Resources Plan or other relevant guidelines)
100th percentile 1-hour SO_2 (as 100% of SO_x) concentrations (µg/m³)				
Highest concentration at **R9** (398 State Highway 1)	0.9	11	11.9	350
Concentration at **R13** (eastern-most point of Paekākāriki township)	0.4	11	11.4	
Predicted 100th percentile 24-hour SO_2 (as 100% of SO_x) concentrations (µg/m³)				
Highest concentration at **R5 and R10** (former market gardens and 528 State Highway 1)	0.2	6	6.2	120
Concentration at **R13** (eastern-most point of Paekākāriki township)	0.0	6	6.0	

- **Benzene**

	Predicted concentrations from MAP	Criterion value (value where risks to human health are identified in the Natural Resources Plan or other relevant guidelines)
Predicted annual benzene concentrations (µg/m^3)		
Highest concentration at **R5** (former market gardens)	0.02	3.6
Concentration at **R13** (eastern-most point of Paekākāriki township)	<0.01	

- **Odour**

	Predicted concentrations from MAP (OU/m3)		Criterion value (value where there may be offensive and objectionable effects)
	Acute (1-hour averaged, 99.9th percentile)	Chronic (1-hour averaged, 99.5th percentile)	
Highest concentration at **R5** (former market gardens)	1.5	1.2	5
Concentration at **R13** (eastern-most point of Paekākāriki township)	0.4	0.3	1