EXPERT WITNESS CAUCUSSING CONFERENCE
AND JOINT WITNESS STATEMENT – AIR QUALITY

IN THE MATTER	ENV-2023-AKL-160
BETWEEN	Allied Asphalt Limited – direct referral application for consents in relation to an asphalt plant in Mt Maunganui

Facilitator	Environment Commissioner Myers
Date	28 March 2024
Venue	Teams

Witnesses	**For**
Jenny Simpson	Allied Asphalt Limited
Robert Murray	Bay of Plenty Regional Council
Lou Wickham	Toi Te Ora Public Health, National Public Health Service
Awhina Ngatuere	Ngati Kuku hapū

JOINT WITNESS STATEMENT

ISSUES

1. **Modelling methodology**

    a. **Suitability of meteorological data used for modelling**

    b. **Inclusion of residential receptors at Kittyhawk Way & Dakota Way**

    c. **PM assessment and background data**

    d. **NO_2 assessment and background data**

a. Suitability of meteorological data used for modelling

Matters of agreement

Tonkin + Taylor has repeated the dispersion modelling using an additional 2021 modelling meteorological dataset provided by BOPRC. This will give 4 years of modelling representing a range of weather conditions, including strong El Nino (2016) and La Nina (2021) years. It was agreed that a representative range of meteorological data will be included in the modelling.

NB: These modelling results were discussed at the conferencing but the results have not yet been circulated to the parties.

(note: comparison of 2021 wind rose for Allied site and airport observational data and model outputs for 2021 to be provided by Jenny Simpson)

b. Inclusion of residential receptors at Kittyhawk Way & Dakota Way

Lou Wickham identified two additional locations of residential activities that need to be considered.

c. PM assessment and background data

Lou Wickham and Robert Murray outlined the expert consensus view taken in the Higgins consent for considering background particulate for cumulative assessment purposes. This was to utilise a range of 98th to 99th percentile values from the de Havilland Way (representing industrial area) and Rata Street (representing residential area) monitoring sites in addition to using hourly background data in the modelling. This provided a range of values below which the experts considered they could be confident the cumulative effects would characterised.[1] The reason for this is because the range of daily PM_{10} values (35 – 43 $\mu g/m^3$) adopted in the Higgins application were significantly higher than the value provided by BOPRC (30 $\mu g/m^3$) for assessment. The four-year mean (2019 – 2022) PM_{10} concentrations of 18 $\mu g/m^3$ (De Havilland Way) and 19 $\mu g/m^3$ (Rata Street) were also higher than the value used in the assessment (14.6 $\mu g/m^3$).

Matters of agreement

The expert consensus is that the decommissioning of the existing asphalt plant and commissioning of the new plant will:

a) reduce the total PM_{10} emissions into the Mt Maunganui industrial airshed on an annual basis; and

b) result in a small improvement in ambient PM_{10} air quality at all locations impacted by the existing plant.

Matters of disagreement

Lou Wickham considers that the use of more conservative background values would suggest the existing plant increases daily PM_{10} levels from just below to just above the WHO guideline. The modelling suggests both the existing and proposed plants add fractional increases to the existing

[1] To clarify, the 98th or 99th percentile values suggest that 98% or 99% of the predicted concentrations will be less than these values.

annual burden (which already exceeds the WHO guideline) as shown in the following table (Allied column is from Table 2-1 of Ms Simpson's evidence dated 29 February 2024).

Existing Plant	Allied	Background	Cumulative	WHO AQG
Daily PM_{10} (4th highest)	3.5	35-43	39-47	45
Annual PM_{10}	0.7	18-19	19-20	15

Proposed Plant	Allied	Background	Cumulative	WHO AQG
Daily PM_{10} (4th highest)	0.76	35-43	36-44	45
Annual PM_{10}	0.16	18-19	18-19	15

All concentrations in $\mu g/m^3$

Jenny Simpson considers that it is inappropriate to add the modelled impact of the existing plant to measured PM_{10} concentrations at de Havilland Way because these measurements already include the impact of the existing plant. She does not consider the Rata Street monitoring dataset is likely to be representative of PM_{10} concentrations in the residential area east of the Allied Asphalt site because the peak PM_{10} concentrations at Rata Street are driven by localised sources, which have included an adjacent unsealed yard, activities at the Port of Tauranga and nearby construction work. She considers that if a similar approach of using a range of possible background PM_{10} concentrations (as per the Higgins expert conferencing) were used in this assessment it would not materially alter her conclusions with regard to PM_{10}.

Robert Murray agrees that the Rata St site is impacted by local sources and may not be completely representative of the residential area to the east of the Allied site, however, it is probably the most appropriate of the sites available at this point.

Lou Wickham concurs with Ms Simpson's that it is not technically accurate to add the Allied emissions to existing measured levels at De Havilland Way. However, they consider the salient point is that background levels of daily PM_{10} concentrations are elevated in the MMA (35-43 $\mu g/m^3$) with little room for new emissions compared with the WHO guideline (45 $\mu g/m^3$). Lou Wickham also concurs with Ms Simpsons view that local industry has resulted in some elevated daily PM_{10} levels at the Rata Street monitoring site. However, they consider this is less significant for 98-99th percentile daily values. They retain their view that the Rata Street monitoring site currently provides the best available data to approximate likely background concentrations in the Omanu residential area (noting there are also residences in and around Rata Street).

Awhina Ngatuere considers it to be paramount that a cautious approach to the PM_{10} modelling is needed because of cumulative effects and the reality that not all contaminants in the MMA are being monitored. Increased production as part of the proposed plant means an increase in trucks

but this is not taken into account in terms of the annual contribution to air pollution /burden because its deemed "permitted activity", nonetheless it undoubtedly has negative impacts to the MMA.

d. NO_2 assessment and background data

Matters of Agreement

The experts agreed that compliance with the 1-hour NESAQ value for NO_2 was not a key issue for this consent and the focus was on 24-hour and annual average concentrations.

The experts agreed that 24-hour and annual NO_2 concentrations will be highly spatially variable depending on the location with respect to roads, as traffic emissions are typically the main source of NO_2.

Recent monitoring data from Whareroa Marae (5 months) includes one day where the WHO 2021 24-hour guidelines value was exceeded by a small margin (25.2 $\mu g/m^3$ compared to 25 $\mu g/m^3$ noting that the WHO daily guidelines permit 3 to 4 exceedances per year). The sampling period average was 8.5 $\mu g/m^3$ (compared to the WHO annual guideline of 10 $\mu g/m^3$). The limited data suggest that the annual average NO_2 concentration at Whareroa Marae (at the end of the 12 month monitoring period) is likely to meet the WHO 2021 annual guideline.

Roadside concentrations of NO_2 measured by Waka Kotahi (using passive samplers) are similar to other state highway roadside monitoring sites in New Zealand and elevated compared to the WHO annual guideline. The experts agreed the impact of ongoing roadworks and repositioning of the monitoring location in 2023 prevented a clear understanding of long-term trends.

In terms of the NO_2 assessment, the modelled hourly emissions of NO_2 from the proposed plant are higher than from the existing plant because of the increased production capacity/fuel consumption compared to the existing plant. However, the change in modelled impacts is not proportional because of the increased stack height.

Matters of disagreement

Lou Wickham considers the available monitoring data suggests that existing 24-hour NO_2 concentrations in the Mount Maunganui Airshed (MMA) and in the Omanu residential area may exceed the WHO daily guideline, particularly near the roadside. They consider that annual NO_2 concentrations in the MMA will likely exceed the WHO annual guidline and that annual NO_2 concentrations in the Omanu residential area may exceed the WHO guideline near roadside locations.

Jenny Simpson considers the monitoring data from Whareroa Marae are consistent with the assumptions set out in her evidence for daily and annual average background concentrations at locations that are not adjacent to heavily trafficked roads. The annual average background concentration may be slightly higher than assumed (from the Waka Kotahi default background dataset), but this would not alter the conclusions of the assessment set out in her evidence (in particular paragraph 105).

Additional commentary

Awhina Ngatuere notes that the monitoring for NO_2 at Whareroa Marae only commenced in August 2023 and this is of concern to the Marae because it only provides a short term dataset. The Marae is particularly concerned with the cumulative effects and long term exposure to the many discharges in the area, particularly because consents are granted in silos and not all the pollutants are being monitored. Awhina considers there is not enough data to fully understand existing air quality at the Marae.

It was also noted by Awhina that Tauranga City Council has plans (Plan Change 33 and the Waka Kotahi "Connecting Mount Maunganui" project) that will increase both traffic and population in the area. The Mount to Arataki Spatial Plan was recently approved which provides that over the next 20 to 30 years the Mount to Arataki area will experience significant future growth, including:

- 18% population growth by 2058
- 29% more jobs within commercial and business areas by 2063
- Over 50% of new jobs will be in the services sector
- 2,600 more dwellings by 2058
- Increasing aging population.

See Spatial Plan here for more info - https://letstalk.tauranga.govt.nz/Portals/14/data/mount-neighbourhood/mount-spatial-plan/files/mount-to-arataki-spatial-plan.pdf.

Awhina Ngātuere considered, and Lou Wickham concurred, that the above highlights that the calculation of background air pollution as well as cumulative effects are significant factors to take into account with this proposal.

2. Adoption of BPO

Matters of agreement

It was agreed that further information should be provided by Allied on the feasibility of low NOx burners.

It was agreed that the proposed engineering controls are the BPO to minimise effects of discharges to air from the asphalt plant. It was also agreed that the use of natural gas as a fuel is BPO subject

to availability and the cost not being prohibitive (noting that this will need to be determined through an appropriate consent condition)*. If the use of natural gas is not practicable, biodiesel or diesel are the best practicable fuel alternatives.

The experts agreed that capture of fumes from the loadout area will increase with increasing degrees of enclosure.

*Note: Awhina Ngatuere noted the importance of prioritising the protection of human health over commercial considerations.

Matters of disagreement

Lou Wickham and Robert Murray consider full enclosure of the loadout area to be BPO for a new asphalt plant. Jenny Simpson requires more information from Allied Asphalt about the practicability of full enclosure to make a conclusion about this and considers partial enclosure may be adequate to minimise fugitive emissions to the greatest extent practicable.

Additional commentary

Lou Wickham and Awhina Ngatuere noted that the dispersion modelling does not include emissions from trucks or fugitve emissions from the loadout area. They also noted that the consideration of BPO does not include emissions from trucks. This is of concern to Ngati Kuku in relation to cumulative effects.

3 Consent conditions for stack emission and boundary air quality monitoring

Robert Murray suggested in his evidence that stack emission testing for particulate, dioxins, benzene, combustion gases and odour should be included as conditions of consent. Particulate, dioxins, benzene and combustion gases would be part of commissioning testing. Depending on the results, particulate testing would be the only contaminant to be tested on an ongoing basis.

Matters of Agreement

It was agreed that emissions of particulate, benzene, combustion gases and odour should be part of commissioning testing and that ongoing monitoring of particulate was appropriate.

Matters of disagreement

It was noted by Jenny Simpson and Robert Murray that dioxin testing can be difficult to carry out and requires laboratory analysis overseas. Jenny and Robert agreed that dioxin testing is not justified.

Lou Wickham considers that polycyclic aromatic hydrocarbons (PAHs) may be more of a concern for asphalt plants than dioxins and could be incorporated into commissioning stack testing (instead of dioxins). Their Mt Maunganui air quality risk assessment highlighted a significant data gap for PAHs and some recent research suggests the toxicity of PAHs may currently be significantly underestimated (e.g., Samburova et al., 2017). Additionally Mx Wickahm considers there is a need to ground truth the assumption that US EPA emission factors are accurate for New Zealand asphalt plants. Robert Murray agrees that PAHs could be incorporated into stack testing.

Jenny Simpson considers that stack emission testing for PAHs is not warranted because the modelled PAH concentration, expressed as "benzo[a]pyrene equivalents", is 0.0017% of the assessment criterion stack. The assessment uses published emission factors, which are based on stack emission testing of asphalt plants in the United States. It is almost certain that actual emissions will not be five orders of magnitude higher than these published emission factors, which would be required for the assessment criterion (the New Zealand ambient air quality guideline) to be exceeded. Jenny noted that Samburova et al. identifies the need for further research and does not proposed new Toxic Equivalence Factors or revised ambient air quality guidelines. She considers BOPRC could require stack testing or further assessment of PAHs in the future, through a review of the consent conditions under proposed Condition 35, if the ambient air quality guidelines for PAHs change over the term of the consent.

Lou Wickham considers that boundary monitoring for PM_{10} using a reference method should be carried out consistent with other industrial sites with fugitive PM_{10} emissions in the MMA.

Jenny Simpson considers that boundary monitoring using a "non reference" method, such as a nephelometer, is appropriate as a management tool for on-site dust management and the additional cost of a reference monitor is not justified. She notes that PM_{10} monitoring using a reference method is a requirement of the Interim Permitted Activity Rule under Plan Change 13, but this is different to a resource consent application where a site-specific assessment is carried out.

Robert Murray agrees that boundary monitoring should be carried and that a "non reference" method would be acceptable. However, the type of monitor needs to be agreed upon with the Bay of Plenty Regional Council.

4. Site contribution to H_2S at Whareroa Marae

Matters of Agreement

No H_2S assessment has been carried out as the only appreciable source of H_2S at the site is displacement of vapours from the headspace of the bitumen tank when it is being filled. Experts (except for Awhina) agreed that Allied are not likely to make any significant contribution to H_2S concentrations at Whareroa Marae. Jenny Simpson will provide commentary around this in her reply statement.

5. Agenda items not discussed

1. Reduction of PM versus increase in NOx

2. Quantifying improvements in airshed concentrations of contaminants including existing plant, proposed increased capacity of exisiting plant and new plant (Note: this item was on the final version of the agenda which was not available at caucusing and therefore not used)

3. Consent Conditions

   - Operating hours of plant

   - Only one plant operating at a time

   - Consent duration

4. Issues raised by Ngati Kuku, including air quality effects at Whareroa Marae and matauranga.

Signed:

Witness	**Signature**	**Date**
Jennifer Simpson		4/4/24
Robert Murray		05/04/2024
Lou Wickham		5 April 2024
Awhina Ngatuere		5/04/2024