



6 April 2023

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## 1.0 Introduction

On 26 March 2020, Higgins Contractors Limited (HCL) applied to Bay of Plenty Regional Council (BOPRC) to replace Discharge Permit 63317 to discharge Combustion Gases, Bitumen, Sulphur Dioxide, Volatile Organic Compounds, Water Vapour and Particulate Matter from an Asphalt Plant to Air. This letter provides a summary of the application to date to assist in the determination of BOPRC's s.95 notification assessment.

## 2.0 Section 95A RMA Assessment

Having considered the matters raised by BOPRC at the meeting on 3 April 2023, HCL has concluded that amending the proposal to cap production at 50,000 tpy is required in order to fully demonstrate to BOPRC that effects are not changing beyond the status quo. HCL still believes that effects of producing 75,000 tpy will result in a less than minor effect on the MMA, however the desire to future proof production is balanced against the desire to ensure only those that are potentially affected by the proposal are notified.

In this respect, HCL officially amend the proposal and propose a condition of consent as follows:

*'The production rate for hot mix asphalt shall be limited to 50,000 tonnes per year.'*

Accordingly, the effects of the proposal are the same on a daily and annual basis as has historically occurred from the asphalt plant, and thereby ensuring effects on the 'environment' can be considered as less than minor in regard to s.95A of the RMA.

## 3.0 Section 95B RMA Assessment

Having concluded that the effects of PM<sub>10</sub> are less than minor, PDP has assessed the need to consider limited notification. In 2022, HCL was notified by BOPRC of odour complaints relating to the Hewletts Road site. As a result of these complaints, PDP undertook an odour investigation to determine the source of these odours. The full assessment is provided in Appendix A and summarised below.

The odour observations indicated that weak to strong bitumen odours may be detected out to a distance of 150 m from the asphalt plant, and were identified as being primarily from the loadout area as opposed to being discharged from the stack. 'Bitumen' was the predominant odour detected 39% of the time and where detected, typically had an intensity of weak to distinct, however, there were also bitumen odours classified as being strong (17%) or very weak (14%). Very strong bitumen odours were detected 2% of the time. These very strong odours were detected at a distance of 150 m from the plant. Other odours were observed which are not attributed to the HCL's operation, and include odours of paint solvent, and of sulphur.



Odour observations undertaken at the Omanu School detected weak bitumen odours on one occasion when the HCL plant was downwind of the school, suggesting the source of odour complaints is likely from elsewhere, e.g. from nearby roadworks.

PDP considers that a lower level of amenity, where weak to distinct odours are detected, aligns with the industrial nature of the area surrounding HCL's site. PDP's observations of strong and very strong odour from HCL were, however, detected at a level and a frequency that might be considered objectionable or offensive to people working in the immediate vicinity of the site (50 to 100 m). In PDP's experience odour from asphalt manufacturing is unlikely to be observed at distances greater than 300 m of the source, which we consider an appropriately conservative distance for limited notification for adverse amenity effects from odour.

These results should be relied on to consider effects on neighbouring parties. Unverified asphalt complaints in the general vicinity are not considered appropriate to make a decision regarding affected parties, and more conclusive data collected by PDP should guide this assessment. Accordingly, PDP consider that persons within 300 m of the HCL plant is appropriate, that could be affected in accordance with s.95E, be limited notified.

#### **4.0 Conclusions**

HCL is amending the proposal to cap annual production to 50,000 tpy. Accordingly, PDP consider that the effects on the environment are less than minor. In regards to odour effects, these are confined and could potentially affect neighbouring parties within 150 m. In PDP's experience with other asphalt plants, there is typically no significant odour observed beyond a distance of 300 m. Limited notification is recommended to neighbouring parties within 300 m, but not beyond.

## 5.0 Limitations

This report has been prepared by PDP on the basis of information provided by HCL. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the report. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This report has been prepared by PDP on the specific instructions of HCL for the limited purposes described in the report. PDP accepts no liability if the report is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

### PATTLE DELAMORE PARTNERS LIMITED

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## Appendix A: Odour Monitoring Procedure

## Odour Investigation Methodology

PDP used a qualitative ambient odour monitoring methodology, which is a variation of the method described in the German Standard Verein Deutscher Ingenieure (VDI) 3940 “*Determination of Odorants in Ambient Air by Field Inspections*” (VDI Method). This is the method recommended in the Ministry for the Environment (MfE) ‘*Good Practice Guide for Assessing and Managing Odour in New Zealand*’ and is commonly used in Australia and Europe for odour assessment.

### Sampling

The modified method used by PDP involved using a single ‘field odour scout’ to visit a selection of sites and sample the ambient air every 10 seconds for 10 minutes giving a total of 60 samples per location. The field odour scout recorded the intensity of the odour (according to a set intensity scale), the odour character (from a list of 40 various odour descriptors), the wind direction, the wind speed, if there was any rainfall, and the time and date for every sample. The wind direction and wind speed were recorded by the field odour scout using a nearby meteorological monitoring site.

### Odour Observations

Five separate investigations were carried out by PDP staff on 3, 5 and 15 August and 8 and 20 September 2022 to help to understand the level of odour associated with the current asphalt production operations. Odour observations were undertaken at different times of the day to try and get a wide range of meteorological conditions and cover a range of different site operations that might be undertaken throughout the day. The times and days selected focused on when winds were lighter and therefore more likely to result in poor dispersive conditions that, based on PDP’s experience, tend to correlate to worst case odour impacts. Based on the wind strength, PDP has ranked the wind speed conditions as being reasonable through to excellent for the expected worst case for odour dispersion and highest likelihood of observing odours.

All odour observations were undertaken when the site was manufacturing asphalt and undertaking load out operations and Table 1 presents the production at the time of the odour observation. The number of locations where odour observations were undertaken varied per visit, with between 6 and 8 locations depending on the direction of the wind and the ability for PDP staff to access locations downwind of the site.

PDP understands that complaints had been received from Omanu School, which is around 900 m to the northeast of HCL’s site, so the school was included during some of the odour observations to try any identify any odour that might be experienced at this location even if the wind was not coming directly from the HCL’s site.

The following sections summarise the findings of the odour observations undertaken. A summary of the results where odour was detected, the character of the odour and the intensity on each of the five days is provided below.

**Table 1: Production Details**

Date	Mix	Plant Rate (tph)	Mix Temperature (°C)	Stack Temperature (°C)
3 August 2022	AC-14 & AC-20	48	160	159 – 167
5 August 2022	AC-20	52 – 60	163	164 – 171
15 August 2022	AC-28	56 – 60	168 – 172	197
8 September 2022	AC-28	40 – 56	169	155 – 181
20 September 2022	AC-28	52	170	193

3 August 2022

PDP staff arrived in the area around HCL’s at approximately 12:30 pm. The wind conditions during the odour investigation were light to moderate winds (3 – 4 m/s) originating from the northwest. PDP considers that these conditions were ‘reasonable’ in terms of undertaking odour observations. Figure 1 is a map of the eight locations where odour observations were made.

**Description of Odours Experienced**

- ✦ Location S1: No bitumen odour detected.
- ✦ Location S2: Very weak to distinct bitumen odour detected 57% of the time.
- ✦ Location S3: Very weak to strong bitumen odour detected 83% of the time.
- ✦ Location S4: Weak to strong bitumen odour detected 95% of the time.
- ✦ Location S5: Weak bitumen odour detected 2% of the time.
- ✦ Location S6: Weak bitumen odour detected 8% of the time.
- ✦ Location S7: No bitumen odour detected, however a significant weak to distinct paint odour detected.
- ✦ Location S8: Weak bitumen odour detected 2 percent of the time.



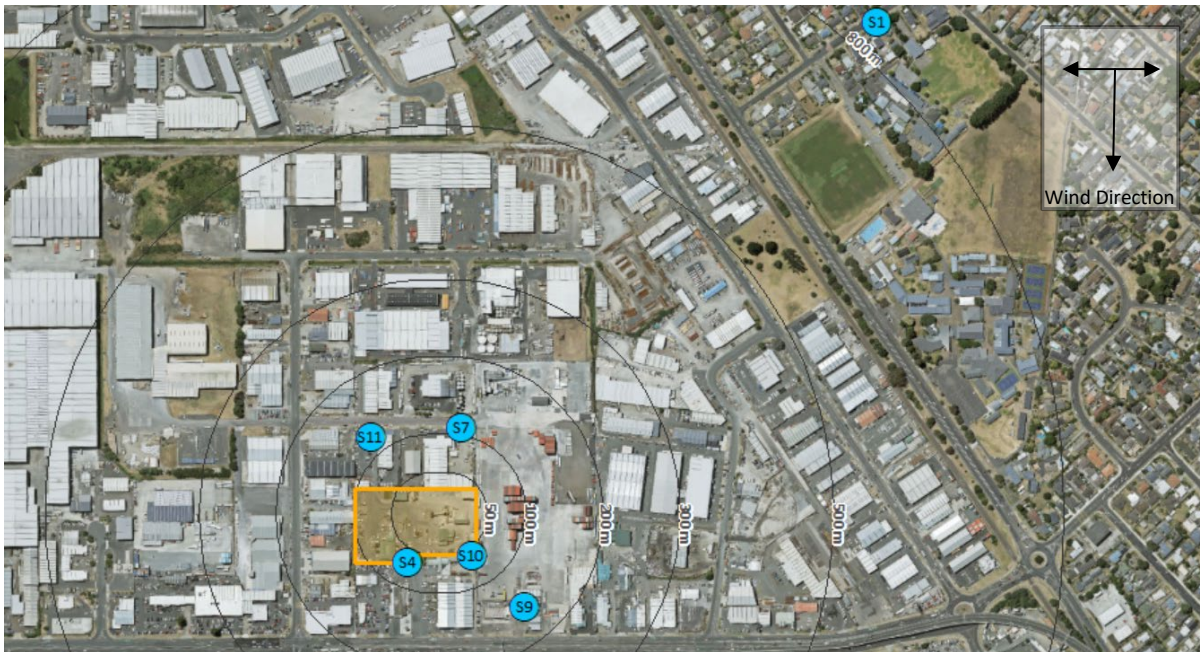
**Figure 1: Locations of the odour observations 3 August 2022**

5 August 2022

PDP staff arrived in the area at approximately 11:30 am. The wind conditions during the odour investigation were light to low winds (1 – 2 m/s) varying from the west to the east via north. PDP considers that the wind speeds were ‘good’ in terms of undertaking odour observations, however the changeable wind direction did make it difficult to be consistently downwind of the site. Figure 2 is a map of the six locations where odour observations were made.

**Description of Odours Experienced**

- ∴ Location S9: Weak bitumen odour detected 25% of the time.
- ∴ Location S10: No bitumen odour detected.
- ∴ Location S1: No bitumen odour detected.
- ∴ Location S7: No bitumen odour detected.
- ∴ Location S11: No bitumen odour detected.
- ∴ Location S4: Weak to strong bitumen odour detected 85% of the time.



**Figure 2: Locations of the odour observations 5 August 2022**

15 August 2022

PDP staff arrived in the area at approximately 1:30 pm and the wind conditions during the odour investigation were calm to low winds (0 – 0.5 m/s) coming from the northeast. PDP considers that these conditions, especially wind speeds, were ‘excellent’ in terms of undertaking odour observations i.e. during the likely worst-case conditions. Figure 3 is a map of the eight locations where odour observations were made.

**Description of Odours Experienced**

- ∴ Location S7: No bitumen odour detected, however a significant weak to distinct paint odour detected.
- ∴ Location S8: Weak bitumen odour detected 2% of the time.
- ∴ Location S12: Weak to distinct bitumen odour detected 12% of the time.
- ∴ Location S3: Very weak to weak bitumen odour detected 25% of the time.
- ∴ Location S13: Very weak to strong bitumen odour detected 42% of the time.
- ∴ Location S1: Very weak to weak bitumen odour detected 12% of the time.
- ∴ Location S14: Very weak to very strong bitumen odour detected 97% of the time.
- ∴ Location S15: Very weak to very strong bitumen odour detected 90% of the time.





**Figure 3: Locations of the odour observations 15 August 2022**

8 September 2022

PDP staff arrived in the area at approximately 9:15 am. The wind conditions during the odour investigation were calm to light winds (1 m/s) predominantly from the south. PDP considers that these conditions were good in terms of undertaking odour observations. Figure 4 is a map of the six locations where odour observations were made.

**Description of Odours Experienced**

- ∴ Location S16: Very weak to strong bitumen odour detected 78% of the time.
- ∴ Location S17: Very weak to very strong bitumen odour detected 73% of the time.
- ∴ Location S8: Very weak to strong bitumen odour detected 60% of the time.
- ∴ Location S12: No bitumen odour detected however a reasonably frequent weak to distinct sulphur odour was detected.
- ∴ Location S15: Very weak to distinct bitumen odour detected 46% of the time.
- ∴ Location S3: Very weak to strong bitumen odour detected 85% of the time.



**Figure 4: Locations of the odour observations 8 September 2022**

20 September 2022

PDP staff arrived in the area at approximately 10:30 am and the wind conditions during the odour investigation were moderate winds (2.5 – 3 m/s) coming from the north. PDP considers that these conditions were reasonable in terms of undertaking odour observations. Figure 5 is a map of the seven locations where odour observations were made.

**Description of Odours Experienced**

- ∴ Location S3: Very weak to very strong bitumen odour detected 80 percent of the time.
- ∴ Location S5: Very weak to very strong bitumen odour detected 95 percent of the time.
- ∴ Location S15: Very weak to strong bitumen odour detected 75 percent of the time.
- ∴ Location S4: Very weak to very strong bitumen odour detected 65 percent of the time.
- ∴ Location S12: No bitumen odour detected however a reasonably frequent very weak to strong sulphur odour was detected.
- ∴ Location S8: Very weak to weak bitumen odour detected 8 percent of the time.
- ∴ Location S16: No bitumen odour detected however a very frequent very weak to distinct paint odour was detected.



**Figure 5: Locations of the odour observations 20 September 2022**

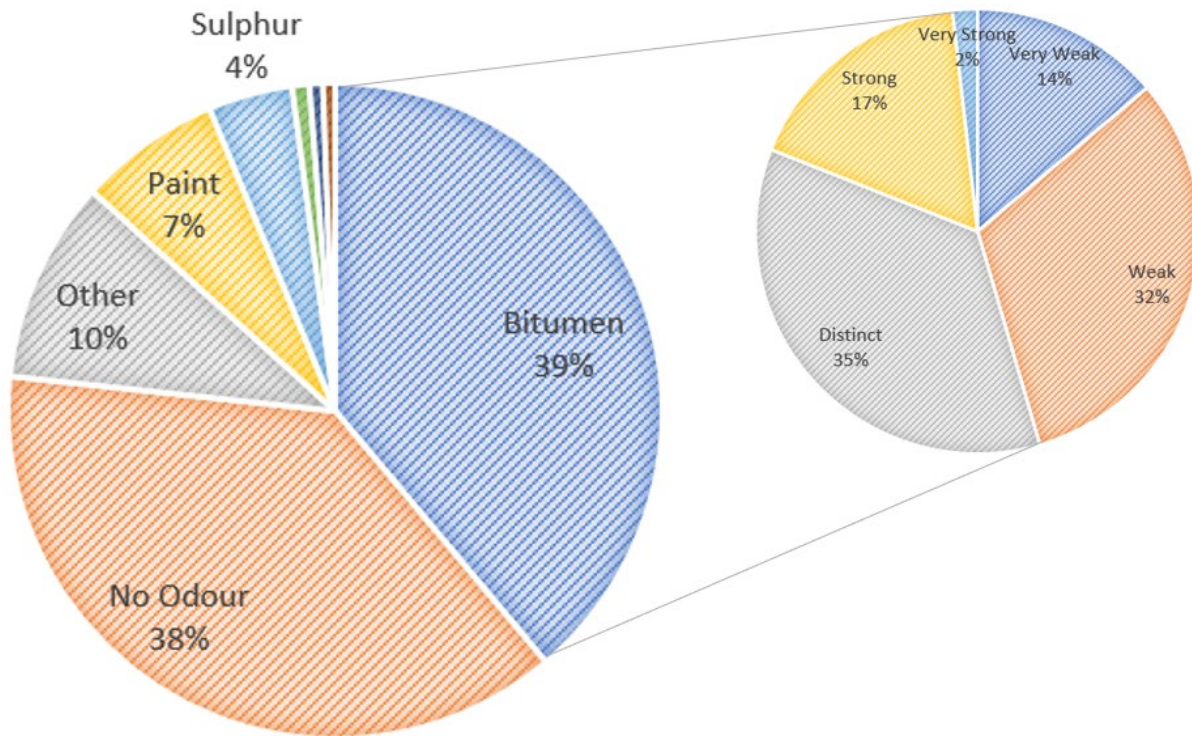
### Summary of Odour Observations

Where odour associated with HCL was detectable, the odour was classified as “very weak” to “very strong” and having a bitumen odour character. The strongest odours were detected near the site boundary. With increased distance from the site, the odour became weaker in intensity and transient in nature, however very strong bitumen odours were occasionally detected out to 150 m from the stack and load out area. Odour observations undertaken at the Omanu school detected weak bitumen odours on one occasion when the HCL plant was downwind of the school, suggesting the source of odour complaints is likely from elsewhere, e.g. from nearby roadworks.

Figure 6 provides pie graphs of the frequency of various odour characters observed and the intensity. No odour was observable 38% of the time, while ‘bitumen’ was the predominant odour and was detected 39% of the time. Other odours included palm kernel, grain, ‘paint’ ‘sulphur’ and undefined. When bitumen odours were detected, they typically had an intensity of weak to distinct, however, there was a considerable number of bitumen odours classified as being strong (17%) or very weak (14%). Also, to note very strong bitumen odours were detected 2% percent of the time.

PDP considers that a lower level of amenity, where weak to distinct odours are detected, aligns with the industrial nature of the surrounding area.

PDP’s observations of strong and very strong odour from HCL’s were, however, detected at a level and a frequency that might be considered objectionable or offensive to people working in the immediate vicinity of the site (50 to 100 metres). For example, PDP staff observed workers at neighbouring sites wearing respirators and after discussion with these people they noted their reason for wearing the respirators was due to health concerns from the odour from HCL.



**Figure 6: Character of odours detected and intensity of bitumen odours**

In summary, based on the odour observations, PDP considers further mitigation is required to reduce the off-site odour effects.

### Odour Discharge Sources

There are two main sources of odour discharges to air from asphalt manufacturing:

1. The stack discharge from the drum-mix plant; and
2. Fugitive emissions from the loadout operations.

The drying drum operates on a continuous basis with the drum used to both dry and heat aggregate and to mix hot aggregate with bitumen. Aggregate is conveyed into the drum and travels along where products of combustion from the burner and excess air dries and heats the aggregate. Hot liquid bitumen is added into the drum about halfway down the drum and the mixing action of the rotating drum ensures a good and even coating of bitumen on aggregate particles.

Combustion gases, dust, bitumen volatile matter and pyrolysis products are passed through a water scrubber before gases are discharged into the air through the stack. From an odour perspective, a water scrubber has little effect in reducing odour emissions.

The hot mix produced in the drum is conveyed into a thermally insulated hot storage bin and then loaded out into a truck as required. During the load-out process, emissions from the hot bitumen can occur from the conveyor system as the material drops into the bin and as the hot material is loaded into a truck.

Both the mixing and load-out processes produce emissions of volatile organic compounds (VOCs), which are associated with the distinctive asphalt odour.

While the vent of the bitumen tank also has the potential to result in odour discharge, the volume of the discharge is very low and infrequent and therefore is very unlikely to result in off-site effects.

### **Cause of off-site odour effects**

PDP has reviewed photos and videos of the discharge from the wet scrubber stack, and while the stack appears to be relatively short, the plume is relatively easy to observe given the amount of water vapour in the discharge. The observations indicate that the plume is not likely to be impacting the ground during the daytime observation periods, especially within the 200 metres from the site in which bitumen odours were detected.

Dispersion modelling of the asphalt plant stack undertaken by PDP suggests that, under poor dispersion conditions, the highest concentrations of odour from the stack are likely to occur at around 100 metres from the southern site boundary. Although the highest predicted odour concentrations modelled from the stack are within the MfE odour guidelines for industrial areas. This would indicate that under normal conditions the stack does not impact upon odour detected near the boundary, however, during poor dispersive conditions there may be cumulative effects from the stack and load-out operations.

From the photos and videos, the discharge from the load-out process is also clearly visible and is distinctly different from the stack. The load-out discharge has an almost constant emission of blue haze, which is associated with VOC's. Given the nature of this emission source, which is continuous and closer to the ground level and based on the observations, and experience at other asphalt sites, PDP considers that the off-site odour effects are most likely a result of the load-out process.

### **Conclusion**

The results of the odour assessment indicate that odour from the asphalt manufacturing process is of a nature and frequency that it is likely to be having an impact on people at neighbouring businesses. In PDP's view, the strongest odours are most likely associated with the asphalt load-out.