Application no:

Date received:

Ministry for the Environment
Manatū Mō Te Taiao

Resource Management (National Environmental Standards for Air Quality) Regulations 2004 – Regulation 16A Exceptional Circumstances

APPLICATION FORM

Before completing this form please read section 3.8 of the 2011 User's Guide to the revised National Environmental Standards for Air Quality.

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Please send your completed application form and all attachments to info@mfe.govt.nz

1 Applicant details

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2 Details of exceedance event

Containment	PM_{10} (24-hour average)
Date of exceedance (*application must be received within 3 months from date of the exceedance*)	31 December 2025
Relevant airshed	Bay of Plenty Regional Airshed

Monitoring station and technical specifications of monitor	**Ranch Road, Mount Maunganui.** Opposite 89 Ranch Road on the northern boundary of the Mount Maunganui College sports fields. Located within the Bay of Plenty Regional Airshed (BOPRA).   Instrument specifications: Particulate Matter as PM_{10} – according to AS/NZS 3580.9.11:20224 'Determination of suspended particulate matter – PM_{10} beta attenuation monitors' using a Thermo model 5028i Beta Attenuation Monitor (BAM). The BAM operates with a full-scale measurement range of 0-10,000 µg/m^3. Watercare is accredited by IANZ for this method.
Summary of monitoring reading showing exceedance event	PM_{10} 55.8 µg/m^3 - 31 December 2025
Analysis of baseline data	Refer to supporting documentation.
Source speciation or other analysis	Refer to supporting documentation.

Explanation of any previous exceedance event/s from this monitoring station in the past 5 years	Ranch Road: This is a recently installed site (recording commenced March 2024) within the Mount Maunganui residential area in the BOPRA, adjacent to the Mount Maunganui Airshed (MMA). Five previous exceedance events have been recorded at this site: • 3 October 2024, • 17 April 2025, • 19 April 2025, • 4 July 2025 • 29 July 2025 Meteorological conditions conducive to elevated wave heights, and the transport and inland deposition of sea spray particles were responsible for the October 2024, two April 2025 and for both July 2025 exceedances. The Minister approved the Bay of Plenty Regional Council's (BOPRC) exceptional circumstances applications for all five exceedances to date.	
Monitoring readings covering exceedance event	☒ Attached	☐ Not attached

3 Details of exceptional circumstances

Exceptional circumstances leading to exceedance	☐ Localised impact on a monitor	☐ Anthropogenic extreme event	☒ Natural disaster or natural extreme event	☐ Other
Explanation of circumstances leading to exceedance event	An increased presence of sea spray particles originating from an elevated sea state and onshore winds is considered to have been the cause of the exceedance occurring on 31 December 2025 at the Ranch Road air quality monitoring station within the BOPRA.			

Reasons why these circumstances were beyond the reasonable control of the regional council	Meteorological conditions conducive to elevated wave heights, and the transport and inland deposition of sea spray particles were responsible for the recorded exceedance. These conditions are well beyond the reasonable control of BOPRC. Page 43 of the "2011 Users' Guide to the revised National Environmental Standards for Air Quality: Updated 2014" (the Users' Guide) states: *"Generally, unforeseeable emergencies and natural disasters cannot be prevented or controlled and are likely to satisfy this criterion."* All evidence that we have examined points to sea spray particles being the source of the PM_{10} exceedances on 31 December 2025. In reference to the requirements of page 44 of the Users' Guide, these exceedances can credibly be considered an unplanned circumstance that could not reasonably be predicted or planned. The events causing the exceedance of the PM_{10} standard on 31 December can be considered exceptional due to their nature as a weather event responsible for the exceedance. The events created a situation where salt spray particles were formed in abundance and then transported under suitable wind patterns, so a conducive weather event that directly led to the exceedance. Page 45 of the Users' Guide states that: *"The majority of exceptional circumstances are likely to be related to a natural disaster or extreme weather event…".* These exceedances are considered to have been caused by sea salt from an elevated sea state condition being transported by strong onshore winds as part of a weather event. Weather events are cited in the Users' Guide as an example of exceptional events. The RMA framework is based on the principle of sustainable management when making resource management decisions. There is no evidence that this event is related to poor resource management of air as a resource. It is considered that the source of the PM_{10} exceedance on 31 December 2025 is an increased ratio of sea salt particles within the local profile. This was generated by the elevated sea state and wind patterns associated with a deep low pressure system centred to the west of the North Island and an adjacent blocking high pressure system to the east of the North Island, this setup pushed a north/north-easterly wind flow onto the Bay of Plenty coastline. This connected series of meteorological events provided a means of particle generation and transportation and appears to be not uncommon as evidenced both by past external SEM analysis and our expanding data collection and consideration. It is unreasonable to expect BOPRC to control an emission when it originates from a specific weather pattern. The 2022 HAPINZ 3.0 report indicates that sea spray is a source of particulate matter (PM) within New Zealand. In the MMA, adjacent to Ranch Road (which is itself within the BOPRA), sea spray has been identified as a PM source through a variety of monitoring programmes. Sea spray was a key contributor to two weather-related PM_{10} exceedances in June 2021, and further exceedances in April 2022, August 2022 (two) and April 2023, recorded at monitors in the MMA. All these events, as well as the five exceedances recorded to date at the Ranch Road monitoring site, have been considered exceptional circumstances by the Minister. The October 2024, April 2025 and July 2025 exceedances at the Ranch Road monitoring station are further instances of a specific combination of meteorological events resulting in exceedances of the PM_{10} standard in the Mount Maunganui area. BOPRC's monitoring of air quality has led to an increasing body of historical data within the MMA (and increasingly at Ranch Road, within the BOPRA). This indicates that specific weather conditions can lead to increased salt spray and elevated PM_{10} readings, sometimes resulting in exceedances of the NES PM_{10} standard. This knowledge has been further supported by a source apportionment study undertaken at the Ranch Road site (and one other location closer to the Port) by GNS and funded by the Port of Tauranga. For several earlier exceedances at the Rata Street monitoring site, we commissioned Scanning Electron Microscope (SEM) analysis of filter samples to contribute to exceptional circumstances applications, as a matter of completeness. In addition, SEM analysis of filter samples was undertaken for three exceedances recorded at Ranch Road: October 2024, because it was the first recorded at the site; for one of the July 2025 exceedances at the request of the Ministry to discount the possibility of a wintertime domestic heating PM signature; and this December 2025 event to have a closer look at the $PM_{2.5}$ fraction. However, the cost to the ratepayer of this external analysis and the subsequent staff processing and evaluation is considerable.

Supporting evidence (eg, ***meteorological report***)	☒ **Attached: X**	☐ Not attached

9 March 2026





Shane Iremonger

Principal Advisor, Science.

Reuben Fraser

General Manager, Regulatory Services.

Background

The Ranch Road monitoring station is the most recent addition to the Regional Council's monitoring network and an integral part of the wider ambient air quality monitoring network adjacent to the Mount Maunganui Airshed (MMA). Like all the sites within this network, it is operated by WaterCare Ltd under contract for the Regional Council. Quality assessed and controlled data is provided from WaterCare on a following month basis. The data used in this supporting document is part of that monthly delivery QA/QC data batch.

Located at the eastern-most position within the network (Figure 1) means that the Ranch Road site is fully exposed to a wide range of anthropogenic and natural sources.



Figure 1. Ambient air quality monitoring sites within the Mount Maunganui Airshed.

Table 1. Ranch Road PM_{10} exceedances.

Date	***Location***	***PM10 24-hour average***
3 October 2024	*Ranch Road*	*61µg/m³ **
17 April 2025	*Ranch Road*	*59µg/m³ **
19 April 2025	*Ranch Road*	*51µg/m³ **
4 July 2025	*Ranch Road*	*65µg/m³ **
29 July 2025	*Ranch Road*	*56µg/m³ **
31 December 2025	*Ranch Road*	*56 µg/m³*

** Caused by an exceptional circumstance and approved by the Minister*

The PM_{10} exceedances can be seen in the full daily timeseries plot (Figure 2).

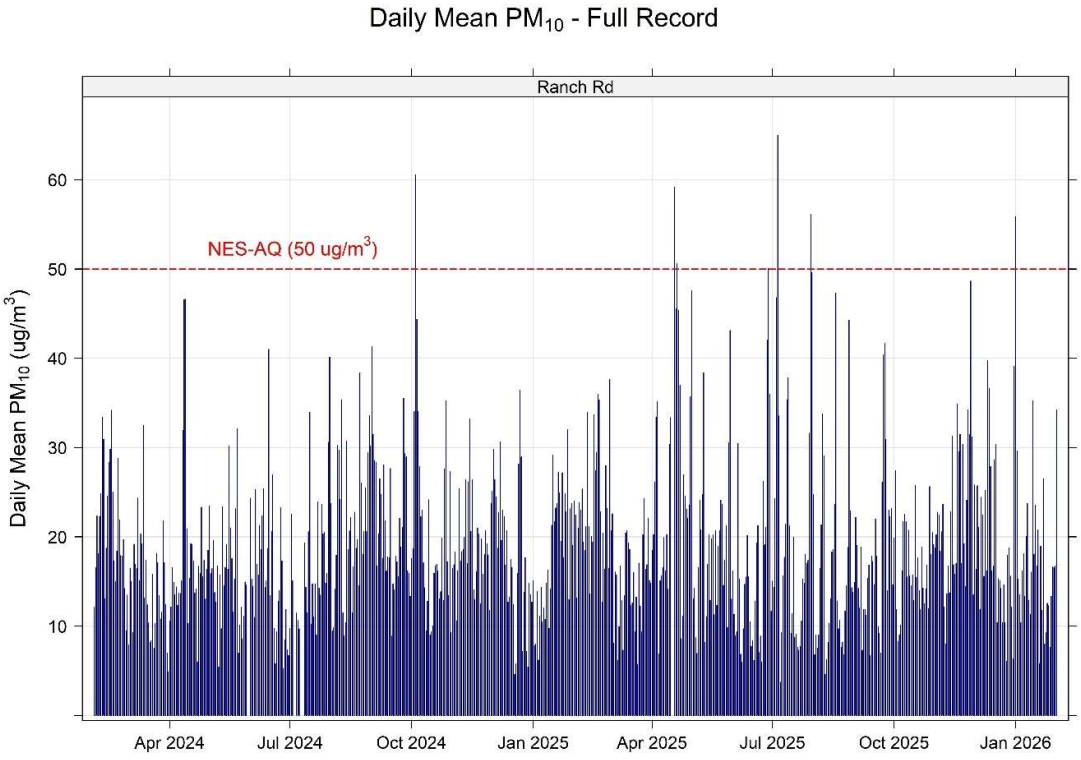


Figure 2. Ranch Road PM_{10} 24-hour timeseries, full record.

Like all ambient air quality monitoring sites located within urban areas, the full timeseries from the MMA exhibits considerable variability (Figure 3). The only real difference from other urban areas is the absence of a dominant wintertime domestic heating signature, such as that shown at the Council's Edmund Road monitoring site in Rotorua. Analysis shows that the opposite is often the case with the Mount Maunganui sites, where an elevated summer pattern can be statistically defined, which is a result of climatic/meteorological drivers, coupled with anthropogenic activity.

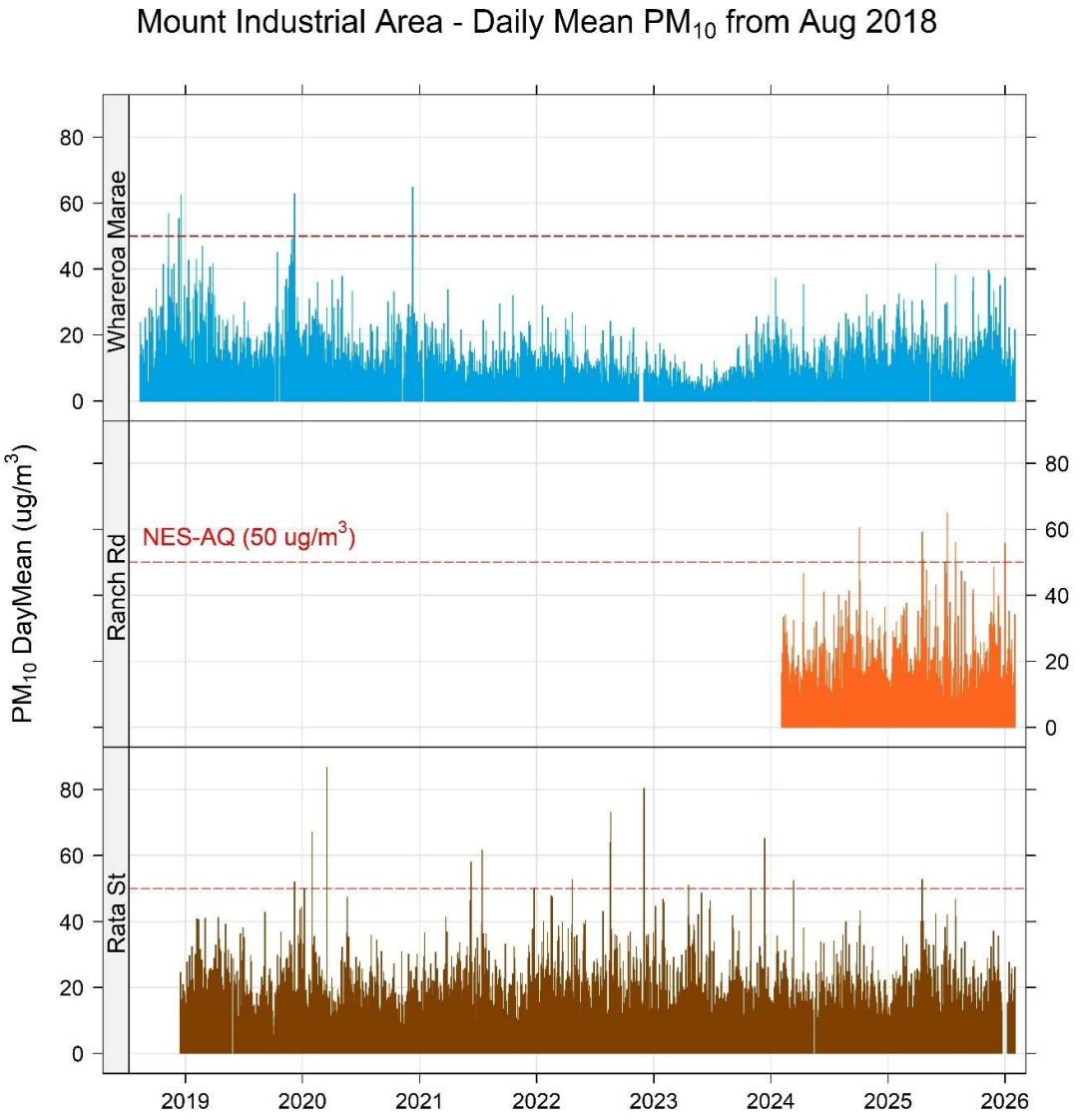


Figure 3. Full PM_{10} data for a selection of sites within the Mount Maunganui Airshed and Ranch Road.

The Ranch Road "Max" polar plot at Figure 4 shows several source patterns whereby higher PM_{10} concentrations are experienced at the site when winds are from the south-west, north-west and east. The eastern PM_{10} signature is when winds are stronger and, interestingly, there is a situation when very light conditions from the northwest result in high concentrations, which could be a local transport signature or even a home heating contribution. For the "Mean" polar plot, there is a strong signature for a range of windspeeds from the arc in which the coastal environment is situated. However, this signature is more prominent when the windspeeds increase. Other sectors of the compass do show instances of elevated PM_{10} values but winds from the coastal sector typically have high particle concentration loads in comparison.

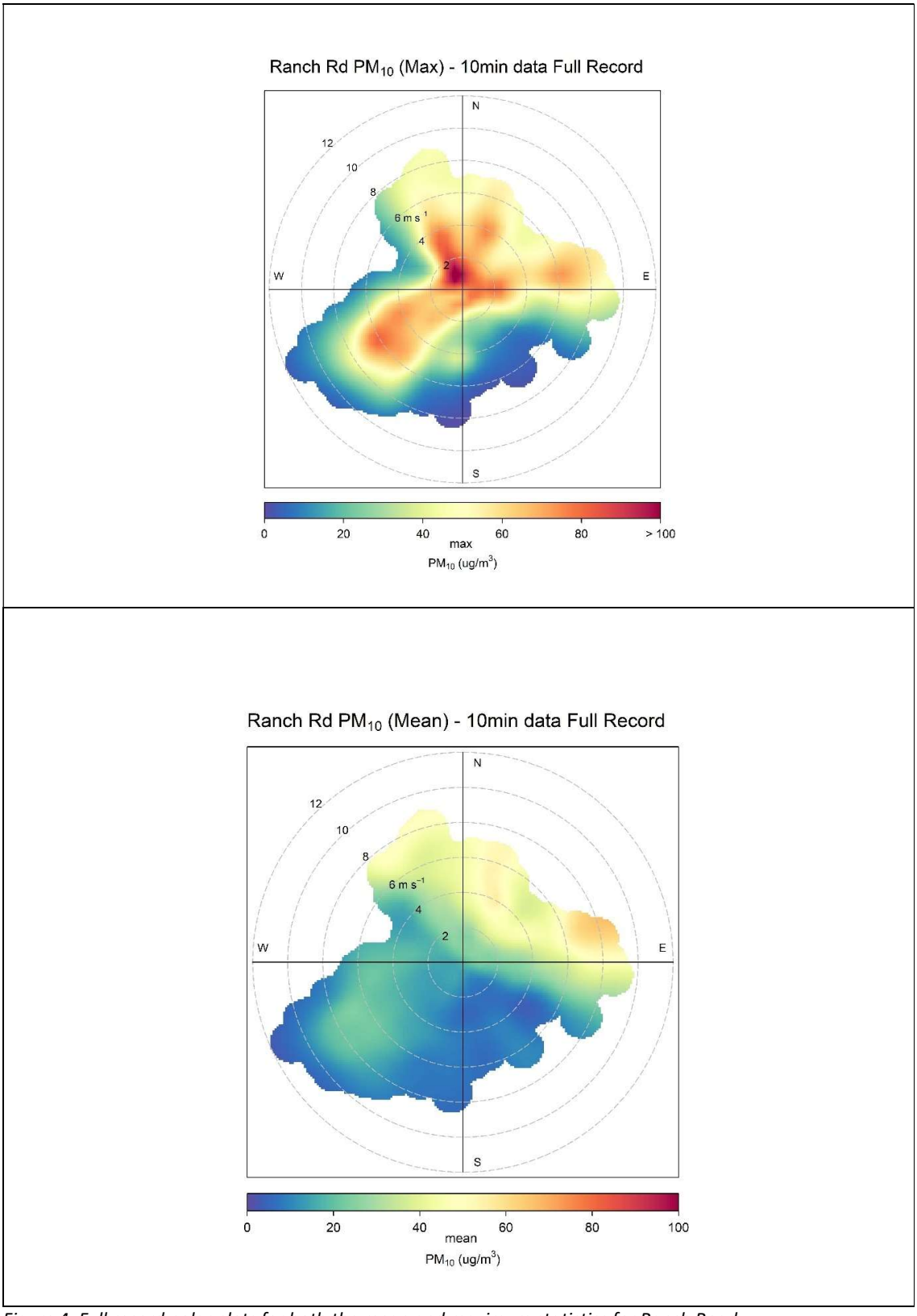


Figure 4. Full record polar plots for both the mean and maximum statistics for Ranch Road.

The spatial aspect can be seen in Figure 5 when the Ranch Road "Max" polar plot (from Figure 4) is overlaid on a recent aerial image. It shows industrial sites on the eastern-most boundary of the adjacent MMA to the left, with the Ranch Road monitor situated in the centre, within the residential land uses of this part of the BOPRA.

Major anthropogenic particle sources are to the south/south-west and coastal sources are in an arc from the north through to the east.

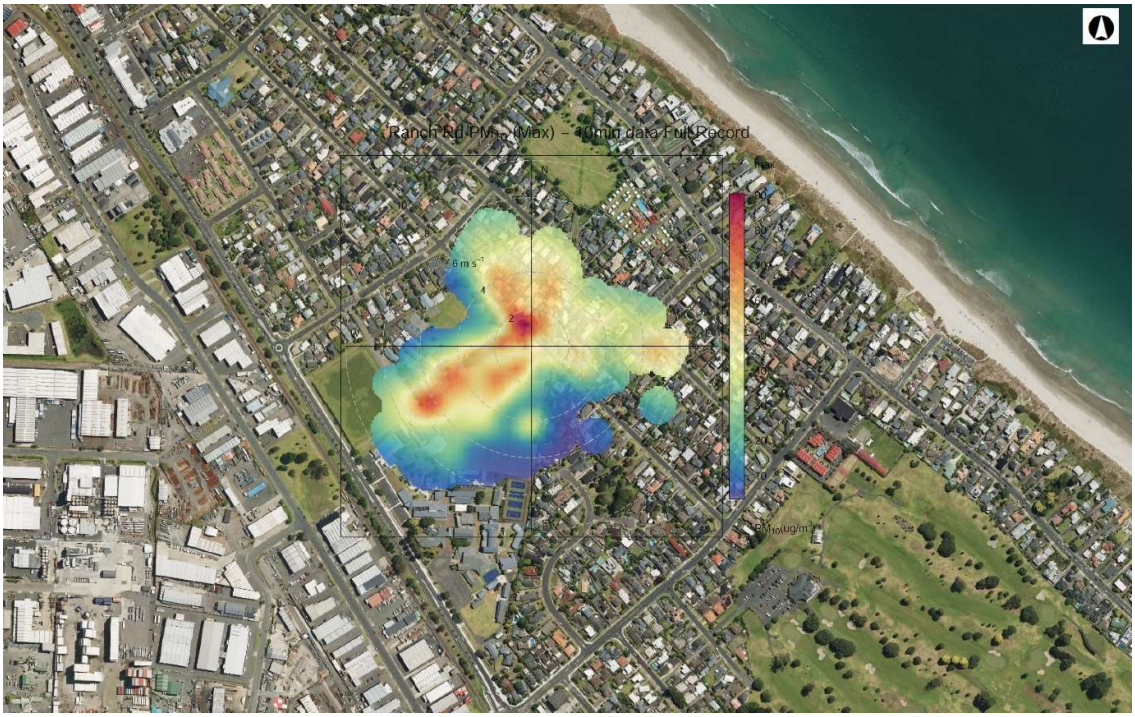


Figure 5. The Ranch Road "Max" polar plot overlaid on aerial imagery to show source locations.

31 December 2025 PM_{10} exceedance event

The following information builds on the background information in the previous section and is more specific to the PM_{10} exceedance events recorded at the Ranch Road monitoring station on 31 December 2025.

Wind direction was investigated and shown to be within the north-east quadrant (Figure 6). This is a band that is away from the industrial sources of PM_{10}, and potential upwind sources are traffic roadways, residential areas, and the Bay of Plenty coastal environment.

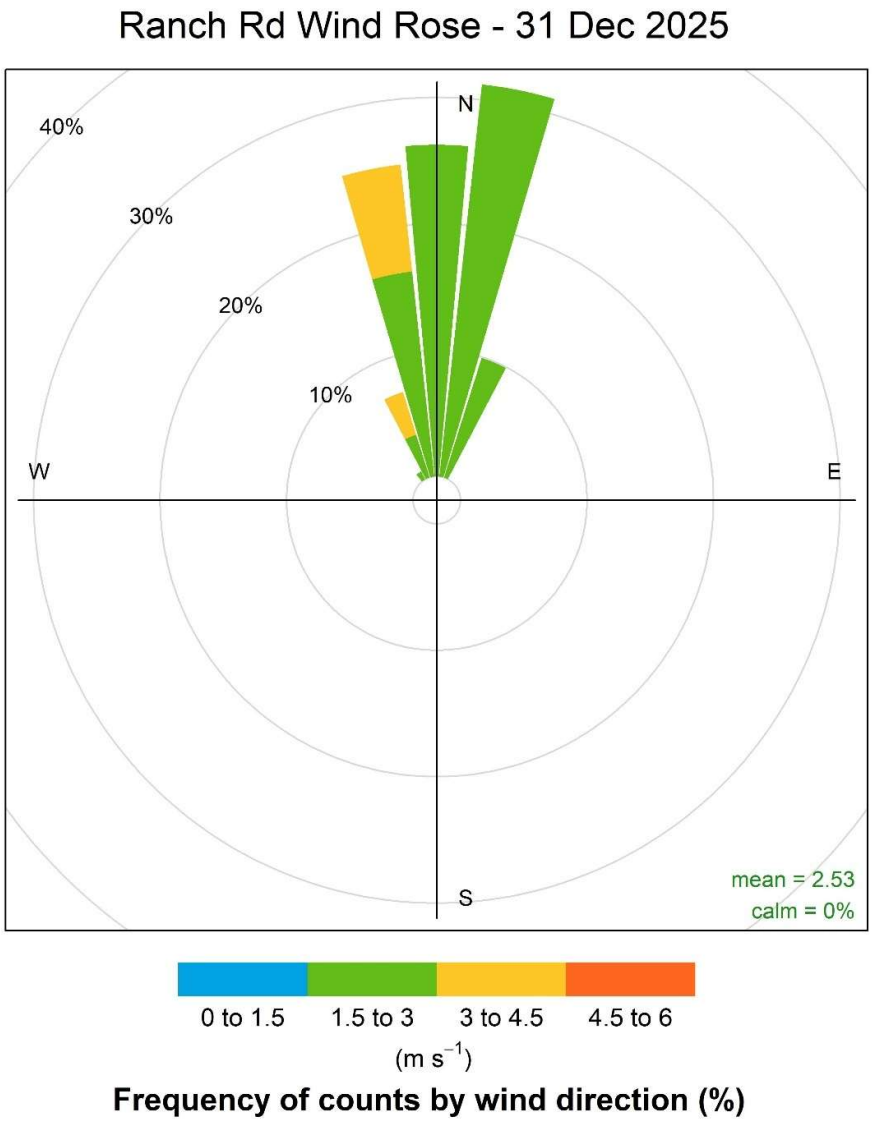


Figure 6. Wind roses for the period 31st December 2025.

The wind flow over the Bay of Plenty is shown in the following maps (Figure 7). They show several important features and drivers related to the exceedance event. Firstly, the presence for several days of one depression located to the north of the Bay of Plenty and another in the Tasman Sea, and a substantial anticyclone to the east of the North Island. The resulting wind flow over the Bay of Plenty is a north-easterly one with a substantial fetch which creates a sea state which will be discussed further in this section. The depression weakened after several days but the anticyclone's continued presence to the south saw a persistent north-east/easterly wind flow.

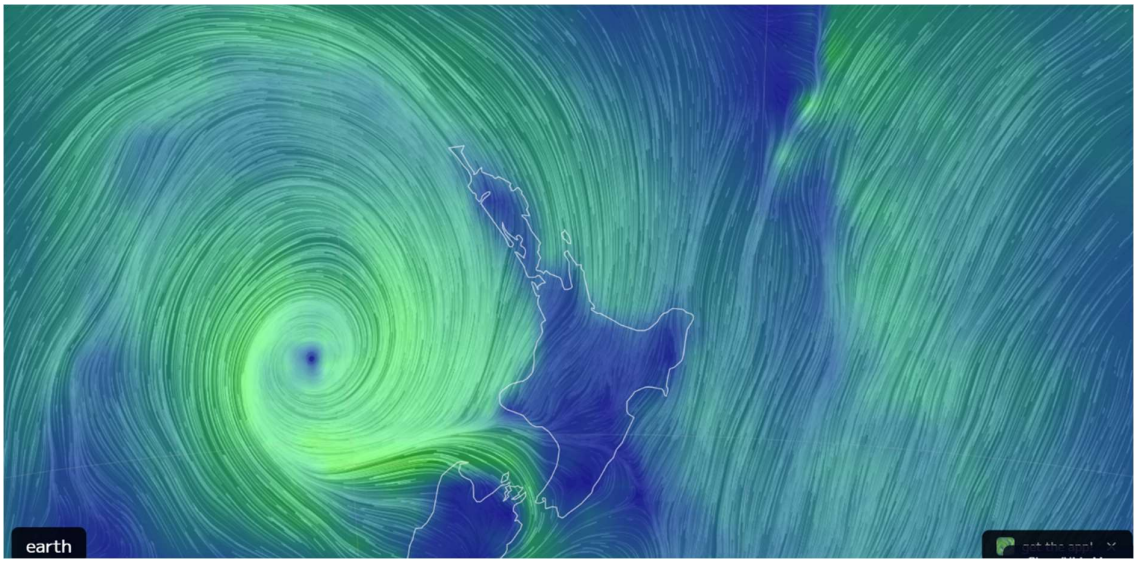


Figure 7. Modelled map for the period of interest.

PM_{10} 24-hour datasets from the MMA sites and Ranch Road (Figure 8) show an increase in PM_{10} concentration over a period leading up to and including the date of the exceedance. It should be noted that individual site locations are not equidistant from the coastline (as shown in Figure 1), therefore the same general patterns of increasing concentrations may apply to all datasets, but site-specific concentrations will vary, which is commonly seen in widespread particulate event such as those associated with sea spray events.

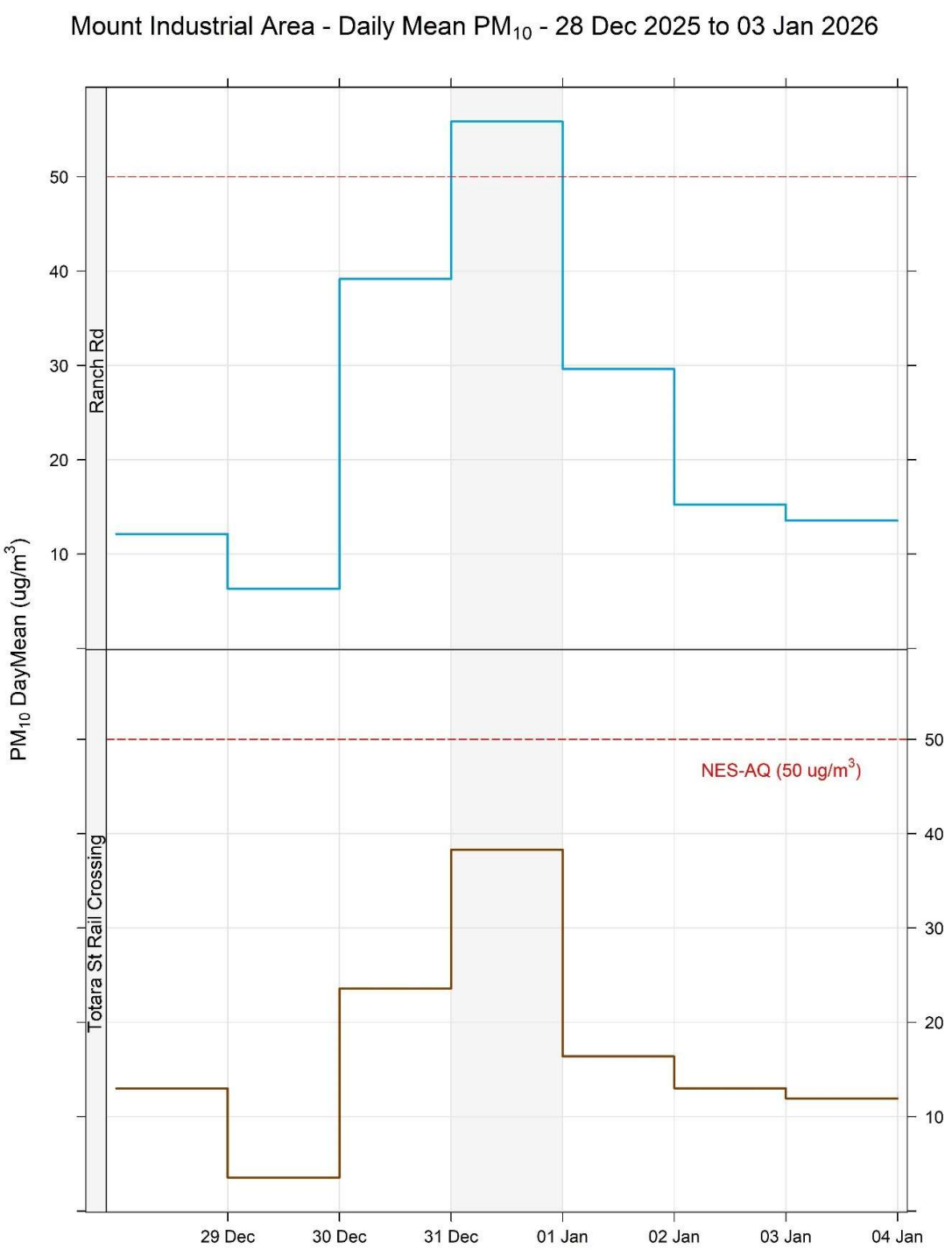


Figure 8. Daily PM_{10} plots for the MMA site and Ranch Road.

The Ranch Road timeseries for the event is shown in Figure 9. The plot shows a developing level of particle concentrations which peak during the day of the exceedance and then decline during a period of subsequent south-westerly winds. The north/north-easterly wind direction relates well with the location of the coastal environment. This pattern is also evident at the Rata Street site (Figure 9). This north-easterly/increasing concentration relationship is further demonstrated with the polar plots in Figure 11, with high values recorded when the north-easterly wind flow is present.

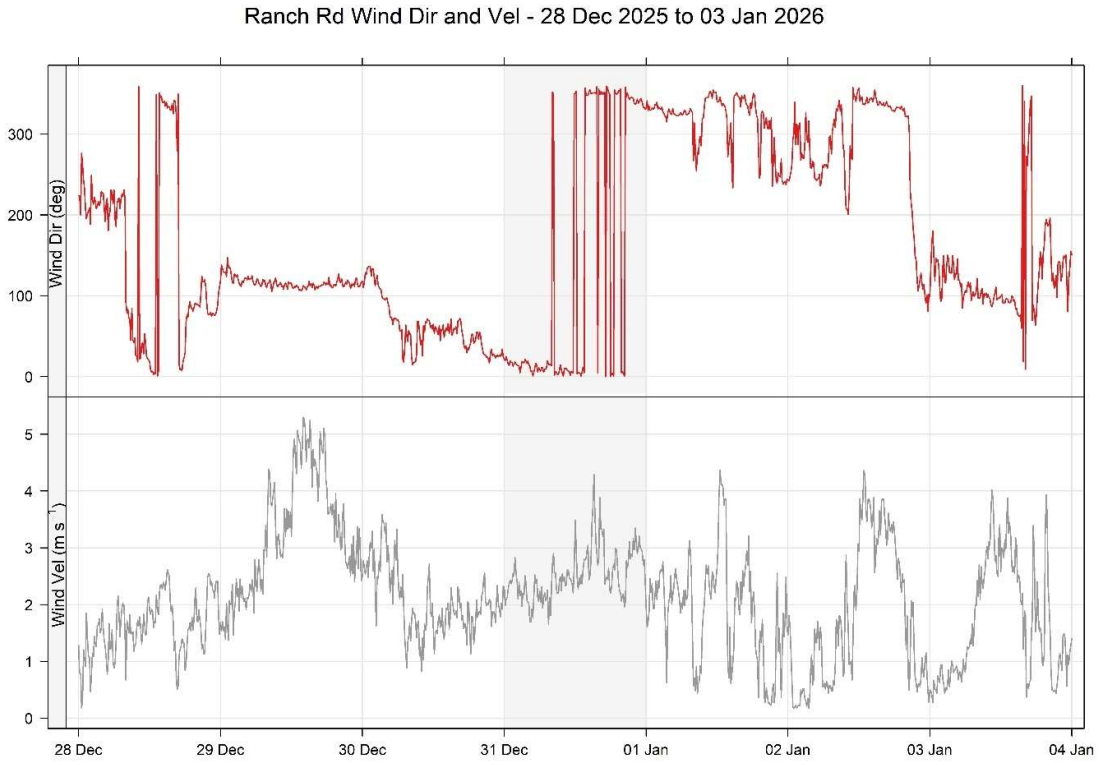


Figure 9. Wind speed and wind direction for 28th December to 4th January 2026 at Ranch Road.

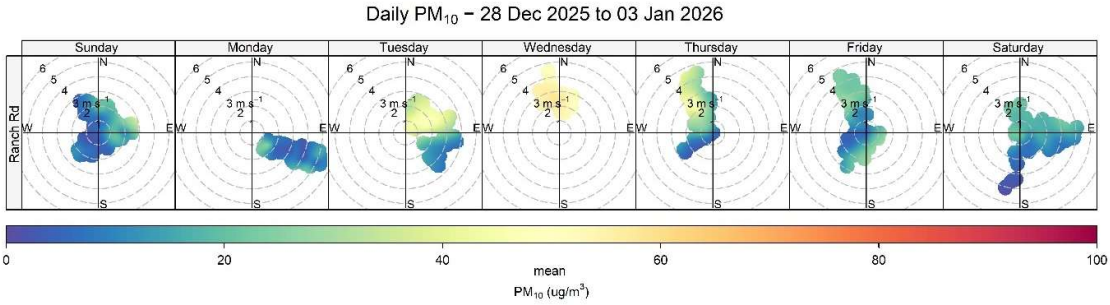


Figure 11. Polar plots for Ranch Road, Rata Street and Totara Street for the December 2025 event and adjacent days.

In addition to traditional air quality datasets, several other parameters have been checked as part of this investigation. Wave parameters from a wave buoy located within the Bay of Plenty, approximately 12km off the coastline were also examined. As can be seen in Figure 12, during the time of the PM_{10} exceedance, an

elevated sea state event was present within the Bay of Plenty. This was sufficiently elevated to result in areas of significant coastal shoreline erosion within the western Bay of Plenty. Wave heights were in a range of 2 to 6 metres for a period of several days. It is this elevated sea state that generated a source of natural sea spray particles that persisted and accumulated over several days leading up to and during the day of the exceedance.

Council officers didn't note any anthropogenic activities as possible causes for these exceedances within the nearby Mount Maunganui area, and furthermore the Council's Pollution Hotline received no calls that could be related to such activities either.

In the instance of this 31 December 2025 exceedance, we believe that the meteorological conditions recorded prior and up to the event, strongly resemble those that accompanied the 11 earlier events at Rata Street and Ranch Road for which BOPRC applied to the Minister (and received confirmation) as exceptional circumstances.

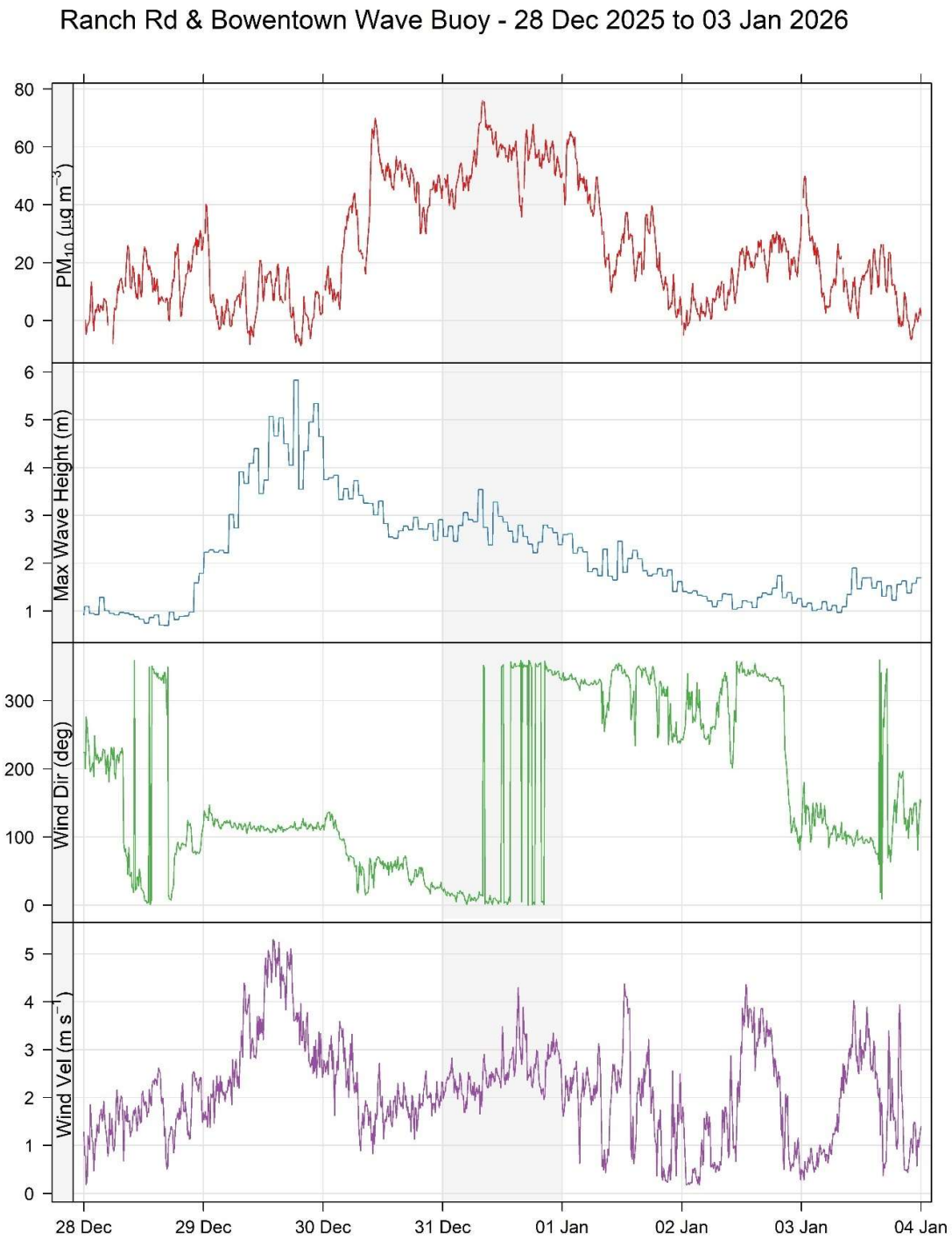
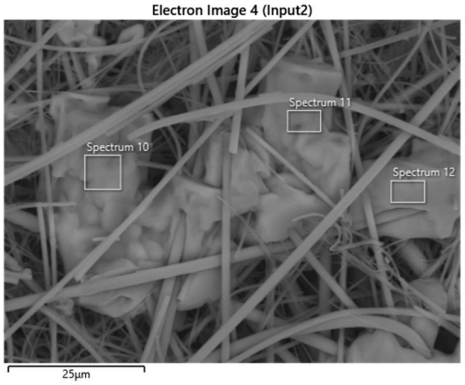


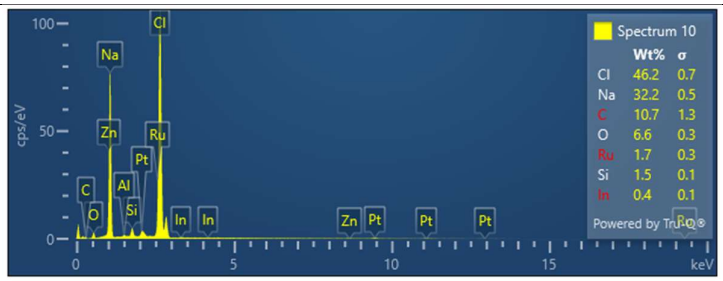
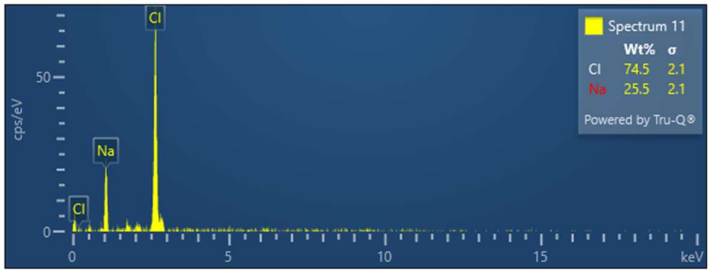
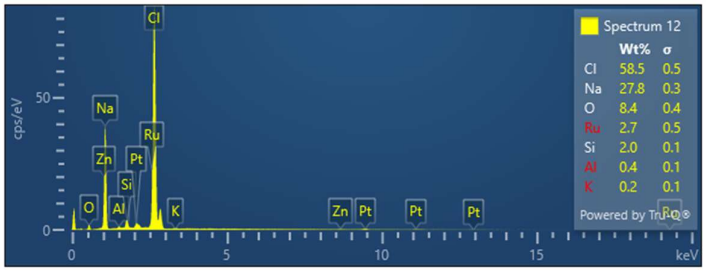
Figure 12. Ranch Road air quality and wave data for the event.

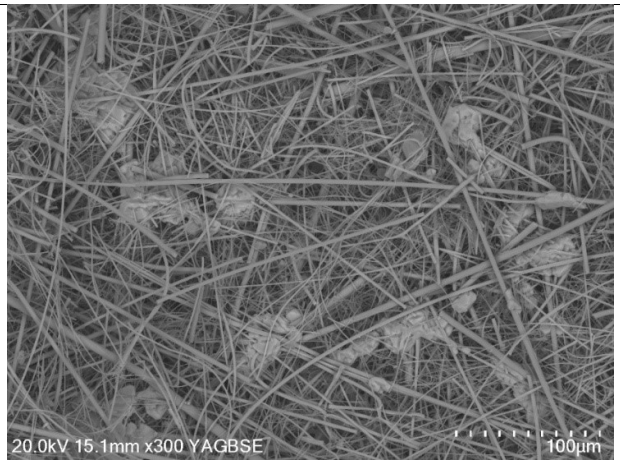
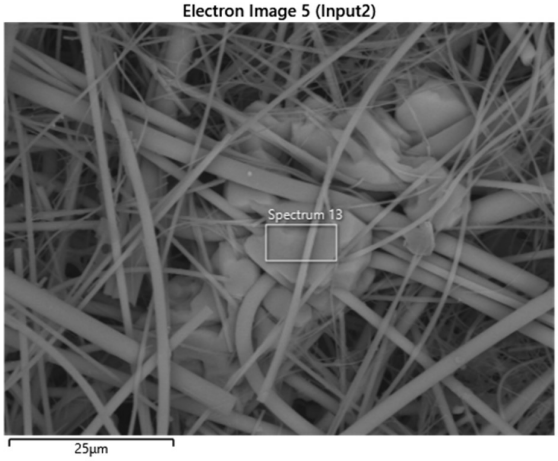
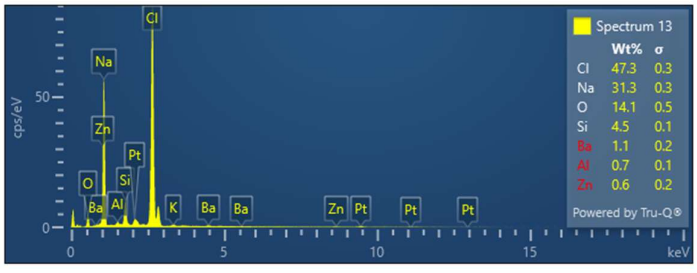
SEM / EDS analysis

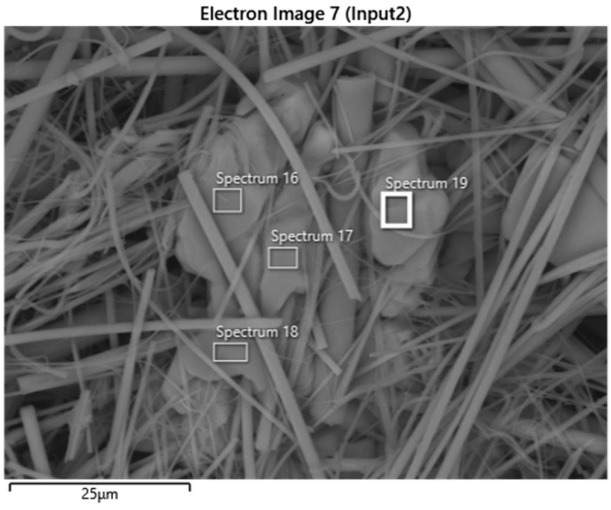
The following results (Table 2) are from SEM and EDS analysis performed by Dr Stella Reynova, Advanced Technical Officer SEM/XRD, Division of Science, Engineering and Computing, at the University of Waikato on the supplied filter tape for the event (Table 2). Note: three SEM images are produced for the 24-hour period; midnight to 8am, 8am to 4pm, and 4pm to midnight. The SEM/EDS analysis for the 31 December 2025 event shows the completely dominant presence (no other particles were visually determined) of cube-like particles (some of which have deteriorated due to moisture). They are indicative of marine aerosol salt particles by both their regular shape and generally larger size, frequently measuring less than 10 microns, but predominantly greater than 2.5 microns. This differs from typical combustion-type particles, which are usually irregular in shape, and usually much smaller in size, indicative of them being less than $PM_{2.5}$. The EDS elemental analysis showed a dominance of Na and Cl composition for the cube-shaped particles, which reinforces the Council's belief that sea spray was responsible for the recorded exceedances.

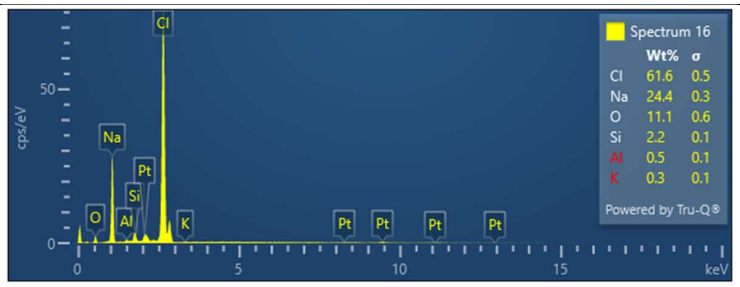
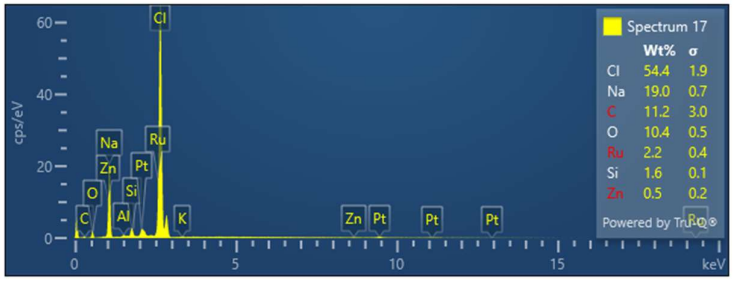
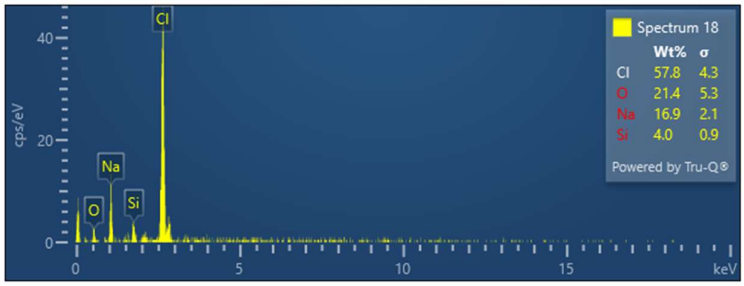
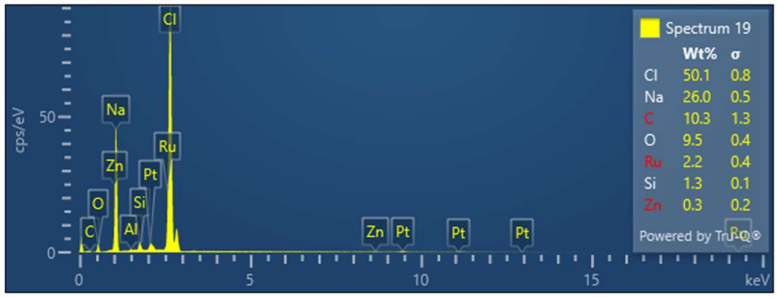
Table 2. SEM/EDS analysis results for the PM_{10} BAM filter tape for the 31st December 2025.

Title	Imagery/Spectra	Comment
00:00 – 08:00 SEM x300		
00:00 – 08:00 SEM x1500		
00:00 – 08:00 SEM x1500		With spectra sites labelled

00:00 – 08:00 SEM x1500 Spectrum 10		
00:00 – 08:00 SEM x1500 Spectrum 11		
00:00 – 08:00 SEM x1500 Spectrum 12		

Title	Imagery/Spectra	Comment
08:00 – 16:00 SEM x300		
08:00 – 16:00 SEM x1500		
08:00 – 16:00 SEM x1500		With spectra site labelled
08:00 – 16:00 SEM x1500 Spectrum 13		

Title	Imagery/Spectra	Comment
16:00 – 00:00 SEM x300		
16:00 – 00:00 SEM x1500		
16:00 – 00:00 SEM x1500		With spectra site labelled

16:00 – 00:00 SEM x1500 Spectrum 16		
16:00 – 00:00 SEM x1500 Spectrum 17		
16:00 – 00:00 SEM x1500 Spectrum 18		
1600 – 00:00 SEM x1500 Spectrum 19		

PM_{10} and $PM_{2.5}$ information

The following plot (Figure 13) shows the relationship between $PM_{2.5}$ and $PM_{10.}$ Combustion particles are typically associated with the finer fraction ($PM_{2.5}$). The plots show that this proportion was very low during the period of the event. These dataset results also support the earlier presented SEM/EDS results which show a marine aerosol-dominated event.

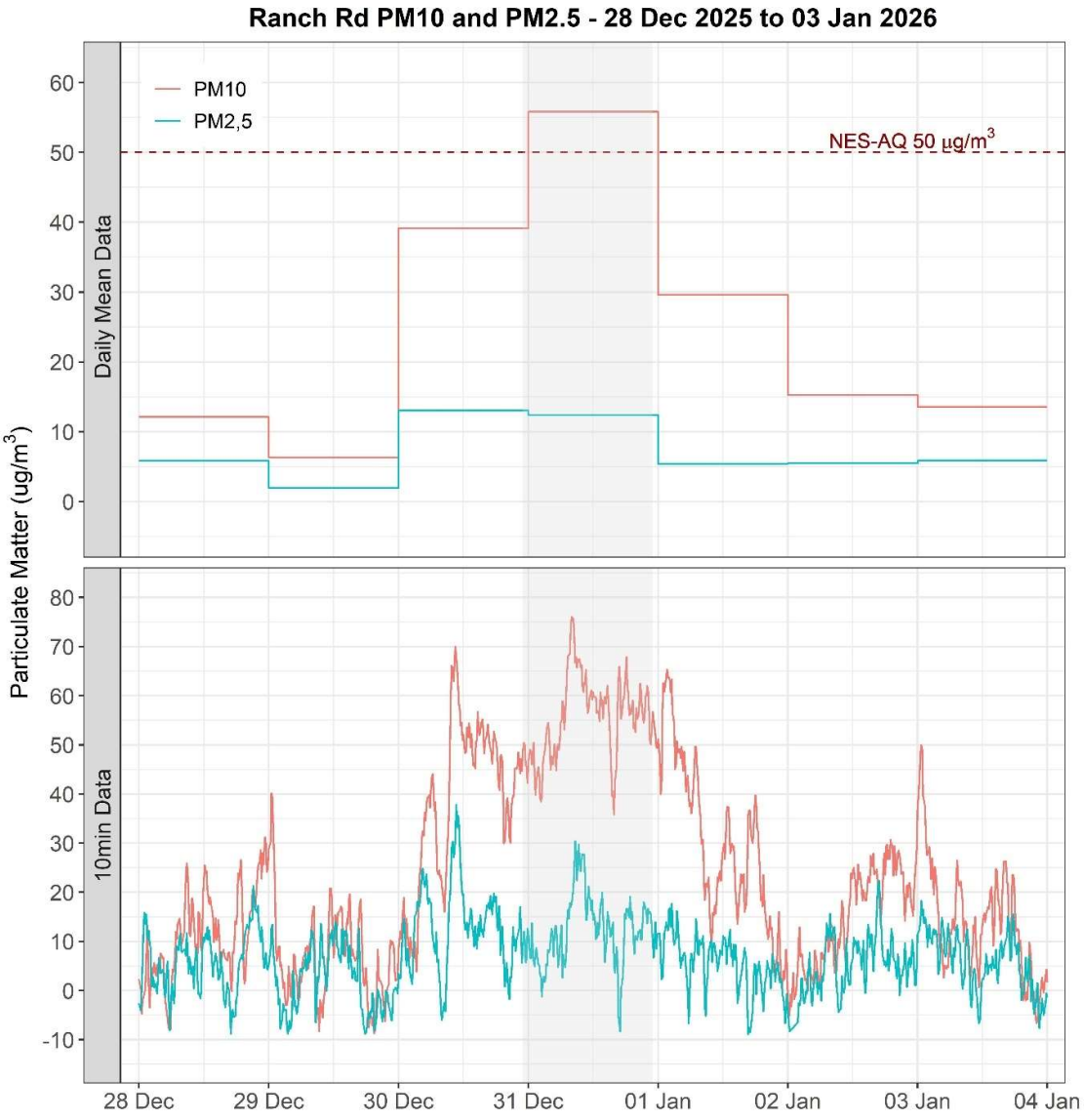


Figure 13. PM_{10} and $PM_{2.5}$ plots for the event and adjacent days.

Conclusion

The information presented within this supporting document demonstrates a pattern of recorded ambient air quality and meteorological data for 31 December (and preceding days) that is in line with the influencing factor of a natural coastal environment source (sea spray-derived particles). This presence of natural particles resulted in concentrations of PM_{10} recorded at the Ranch Road monitoring site that exceeded the 24-hour standard of 50µg/m3 on 31 December and an increase in PM_{10} concentrations in the preceding days, with the entire PM_{10} "event" being the result of an elevated sea state. This phenomenon appears to be not uncommon as our datasets (and analysis) continue to grow and develop as BOPRC commits significant resources to managing the air quality within the Mount Maunganui area, especially within the MMA.

