Annual Air Quality Report

1 September 2021 – 31 August 2022

tasman district council | Te Kaunihera o te tai o Aorere

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1. Introduction

1.1. This report summarises the air quality work programme undertaken between 1 September 2021 and 31 August 2022. This includes the winter 2022 results for air quality monitoring for particulate pollution in the Richmond Airshed against compliance with the requirements of the Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (Air Quality NES). Temporary particulate monitoring results from Motueka, Brightwater, Wakefield and Riwaka during winter 2022 are also presented. The work programme also includes compliance and enforcement action, our non-regulatory programme (e.g. education and supporting communications), and discharges to air policy planning.

1.2. The report is structured as follows:

- **Section 2** – provides information on why air quality is important
- **Section 3** – sets out the legislative framework for air quality
- **Section 4** – provides the winter 2022 monitoring results and analysis for the Richmond Airshed, and towns of Motueka, Brightwater and Wakefield
- **Section 5** – summarises national research reports published late 2021 and 2022
- **Section 6** – summarises the complaints received in relation to discharges to air complaints and compliance actions undertaken between 1 April to 30 September 2022
- **Section 7** – sets out the non-regulatory work programme including education and supporting communications
- **Section 8** – sets out the air issues and options work that is under way to inform the development of our new resource management plan.

2. Why is Air Quality Important?

2.1. Good air quality is fundamental to our wellbeing and is a taonga to be protected, restored or improved. The presence of contaminants in the air can have adverse health and nuisance effects on people, property and the environment.

2.2. Small particles of pollution are known as Particulate Matter (PM) as shown in Figure 1. They consist of solid and liquid particles suspended in the air and are usually measured in two sizes:

- PM_{10} refers to particles that have a diameter of less than 10 microns (coarse component).
- $PM_{2.5}$ refers to particles that have a diameter of less than 2.5 microns (fine component) and is a subset of PM_{10}.

2.3. Particulate matter comes from:

- Human activities such as burning of fuels for home heating, outdoor burning to dispose of green waste, car exhaust emissions, road dust and quarrying activities; and
- Natural sources such as wind-blown dust, plant pollen, sea salt and volcanic eruptions.

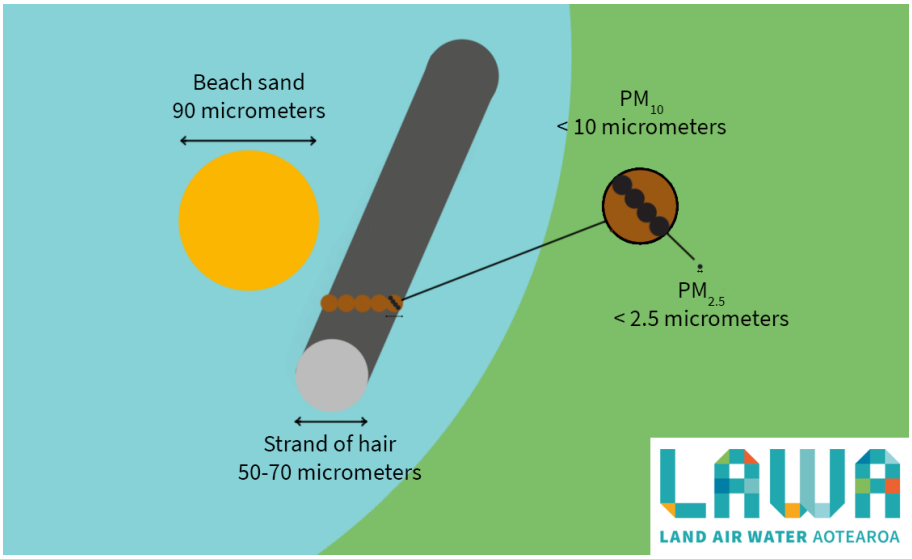


Figure 1: Relative size of PM_{10} and $PM_{2.5}$ (Source: Land, Air, Water Aotearoa)

2.4. There is a substantial body of evidence – both internationally and in Aotearoa New Zealand – relating to the adverse health impacts of particulate matter pollution. People with pre-existing respiratory and heart conditions, diabetes, the young, and older people are particularly vulnerable to air pollution. These tiny airborne particles of pollution can cause a range of health effects as shown in Figure 2.

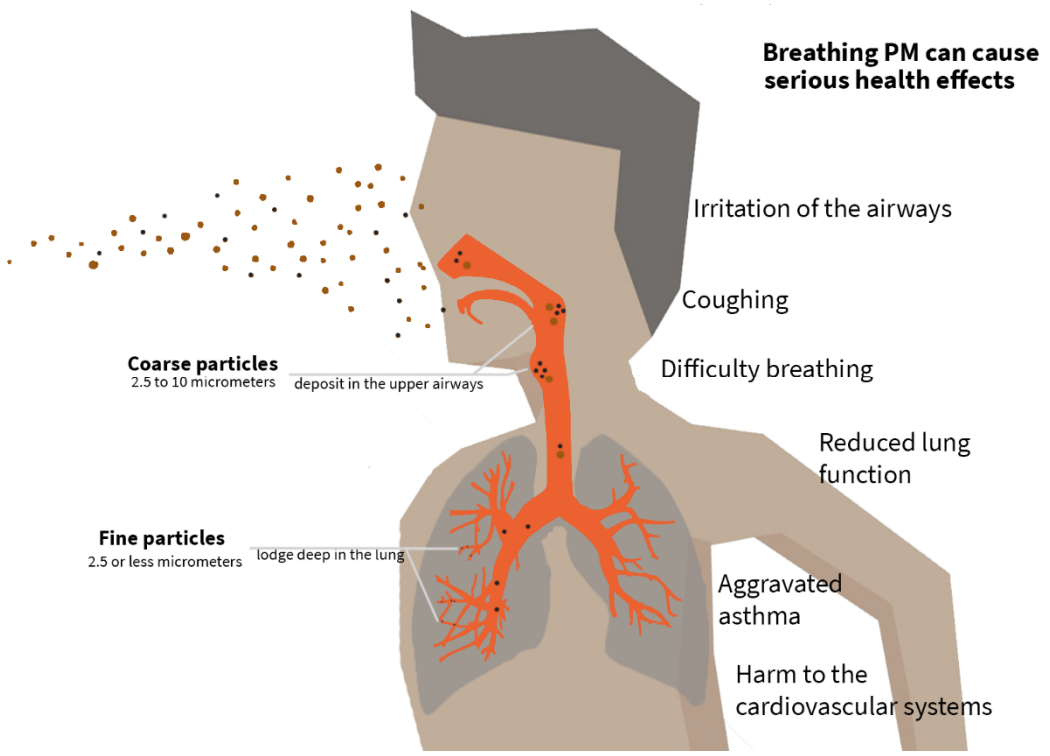


Figure 2: Examples of health effects of PM pollution (Source: Land, Air, Water Aotearoa)

2.5. Air pollution can also affect our day-to-day activities and quality of life. It can be a hazard or nuisance by:

- Smoke blown towards roads can reduce visibility and create traffic hazards.

- Smoke and odour make the air unpleasant and unhealthy to breathe.
- Particulates such as ash are a nuisance by landing on houses, cars, washing, and play areas.
- Particulates can contaminate garden soil, fruit and vegetables, and drinking water collected from roofs.

3. Legislative Framework and Guidance

This section sets out the legislative framework that manages air quality in New Zealand under the Resource Management Act 1991 (RMA 1991). Several legislative amendments (national and international commitments) are underway which will have implications for management of discharges to air in the Tasman District as outlined below.

3.1 National Environmental Standards for Air Quality

3.1.1 The National Environmental Standards for Air Quality (Air Quality NES) are regulations made under the RMA 1991 which aim to set a guaranteed minimum level of health protection for all New Zealanders. The Air Quality NES came into effect in 2004 and was amended in 2011. It includes a standard for PM_{10} for outdoor air quality, being 50 µg/m^3 (micrograms per cubic metre) calculated over a daily (24-hour) period (see Section 4.1, Table 1). The Air Quality NES does not apply to indoor air quality and currently does not have a standard for $PM_{2.5}$.

3.1.2 Under the Air Quality NES, the geographic boundary of each regional council or unitary authority is defined as an 'airshed', within which each council is responsible for monitoring and managing air quality. In addition, a council may apply to the Minister for the Environment to partition off a part of their region as a separate airshed for air quality management. These sub-airsheds are specified by notice in the Gazette and are commonly known as 'gazetted airsheds'. In the Tasman District there are two airsheds – the gazetted Richmond Airshed and the 'rest of district' airshed. Under the Air Quality NES, airsheds are only allowed one permissible exceedance of 50 µg/m^3 over 24-hours, in any 12-month period.

3.1.3 While the Air Quality NES provides a level of health protection from air pollution, it should be noted that the 50 µg/m^3 concentration limit for PM_{10} is not a 'no-effect' threshold. Council has a regulatory obligation to comply with this limit but achieving even lower concentrations of particulate matter will ultimately result in improved health outcomes for the community.

3.1.4 Over the last two decades, the focus on particulate matter pollution under the Air Quality NES has been to manage short-term exposure to PM_{10}. More recent international investigations suggest that greater focus should be placed on the management of smaller particles, $PM_{2.5,}$ as these are typically more harmful and are more controllable, given their greater apportionment to anthropogenic sources relative to PM_{10}. Evidence also supports management of longer-term exposure to particulate matter given the additional health effects arising.

Air Quality NES Under Review and wider RMA 1991 Reform

3.1.5 The Air Quality NES has been under review for several years. In 2020, the Ministry for the Environment (MfE) released a consultation document 'Proposed Amendments to the National Environmental Standards for Air Quality (2020)' which outlined proposed amendments to

address two issues, being (1) home heating[1] which is the primary source of $PM_{2.5}$ in New Zealand, and (2) proposed controls on mercury emissions to help New Zealand meet its obligations under the Minamata Convention on Mercury. The Council provided feedback at that time and MfE published a summary of submissions report in December 2020. Over 2021, the Air Quality NES review was paused while new evidence was gathered (see Section 5.2 on the Health and Air Pollution in New Zealand study).

3.1.6 More recently the review has stalled as a result of the wider Resource Management Act 1991 (RMA 1991) reforms. The RMA 1991 will be replaced by three new pieces of legislation[2], with the Natural and Built Environments Act (NBE Act) proposed to be the core replacement Act. It is proposed that a 'National Planning Framework' (NPF) under the NBE Act would set out integrated strategic direction on the management of the environment and would be a single, comprehensive framework that will consolidate national direction. The intent of existing national direction prepared under the RMA (for example national policy statements and national environmental standards) will form the basis of the NPF with updates necessary to ensure alignment with the new Act. Under the proposed new system, national direction included in the NPF would be implemented through Regional Spatial Strategies (long-term spatial plans) made under the proposed Spatial Planning Act, and Natural and Built Environments Plans (property-level rules and direction)[3].

3.1.7 The Natural and Built Environments Bill and Spatial Planning Bill were introduced into Parliament in November 2022. At the time of writing, the government intends to pass the proposals into law in this parliamentary term (e.g. by October 2023). However, it is unknown how MfE intends to incorporate the Air Quality NES review within the development of the new NPF or if it will form a later piece of work (as the NPF is still in development and was not released alongside the two Bills). Council staff will actively engage in any review process as the opportunity arises.

3.1.8 The outcome of the Air Quality NES review and/or wider RMA 1991 reform is likely to have significant implications for the management of the Richmond Airshed, and potentially other townships, if the Council is required to monitor and manage $PM_{2.5}$ given the results of monitoring to date (see Sections 4.3 – 4.6).

3.2 Resource Management Act 1991 – Greenhouse Gas Emissions

3.2.1 Since 2005, the RMA 1991 effectively stopped councils from considering the effects that discharges involving greenhouse gas (GHG) emissions to air have on climate change. On 30 November 2022[4], those prohibitions were repealed (under the Resource Management

[1] The 2020 MfE proposal was to introduce a daily $PM_{2.5}$ standard of 25 $\mu g/m^3$ with three or fewer exceedances allowed in a 12-month period. This is a lower threshold in comparison to the more recent 2021 WHO $PM_{2.5}$ daily guideline of 15 $\mu g/m^3$ with 3 – 4 exceedances allowed in a 12 month period.
[2] The Natural and Built Environments Act, Spatial Planning Act, and the Climate Adaptation Act.
[3] More information on the RMA 1991 reform is available at: https://environment.govt.nz/what-government-is-doing/areas-of-work/rma/resource-management-system-reform/key-components-of-our-future-resource-management-system/.
[4] The government approved a delay in the enactment of climate change amendments to the RMA from 31 December 2021 to 30 November 2022.

Amendment Act 2020)[5] and now enable councils to consider GHG emissions when consenting discharges to air.

3.2.2 Given that councils have not been required to exercise such a function, rules in existing plans are non-existent or not fit-for-purpose to address GHG emissions. To address this, MfE is currently working on a national policy statement and national environmental standard initially focusing on industrial process heat and staff are engaged in that process. Given MfE's focus on process heat, there are likely to be gaps in the policy framework of the Tasman Resource Management Plan to address GHG emissions. Staff will deal with this on a case-by-case basis in the absence of specific guidance from MfE via the resource consenting process.

3.2.3 Additionally, the Resource Management Amendment Act 2020 requires councils to have regard to emissions reduction plans and national adaptation plans when making and amending regional policy statements, regional plans and district plans (from 30 November 2022). In 2022, MfE released New Zealand's first Emissions Reduction Plan and National Adaptation Plan. MfE released implementation guidance for councils in late November on how to have regard for these documents. This is helping staff to better understand how the Council can respond to the requirements in the Plans through Council's own activities that generate GHG emissions in addition to regulation of activities under our resource management plan.

4 Air Quality Monitoring and Assessment

This section provides an overview of how air quality is monitored in the Tasman District, with focus on the Richmond Airshed's compliance under the Air Quality NES and more recent research monitoring in Motueka and Brightwater. It includes the results of the winter air quality monitoring in these townships for 2022.

4.1 Air Quality Standards and Guidelines

4.1.1 Table 1 illustrates the current Air Quality NES standards for particulate matter concentrations along with the Ministry for the Environment's 2002 ambient air quality guidelines and 2021 World Health Organization (WHO) guidelines. The current daily standard is for PM_{10} and there is also an annual New Zealand guideline for PM_{10}. There are currently no standards or guidelines in New Zealand for $PM_{2.5}$. The PM_{10} particulate matter standard under the Air Quality NES is a concentration limit set to protect human health and incorporates one allowable exceedance per 12-month period.

Table 1: Particulate Matter Standards and Guidelines[6]

Particle size	Averaging period	NES standard*	MfE 2002 guideline‡	WHO 2021 guideline§
PM_{10}	24-hour	50 µg/m^3	50 µg/m^3	45 µg/m^3
PM_{10}	Annual	-	20 µg/m^3	15 µg/m^3
$PM_{2.5}$	24-hour	-	-	15 µg/m^3

[5] For example, see RMA sections 70A, 70B, 104E, and 104F.

[6] µg/m^3 = micrograms per cubic meter. For example, 50 µg/m^3 refers to the weight of the particles in micrograms contained in one cubic meter of air.

$PM_{2.5}$	Annual	-	-	5 µg/m^3

* Resource Management (National Environmental Standards for Air Quality) Regulations 2004 - Schedule 1 Ambient air quality standards for contaminant.

‡ Ambient air quality guidelines: 2002 update, Ministry for the Environment.

§ WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide.

4.1.2 The WHO guidelines include both short term (daily) and long-term (annual) averages of pollutant concentrations. These guidelines were revised in 2021 and have more stringent criteria for particulate matter and other pollutants than previously. The guidelines represent the most up-to-date scientific understanding of the effects of key pollutants on human health. MfE will need to consider these updated guidelines as part of the current Air Quality NES review.

4.1.3 The Air Quality NES currently does not include a national standard for $PM_{2.5}$. However, it is anticipated that future Air Quality NES amendments will introduce one or more standards for $PM_{2.5}$. MfE's consultation document, 'Proposed Amendments to the National Environmental Standards for Air Quality (2020)', provided an indication of likely amendments (see paragraph 3.1.5 and footnote 1). However, that document precedes the more recent 2021 WHO guidelines and for councils there is now some uncertainty about the substance of the Air Quality NES review as a result.

4.2 Monitoring Instruments

Richmond Airshed

4.2.1 Particulate matter has been monitored in the Richmond Airshed since 2000 and the Air Quality NES standard for PM_{10} has been exceeded every winter until 2021 (where results are available). Concentrations of $PM_{2.5}$ have been measured in Richmond since October 2015. The Richmond air quality monitoring equipment is located at the dedicated air quality portacom building at 56 Oxford Street, central Richmond.

4.2.2 One instrument, a beta attenuation monitor (Thermo Scientific Model 5028i instrument), which measures PM_{10} (channel A) and $PM_{2.5}$ (channel B) simultaneously is used for monitoring Particulate Matter (PM) air quality in Richmond. This has been the main instrument for recording PM_{10} from January 2019 and complies with Schedule 2 of the Air Quality NES regulations. The PM_{10} has been collected in general accordance with Australian/New Zealand Standard AS/NZS 3580.9.11:2016 titled "Methods for sampling and analysis of ambient air—Determination of suspended particulate matter—PM_{10} beta attenuation monitors".

4.2.3 Previous instruments used in Richmond included the following:

- Thermo FH62 Beta Attenuation Monitor (FH62 BAM) used for PM_{10} reporting for the period August 2005 to December 2018 (with adjustment factors applied) and withdrawn in June 2021.
- Partisol gravimetric air quality sampler (R&P Model 2000) for period July 2005 until December 2020 and decommissioned as no longer required for co-location with FH62 BAM in Richmond. This instrument was set up temporarily in Brightwater over winter

2022 as a co-location instrument for the Brightwater and Wakefield study (see Section 4.6).

4.2.4 Watercare Services Limited carry out quarterly and annual calibrations on these instruments. Due to Covid-19 travel restrictions from August 2021 onwards, the instrument calibration audits on the instruments were delayed with the first audits undertaken in December 2021, followed by March, June and August 2022. Instrument flow problems were noted with the $PM_{2.5}$ channel for Richmond, with flows failing in December 2021 and March 2022. The failed flow was attributed to chamber pins not closing properly and the problem was likely present over the period from 1 October 2021 to 25 March 2022 and means the readings in the instrument were lower than actual. As the leak occurred during the summer period, this may affect the annual average value for this parameter, but not the number of exceedances, which usually occur in winter.

Motueka, Riwaka and Brooklyn

4.2.5 In 2018 the Council established an air quality monitoring program to better understand if there are air quality issues in the Motueka, Riwaka and Brooklyn areas. The program spans several years and involves temporary monitoring of PM_{10} and/or $PM_{2.5}$ to collect baseline data. This is to understand if there are air quality issues associated with smoke pollution (home heating and/or outdoor rural burning) in the wider area, which may require permanent monitoring and a need to introduce management tools.

4.2.6 In 2020 and 2021, a temporary monitoring site was established in Motueka, at Ledger Goodman Park, with one instrument set up for PM_{10} using an Air Quality NES approved monitoring instrument (Partisol 2025). In January 2022, the instrument was adapted to monitor the smaller size fraction $PM_{2.5}$ in order to better understand the air quality in the township. The results are reported in Section 4.4.

4.2.7 Council staff also commissioned Mote Limited to undertake temporary air quality monitoring in Riwaka this winter using a low-cost air quality sensor (called a 'dustmote') which is suitable for research purposes[7]. This study was a follow up from the 2021 Riwaka/Brooklyn study. The results from this Riwaka study are reported in Section 4.5.

Future Monitoring and Instruments

4.2.8 Through the 2021-2031 Long Term Plan, budget is in place to purchase a new Air Quality NES-approved monitoring instrument for Motueka if permanent monitoring is required in the township. Alternatively the budget will be used to replace/upgrade the Partisol at Richmond (2022/23 financial year). However, staff are delaying purchasing a new monitor until there is more certainty regarding requirements from an updated Air Quality NES (e.g. $PM_{2.5}$ monitoring and if a standard method is prescribed nationally for all councils to use).

4.2.9 Budget is also available for winter-time temporary monitoring as part of a 'surveillance' work programme of smaller towns in the District. Brightwater and Wakefield was completed in winter 2022 (brought forward from 2023 to 2022, see Section 4.6) and Murchison is budged

[7] 'Dustmote' sensors (Met One ES642 near-forward nephelometers) are easily locatable, low-cost air quality monitoring devices which are suitable for research purposes but are not an Air Quality NES approved instrument.

for winter 2026. The Air Quality NES only requires the identification and monitoring of airsheds where air quality standards are likely to be breached.

Future Monitoring – Nitrogen Dioxide

4.2.10 An air quality indicator which may be subject to future monitoring by Council is nitrogen dioxide (NO_2). In urban areas the main source of NO_2 is vehicle emissions (and NO_2 can be used as a proxy for other vehicle-related pollutants such as benzene, black carbon (e.g. soot) and volatile organic compounds). The current Air Quality NES 1-hour standard for NO_2 is 200 µg/m^3 and allows for 9 exceedances in a 12-month period. There is also an ambient air quality guideline of 100 µg/m^3 (24-hour) for NO_2. The 2021 WHO guideline recommends a long term (annual[8]) NO_2 level of 10 µg/m^3; and a short-term (daily, 24-hour) level of 25 µg/m^3 with three to four allowable exceedances per year.

4.2.11 Since 2007, Waka Kotahi has undertaken a national monitoring programme for NO_2 on state highways (as a proxy for vehicle-related air pollution) as part of their commitment to reducing vehicle emissions where this is a significant source of air pollution. Data on NO_2 levels from studies undertaken by Waka Kotahi[9]includes one site near the Richmond deviation and three sites in Nelson. The sampling is undertaken using passive diffusion tubes which are deployed for a month and then sent to a laboratory for results reported as a month time-weighted-average. This data is not able to be used as a direct comparison of NO_2 levels against the Air Quality NES one-hour average standard but can be used as an indicator for annual concentrations. In 2021 for Richmond[10], the annual NO_2 was 13 µg/m^3, which exceeds the 2021 WHO annual guideline of 10 µg/m^3.

4.2.12 To date, the Council has not undertaken any surveillance monitoring of NO_2 in Richmond. Monitoring by Nelson City Council for NO_2 and carbon monoxide has been undertaken using NES approved methods. Recent results for Nelson in winter 2021 indicated that there has been no exceedance of the 1-hour standard, and there were no exceedances of the 24-hour Ambient Air Quality Guideline value for NO_2. The 2021 WHO daily guideline was exceeded on three occasions[11] at one site in Nelson; the other site in Nelson had no exceedance of any of the standards.

4.2.13 As detailed in Section 5.2, the 2022 Health and Air Pollution in New Zealand (HAPINZ) report highlights that NO_2 from transport emissions has a much larger contribution to air pollution health impacts and associated social costs than previously thought. The results of this report, in combination with revised 2021 WHO guidelines, suggests that the Council should review the frequency of monitoring NO_2 as an indicator for transport emissions. This would also assist in Council's wider contribution to climate change initiatives.

[8] The revised 2021 WHO guidelines adjusted almost all air quality guideline levels downwards including NO_2 – the previous 2005 WHO annual NO_2 guideline recommended 40 µg/m^3.

[9] https://www.nzta.govt.nz/assets/resources/air-quality-monitoring/docs/Ambient-air-quality-nitrogen-dioxide-monitoring-data-summary-2007-2021.xlsx

[10] National air quality (NO2) monitoring network | Waka Kotahi NZ Transport Agency (nzta.govt.nz)

[11] Mote Limited "Nelson City Council Continuous Ambient Air Quality Monitoring Report for Blackwood and St Vincent Streets : May to October 2021" Final Report 14 Dec 2022

4.3 Richmond Airshed 2022 Monitoring Results and Analysis

4.3.1 The Richmond Airshed is monitored continuously because it exceeds the Air Quality NES standard for concentrations of particulate matter during winter months. It is classified as a polluted under the Air Quality NES and requires targeted management. The key source of pollution in the airshed is biomass combustion (burning of wood) over the cooler winter months, primarily associated with home heating.

Richmond Airshed PM_{10} Results and Meteorology

4.3.2 Based on the weather records from the Tasman District Council, 189 Queen Street meteorological monitoring site, the winter of 2022 had above mean temperatures for winter with a cooler period in June. The wind speed has been similar to the ten-year average for the first part of the winter in May and June and windier than average for July and August. The warmer and slightly windier conditions in winter 2022 were favourable in terms of air quality, as these conditions allow pollutants to dilute and disperse.

4.3.3 Daily 24-hour average PM_{10} concentrations measured using the BAM monitoring instrument in Richmond over the monitoring year period (1 September 2021 to 31 August 2022) are shown in Figure 3. The data capture rate for the Richmond BAM was 99% with valid daily PM_{10} data recorded for 98% of the monitoring period. The data for winter 2022 shows peak particulate matter concentrations coinciding with periods of cool and calm weather. There were no exceedances of the Air Quality NES observed (although one day was very close, see Table 2 and paragraph 4.3.5). Previous source apportionment work has shown smoke in the Richmond airshed is mainly associated with biomass combustion (wood smoke) primarily from the use of wood burners for home heating.

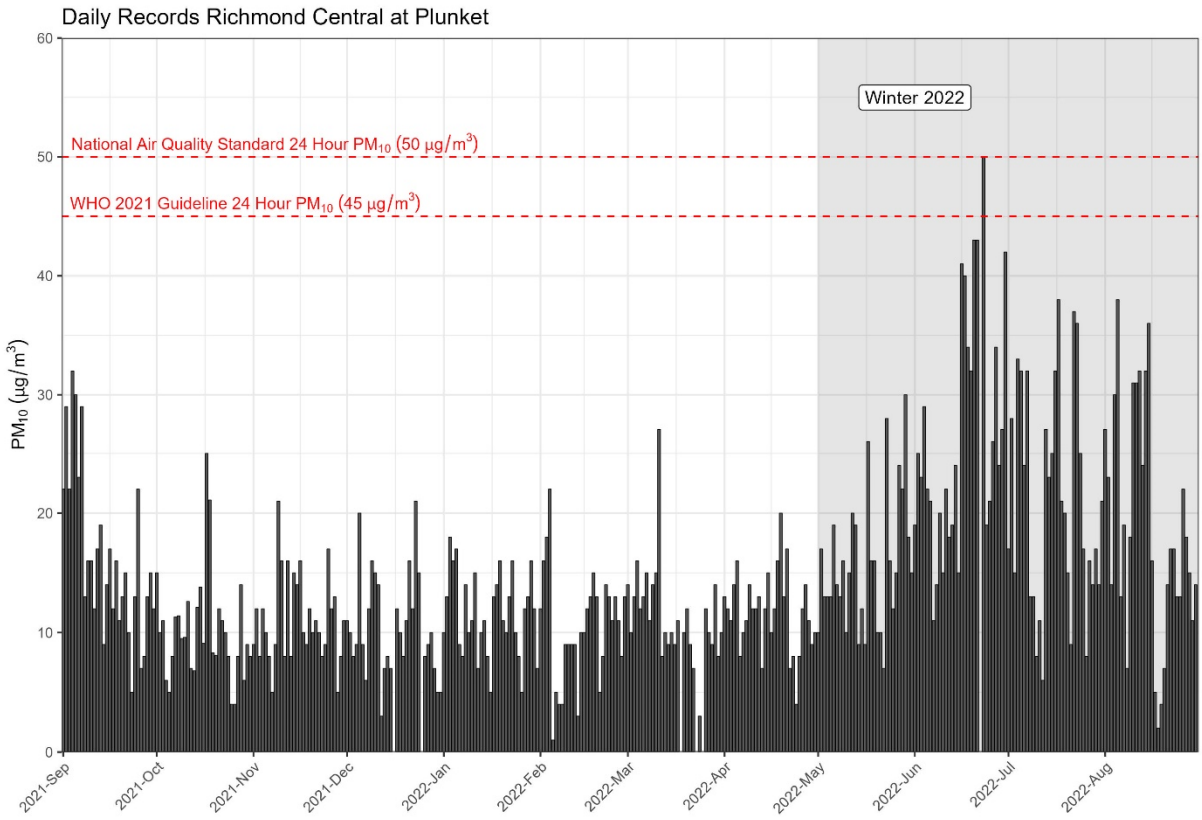


Figure 3: Richmond daily PM_{10} concentrations in µg/m³ (1 Sep 2021 – 31 Aug 2022)

4.3.4 Table 2 shows the PM_{10} daily average data for the year, starting 1 September 2021. The summary of annual average PM_{10} concentrations for Richmond for 2021/2022 is 15 µg/m³, which does not exceed the current MfE annual ambient air quality guideline value of 20 µg/m³ and equals the2021 WHO annual guideline of 15 µg/m³. The winter (May-August 2022) average was 20 µg/m³ and the average for the non-winter months (September 2021 – April 2022) was 12 µg/m³.

Table 2: Richmond Daily Average PM_{10} concentrations in µg/m³ in 2021/2022

Valid Data:					98%							
Data Capture Rate:					99%							
	2021				2022							
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Minimum	5	4	5	3	5	1	3	4	7	11	6	2
Mean	16	10	11	10	12	10	11	12	16	27	21	19
Median	15	10	10	10	11	10	10	12	15	24	20	17
Maximum	32	25	21	21	18	22	27	20	30	50	38	38
Air Quality NES Exceedances (>50 µg/m³)	0	0	0	0	0	0	0	0	0	0	0	0
WHO 2021 Guideline Exceedances (>45 µg/m³)	0	0	0	0	0	0	0	0	0	1	0	0
Annual Mean	15											

4.3.5 Over the monitoring period, the maximum PM_{10} daily average was 50 µg/m^3 (Table 3). This value is the Air Quality NES PM_{10} threshold concentration but is not a breach as the regulations specify that the contaminant must not 'exceed' its threshold concentration (e.g. is greater than 50 µg/m^3). However, this recorded value is greater than the 2021 WHO daily guideline value of 45 µg/m^3. This occurred when there were cool and calm conditions, with light wind speeds of 3-4km/hour and cool night-time temperatures. It is also noted that the 22 June 2022 was missing a daily record due to planned maintenance, so may also have been elevated. The period of cool and calm weather had been present for a few days prior to the exceedance of the WHO daily guideline for PM_{10}.

Table 3: High 24-hour PM_{10} values in Richmond in 2022

Date	PM_{10} Concentration measured (µg/m3)	Daily Wind Speed (km/hr)	Night-time 4-hour Temp (8pm-12pm) °C
Thursday 23/06/2022	50	3.4	6.4

4.3.6 PM_{10} has been measured in Richmond since 2000, with gaps in the data for 2001/2002 and continuous monitoring using a BAM from 2006. Figure 4 shows the number of exceedances of the daily particulate matter standard since monitoring began in Richmond. In 2022, the Richmond airshed had no exceedances of the Air Quality NES. Figure 5 shows the winter PM_{10} trend normalised to consider seasonal variations in wind speed and temperature and includes the number of estimated days in which meteorological conditions are comparable to historic records where exceedances were observed. Note that these "high pollution potential days" have only been calculated from 2006 onwards due to data availability. The trend in PM_{10} since monitoring records began in 2000 has shown a significant improvement (i.e decrease in number of exceedances) up until 2010 and then a tapering of reductions from 2010 to 2021. Although the monthly PM_{10} trend data for the last ten years suggests an improving trend, this should be treated with caution given the flat line trend with no significant reductions in second highest PM_{10} for the preceding years from 2014 to 2021.

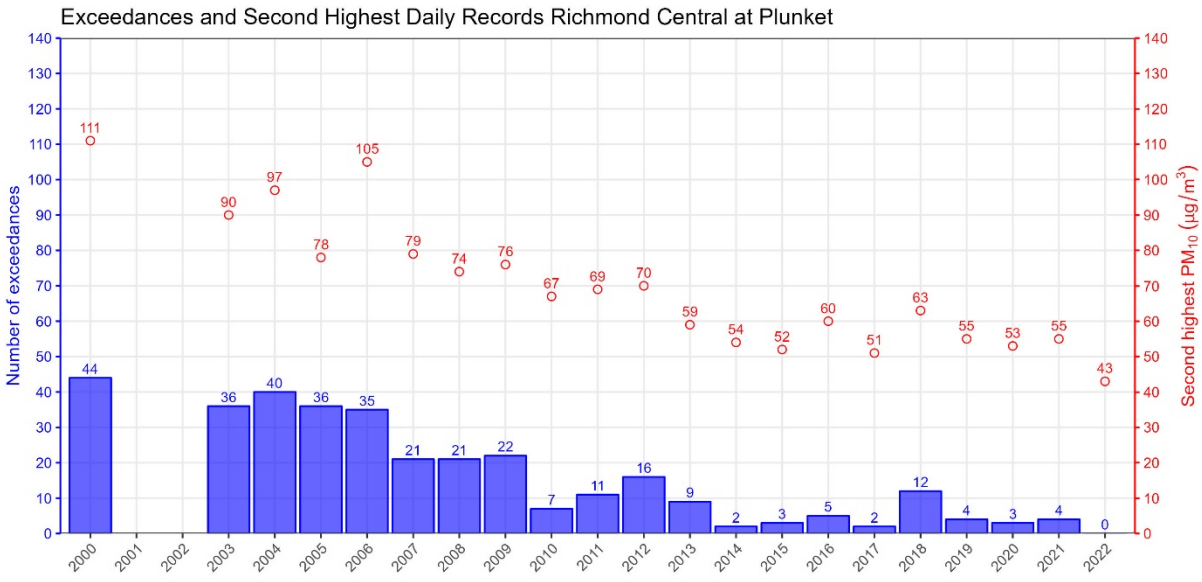


Figure 4: Number of Exceedances of 24-Hour PM_{10} (Richmond, 2000 to 2022)

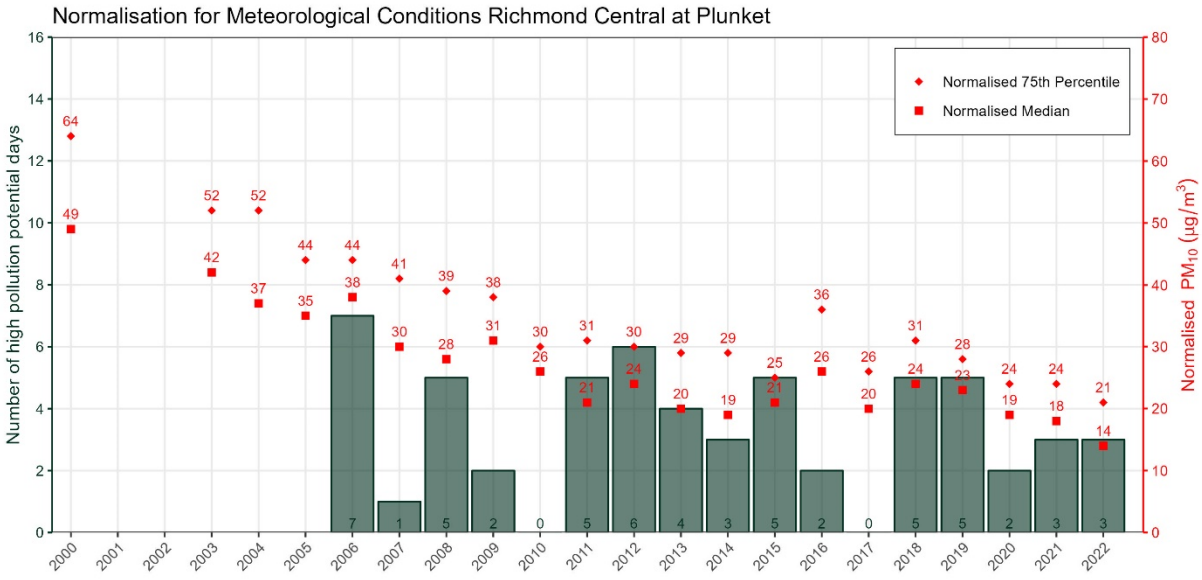


Figure 5: Number of high pollution days and winter PM_{10} normalised for meteorological conditions (Richmond, 2000 to 2022)

4.3.7 Despite the Richmond Airshed having no exceedances over 2022, the Airshed still remains 'polluted' and non-compliant with the Air Quality NES. This is because the Air Quality NES's Regulation 17(4)(b) states that an airshed stops being a polluted airshed when the PM_{10} standard is not breached for 5 years.

Richmond Airshed $PM_{2.5}$ Results

4.3.8 The daily 24-hour average $PM_{2.5}$ concentrations available for Richmond from the continuous BAM is shown in Figure 6. Daily $PM_{2.5}$ was recorded for 97% of the monitoring period. The $PM_{2.5}$ exceeded the 2021 WHO daily guideline value of 15 µg/m^3 a total of 58 days. The data

for winter 2022 shows the typical seasonal pattern, with peak PM concentrations occurring in winter which is typically associated with the use of wood for home heating.

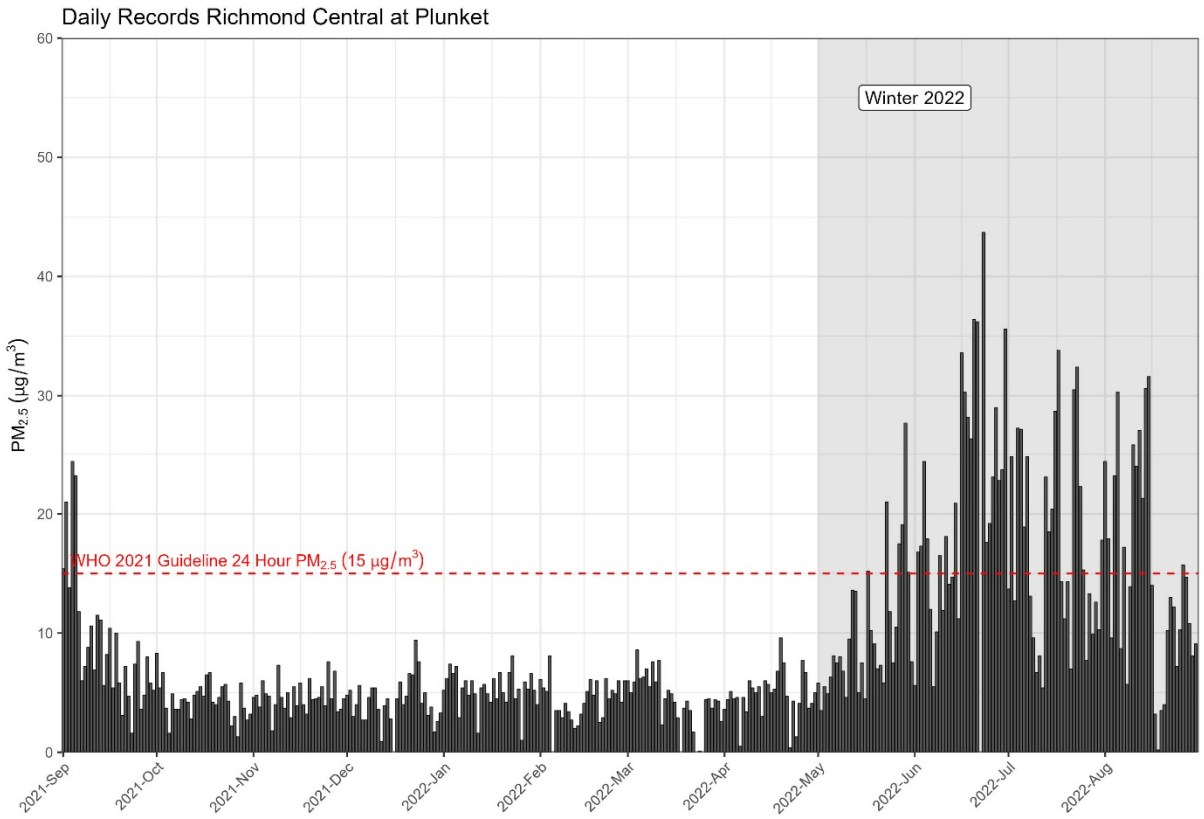


Figure 6: Richmond Daily $PM_{2.5}$ concentrations in µg/m³ (1 Sep 2022 – 31 Aug 2022)

4.3.9 Table 4 summarises the $PM_{2.5}$ daily average data for the year, starting 1 September 2021, with highlighted cells exceeding the 2021 WHO daily guideline (15 µg/m³).

Table 4: Daily Average $PM_{2.5}$ measured in Richmond in 2021/2022

Valid Data:					97%							
Data Capture Rate:					98%							
	2021				2022							
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Minimum	1.6	1.3	1.8	0.9	1	2	0.1	0.4	3.5	5.5	5.4	0.2
Mean	9.3	4.4	4.7	4.4	5.3	4.5	4.7	4.8	9.9	21.5	17.3	14.9
Median	7.7	4.4	4.6	4.3	5.3	4.5	4.5	4.8	7.6	19.2	14.3	13.4
Maximum	24.4	8.3	7.6	9.4	8.1	8.1	8.6	9.6	27.7	43.7	33.8	31.6
Previously reported WHO 2005 Guideline Exceedances (>25 µg/m3)	0	0	0	0	0	0	0	0	1	9	6	5
WHO 2021 Guideline Exceedances (>15 µg/m^3)	4	0	0	0	0	0	0	0	6	21	15	12
Annual Mean	8.8											

4.3.10 The annual average $PM_{2.5}$ concentrations for Richmond for 2021/2022 is 8.8 µg/m^3, which is above the 2021 WHO annual air quality guideline value of 5 µg/m^3. The winter (May-August) average was 16 µg/m^3 and the average for the non-winter months (September – April) was 5 µg/m^3. Based on the 2021/2022 annual value of 8.8 µg/m^3, a reduction of 43 % in $PM_{2.5}$ would be required to meet the 2021 WHO annual guideline of 5 µg/m^3.

4.3.11 The 2021 WHO daily guideline value of 15 µg/m^3 was exceeded five months of the year, with most exceedances occurring over the months of June-August. The maximum daily $PM_{2.5}$ concentration measured in Richmond was 43.7 µg/m^3 on 23 June 2022, which is the same date as the highest PM_{10} value recorded. This is nearly triple the 2021 WHO daily guideline value. Based on the winter 2022 data, the fourth highest daily $PM_{2.5}$ was 35.6 µg/m^3, so a reduction in daily winter $PM_{2.5}$ of around 58% would be required to meet the 2021 WHO daily guideline value[12].

4.3.12 It is important to note that previous annual air quality reports referred to the 2005 WHO guideline that had a $PM_{2.5}$ daily value of 25 of µg/m^3. The updated 2021 WHO guideline is 15 µg/m^3, which has given rise to more breaches than previously reported (in comparison to the WHO 2005 guideline). The $PM_{2.5}$ data for 2022 is similar to the last few years monitoring in Richmond. In 2019 and 2020, there were between 24-25 exceedances of the 2005 WHO daily $PM_{2.5}$ guideline of 25 µg/m^3 over the winter period, compared with 24 in 2021 and 21 in 2022.

4.4 Motueka Temporary $PM_{2.5}$ Monitoring Results and Analysis

Analysis of Motueka $PM_{2.5}$ Results

[12] The 2021 WHO $PM_{2.5}$ daily guideline allows for 3 exceedance days per year (based on the 99th percentile), hence the fourth highest daily $PM_{2.5}$ value for Richmond is considered for this analysis.

4.4.1 Staff have completed a full year monitoring programme of $PM_{2.5}$ (January 2022 – January 2023) in Motueka using a Partisol gravimetric sampler (Thermo 2025i) monitoring $PM_{2.5}$ daily. Data results in this report covers the period 1 January 2022 to 31 August 2022, with 6 periods of no data captured due to various mechanical issues including pump failure and shuttle errors, and a request to turn off the monitor over Matariki weekend to preempt potential noise complaints. It is noted that three of these gaps were during the winter months, so there is an incomplete dataset over the winter period. The daily $PM_{2.5}$ data is presented in Figure 7. Daily $PM_{2.5}$ was recorded for 80% of the period from May to August. The $PM_{2.5}$ exceeded the 2021 WHO daily guideline value of 15 µg/m^3 a total of at least 21 days. Given the significant period of missing data over winter, additional $PM_{2.5}$ exceedances in Motueka are likely to have occurred. The data for winter 2022 shows the typical seasonal pattern, with peak PM concentrations occurring in winter which is associated with the use of wood for home heating.

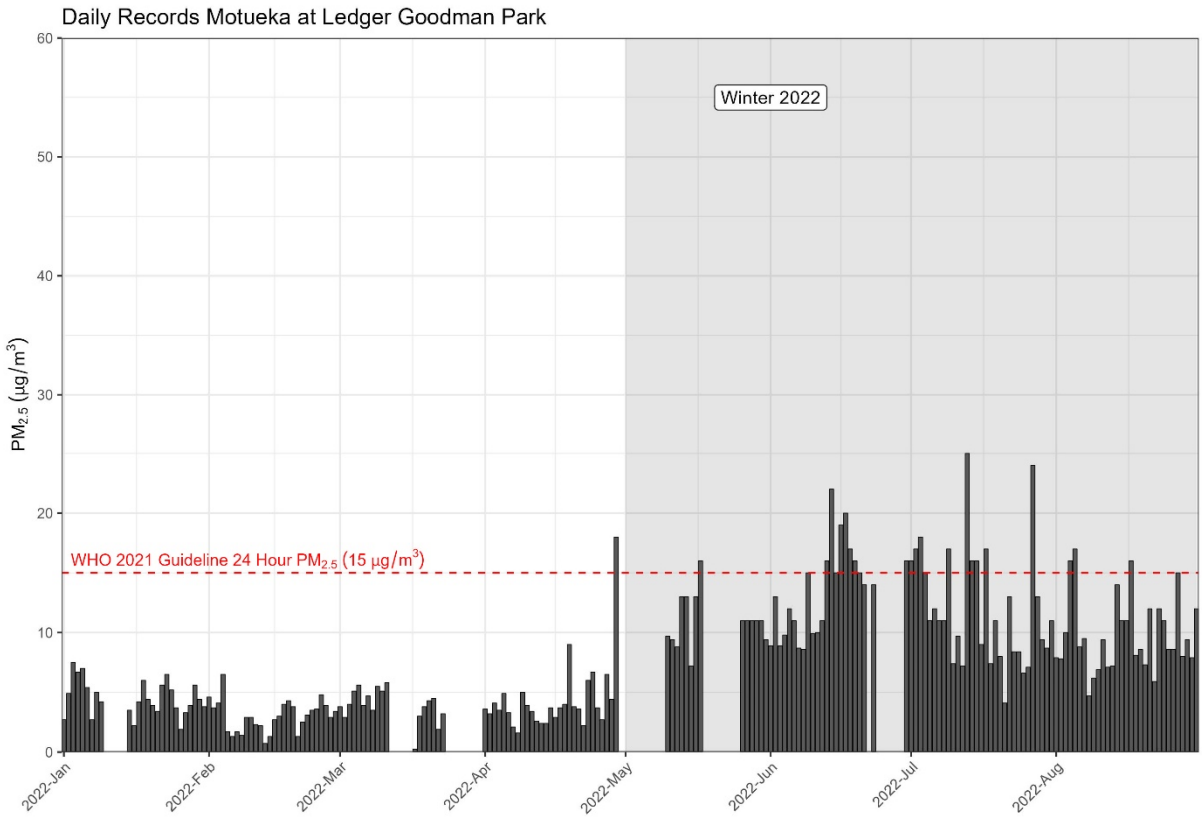


Figure 7: Daily average $PM_{2.5}$ concentrations measured in Motueka (1 Jan – 31 Aug 2022)

4.4.2 Table 5 summarises the Motueka $PM_{2.5}$ daily average data. The 2022 winter (May-August) average $PM_{2.5}$ concentration for Motueka is 11.6 µg/m^3, with the highest value being 25 µg/m^3. Cells are highlighted exceeding the 2021 WHO daily guideline (15 µg/m^3).

Table 5: Daily Average $PM_{2.5}$ measured in Motueka in 1 Jan – 31 August 2022

Valid Data (May – Aug):	80%
Data Capture Rate (May – Aug):	81%

	2022							
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**
Minimum	1.9	0.7	0.2	1.6	7.2	8.6	4.1	4.7
Mean	4.5	3.0	3.9	4.4	11.0	13.5	12.1	9.8
Median	4.3	3.0	4.0	3.7	11.0	14.0	11.0	8.8
Maximum	7.5	6.5	5.8	18.0	16.0	22.0	25.0	17.0
2021 WHO Guideline Exceedances (>15 µg/m^3)	0	0	0	1	1	7	9	3
Days measured (Total days)	26 (31)	28 (28)	18 (31)	29 (30)	14 (31)	23 (30)	31 (31)	31 (31)
Annual Mean	7.7							

4.4.3 Figure 8 compares the $PM_{2.5}$ values for Richmond and Motueka for the reporting year. The comparison shows the fine particulate matter is similar for both townships during the non-winter months. During the winter months, $PM_{2.5}$ values in Motueka are generally lower than Richmond, with the peak concentration in Richmond of 43.7 µg/m^{3}compared to 25 µg/m^3 in Motueka. The median for May-August in Richmond was 14 µg/m^3 and Motueka was 11 µg/m^3. Gaps in data in Motueka in mid-June coincided with the peak $PM_{2.5}$ date in Richmond, so the period of missing record is when additional exceedances in Motueka are likely to have occurred.

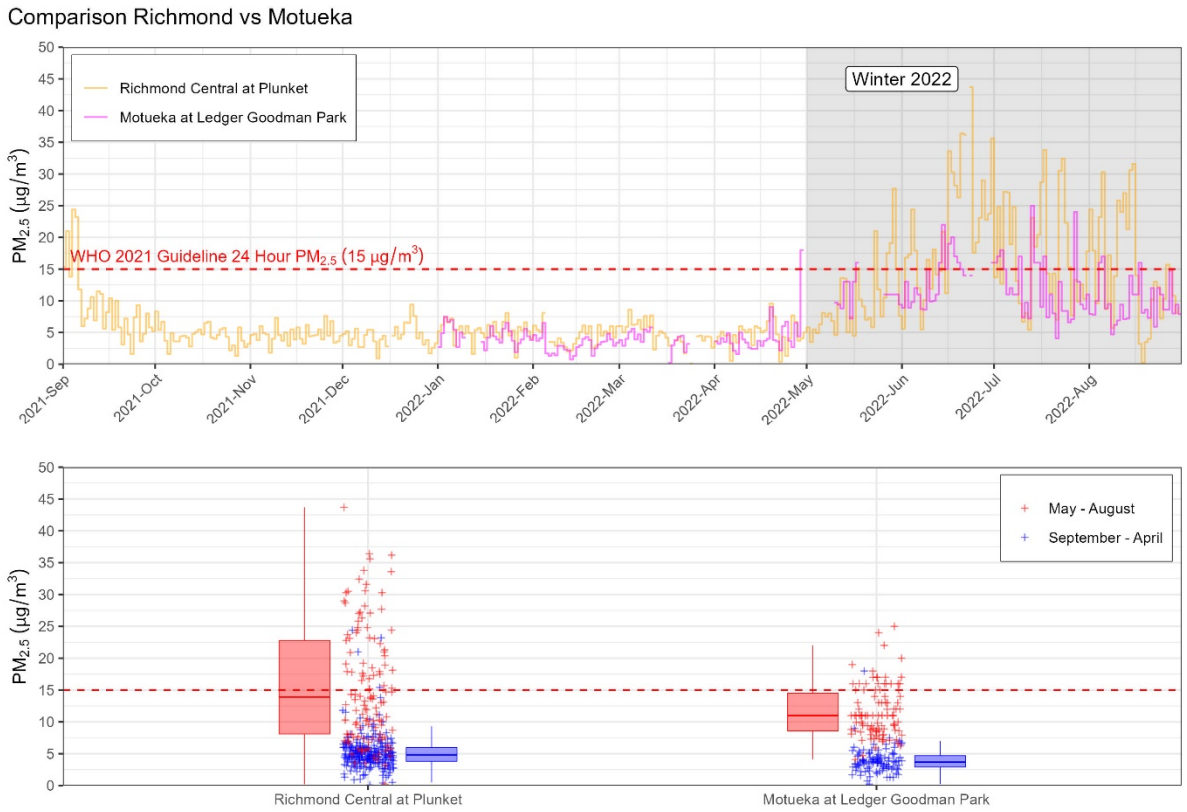


Figure 8: Comparison $PM_{2.5}$ between Richmond and Motueka (1 Sep 2021 – 31 Aug 2022)

4.4.4 At the time of writing, the results and analysis of the full year data set are not yet available but will be reported to Council at a future meeting.

4.5 Riwaka Air Quality Monitoring 2022

4.5.1 As reported in the 2021 Annual Air Quality Report, Council undertook temporary monitoring of $PM_{2.5}$ over winter 2021 in four locations around Riwaka and Brooklyn. The results of monitoring indicated that the 'dustmote' air quality sensors deployed in Riwaka and Brooklyn complied with the 2021 WHO daily guideline for $PM_{2.5}$. Analysis of the 2021 results concluded that the primary source of emissions in the Riwaka and Brooklyn area was domestic home heating. However, some caution needed to be exercised with this conclusion as anecdotal evidence suggested that winter 2021 was not a 'normal' year for outdoor burning and that particulate matter concentrations in the Riwaka and Brooklyn area may be much higher during 'typical' conditions.

4.5.2 Given the results of the 2021 monitoring programme, Council staff sought to complete surveillance monitoring over winter 2022. Mote Ltd installed a dustmote sensor at the same Riwaka East location (as the 2021 study) over the winter months to monitor $PM_{2.5}$ between 26 May and 9 August 2022. This monitoring was provided free of charge by Mote Ltd who had also completed the 2021 study.

4.5.3 The results of the 2022 monitoring indicate that air quality at the Riwaka East location complied with both the proposed 2020 MfE daily standard[13] for $PM_{2.5}$ of 25 µg/m^3 as well as the 2021 WHO daily guideline of 15 µg/m^3 (Figure 9).

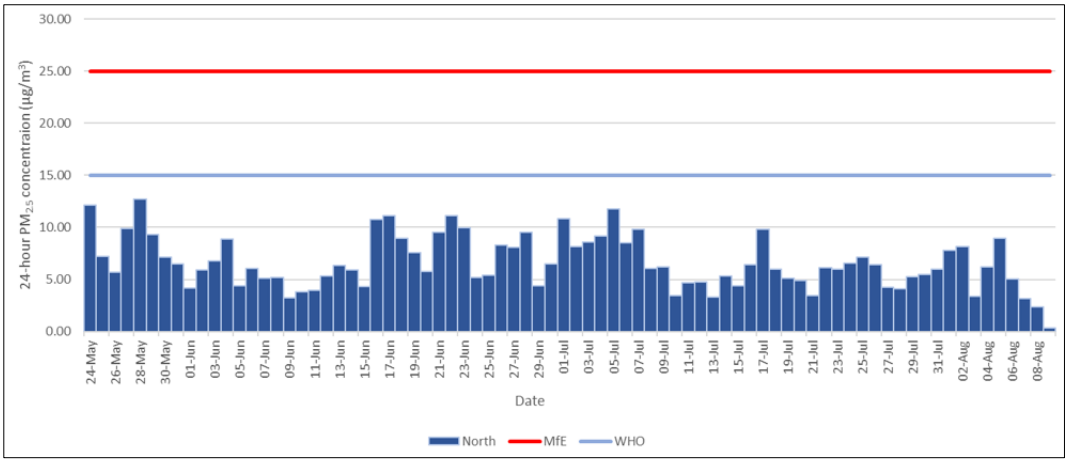


Figure 9: Riwaka East 24-hour average $PM_{2.5}$

4.5.4 A comparison of the $PM_{2.5}$ data found that the peak daily (24-hour) and average concentrations between 2022 and 2021 were very similar. These results suggest that the 2021 and 2022 $PM_{2.5}$ concentrations were comparable and that the findings from the 2021 investigation are valid.

4.6 Brightwater and Wakefield Air Quality Monitoring 2022

4.6.1 Surveillance air quality monitoring was also completed in Brightwater and Wakefield over winter 2022. Previously, short-term research monitoring was completed in these two towns during the 2006-2008 winters. The limited results suggested that air quality was generally good in Wakefield but there was possibly isolated 'hot spots' of poor air quality in Brightwater. Since then, monitoring technology has improved, there are more households and more wood burners, and how householders operate their wood burners can vary which affects air pollution. For these reasons, it was important to undertake surveillance monitoring to gain an updated understanding of air quality in these towns and if there is a need for ongoing monitoring and management tools (education and advice, rules, etc).

4.6.2 Mote Ltd was commissioned to monitor $PM_{2.5}$ in Brightwater and Wakefield from May to August using a network of 'dustmote' air quality sensors. Each town had a network of three dustmotes and one meteorological monitoring station to monitor air quality, wind and temperature during the monitoring period of 26 May – 7 September 2022. The monitoring extended into the first week of September due to timings for instrument collections coinciding with Mote travel in the region.

4.6.3 As part of the study, Council staff also co-located a Partisol gravimetric sampler (Thermo 2025i), an Air Quality NES approved instrument, at the Brightwater North site. This

[13] 2020. Ministry for the Environment. *Proposed Amendments to the National Environmental Standards for Air Quality*. Wellington.

instrument monitored $PM_{2.5}$, generally sampling at 1 in 3 days over 22 June – 12 September 2022.

Analysis of Brightwater Partisol Results

4.6.4 The 1 in 3 day partisol $PM_{2.5}$ data is presented in Figure 10. $PM_{2.5}$ was recorded for 83% of the period from June to September. There were four periods of no data because of power outages and two data points removed due to possible flow issues and data anomalies, compared with the co-located dustmote data. There were no exceedances of MfE's proposed 2020 daily standard for $PM_{2.5}$ of 25 µg/m^3. The $PM_{2.5}$ breached the 2021 WHO daily guideline value of 15 µg/m^3 a total of at least five days. The highest $PM_{2.5}$ concentration of 23 µg/m^3 was measured on 25 June 2022, with the median over the monitoring period of 11 µg/m^3.

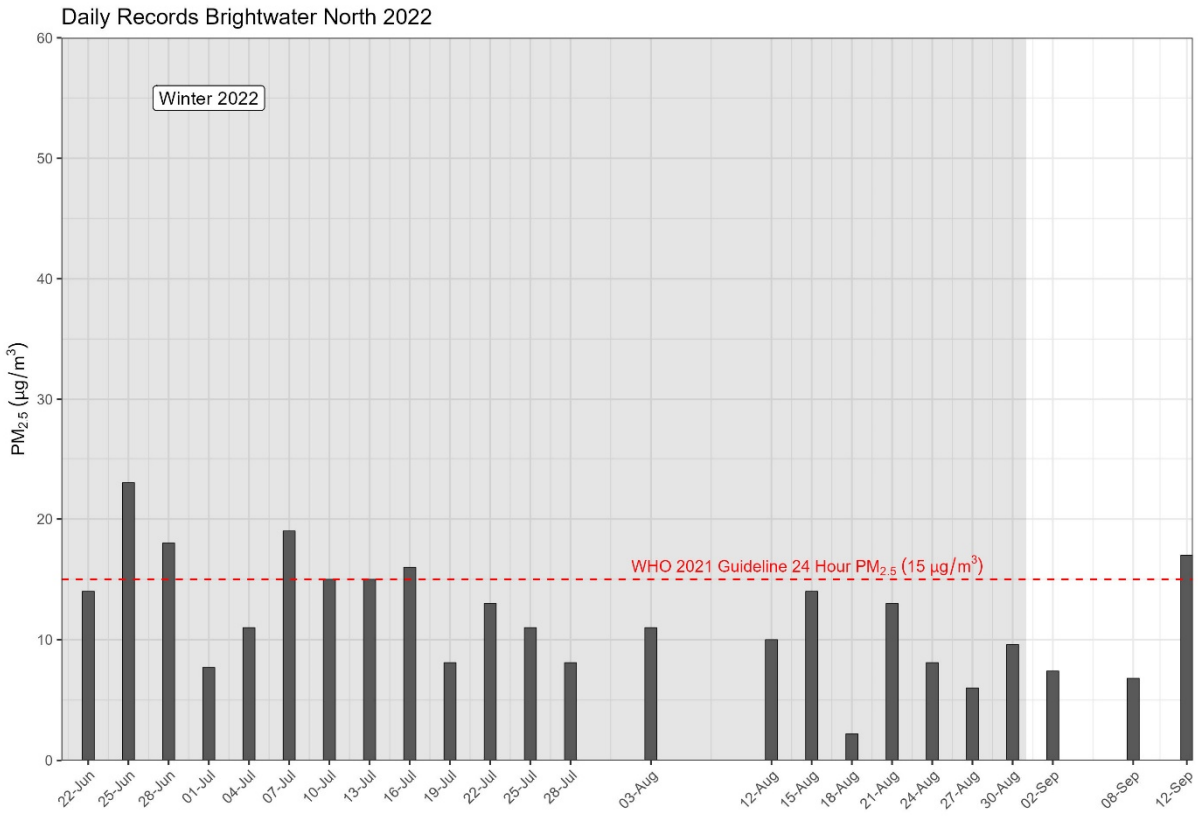


Figure 10: Daily average $PM_{2.5}$ concentrations measured in Brightwater (22 June – 21 Sep 2022)

Analysis of Brightwater and Wakefield Dustmote and Meteorology Results

4.6.5 The information below has been summarized from the report "Wakefield and Brightwater $PM_{2.5}$ Monitoring Network: May – September 2022" prepared by Mote Ltd.

4.6.6 The data capture rate for the dustmote sensors over the monitoring period was 96%, despite a significant storm event on 18 August 2022. The instruments displayed a reasonable agreement with the Council's Partisol instrument, an Air Quality NES compliant monitor, that was operated at the Brightwater North site.

4.6.7 Maximum daily $PM_{2.5}$ concentrations of between 10 and 30 µg/m^3 were measured at each of the six instruments located in Brightwater and Wakefield during the study period. The

emission profile is consistent with emissions from domestic home heating. The proposed 2020 MfE daily $PM_{2.5}$ standard of 25 µg/m^3 allows for three exceedances per year. On this basis while both the Brightwater North and Wakefield North sites both exceeded the limit of 25 µg/m^3, only the Wakefield North site breached the proposed standard as there were four days when the average 24-hour $PM_{2.5}$ concentration exceeded the 25 µg/m^3 limit. However, it should be noted that one of these days the concentration was 25.4 µg/m^3 which is only marginally higher than the proposed standard.

4.6.8 In comparison to the 2021 WHO daily guideline for $PM_{2.5}$ of 15 µg/m^3 which also allows for 3-4 exceedances per year, four of the six monitoring sites breach the guideline (using a threshold of 3 exceedances) as shown in Table 6 below.

Table 6: Number of days where Brightwater/Wakefield monitoring locations breach 2021 WHO 24-hour guideline

Location	Number of days where 24-hour average $PM_{2.5}$ is greater than 15 µg/m^3	Allowable number of exceedances per year	Number of days where $PM_{2.5}$ breaches 2021 WHO guideline
Brightwater north	27	3	24
Brightwater central	7	3	4
Brightwater south	0	3	0
Wakefield north	45	3	42
Wakefield central	27	3	24
Wakefield south	2	3	0

4.6.9 Wind speeds during the study remained relatively low and were typically south/south-westerly, although nearby topographical features appeared to have had some effect on both wind direction and wind speed. Most sites displayed clear evidence of cold flow drainage under light winds which appeared to be the dominant dispersive mechanism at night. It is likely that this dispersive mechanism resulted in the southern sections of both Brightwater and Wakefield to exhibit better air quality than the monitoring stations to the north.

4.6.10 Despite some very heavy rainfall events during 2022, the frequency of wet days (<30mm per day) is broadly similar to that of the previous four years. Furthermore, given that daily air temperatures were similar to previous years, it is likely that the data collected during the 2022 monitoring period is broadly representative of typical emissions in the Brightwater and Wakefield communities. At the time of writing, staff are yet to determine the next steps for our surveillance monitoring programme of smaller towns in the District.

5 National Research Reports

5.1 Our Air 2021

5.1.1 In December 2021 'Our Air 2021' was published which forms a series of environmental reports produced by MfE and Stats NZ. This report presents the latest data on the state of New Zealand's air quality. The report shows that nationally air quality has generally improved at most sites and across many of the indicators used. However, there are many New Zealand

urban areas that continue to experience poor air quality at times and this is often in cooler months or where there is heavy traffic[14].

5.1.2 The report includes key findings for a range of indicators: PM_{10} concentrations, $PM_{2.5}$ concentrations, nitrogen dioxide concentrations, sulphur dioxide concentrations, ground-level ozone concentrations, carbon monoxide concentrations, air pollutant emissions, and the health impacts of air pollution. It also references the impacts of Covid-19 lockdowns on air quality over 2020, which nationally temporarily decreased concentrations of several key pollutants, particularly nitrogen dioxide due to reduced vehicle traffic.

5.1.3 The report is a high-level national snapshot of air quality. The Richmond airshed is only mentioned twice in the report, included in figures showing (a) PM_{10} trends (2011-2020) and (b) days above the 2021 WHO daily air quality guideline for PM_{10} (2017-2020). Both figures indicate that while overall air quality is improving in the Richmond Airshed, in comparison to other airsheds nationally it remains 'polluted' under the Air Quality NES and management tools are required to enable continued improvement.

5.2 Health and Air Pollution in New Zealand 2016 (March 2022)

5.2.1 The Health and Air Pollution in New Zealand (HAPINZ) report[15] was released in March 2022 and presents the health impacts and social costs[16] associated with air pollution in New Zealand for the year 2016. It is the third time that this research has been commissioned by government departments (Ministry for the Environment, Ministry of Health, Te Manatū Waka Ministry of Transport and Waka Kotahi NZ Transport Agency), with previous reports released in 2012 and 2007.

5.2.2 The study results are for the year 2016 (the most recent year of data available when the study was being carried out). Most air quality, health and population data for the study was averaged over 2015–2017. The study assessed and/or modelled exposure to particulate matter ($PM_{2.5}$ and PM_{10}) and nitrogen dioxide (NO_2) at the census area unit (CAU) 2013 level for all of New Zealand. The following information is sourced from the report and model[17].

5.2.3 The key findings about the health impacts of air pollution in New Zealand in 2016 were:

- More than 3,300 deaths from human-made air pollution in 2016.
- Air pollution harms were mainly caused by transport and domestic fires – with transport having a much larger impact than previously thought.
- Social costs from human-made air pollution were $15.6 billion in 2016, with NO_2 exposure accounting for just over 60% of the total costs.
- Largest health impacts of air pollution were in Auckland and Christchurch.
- The lower South Island had higher rates of premature deaths from air pollution.

[14] Ministry for the Environment & Stats NZ (2021). New Zealand's Environmental Reporting Series: Our air 2021: preliminary data release. Retrieved from environment.govt.nz.
[15] Kuschel et al (2022). Health and air pollution in New Zealand 2016 (HAPINZ 3.0): Volume 1 – Finding and implications. Report prepared by G Kuschel, J Metcalfe, S Sridhar, P Davy, K Hastings, K Mason, T Denne, J Berentson-Shaw, S Bell, S Hales, J Atkinson and A Woodward for Ministry for the Environment, Ministry of Health, Te Manatū Waka Ministry of Transport and Waka Kotahi NZ Transport Agency, March 2022.
[16] Costs are referred to as social costs rather than health costs because they denote the total costs to society of the health effects, which are more than just the costs incurred by the health system.
[17] Available at: https://www.ehinz.ac.nz/projects/hapinz3/explore-publications-and-data/

- Health impacts from air pollution have increased since 2006, driven by NO_2.
- Large proportion of the population exposed to poor quality air, with persisting inequalities for Pacific peoples.

5.2.4 MfE prepared additional content to help local government better understand the implications of the study for individual regions. Using region-specific data, a factsheet template has been populated for Tasman (see Appendix A). Key information presented in the Tasman factsheet includes:

- Health impacts for the Tasman District in 2016 due to anthropogenic air pollution ($PM_{2.5}$ and NO_2) included 34 deaths, 40 cardiovascular hospitalisations (all ages), 43 respiratory hospitalisations (all ages), and 21,485 restricted activity days (all ages).
- In 2016, the associated social costs in Tasman are estimated at $159 million, with $72 million from domestic fires and $81 million from motor vehicles.
- Looking at pollutants, Tasman contributed 0.8% of the national costs associated with NO_2 pollution from all sources and 1.4% of those associated with $PM_{2.5}$ pollution.
- Since the 2007 report was published (HAPINZ 1.0 using 2006 data), Tasman's population has increased by 13.3% and anthropogenic air pollution social costs have increased by 3.3% over this time.

5.2.5 The report proves some stark information on air quality and social costs for both New Zealand and Tasman. However, even small improvements in air quality can deliver significant health benefits. For example, reducing current (2016) levels of $PM_{2.5}$ and NO_2 air pollution by just 5% in Tasman would reduce the number of premature deaths by 2; reduce the number of cardiovascular and respiratory hospitalisations by 5; and reduce the number of restricted activity days by more than 1,664.

5.2.6 Council staff are working through the implications of the report in discussion with other unitary/regional council staff (via the National Air Quality Working Group). A key consideration will be the social costs of NO_2 exposure nationally, which the researchers noted as being a significant and surprising finding of the study. Many councils, including Tasman, have focused largely on monitoring and managing particulate matter to date. There is currently no Council budget set aside for NO_2 monitoring and this would need to be allocated through the next Long Term Plan process.

6 Complaints and Enforcement

During the six-month period from 1 April to 30 September 2022, the Council received 132 air quality related complaints, 34 of these related to odour; 3 were dust related; 5 were discharge of pesticide/herbicide complaints and 90 complaints related to smoke. Two of these odour complaints were received in relation to Talleys' factory site in Motueka. In 2021 there were zero complaints during the reporting period compared to 71 in 2020 for the Talley site. This total number of complaints is tracking down on previous years, where Council received 164 total air related complaints in 2021, 338 total air related complaints in 2020, and 208 complaints in 2019.

6.1 Odour

6.1.1 Odour complaints can be broken down into different odour sources as follows:

- Wastewater/sewerage: 25
- Industrial: 2
- Rural: 5

6.2 Smoke

6.2.1 Ninety complaints related to smoke and the cross-boundary effect of smoke were recieved. The cross-boundary complaints can be broken down by area:

Golden Bay	• 3 rural outdoor burn • 1 smokey chimney
Murchison	• 3 rural outdoor burn • 1 urban outdoor burning
Motueka, Lower Moutere and Riwaka	• 22 rural outdoor burning • 4 urban outdoor burning • 2 household smokey chimney • 2 industrial smoke complaints
Waimea, Wakefield, Upper Moutere, Māpua	• 15 rural outdoor burn • 4 urban outdoor burning • 1 industrial smoke complaint
Richmond	• 10 household smokey chimney • 2 urban outdoor burning • 20 rural outdoor burning

6.2.2 Staff conducted three evening Richmond Airshed 'non-compliant wood burner' patrols over winter 2022 (one evening each in the months of July, August, September). A total of 124 homes were monitored and as a result three were found to be operating non-compliant wood burners. The residents of these properties worked with staff to reach compliance. Interestingly, all had initially responded to the Council's 'Property Purchased within Airshed' questionnaire acknowledging their wood burner is non-compliant and confirming they would not operate them; one even had a site inspection with a compliance officer in their home.

6.2.3 Staff followed up on smokey chimney complaints and educational advice was provided about best practice wood burner use, wood moisture levels and storage of wood. Property owners generally took this positively as they did not wish to annoy neighbours or contribute unduly to the overall smoke in Richmond. The suggestion that they physically check their chimney to ensure they were 'doing it right' gave them some ownership of the positive changes they could make with their wood burner use. A common practice is that older wood burner models can 'bank down' overnight. However, national information and tests have shown that it does not add to the warmth of a house but greatly increases air pollution.

6.3 Enforcement (smoke related)

6.3.1 Staff undertook the following enforcement action during the 6-month period:

- 3 abatement notices were issued requiring compliance with Tasman Resource Management Plan (TRMP) smoke discharge rules.
- 3 abatement notices issued to cease the burning of prohibited items.
- 11 infringement notices issued for breach of the TRMP outdoor burning rules.
- 32 warnings/educational advice given.
- 1 outdoor burn resulted in serious breaches of the TRMP rules and is currently before the courts.
- Education and best practice advice was given in most instances where a burn was confirmed.

The photos over page illustrate five outdoor fires that resulted in enforcement action this year.

Photo 1 (left): Orchard, Motueka Valley Highway; Photo 2 (right): Farm, Dovedale

Photo 3 (left): TDC leased land, Takaka; Photo 4 (right): Farm, Motueka River West Road

Photo 5: Orchard (Peach Island)

6.4 Richmond Airshed

6.4.1 The Richmond airshed contains a total of 6,894 properties (at October 2022). Of these properties, Council records identify that there are 5,617 properties that have either a compliant wood burner; a compliant wood pellet burner; a cooker; or an alternative heating source. These figures are based on current available information (at September 2022).

6.4.2 Within the airshed, 320 properties are currently known to be subject to our TRMP Rule 36.3.7.5. This means the property has on-sold since January 2007 and the owners are required to upgrade their wood burner if they have a non-compliant model and wish to use a wood burner. Of these properties, a total of 118 property owners have advised Council staff that they do not use their wood burner and have alternative heating (however they do wish to keep the option of wood burner replacement open as the TRMP rules do not require removal of non-compliant burners in these circumstances).

6.4.3 That leaves 202 properties that Council believe are potentially using non-compliant wood burners within the Richmond Airshed. Complaints relating to smokey chimneys resulted in education and advice to property owners to ensure the wood burner was being used correctly and burning compliant dry wood. All property owners with non-compliant wood burners were notified pre-winter of their wood burner status and advised of the need to upgrade their wood burner or use an alternative heating source.

6.4.4 There are 246 properties within the Airshed which the Council does not have heating details for ('unknown' heating source). These properties have not sold since 2007 and staff believe the majority have removed their wood burner, however work will be ongoing over this summer to further identify these properties with a physical check. Any identified with a non-compliant wood burner will be contacted and advised that they are unable to use their wood burner. Staff will again target these non-compliant properties to enable the owners sufficient

time to remediate their situation prior to the 2023 winter. Within the Richmond Airshed there are approximately 627 cookers and older style burners (16+ years old) which are legally allowed to operate under the TRMP permitted rules (as the property has not sold since 2007 in the case of older wood burners). These burners do not meet the Air Quality NES emission and efficiency standards. Education is required with these property owners around efficient use of these old burners, utilising best practice methods and dry wood to minimise smoke discharge.

7 Non-Regulatory Programmes

This section sets out the Council's non-regulatory air work programme which includes the Good Wood scheme and education via the Council's communications. Alongside implementation of the Tasman Resource Management Plan's discharges to air rules, these non-regulatory programmes can contribute to reducing winter-time air pollution through a number of often simple actions undertaken by residents and land managers in our District.

7.1 Good Wood Scheme

7.1.1 The Council continues to implement the Good Wood Scheme in partnership with Nelson City Council (NCC). The voluntary scheme requires wood merchants to supply firewood according to specified best practice performance standards. Wood merchants are required to sign the Good Wood Supplier Agreement annually and adhere to a number of conditions. In return, both Councils promote these wood merchants as Good Wood suppliers on our websites and in Council communications (e.g. social media and advertisements in local newspapers).

7.1.2 Tasman and Nelson City Council staff host annual Good Wood meetings for wood merchants, wood burner retailers and the Home Heating Association. These meetings are an opportunity to discuss how the scheme is working, and any issues or concerns. Meetings were held in both November 2021 and November 2022 and while low in attendance, they were constructive meetings.

7.1.3 For several years Nelson City Council have offered a 'Good Wood' discount promotion over November and December, providing $25 discount off the price of firewood per household (40 discounts available per merchant). The purpose of the promotion is to encourage households to purchase their wood early and from a Good Wood supplier. In late 2022, working in partnership with Nelson, staff successfully provided the promotion within the Tasman District.

7.2 *'Are you air aware?'*

7.2.1 In March 2022, staff ran a month long 'Are you air aware?' education campaign. The campaign was primarily targeted at families and youth and included several air aware activities to learn about and improve air quality in households. Resources included:

- Air Aware booklet: contains tips for keeping our air clean and your home healthy and warm.
- Air Aware Bingo: challenges you to learn about air quality, share what you learn with friends and whānau, and take action to improve air quality at your place.
- Air Aware experiment: embrace your inner-scientist to create pollution traps and investigate how clear the air is at different locations around your home, school or workplace.

- Air Aware Quiz: a short online quiz to test how "Air Aware" you are.

7.2.2 The campaign was promoted through posters and activity packs on display at libraries and service centres, a Newsline article (4th March edition), and social media posts. Schools participating in 'Enviroschools' were also emailed inviting them to participate and receive information/activity packs. Two classes at Waimea College and Appley School participated in Air Aware activities and staff received positive feedback about the resources.

7.2.3 To encourage participation, a prize draw was also developed which required participants to send in evidence of their completed activities or complete the online quiz. The quiz had steady participation throughout the competition period (103 people) and was boosted through social media. There was a lack of entries for the prize draw for the other activities and this was likely as a result of the short lead in time for the campaign launch, and school/community disruptions from the Covid-19 omicron outbreak. Nonetheless, the campaign has delivered a range of air aware activities and information which is accessible on the Council's website as a resource for schools and the wider community. Staff are yet to decide if a similar campaign could be run in 2023.

7.3 Warmer Healthier Homes Te Tau Ihu Charitable Trust

7.3.1 Since 2014, Warmer Healthier Homes Te Tau Ihu Charitable Trust (WHH) has operated across top of the south assisting homeowners and community members most in need to improve insulation measures, heating and overall efficiency by retrofitting into existing owner-occupied homes. WHH administers central government funding from the Energy Efficiency and Conservation Authority (currently at 80% funding) and local third-party funding (20% funding) to 100% subsidise home insulation to residents who meet the required criteria. The positive effects of improved insulation in homes are well documented – better insulation means a warmer, drier and healthier home that will be easier and cheaper to heat. This results in improved air quality outcomes as less wood is required to be burned for home heating, resulting in reduced levels of smoke.

7.3.2 In May 2021, the Council contributed $60,000 to WHH that is directly being used to retrofit insulation into qualifying households in the Tasman District. This funding was allocated for WHH to spend it over the following three-year period (from the Council's climate change budget). Over the 2021/2022 financial year, the Council's support enabled insulation of 116 houses in the Tasman District. Staff continue to promote the subsidy via the Council's communication channels which has proved successful in raising awareness of the scheme.

7.3.3 In September, WHH celebrated the milestone of 3000 houses retrofitted with insulation across Te Tau Ihu since its inception in 2014. While Tasman Council has only been part of the scheme in more recent years, its contribution has provided warm and healthy homes to a number of families in the District.

7.4 Air Quality Education and Advice via Council Communications

7.4.1 Council staff have an ongoing work programme to educate and promote better burning to reduce air pollution over autumn and winter months. In addition to the March 'Air Aware' campaign, staff continued to utilise social media and Newsline to promote home heating and rural outdoor burning best practice advice. This supplements the wealth of information

provided on the Council's air quality webiste pages, including best practice guides for home heating and outdoor burning.

8 Discharges to Air Policy Planning

8.1 Discharges to Air Issues and Options

8.1.1 Since 2019, work has been underway to review the suite of Tasman's resource management plans, with the replacement plan called Aorere ki uta, Aorere ki tai – Tasman Environment Plan. Over 2021-2022, staff have been developing topic-specific 'issues and options' papers and workshopping these with Councillors. An initial 'discharges to air' issues and options paper was drafted and workshopped with Councillors in November 2021. The identified issues included smoke from domestic home heating; outdoor rural burning; agrichemicals; odour, dust and other nuisances; large scale combustion; and greenhouse gas emissions. More recently, detailed work has commenced to further understand the issues and options to manage the Richmond Airshed, and outdoor rural burning and this will be completed by July 2023.

8.1.2 Staff completed community engagement over October – December 2022 on a number of planning topics (largely district plan topics) to seek feedback on issues and options. However, the air topic was not included in this round of engagement. Feedback on air issues and options will be sought at a later date along with other natural resource topics.

8.2 Developing a New Resource Management Plan and Timing of National Direction

8.2.1 One of the key proposals under the RMA system reform and proposed replacement legislation is that Tasman and Nelson Councils will be required to prepare joint plans (e.g. Regional Spatial Strategy and a Natural and Built Environments Plan). At the time of writing, given there are currently some uncertainties regarding transitional arrangements for the new legislation, both Councils are yet to determine when joint plan-making will commence and what this means for existing work progammes under the RMA 1991 (e.g. development of the Aorere ki uta, Aorere ki tai – Tasman Environment Plan and the draft Whakamahere Whakatū Nelson Plan).

8.2.2 It is important to note that the Council is currently in a good position in relation to our work programme and the wider RMA 1991 reform. This is because plan preparation is in its early stages with the development of background work relating to the identification of issues and options and progressing technical work/research. This work is required to inform the new resource management plan, regardless of the legislative framework it may be prepared under.

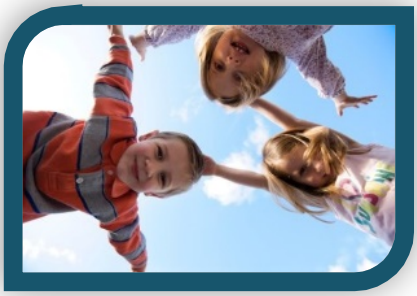
8.2.3 Nationally, councils would welcome confirmation from MfE on the scope of the future Air Quality NES or National Planning Framework requirements to monitor and manage $PM_{2.5}$ sources and what the standard may be (e.g. daily standard of 25 µg/m^3 as proposed by MfE in 2020, or the 2021 WHO guideline of 15 µg/m^3). The potential requirement to monitor and manage $PM_{2.5}$ will potentially have significant implications for the management of Tasman's air resource. For example, the requirement to monitor and manage $PM_{2.5}$ sources could result in the establishment and targeted management of new airsheds. Council staff are cognisant of the issues and have ensured that our air quality work programme considers the likelihood of a $PM_{2.5}$ monitoring and management framework in the future. It is likely that such a new

framework would have significant budget and staff resourcing implications for Council, linked to additional monitoring, compliance and behaviour change actions required to meet a more stringent regulatory framework.

Appendix A: Health and Air Pollution in New Zealand – Tasman Factsheet

HAPINZ 3.0

He rangi hauora he iwi ora



Tasman factsheet

What are the air pollution impacts for our region?

Table 1 shows the estimated health impacts due to $PM_{2.5}$ and NO_2 pollution from anthropogenic sources in Tasman in 2016. The associated **social costs are estimated at $159 million** with $72 million from domestic fires and $81 million from motor vehicles.

Table 1: Health impacts for the Tasman region in 2016 due to anthropogenic air pollution (in cases)

Health effect	Cases by source (number)				
	Domestic fires	Motor vehicles	Industry	Windblown dust	Total
Cases due to both $PM_{2.5}$ and NO_2					
Premature deaths (all adults)	15	17	0.0	1	**34**
Cardiovascular hospitalisations (all ages)	24	14	0.0	2	**40**
Respiratory hospitalisations (all ages)	14	28	0.0	1	**43**
Asthma prevalence (0-18 yrs)		67			**67**
Restricted activity days (all ages)	17,641	2,004	24	1,816	**21,485**

How does Tasman compare relative to the national numbers?

While Tasman's population in 2016 was approximately 1.1% of New Zealand's (51,895 vs 4.71 million), Tasman was responsible for 1.0% of the national anthropogenic air pollution social costs ($159 million vs $15.61 billion).

Looking at sources, Tasman contributed 0.8% of the national costs associated with total air pollution from motor vehicles and 1.6% of those associated with domestic fires. Motor vehicle costs in Tasman were approximately 1.1 times greater than those for domestic fires – compared with a national average of 2.3.

Looking at pollutants, Tasman contributed 0.8% of the national costs associated with NO_2 pollution from all sources and 1.4% of those associated with $PM_{2.5}$ pollution. NO_2 pollution costs in Tasman were approximately 0.8 times greater than those for $PM_{2.5}$ pollution – compared to the national average of 1.5.

How has air quality changed in Tasman since 2006?

Between 2006 and 2016, the New Zealand population increased by nearly 13%. While national annual average $PM_{2.5}$ concentrations due to anthropogenic sources improved (reduced) by 21%, national annual average NO_2 concentrations worsened (increased) by more than 13%. As a result, **overall social costs increased by just over 10% across New Zealand**.

Over the same period, Tasman's population increased by 13.3% and **anthropogenic air pollution social costs increased by 3.3%.**

What more do we need to do to improve Tasman's air quality?

Even small improvements in air quality can deliver significant health benefits. For example, reducing current (2016) levels of $PM_{2.5}$ and NO_2 air pollution by just 5% in Tasman would:

- reduce the number of premature deaths by 2
- reduce the number of cardiovascular and respiratory hospitalisations by 5
- reduce the number of restricted activity days by more than 1,664

The World Health Organization (WHO) has recently released new guidance on acceptable levels, based on the latest science[18]. For many pollutants, the new guidelines are much tighter. For example, the guideline for annual average NO_2 concentrations has reduced by 75% from 40 µg/m^3 to 10 µg/m^3.

Some of the ways in which we can reduce air pollution levels, include:

- Reducing the amount we travel overall
- Shifting some of our trips to active modes (walking and cycling)
- Improving home insulation so we don't need to burn as much fuel to heat our homes
- Upgrading existing domestic fires to cleaner home heating methods.

Initiatives that encourage more walking and cycling can deliver a "trifecta" of air quality, climate change and increased activity (exercise) co-benefits.

[18] *WHO global air quality guidelines. Particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide*, September 2021. https://www.who.int/publications/i/item/9789240034228.