# MPDC

# Te pūrongo o Te oranga o te Taiao
# State of Environment

REPORT

Te kaunihera ā-rohe o
matamata-piako
district council


H A U
A I R

# AIR 2022 – 2023

## General Statement

The management and monitoring of air pollutants is crucial to the health and wellbeing of people.

This chapter details the air quality monitoring carried out across the region by Waikato Regional Council (WRC) to maintain and improve our current levels of air quality.

Through extensive climate monitoring at sites across the region, WRC has collected data on air quality, which helps guide decision-making by the Waikato Regional Council and many other individuals and agencies including MPDC.

Exceeding safe limits of air pollution can have adverse effects on people, by causing respiratory conditions, cardiovascular issues, and irritation of the skin, nose, eyes and throat. Air pollution can also affect people's emotional and mental wellbeing.

Air is made up of nitrogen and oxygen gases, with minute amounts of carbon dioxide and other gases. Contamination of the air occurs through solid contamination such as dust and discharged particles from fires, liquid contamination such as pesticides and herbicides, and gas contamination. Some air contamination occurs naturally, through geothermal emissions but most, occurs through human activity.

In the Waikato region, emissions are mostly from house fires, agrichemicals, motor vehicle emissions, industry discharge, outdoor burning and livestock farming practices. Air is considered to be polluted when these contaminants are airborne for long enough, and at concentrations that could affect people, plants and animals. Air pollution can happen at multiple scales. Particle matter like dust and smoke, transport emission and industry discharge are influential at a regional level, but contribute to accumulative global scale pollution, which culminates in adverse effects such as climate change and ozone deterioration.

## Sources of pollutants

The Waikato Regional Council monitors the proportion of carbon dioxide (CO2), carbon monoxide (CO), nitrogen oxide, sulphur dioxide and fine particle matter ($PM_{10}$) in the air daily, from industry, motor vehicles and domestic heating throughout the Waikato Region.

Common Sources of pollutants are:

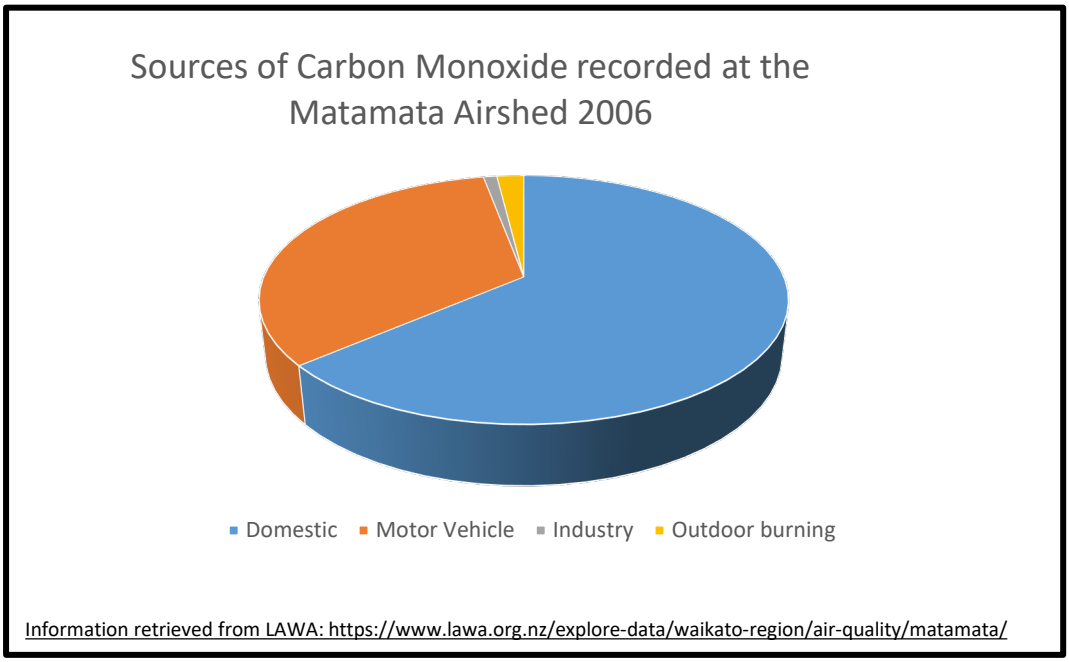
- Carbon dioxide - is a greenhouse gas. It is thought that increasing amounts of gases will contribute to climate change.

- Carbon monoxide - is a poisonous gas that is colourless, odourless and tasteless. It is absorbed into the bloodstream of people and animals, causing health effects ranging from headaches and dizziness to loss of consciousness and death.
- Nitrogen oxide - can affect people's health by causing respiratory problems. It can be damaging to our environment by contributing to ozone loss and greenhouse gases.
- Sulphur dioxides - have a strong, unpleasant smell, and can harm people's health and our environment.

## Carbon Monoxide

Most carbon monoxide in urban areas are sourced from motor vehicle, domestic home heating and industry. The figure below indicates the most recent published carbon monoxide readings for Matamata – 2006 (Land Air Water Aotearoa).

Sixty five percent of all carbon monoxide pollutants were from domestic contributions such as home fires, 34% of carbon monoxide pollutants were from vehicle use, only 2% were from outdoor burning and less than 1% were from Industry related processes.

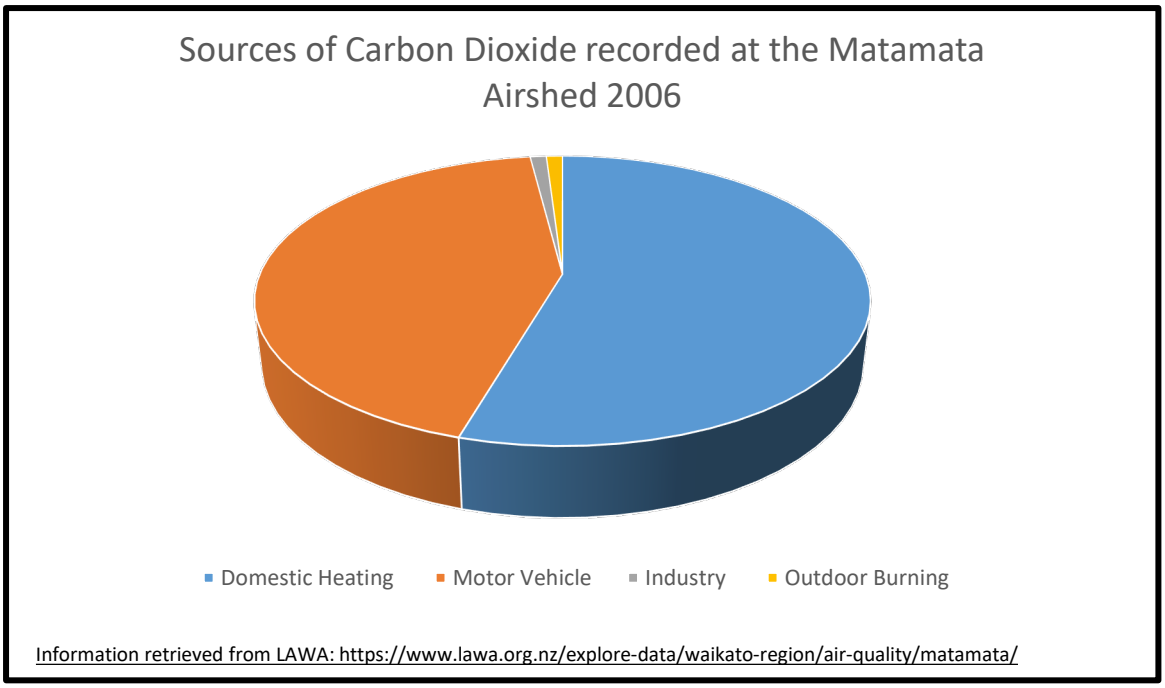



Information retrieved from LAWA: https://www.lawa.org.nz/explore-data/waikato-region/air-quality/matamata/

## Carbon Dioxide

Measuring the amounts of carbon dioxide in the air, and identifying the sources of this gas is critical as this greenhouse gas is thought to be one of the greatest contributors to global shifts such as climate change. It is critical to highlight the sources and find methods of reducing this pollutant as this plays greatly into the role of planning for large-scale changes in our natural and built environments in the future.

In the Waikato Region, carbon dioxide is sourced mostly from motor vehicles, industry and home heating. Over 50% of all carbon dioxide emissions sourced from the Matamata airshed is from domestic heating, followed by motor vehicles at approximately 43%. Carbon dioxide sourced from industry and outdoor burning equates to less than 3% of the districts total.




Information retrieved from LAWA: https://www.lawa.org.nz/explore-data/waikato-region/air-quality/matamata/

## Fine Particle Monitoring ($PM_{10}$)

Amongst the most significant air pollutant in New Zealand are small airborne particles known as particulate matter. Particulate pollutants are usually found in higher concentrations in towns and cities. Exposure to high levels of airborne particle pollutants has the potential to cause respiratory and cardiovascular issues for asthmatics, children and the elderly as well as increased risks of lung cancer and bronchitis. The size of these particles are smaller than 10 microns (1 micron is one-millionth of a metre), which makes it easy to inhale and difficult to detect.

The National Environmental Standards for Air Quality (NES-AQ) are set by the New Zealand Government and are legally binding in New Zealand. The NES-AQ set limits for five air pollutants and allows some exceedances. Air quality limits set by the NES-AQ include daily average $PM_{10}$, hourly average nitrogen dioxide and sulphur dioxide. A national standard for $PM_{2.5}$ is pending.

Regional councils and unitary authorities are responsible for managing air quality under the Resource Management Act. They are required to identify areas where air quality is likely, or known, to exceed the NES-AQ. These areas are known as airsheds.

Land Air Water Aotearoa (LAWA) and the Waikato Regional Council (WRC) Reports on $PM_{10}$ concentrations each year.

## Fine Particle Matter in Our District

There is currently one gazetted airshed in our district that monitors $PM_{10}$ concentrations, which is located at Morrinsville College. This data is collected and reported as an average level for each 24-hour period. This 24-hour period is significant in determining adverse effects on human health and notifying the public if unsafe concentrations are reached.

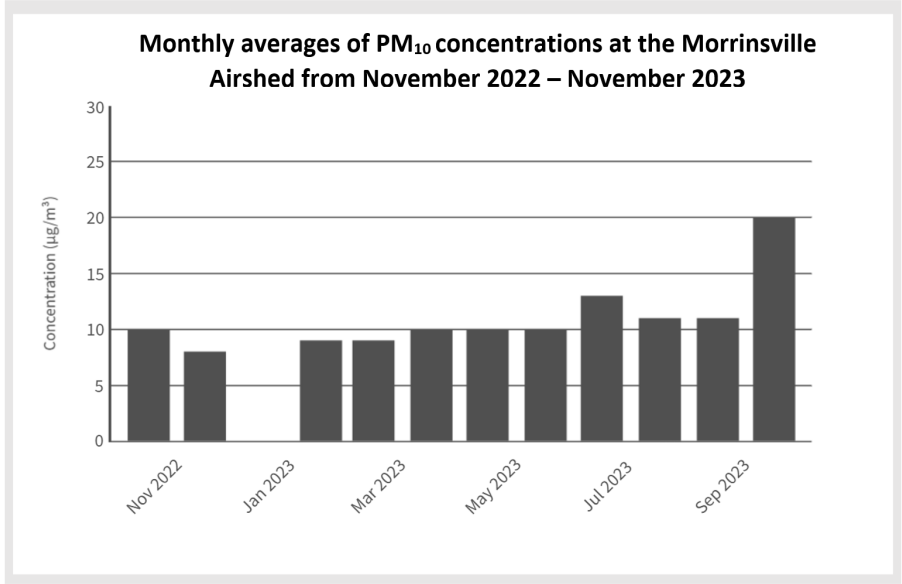
According to LAWA, the data below from the Morrinsville Airshed shows there was one exceedance between November 2022 and November 2023, which still meets the NES-AQ standards. The $PM_{10}$ daily average concentrations and exceedance days are compared to the National Standard (NES-AQ), and the $PM_{10}$ annual average concentrations are compared to the WHO guideline. There are no guidelines for hourly or monthly average concentrations.

**$PM_{10}$ Average concentrations at the Morrinsville Airshed from November 2022 – November 2023**

| $PM_{10}$ | Data verified to 01/05/2023 | | | |
|---|---|---|---|---|
| HOURLY AVERAGE | DAILY AVERAGE | MONTHLY AVERAGE | ANNUAL AVERAGE | EXCEEDANCE |
| 13 Nov 2023 hour to 8:00 PM | 12 Nov 2023 | October 2023 | 2022 | 2023 Year to date |
| 8 µg/m³ | 10 µg/m³ | 20 µg/m³ | 9 µg/m³ | 1 Exceedances |
| No guideline | Under NES-AQ (<=50 µg/m³) | No guideline | Under WHO (<=15 µg/m³) | Meets NES-AQ |

Information retrieved from LAWA: https://www.lawa.org.nz/explore-data/waikato-region/air-quality/morrinsville/morrinsville-college/

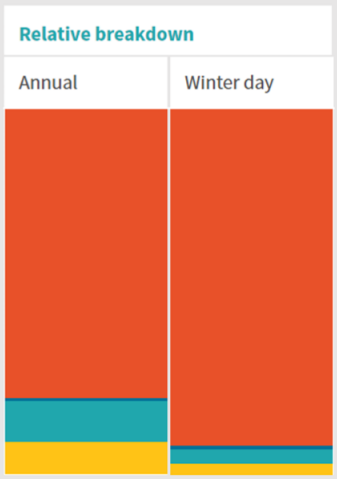
The information below shows that generally, concentrations are good for most of the year, with an increase in PM concentrations during cooler months, which is due the majority of $PM_{10}$ in the Waikato being produced by home fires. Overall, the air quality in the Matamata-Piako District is well below the NES-AQ maximum threshold for daily averages, with all concentrations of $PM_{10}$ for the year remaining below half of the World Health Organisation's acceptable threshold.




Information Retrieved from LAWA: https://www.lawa.org.nz/explore-data/waikato-region/air-quality/morrinsville/morrinsville-college/

The data below is taken from the Matamata Airshed, which shows that major sources of $PM_{10}$. Annual averages suggest that home heating is still the largest source of fine particle matter at 79%, outdoor burning accounted for 11% of fine particle matter and 10% from motor vehicles. Industrial activity accounted for 1% in both annual and winter-day readings

| Source | Annual percentage | Winter day percentage |
|---|---|---|
| Home heating | 79% | 92% |
| Industrial | 1% | 1% |
| Outdoor burning | 11% | 4% |
| Traffic | 10% | 4% |




*Sources of $PM_{10}$ in **Matamata** from home heating, industrial activities, outdoor burning and motor vehicle use. Indoor sources and natural sources are not included in this information. Values used in this table are from Ministry for the Environment Data Service 2013. Information sourced from: LAWA, 2021 (https://www.lawa.org.nz/explore-data/waikato-region/air-quality/matamata/)*

Over the last 10 years, there has been a decline in particulate matter present in the air, particularly in the winter months. This suggests that residents of the district are shifting from domestic fires to alternative means of warming their homes, which is a positive trend. By shifting away from domestic fires as a way of heating homes, there could be a significant change in the hourly readings, therefore reducing the overall average suspended fine particle matter within the district. This could result in better health outcomes for residents and for the environment.

RERENGA RAUROPI
BIODIVERSITY

# BIODIVERSITY 2022 - 2023

## General statement

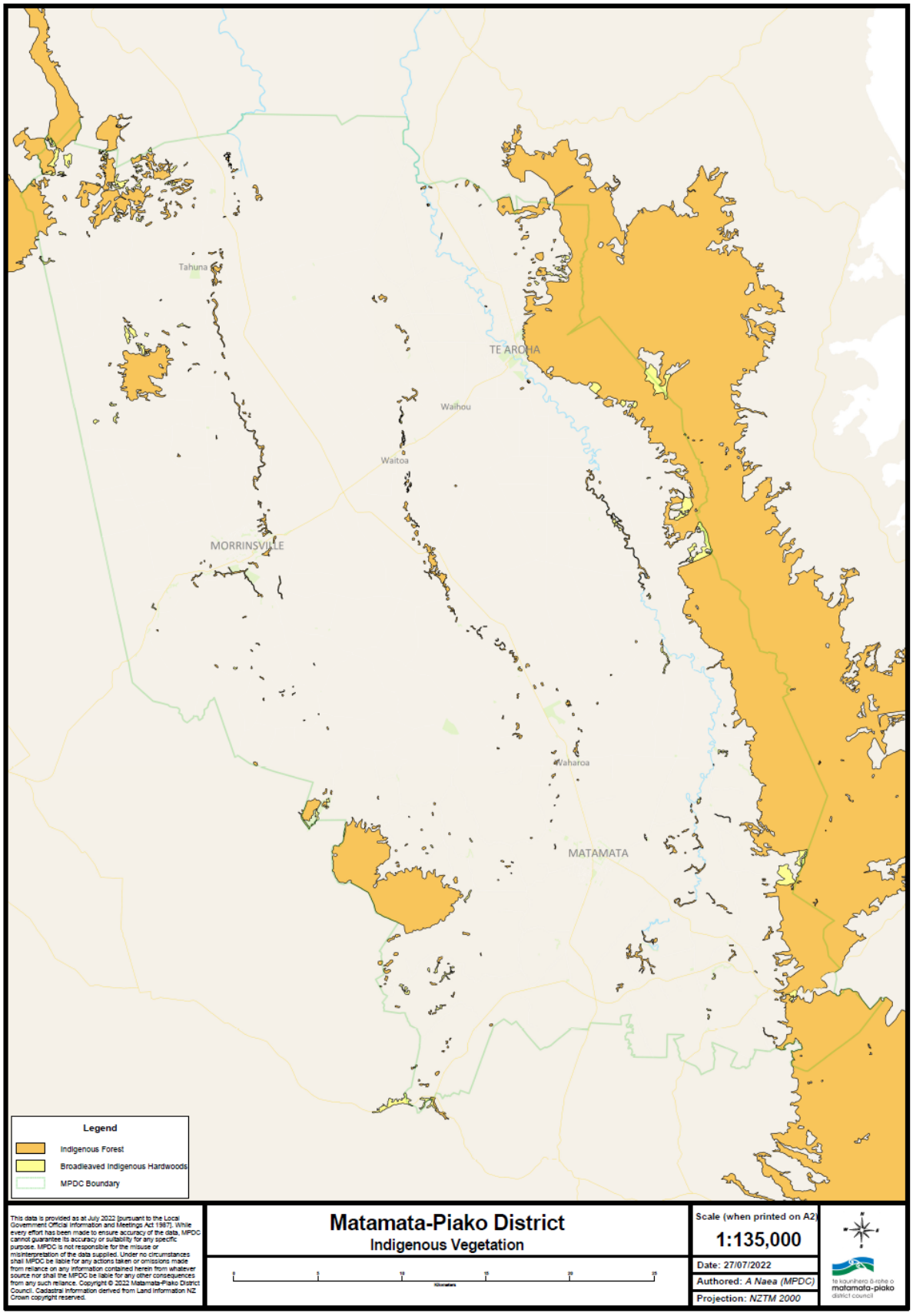
The Matamata-Piako District is fortunate to have an outstanding natural environment. Its landscape includes the Kopuatai Peat Dome, Hinuera Valley, the Kaimai-Mamaku Ranges and Te Aroha Mountain. It is crucial that the extent of indigenous vegetation be protected and preserved for us all to enjoy and for future generations. Like most districts in New Zealand, a balancing act has to be achieved to preserve indigenous vegetation, wetlands and biodiversity, while ensuring adequate development is provided for. The primary activity affecting indigenous vegetation and biodiversity is land use changes such as drainage, land clearance, subdivision and development. Habitat destruction, isolation and land fragmentation are just some of the effects of land use changes, which we can try to mitigate.

## Our District

Extent of indigenous vegetation and wetlands

There are 20, 890.8 ha of indigenous vegetation and 5393.13 ha of wetlands within the Matamata-Piako District. Our indigenous vegetation is made up of indigenous forest, indigenous hardwoods, manuka and kanuka. The map below outlines the extent of indigenous vegetation within our district.

A large portion of our indigenous vegetation is within Kaimai-Mamaku Forest Park, Hangawera, Te Tapui Reserve and the southern aspect of Maramarua Forest. Within Matamata-Piako, the Kaimai Forest Park makes up an area of 14,670 ha, and the Kopuatai Peat Dome an area of 5,313 ha (approximately one third of the Dome is within Matamata-Piako). In addition, Te Tapui Reserve comprises 2,382 ha. There are also 404 ha within Matamata-Piako that are protected by covenants under the Queen Elizabeth II Trust.






# Matamata-Piako District

## Indigenous Vegetation

0 5 10 15 20 25
Kilometers

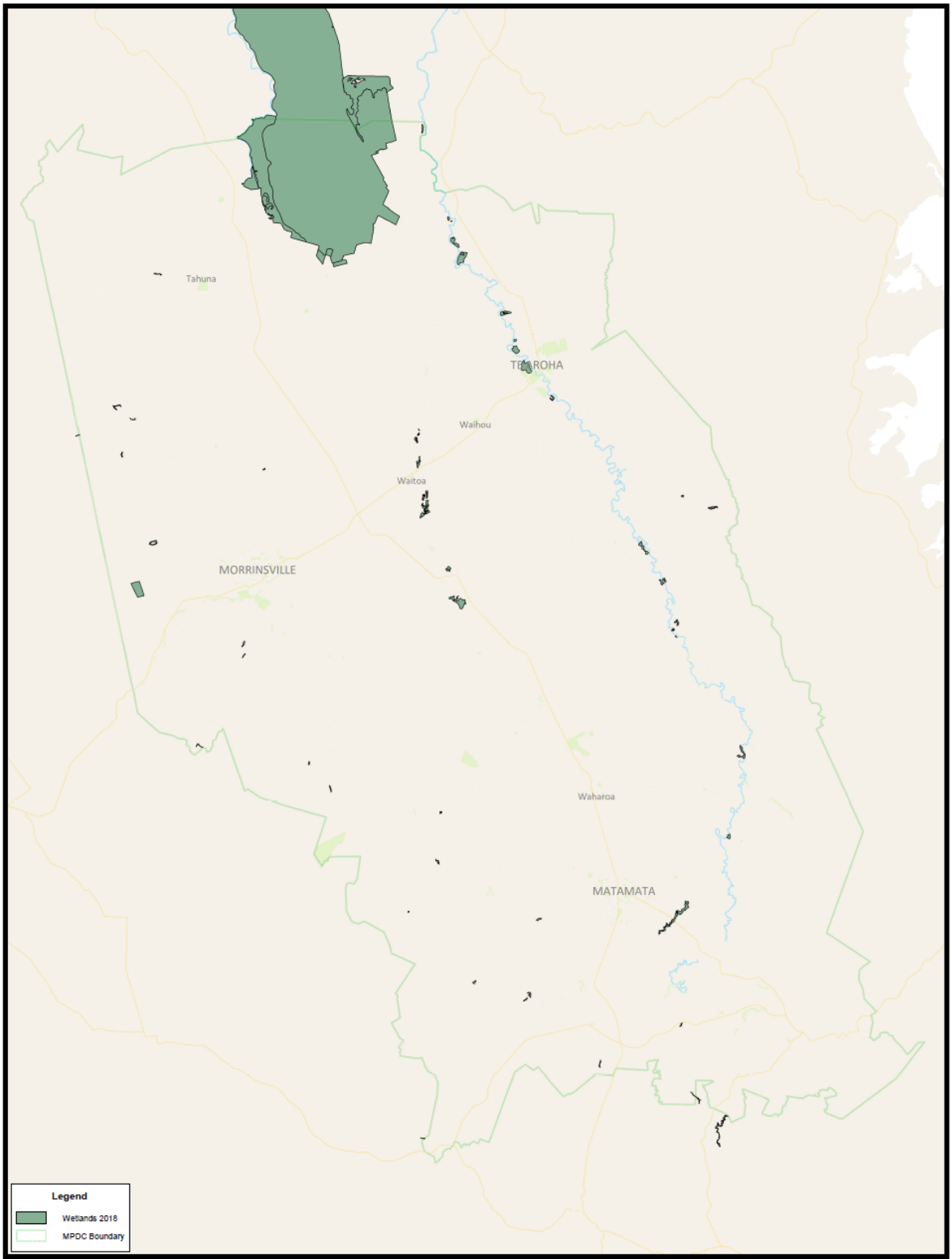
Scale (when printed on A2): 1:135,000

Date: 27/07/2022

Authored: *A Naea (MPDC)*

Projection: *NZTM 2000*

te kaunihera ā rohe o matamata-piako district council






# Matamata-Piako District
## Wetlands

Scale (when printed on A2)
1:135,000

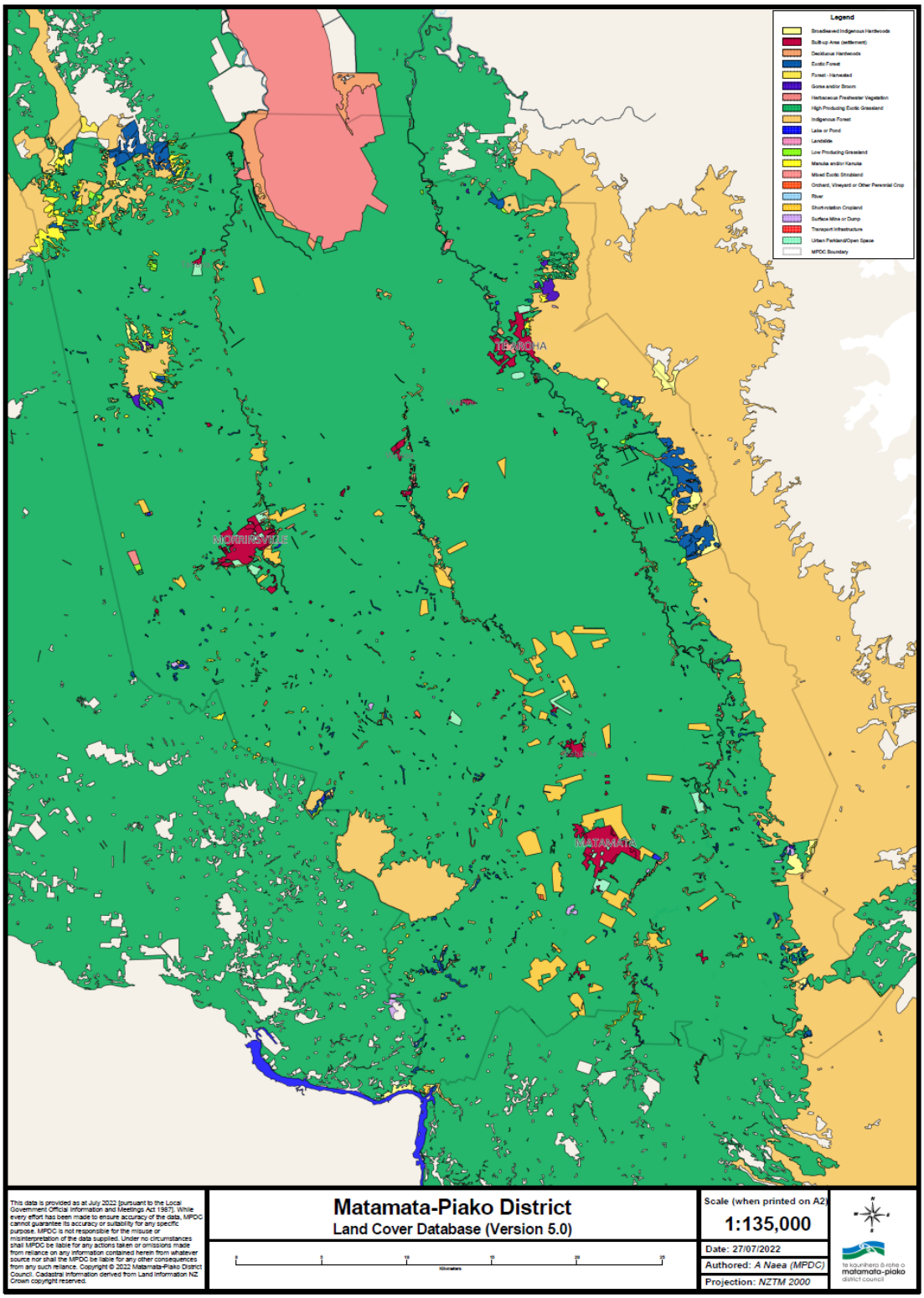
Date: 27/07/2022

Authored: *A Naea (MPDC)*

Projection: *NZTM 2000*

te kaunihera ā-rohe o matamata-piako district council

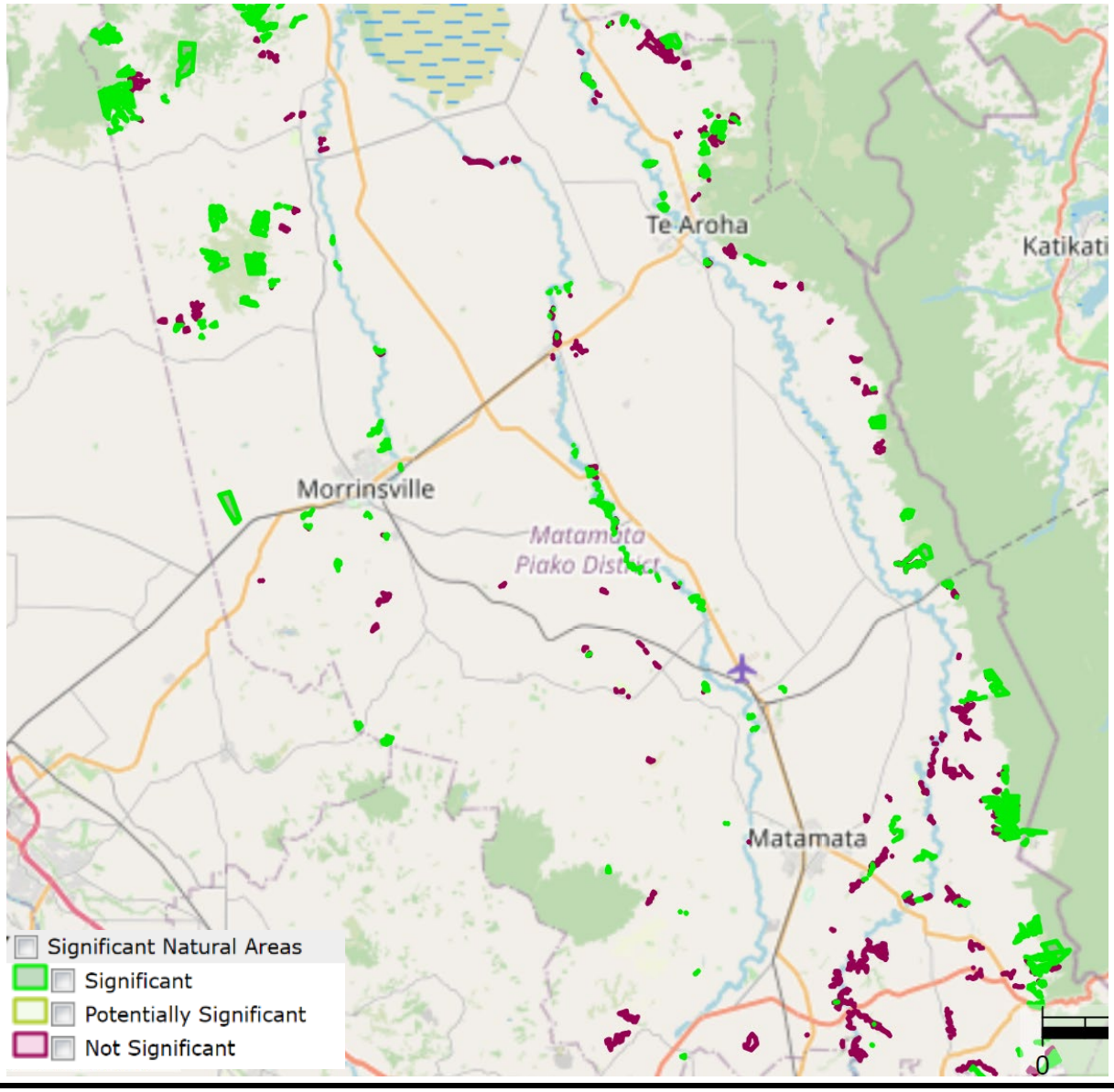
Within our district, there is also a number of other classes of biodiversity to consider the protection of. Many species have been introduced to New Zealand (exotic), and have since become an integral aspect of the various ecosystems in which they exist. These include high production grasslands, exotic forests, freshwater vegetation, crops, low production grasslands, orchards and shrub land. The map below represents both indigenous and exotic biodiversity within our district, as well as our settlement areas, lakes or ponds and rivers.



Indigenous Vegetation Cover of Protected Areas

There are 721 ha of significant natural features within the district.
In 1840, 95% of the district was covered in native vegetation; this figure is now 11.8%. A large proportion of that is held within the Kaitiaki (Conservation) Zone. Through our district plan, we have protected natural landscapes and features as well as significant natural areas. The diagram below outlines the proportion of the significant natural areas within our district (shown as green). Protecting areas has shown to increase indigenous vegetation cover as well as support the many species that live within that ecosystem. Protecting these features helps preserve the district's unique landscapes and gives us the best chance of maintaining and restoring biodiversity.

Map of Matamata-Piako District's Significant Natural Areas by category (Significant, Potentially Significant and Not significant)

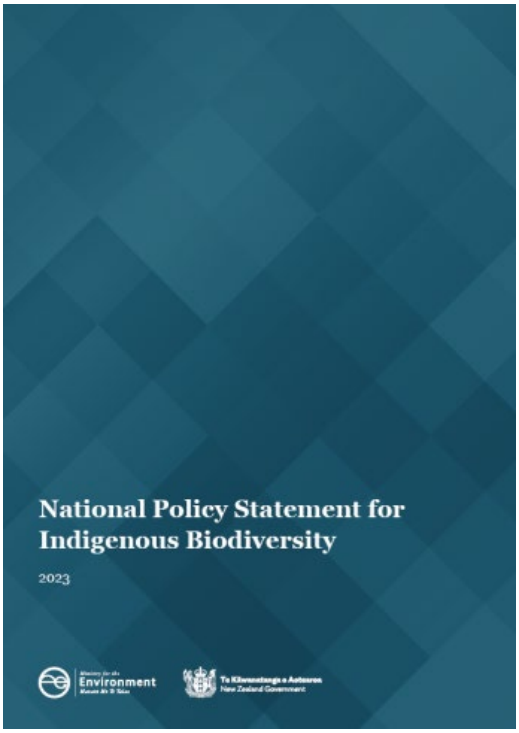


| **Biodiversity within the Matamata-Piako District in area** | | |
|---|---|---|
| Biodiversity Description | Area ($m^2$) | Area (ha) |
| High Producing Exotic Grassland | 1412542353 | 141254.2 |
| Built-up Area (settlement) | 16994832.1 | 1699.483 |
| Indigenous Forest | 191431032.9 | 19143.1 |
| Exotic Forest | 19364952.3 | 1936.495 |
| Herbaceous Freshwater Vegetation | 46674169.2 | 4667.417 |
| Broadleaved Indigenous Hardwoods | 8744139.9 | 874.414 |
| Deciduous Hardwoods | 10022556.8 | 1002.256 |
| Short-rotation Cropland | 28144104.1 | 2814.41 |
| Lake or Pond | 791894.9 | 79.18949 |
| Manuka and/or Kanuka | 8733077.7 | 873.3078 |
| Forest - Harvested | 543017.9 | 54.30179 |
| River | 2250852.4 | 225.0852 |
| Urban Parkland/Open Space | 4152142.8 | 415.2143 |
| Low Producing Grassland | 1217287 | 121.7287 |
| Surface Mine or Dump | 1145628.2 | 114.5628 |
| Gorse and/or Broom | 2149474.5 | 214.9475 |
| Transport Infrastructure | 98275.9 | 9.82759 |
| Orchard, Vineyard or Other Perennial Crop | 232639.4 | 23.26394 |
| Mixed Exotic Shrubland | 179437.3 | 17.94373 |
| Landslide | 46560.2 | 4.65602 |

| | | |
|---|---|---|
| **Total Area** | **1755458429** | **175545.8** |
| Wetlands | 53,931,311.30 | 5393.131 |

Information retrieved from Land Air Water Aotearoa (LAWA) 2018

## What's happening




The Government has released the new National Policy Statement for Indigenous Biodiversity (NPS-IB) to protect and maintain indigenous biodiversity across Aotearoa New Zealand. The NPS-IB came into force on 4 August 2023 and directs local authorities to update their policies, plans and strategies to reflect NPS-IB requirements. Some implications are immediate, while others will need to be implemented by mid-2033.

The NPS-IB seeks to respond to any biodiversity threat, including by requiring at least no overall loss in indigenous biodiversity and by promoting and providing for the restoration of indigenous biodiversity.

There has been criticism of the Resource Management Act 1991 (RMA) for failing to adequately protect indigenous biodiversity. The NPS-IB is intended to set clear and consistent criteria for identifying and managing indigenous biodiversity across different districts and regions. It applies to the terrestrial environment and specified highly mobile fauna and wetlands.

The NPS-IB has been developed under RMA, which the Government plans to repeal and replace with the Natural and Built Environments Act (NBA). When this occurs, the NPS-IB will be transitioned into the proposed National Planning Framework developed under the NBA.


WHENUA
LAND

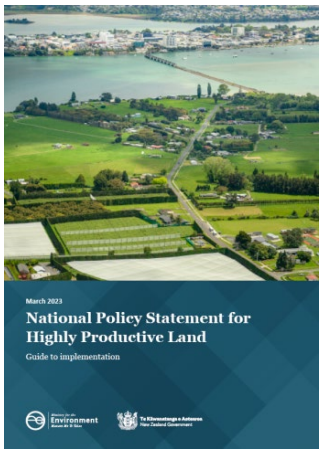
# LAND 2022 – 2023

Over the last 150 years of New Zealand's history, people have made significant changes to our land – particularly in the Waikato region. Native forests have been cleared and wetlands drained to create opportunities for different land use activities. With increased pressure on land, it is imperative to understand the effects of activities on the land, and how these can be managed.

Our soils are considered to be a non-renewable resource, like fossil fuels. It takes thousands of years for rocks to become soil, and hundreds more years for the soil to build up organic matter. This organic matter is what allows soil to carry out its various functions. Depleting the soil quality and poor soil management can be detrimental. Therefore, making good decisions around our land and soil is critical to our wellbeing.

## What's happening:

The Government has released the National Policy Statement for Highly Productive Land (NPS-HPL) to protect highly productive land from inappropriate subdivision, use and development and to ensure its availability for food and fibre production. This National Policy Statement took effect on 17 October 2022.
The NPS-HPL responds to the 'Our Land 2018' report, which found that urban expansion and development is reducing the availability of Aotearoa's most fertile and versatile productive land. Its purpose is to direct subdivision and development away from highly productive land and to protect land used for food production.




The NPS-HPL relies on the Land Use Capability (LUC) system, which categorises land into eight classes. Land that is classed as LUC 1 is the most versatile, productive and has the fewest limitations, making it best suited to food and fibre production. Conversely, LUC 8 is the least versatile and productive and has the greatest number of limitations. LUC classes 1, 2 and 3 will be protected by the NPS-HPL.

In the Matamata-Piako district approximately 75% of our soils are very versatile soils (soil class 1- 3). These are also known as 'high-quality soils in the Matamata-Piako District Plan. These versatile soils have a large impact on the type of businesses in our district and also to our districts economy.

## Soil Quality in our District

Soil quality is incredibly important to our district as it plays a key role in many of our land use classifications. Agriculture and dairy products are considered part of the district's major economic base and are a big contributor to the district's GDP. Therefore, close monitoring and proper management of soils is critical. Good quality soils have properties that enable multiple

land uses. Ideally, soils should be able to hold water and nutrients where it will be made available for plant roots to use, suppress weeds and pests, perform carbon sequestration from the atmosphere, filter water that flows through it before reaching waterways, absorb heavy rainfall which prevents flooding and support biological activity/organisms.

This year, the Waikato Regional Council (WRC) carried out testing in two sites in our district. Below is the data collected at each site.

Site 1 was being used for 'Drystock', which is predominantly for grazing cattle, sheep and deer. Of the seven factors measured, the hot water extractable nitrogen (mg/kg) was below the target level of 225, at 205. This indicates that the level of nitrogen available for biological activity of organisms is less than ideal, and fertiliser will be needed to support biological activity of organisms. The other measure that did not reach target levels were the hot water extractable carbon, which was measured at 2045 mg/kg. This is above the target level of 1800 mg/kg, indicating that there is insufficient carbon available for microorganisms to use for food and metabolic processes. Otherwise, five of the seven factors measured for site 1 were within normal limits.

The second site sampled was being cultivated for crops. There were two measurements below target levels for this site. Hot water extractable nitrogen was measured at 80 mg/kg, which is well below the target of 225 mg/kg. This indicates that like site 1, there is not enough nitrogen available for organisms to survive. Anaerobically mineralised nitrogen was measured below 50 mg/kg indicating that the soil is deficient for pasture as there is not enough nitrogen available to plants through microbial activity. All other measurements were within acceptable limits for site 2.

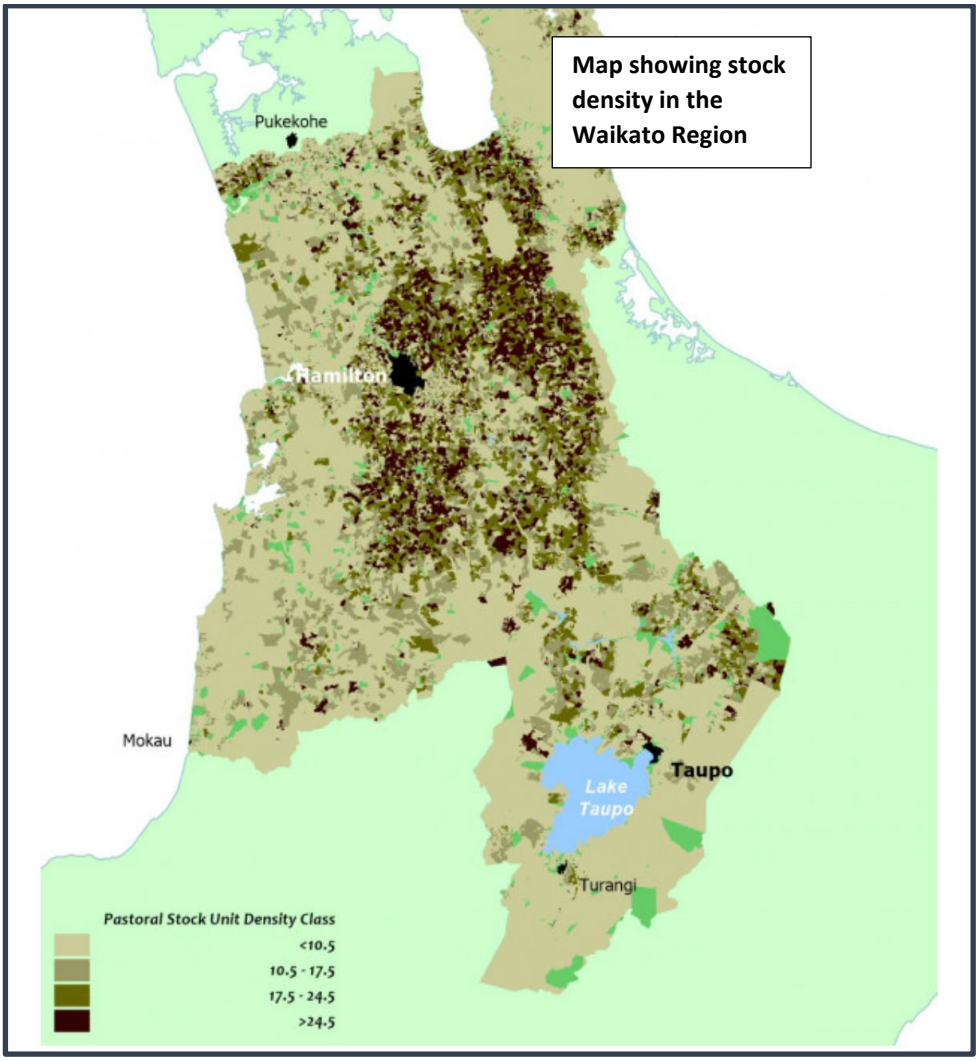
| | Land Use | pH<br>Soil fertility | Total Carbon %<br>Organic matter content. Organic matter helps to store water, nutrients | Total Nitrogen %<br>Nitrogen reserves in soil. Below 0.2% is deficient for grass and crops | Hot water extractable Carbon (mg/kg)<br>Biological activity and Carbon availability for microorganism to use as food. Soil structure degraded at <1800 | Hot water extractable Nitrogen (mg/kg)<br>Biological activity and amount of Nitrogen available for organisms. Less than 225 indicate Nitrogen fertiliser needed | Anaerobically mineralised Nitrogen (mg/kg)<br>Below 50 is considered deficient for pasture | Macroporosity<br>Soil compaction. Needs to have >10 for root growth and water infiltration |
|---|---|---|---|---|---|---|---|---|
| 1 | Drystock | 5.7 | 5.1 | 0.43 | 2045 | 205 | 116 | 15.3 |
| 2 | Being Cultivated | 6.2 | 4.2 | 0.45 | 1033 | 80 | 43 | 18 |

## Stock Density of our Soils

Stock density is one of the indicators to determine how tightly compacted the soils are as a result of livestock grazing and machinery related techniques. The soil structure becomes compromised when it is compacted, and this tight packing of soil and root systems also reduces the diversity and extent of biomatter. While both sites sampled this year indicate good macroporosity or adequate soil compaction for root growth and water infiltration, it

is important to examine all the data available from the Waikato Regional Council related to stock density as half the sites sampled last year (2021 – 2022) showed high levels of soil compaction.

The map below shows stock density (pastoral stock class) in the Waikato region. Waikato Regional Council monitor stock density to find out where livestock farming is likely to have the most effect on soil and water quality in the region. Correlations can be drawn to areas of high stock density, soil compaction and high levels of nitrogen in soils and waterways.




Information retrieved from Waikato Regional Council: https://www.waikatoregion.govt.nz/environment/land-and-soil/land-use-in-the-waikato/regional-stock-density-map/


URURUA
WASTE

# WASTE 2022-2023

## Our District

Waste within our district is made up of household kerbside waste collection (bags and bins), waste from industrial or commercial activity, and waste from residents and businesses taking loads to the three transfer stations, as well as waste taken directly to privately operated landfills.

While we are doing a lot of recycling, we could be doing more.

There is urgency to move away from our current high-waste society to becoming a low-waste society. This requires us all to rethink our approach, reshape our behaviours and reimagine the future of waste management. This shift not only requires us to recover resources at the end of their use rather than disposing of them, but also to choose and use resources in ways that can ensure they do not generate waste. The concept of recycling is not just primarily about reducing how much waste is taken to landfills but also reduces the need to extract further raw materials from the earth needed to create the product.

## Para-Kore (Zero Waste)

Reframing our thinking around waste aligns with the principle of kaitiakitanga or guardianship, whereby we adopt an integrated view of the environment and protect our natural environment from degradation. “Everything in nature is part of a closed, continuous, endless cycle” (WMMP). This is called the Circular Economy. Modern methods of manufacturing and material sourcing have led to an increase in volume of production and in-organic material.

Our vision is to embrace Zero Waste (Para Kore) and the Circular Economy (Ōhanga āmiomio) as an alternative to the traditional linear economy. Circular economies means we keep resources in use for as long as possible, extracting the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life where possible.

## Waste Management and Minimisation Plan (WMMP)

Council is required to develop and adopt a Waste Management and Minimisation Plan (WMMP) under s44 of the Waste Minimisation Act 2008. Our last Waste Management and Minimisation Plan (the Plan) was adopted in 2017 in partnership with our neighbours Thames-Coromandel District Council (TCDC) and Hauraki District Council (HDC).

While our Plan covered the period from 2017 to 2023, significant changes in Central Government policies, and in the waste industry sector have resulted in us reviewing our Plan in 2020 to ensure it is ‘fit for purpose’. Amendments were consequently made in 2021. The WMMP is a collaborative model where Council, businesses, Iwi, community groups and householders can all work together to build new waste minimisation services and grow local economic development, ultimately building community resilience at the same time. This plan aims to enable all individuals and businesses have access to recycling, resource recovery and

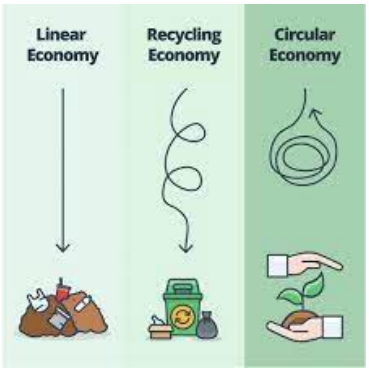
waste management services. There is an opportunity to create more education and understanding around taking responsibility of our waste, therefore creating awareness of the value in resources being used, recycled and avoiding sending waste to a landfill.

**The Future of Waste in our District**

Central government have proposed a shift towards a low waste, low carbon future. In turn, there are likely to be increased costs associated with landfill disposal over the next few years. When planning for the future of our district it is critical to identify how to implement effective waste management systems that work towards waste minimisation and resource recovery before it is sent to landfills.

We propose to do this by sequentially converting our refuse transfer stations into community resource recovery centres (CRRC) which will provide for greater separation of wastes and provide for collaboration enterprises that allow for community and business input. These changes are fundamentally different to the current practises. The changes suggested by central government and Council calls for changes in behaviour and practices, but using a circular economy methodology will move us closer towards meeting the goals and objectives of the WMMP.

**Working towards a low-waste future and a circular economy**




One of the goals set out in the WMMP vision is to have 'a community that considers, and where appropriate, implements initiatives and innovative ways to assist in reducing, reusing and recycling wastes therefore minimising the waste that is sent to landfills' by:

- Provide sustainable waste minimisation services that are cost-effective to the community
- View waste as resource, making the necessary improvements and modifications to collections and facilities so that more materials and products can be diverted from landfill
- Making waste reduction, reuse and recovery initiatives our priority and align with other council objectives
- Reduce barriers that prevent the community from making the best use of the existing services
- Find and implement new ways that waste can be reduced, reused and recycled
- Examine feasibility options for developing community recovery centres
- Review processes and methods of waste management to keep it within the district

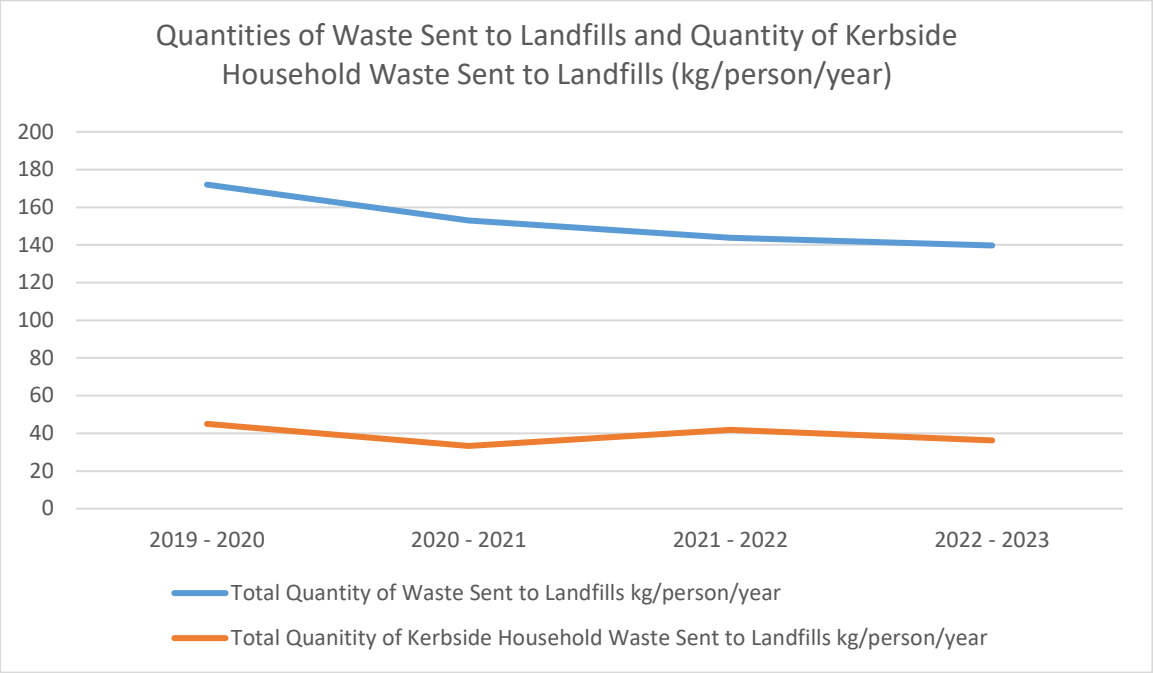
The second goal outlined in the WMMP vision is to 'minimise environmental harm and protect public health' by:

- Ensuring the reduction of environmental harm is understood from a holistic perspective, including tikanga and mātaurangi Māori (indigenous knowledge) as an important aspect of creating sustainable practices.
- Identifying all impacts on the environment and the public health implications of all waste management options, and ultimately looking at what is most cost effective for the community

**How are we tracking?**

There are two targets that the Matamata-Piako District Council is looking at tracking related to landfills. These two targets require the total quantity of waste sent to landfills to be reduced by 1% per person per year and expect a 5% decrease in kerbside household waste to landfill from approximately 62kg per person per annum to 59kg. For more information please visit our webpage: https://www.mpdc.govt.nz/wmmp

The following section looks at how our district is tracking.




The average kg of waste sent to landfills per person per year, has decreased steadily since the Plan was first implemented. In the 2022 – 2023 period there was an average of 139.7kg of waste per person, sent to landfills, which is a reduction of 4.1kg compared to the 2021 – 2022 period where there was an average of 143.8kg of waste sent to landfills. In the period 2020 – 2021, there was an average of 153.5kg of waste per person sent to landfills, which means that between 2020 – 2021 and 2021 – 2022, there was a reduction of 9.69kg per person. Our largest drop in landfill waste was between the period 2019 – 2020 and 2020 – 2021 where we saw a drop of 18.51kg per person.

The total kerbside waste sent to landfills for the year 2021-2022 was 41.79kg per person. This is an increase from 2020 – 2021 period, where was only 33.32kg per person. However, both these years were lower than the previous year (2019 – 2020) which had a total quantity of kerbside waste of 45kg per person. This year has had the lowest value, with only 36.4kg per

person which indicates a drop of 5.4kg per person from the 2021-2022 period. This is a really encouraging trend for our district.

On the face of it, this demonstrates that less rubbish is being sent our landfills, perhaps a result of increased uptake of recycling methods, choosing to reuse or repurpose and/or an uptake of Council's messaging around rubbish around how to correctly recycle or manage your waste rather than sending it to landfills. However, Covid-19 protocols did change the availability of the Council's collection services, which generally resulted in a decrease in material going to landfill. Due to these significant changes and impacts of Covid-19, it has been tricky identify conclusive patterns and behavioural changes.

Total Quantity of Waste sent to Landfills, per person per year

| | Total quantity of waste sent to landfills per person per year | Reduction by how many kg compared to the year before: |
|---|---|---|
| 2022 – 2023 | 139.7 kg | 4.1 kg |
| 2021 – 2022* | 143.8 kg | 9.69 kg |
| 2020 – 2021* | 153.5 kg | 18.51 kg |
| 2019 - 2020 | 172 kg | |

*Covid-19 protocols changed the availability of council's rubbish collection services during these years and there was a decrease in total amount sent to landfills. Due to these significant changes and impacts of covid-19, it has been tricky identify patterns and behavioural changes.

Amount of Kerbside Household Waste sent to landfills, per person per year

| | Total quantity of Kerbside Household Waste Sent to Landfills (kg/person/year) | Reduction by how many kg compared to the year before: |
|---|---|---|
| 2022 – 2023 | 36.4 kg | 5.4 kg |
| 2021 – 2022* | 41.8 kg | -8.5 kg |
| 2020 – 2021* | 33.3 kg | 11.7 kg |
| 2019 - 2020 | 45 kg | |

*Covid-19 protocols changed the availability of council's rubbish collection services during these years and there was a decrease in total amount sent to landfills. Due to these significant changes and impacts of covid-19, it has been tricky identify patterns and behavioural changes.


A W A
W A T E R

# Water 2022 - 2023

Water is critical to all aspects of our lives. Freshwater is precious and limited, a taonga of huge significance. The Waikato Regional Council (WRC) collects information on water quality, wetlands, lakes, rivers, ground water, storm water and water allocation. For the purpose of analysing the data at a local level, the two key components examined in this report are ground water availability and river water quality for recreational use.

Groundwater

Groundwater is characterised by rainwater that has percolated through soil to underground rock fractures or porous sediment. These are known as aquifers. Groundwater accounts for 90% of the Waikato's fresh water resource. To access the aquifers, wells are drilled to pump the water away from the aquifers to where it is needed. For example, for drinking water, industrial and agricultural use. The amount, quality and usage of groundwater varies greatly within the region.

Ground water quality depends on how vulnerable the groundwater aquifers are to contamination. Contamination of groundwater can take place when pollutants travel through the soil into the aquifers. Once polluted, it can be challenging to reverse this entirely. Hence, the importance of ensuring optimal ground water protection. Contaminants in the ground water can be due to pollution from point source or non-point source. Septic tanks, leaking treatment ponds, waste disposal sites are examples of point source contaminants, while agricultural land use activities, saltwater intrusion, fertiliser and pesticide applications are examples of non-point source pollutants.

Groundwater use, also known as water allocation is monitored by the Waikato Regional Council to ensure these aquifers will sustain everyone's needs.

Groundwater Availability – Waikato Regional Council

Waikato Regional Council monitors 'available' levels of groundwater to ensure groundwater resources are used sustainably.

'Available' groundwater is the total volume of groundwater that can be taken from an aquifer without affecting the aquifer. This simple assessment of available groundwater treats the aquifer in isolation to any connected streams and rivers. Areas listed as having low or medium stress may be having a significant impact on nearby streams and rivers. Where possible, the Waikato Regional Council encourages the use of groundwater rather than surface water.

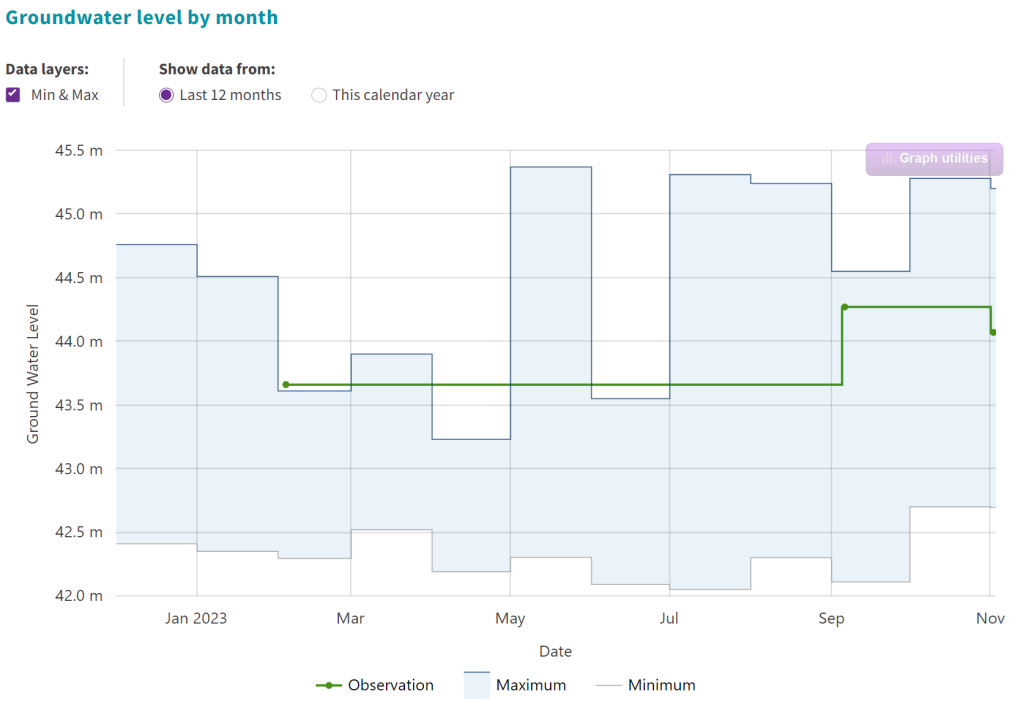
Although in some catchments, groundwater is connected to surface water and groundwater allocation may be limited by surface water availability. Please read the section below if you would like more information on consented water take. As more water is taken from an aquifer, the volume of 'available' groundwater for future use drops. The Regional Council estimates the level of stress on groundwater resources by comparing the volume of 'available' groundwater to the volume that has already been allocated for use.

Waikato Regional Council divides the groundwater resources they monitor in our region into three categories: low, medium and high stress.

- Low stress areas have less than 10% of available groundwater allocated for use. This equates to around 90% of sites in the Waikato Region.
- Medium stress areas have between 10% and 30% of available groundwater allocated for use. This equates to just under 10% of sites in the Waikato Region.
- High stress areas have more than 30% of available groundwater allocated for use. This equates to around 1% - 2% of sites in the Waikato Region.

The graph below shows the recent groundwater level (green line) compared to the maximum and minimum range measured at Bore 64 - Station 831 (Waharoa Aerodrome), during the same time of the year. You can read the latest groundwater levels for our district at the following link:

https://www.waikatoregion.govt.nz/environment/envirohub/environmental-maps-and-data/station/15742/GWL?dt=Groundwater+Level

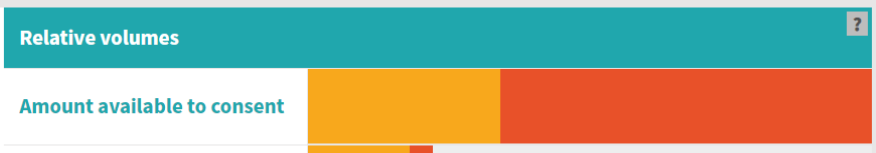



Groundwater Availability - Land Air Water Aotearoa (LAWA)

LAWA hold information pertaining to consented groundwater takes. Below is a breakdown if how much water is available to use compared with the amount that is actually consented for use. It also demonstrates how much of the water is surface water and how much is groundwater. Only 6% of groundwater that is available has been consented for use.

## Consented water by source

Relative volumes




| Source | Amount available to consent | Volume consented | Consented as a percentage of available |
|---|---|---|---|
| Surface Water | 1.13 billion $m^3$ | 0.6 billion $m^3$ | 53% |
| Groundwater | 2.18 billion $m^3$ | 0.13 billion $m^3$ | 6% |
| **Total** | **3.32 billion $m^3$** | **0.73 billion $m^3$** | **22%** |

You can read more information on water quantity, purpose for water use, and the rates of take at the following link:

https://www.lawa.org.nz/explore-data/waikato-region/water-quantity/

River Water Quality for Contact Recreation

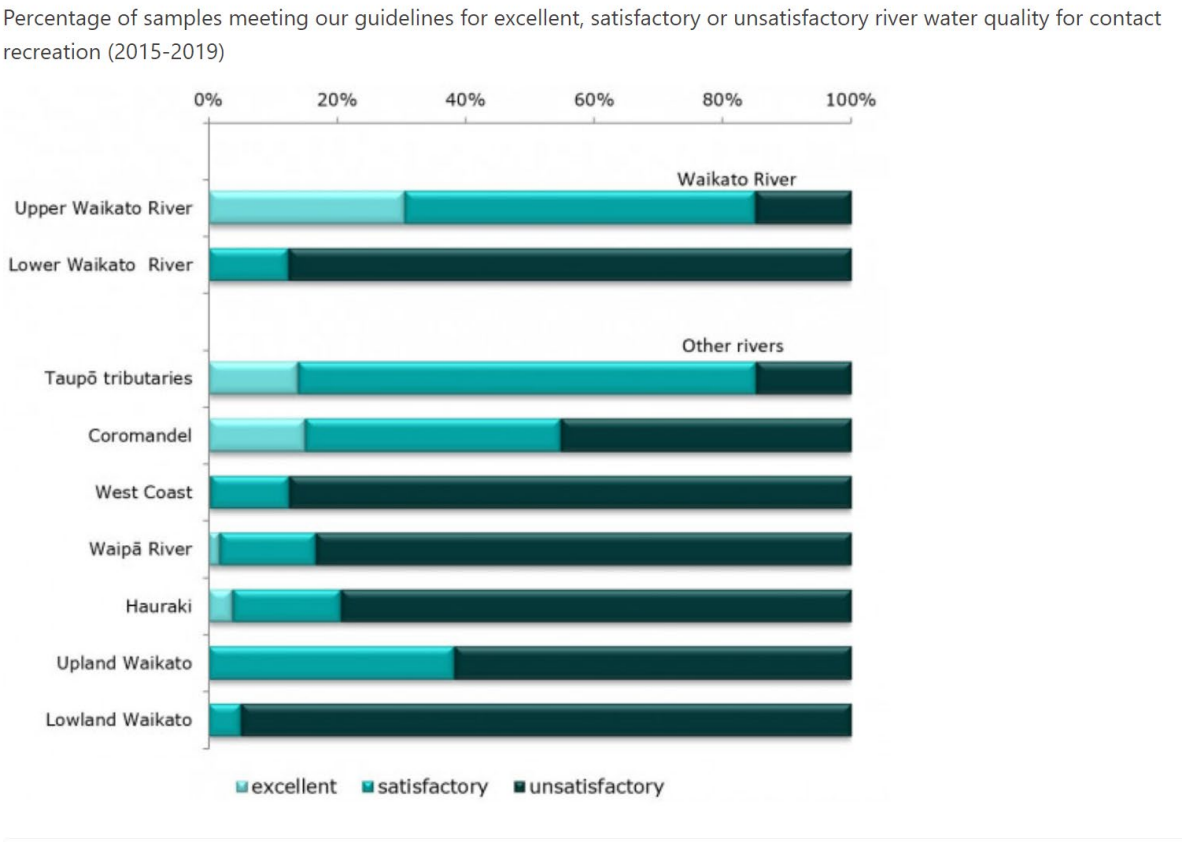
Routine monitoring of rivers and streams in the region, is used to assess the suitability of the water for recreational water activities such as swimming and other water sports. Microorganisms from human and animal faeces can get into the waterways. This can be dangerous for people exposed to these organisms. Other matter such as silts and clay can enter the waterways, reducing the water clarity. There are a total of 115 sites across the Waikato Region, where testing takes place.

There are two important water quality measures taken for each site – faecal bacteria levels and water clarity. Using these values, a 'pass rate' is determined for each site.

There are some parts of the region where river water quality is good, such as the upper Waikato River, tributaries of Lake Taupo and Coromandel waterways. River water quality in the lowland areas such as the Hauraki Plains and lowland tributaries of the Waikato River are not as good, which is reflective of the greater land use activities in the lowland aspects of the region, and due to waterways collecting water pollutants and creating a pooling of these contaminants. Increased levels of faecal bacteria and fine silts, and impacts of non-point source contamination from runoff are significant attributing factors.

The graph below shows the percentage of samples from rivers around the region meeting or exceeding water quality guidelines for recreational use, collected between 2015 - 2019. These are categorised as excellent, satisfactory or unsatisfactory. River samples from within the

Hauraki area indicates that less than 5% of the sites sampled proved to have excellent river water quality for recreational use. Over 80% of sample sites from rivers within the Hauraki area had unsatisfactory water quality for recreational use. Please read below for information specific to each of our three rivers in a recreational use context.




Information retrieved from Waikato Regional Council: https://www.waikatoregion.govt.nz/environment/water/river-and-stream-monitoring/indicator-river-water-quality-contact-recreation/

To focus on the Matamata-Piako District a little closer, below are three snapshots of river water quality for contact recreation in the Piako, Waitoa and Waihou Rivers. If you would like to view the safety of other sites that were tested, please visit the following link and use the interactive map on the bottom of the page to find your recreational swimming spot: https://www.waikatoregion.govt.nz/environment/water/rivers/water-quality-monitoring-map/


Piako River:

The dark blue shading indicates the water sample returned an 'unsatisfactory' result for both baseflow clarity and presence of E.Coli. The ecology tests show that the Piako River sample contained unsatisfactory levels of nitrogen, phosphorus and high turbidity (suspended particles). There was low levels of ammonia and a suitable pH level.

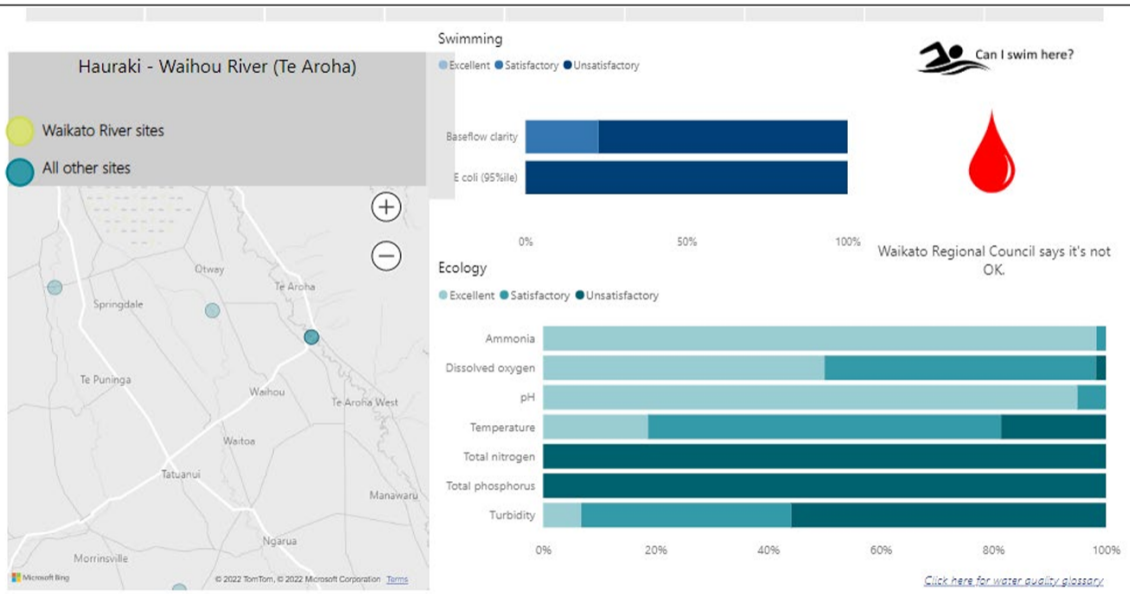
Despite over half of the indicators being either excellent or satisfactory – The Waikato Regional Council deemed the Piako River unsafe for recreational use.


Waitoa River:

Similarly to the Piako River, both indicators showing water clarity and E.Coli levels have produced mostly unsatisfactory samples for recreational swimming.

The ecology samples from the Waitoa River show that there are still unsatisfactory levels of phosphorus present, and even higher levels of nitrogen compared to the Piako River. There is concerning levels of dissolved oxygen which suggest the water has a very poor ability to support aquatic life. There are also slightly higher levels of ammonia in the Waitoa River.

The Waikato Regional Council have deemed the river water in the Waitoa River unsafe for recreational use.




Waihou River:

The Waihou River samples have demonstrated low levels of ammonia, satisfactory levels of dissolved oxygen and excellent pH levels. Much like the Waitoa and Piako rivers, there are still very high levels of nitrogen, phosphorus and turbidity. There are also unsatisfactory levels of water clarity and E.Coli.

The Waihou River was deemed unsafe for recreational use.