



ENVIRONMENTAL REPORTING & AIR QUALITY MONITORING

1 ACTIVITY OVERVIEW

The Science and Innovation Team serves a range of environmental reporting functions including research into the effects of climate change and drinking water security, and ongoing development of data management tools to support environmental reporting. The team works closely with Horizons' Communications team to share data and information via the Horizons and **Land, Air, Water Aotearoa (LAWA)** websites, as well as provide annual **State of Environment (SOE)** reporting. The team also monitors air quality in Taihape and Taumarunui and works alongside the Communications Team to run public information campaigns about good wood-burning practices.

The activity update below reports on progress on environmental reporting and air quality activities during the reporting period (1 October to 31 December 2020).

2 ANNUAL PLAN TARGETS

2.1.1 The Annual Plan targets for Environmental Reporting and Air Quality Monitoring are aggregated in Table 1 below.

Table 1 Progress reporting for Environmental Reporting and Air Quality Monitoring Annual Plan targets for 2020-2021.

Performance Measures for Levels of Service	Target 2020-21	Progress Update
Environmental Reporting and Air Quality Monitoring Activity		
Provide an annual summary report on the state of the environment.	1	Catchment summary reports are on track to be delivered this financial year.
Develop and implement a science communication strategy.	Report progress to Council annually	The strategy and action plans for science communication will be implemented throughout the year.

Performance Measures for Levels of Service	Target 2020-21	Progress Update
Complete drinking water supply research with a focus on Council-operated drinking water supplies and complete an annual report on this to Council.	1	This year the drinking water programme will be funding the groundwater bore inspections in priority source protection zones and this will be reported on to territorial authorities and to Council. This work is currently being scoped.
Investigate one aspect of climate change impact in the Region and report on this to Council.	1	This year the climate change research budget is being used to fund a Regional Climate Change Risk Assessment. This project has been contracted to Tonkin + Taylor and the first round of community engagement is complete. Hui are planned for March 2021 with rangatahi from iwi across the region to look at risks from climate change hazards, as well as workshops with subject matter experts.
Air quality is monitored in Taihape and Taumarunui and reporting is made available to the public via LAWA and the annual State of Environment report.	Completed	Monitoring is ongoing and data is made available to the public via the Horizons and LAWA websites. New air quality monitoring equipment (5014i BAMS) for the Taihape and Taumarunui sites will be installed in the next two months. A new site is to be found in Taihape as the Fire Station is to undergo a rebuild.
Undertake an annual public education campaign on air quality.	1	A public awareness campaign was completed in March-April 2020 and guidance information on 'good' burning was shared via social media through winter. A similar campaign will be run this year.

3 ACTIVITY UPDATE

STATE OF ENVIRONMENT REPORTING

- 3.1.1 The previous **State of Environment (SOE)** report was published in May 2019 and a framework for annual reporting, in the form of catchment summary report cards, was developed. In September 2019, we published a suite of SoE summary report cards for each of the seven major catchments or **Freshwater Management Units (FMUs)** in the region.
- 3.1.2 Staff are updating the catchment summary (state of environment) report cards, with a view to publishing these in the first half of 2021. These report cards provide an annual snapshot of the current state of the environment for each FMU.

AIR QUALITY

- 3.1.3 Air quality monitoring at Horizons' designated airsheds, Taihape and Taumarunui, continues. Existing BAM units have had their pre-winter independent annual calibration checks and at present are operating adequately. There have been no

verified exceedances of the **Air Quality National Environmental Standards (NES)** recorded at either location this year.

- 3.1.4 We have purchased two new 5014i BAM units that are capable of monitoring both coarse and fine particles (PM₁₀ and PM_{2.5}) to comply with the amendments proposed by the **Ministry for the Environment (MfE)** to the **National Environmental Standards for Air Quality (NESAQ)** in late 2019. The changes propose limits on both daily and annual concentrations of fine particle (PM_{2.5}) in ambient air. An average daily limit of 25µg/m³ with no more than three exceedances per year and an annual limit of 10µg/m³ are proposed.
- 3.1.5 The two BAM recording units have been trialed in the office, calibrated and new housings for the units have been delivered; they will now be installed at Taihape and Taumarunui before winter arrives. The new BAM units will enable us to maintain a long-term record for PM₁₀ at the sites and will also allow us to comply with the proposed change to PM_{2.5} monitoring under the proposed amended NESAQ.

ENVIROLINK

- 3.1.6 Envirolink is a regional council-driven funding scheme which aims to support regional councils in two areas of environmental management: adapting management tools to local needs, and translating environmental science knowledge into practical advice by:
- Improving science input to the environmental management activities of regional councils;
 - Increasing the engagement of regional councils with the environmental **research, science and technology (RS&T)** sector; and
 - Contributing to greater collective engagement between councils and the science system generally.
- 3.1.7 The Envirolink scheme funds research organisations (Crown Research Institutes, universities and some not-for-profit research associations) to provide regional councils with advice and support for research on identified environmental topics and projects. Funds are administered by the [Ministry of Business, Innovation & Employment - Science and Innovation](#). Envirolink commenced on 1 December 2005 in trial form and is now a well-established investment scheme. Investment funding of \$1.6 million (excluding GST) per annum is available to regional councils to contract government-funded research organisations to transfer environmental research knowledge.

- 3.1.8 During 2020-21, Horizons has successfully secured Envirolink funding for six projects to the value of \$145,020. A synopsis of these projects is provided below.
- 3.1.9 A large advice grant for water quality trend analysis and reporting guidance was put forward on behalf of the regional sector. The project involves the preparation of a comprehensive guidance document to facilitate more consistent assessment of temporal trends in our monitored parameters for freshwater (nitrate, *E. coli*, dissolved reactive phosphorus etc.). The guidance will consider trend analysis requirements in the context of regional reporting purposes and the national freshwater policy reforms. The funding for this work totals \$46,632 and will be completed by NIWA and Land Water People Limited with review from scientists from the Cawthron Institute and Ministry for the Environment.
- 3.1.10 Over the last few years Horizons has been gradually acquiring baseline information about the state of its **coastal marine area (CMA)**. In 2018, NIWA prepared an initial stocktake that identified priority areas to obtain further information. NIWA will complete the following three priorities for this Envirolink (\$38,737) project:
1. undertake a summary and analysis of seafloor biotic sampling information for the western and eastern CMAs;
 2. extract maps of threatened marine mammals and marine invertebrate distribution on the reach of the CMAs from existing spatial models; and
 3. extract maps of reef and demersal fish (those living near the seabed) distribution in the eastern CMA from spatial models.
- 3.1.11 The **National Environmental Monitoring Standards (NEMS)** for discrete water sampling and laboratory testing were released in 2019. The aim of NEMS is to improve consistency in State of the Environment long-term monitoring. To ensure Horizons' data is in line with the new NEMS requirements, current methodology used to measure some water quality variables will need to be modified. Changes in methodology can, however, result in a "step change" in the data which can affect trend analysis. To address this risk, a paired laboratory nutrient analysis is being carried out by NIWA (\$10,000 funding). This has involved collecting and analysing nutrient samples applying the different methodologies over a 12-month period, from which NIWA will interpret the data and provide recommendations to align the datasets.
- 3.1.12 A small advice grant of \$5,460 was approved for a review of the new NEMS for the collection and laboratory processing of macroinvertebrate samples. The key

component of this review is an independent external peer review to inform revisions to the draft NEMS for macroinvertebrate monitoring ahead of its release to the public. This work will be carried out by Jon Harding (University of Canterbury) and Kevin Collier (University of Waikato).

- 3.1.13 A small advice grant for \$10,000 will be used to fund a two-day aquatic weed identification course run by NIWA. This is to upskill Horizons biosecurity officers on pest plants in the riparian and freshwater environment. The course will also cover management options for those weeds in the sensitive freshwater environment.
- 3.1.14 An Envirolink Tool grant of \$175,000 was approved to provide guidance on the selection and application of appropriate surrogate monitoring technologies for robust **suspended sediment concentration (SSC)** load measurements needed to support freshwater and coastal management. SSC is an important instream measurement of sediment as it plays a major role in decreasing water quality, degrading aquatic habitats and altering channel morphology. However, high frequency data in understanding sediment concentrations in stream, and a surrogate measurement, is often used to achieve this. This guidance on surrogate technologies is needed as there is currently little information available on which option is best used in each context and how to operate it effectively. It will address methods already used, such as optical turbidity as well as new (to New Zealand) methods such as acoustic back scatter point and profiling instruments. This tools grant was put forward by the Environmental Data **special interest group (SIG)**, championed by Horizons Regional Council and Auckland Council, with support from the Coastal SIG, River Managers Group, Land Managers SIG and Land Monitoring Forum. The work will be completed by NIWA over a two-year period.
- 3.1.15 Two other sector-wide tool grants that have been approved are the microbial risk assessment tool for discharges near drinking water wells, to be carried out by ESR and GNS Science (total \$230,000 over two years) and the monitoring and evaluation of riverine flow management under the NPS-FM to be carried out by NIWA and the Cawthron Institute (\$220,000 over two years). These grants were championed by the Groundwater and Surface Water Integrated Management (SWIM) SIGs, respectively.

DRINKING WATER

- 3.1.16 Since July 2018, Council has included additional funding of \$100,000 per annum in the Long-term Plan to inform decision-making concerning the management of existing and

future public water supplies, including ensuring communication with other agencies involved in drinking water supply management.

- 3.1.17 Previous reports have delineated source protection zones for all council controlled drinking water supplies (and some selected large supplies) to help with risk identification and management. During the reporting period, the delineation of source protection zones was finalised for Council-operated supplies that serve fewer than 500 people, and some large non-Council operated supplies. The report outlines recommendations to improve security of the supplies assessed, and has been shared with stakeholders.
- 3.1.18 Building on recommendations from previous work, inspections of groundwater bores in source protection zones one and two are planned for this financial year. These are areas in the immediate vicinity of an intake structure and those where contaminants can reach the supply within eight hours or in harmful concentrations, respectively. A method for prioritising which groundwater bores across the region should be targeted first is currently being contracted. Field surveys and data analysis will assess the security of current groundwater bores in relation to drinking water supply.

COMMUNITY AND NATIONAL ENGAGEMENT

- 3.1.19 An important part of our role is to ensure up-to-date and relevant scientific information is effectively communicated to Horizons staff, Councillors, consent holders, iwi, the public, and any other parties interested in aspects of natural resource management.
- 3.1.20 Staff have been working on developing a community engagement plan for Horizons 'Our Freshwater Future' programme, with the first round of community engagement underway in late February 2021. Initial conversations will focus on confirming/identifying the values we associate with freshwater, to help frame our long-term vision and inform future discussions around setting objectives, limits and action plans to maintain/improve water quality. These conversations will involve iwi/hapū, stakeholders and community groups through print, digital and social media channels, community and public events, and local hui and meetings. Further information will be made available to Horizons' Strategy and Policy Committee on 9 March 2021.
- 3.1.21 On 4 February 2021, Horizons Regional Council hosted a science and research exchange with staff and researchers from Manaaki Whenua – Landcare Research

(Figure 1). The purpose of this exchange was to continue to build the relationship between the two organisations, to drive the application of science to support regional outcomes, community engagement with science, and uptake and value of data and information. The exchange focused on Council's key challenges: freshwater, climate change, biodiversity and unlocking information. Horizons staff provided an overview of issues within the local context, while Manaaki Whenua staff provided short presentations of relevant work underway that might assist Horizons. The exchange also provided an opportunity for both teams to explore a technique for engaging communities in identifying problems and solutions to environmental challenges, using the Ohau River as an example.



Figure 1 Staff and researchers from Horizons and Manaaki Whenua Landcare Research share ideas for water quality improvement in the Ohau River Catchment as part of their science exchange.

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