**Physicians and Scientists for Global Responsibility New Zealand.**

# Natural Environment Bill 2026.

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## New Zealand Charitable Trust

**PSGRNZ would welcome an opportunity to speak to this submission.**

Physicians and Scientists for Global Responsibility Charitable Trust (PSGRNZ) works to educate the public on issues of science, medicine, technology (SMT). PSGRNZ work to encourage scientists and physicians to engage in debate on issues of SMT, particularly involving genetics and public and environmental health.

**February 13, 2026.** The Physicians and Scientists for Global Responsibility New Zealand (PSGRNZ) thanks the Environment Committee for this opportunity to contribute to scrutiny and examination of this Natural Environment Bill 234-1. We recommend that the Bill is placed on hold pending greater investigation.

The Explanatory Note of the Bill claims that this Bill will retain and strengthen core compliance and enforcement components of the RMA. These are 'intended to prevent adverse effects and remedy harm that occurs, support information gathering to inform decision-making, enable a range of accountability mechanisms, and enable effective administration of compliance and enforcement and cost recovery.'

Yet the Bill, as drafted, lacks the substantive capacity to fulfil such a stewardship role.

The purpose of this future Natural Environment Act is to establish a framework for the use, protection and enhancement of the natural environment. Central government has a broader and more active role in shaping and overseeing the new system, yet the Ministry for the Environment lacks the powers and resourcing to adequately understand and work with other agencies to evaluate man-made (anthropogenic) chemicals and emission risks (inclusive of radiofrequency electromagnetic fields (RF-EMFs)).

The Bill's narrow operational focus reflects legacy thinking, entrenched path dependency in regulatory design, and an unduly risk-averse approach to analytical scope. PSGRNZ recognises that Select Committees, and the data-analysis tools used to review submissions, necessarily prioritise material that engages directly with the text of the Bill. However, the matters raised in this submission, while at times appearing removed from the immediate drafting, reflect longstanding failures of governance that have produced the very conditions that earlier Regulatory Impact Statements acknowledge as problematic.

The repeated signalling of knowledge gaps, failures to require or resource scientific inquiry, and the resulting institutional ignorance in this submission document should alert the reader that these problems are historically entrenched, culturally reinforced, and not readily remedied.

## Contents

## 1. NARROW OPERATIONAL FOCUS AT LOCAL, REGIONAL & CENTRAL GOVERNMENT LEVEL

1.1. The Bill's design is fundamentally deficient. It lacks any clear, principled framework for inquiry or exploratory research and provides no credible mechanism to ensure equity or burden-sharing when environmental limits tighten or when cumulative effects emerge belatedly, as they often do.

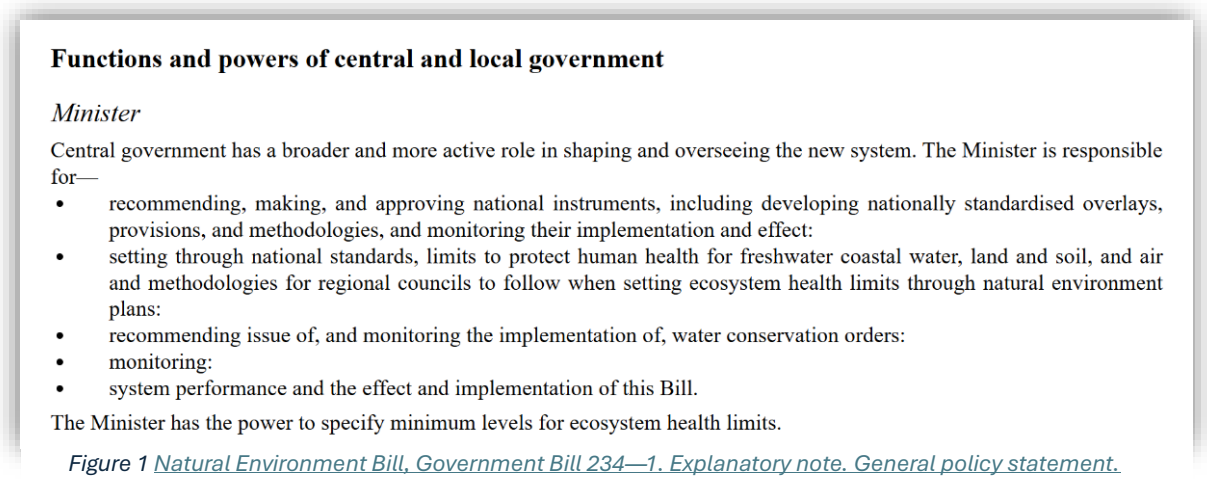
1.2. There is no decision-making pathway/hierarchy to judge decision-making between economic efficiency and health protection when the information is uncertain and contested, or where there is missing data.

1.3. 'Best obtainable information' is narrowly presumed, and does not extend to an obligation for the Ministry for the Environment to evaluate the scientific literature and undertake an assessment of the state of scientific knowledge concerning an issue, before the Ministry would recommend, make or approve a national instrument and set national standards. This includes any requirement that monitoring frameworks would be in alignment with best global practice, and which would reflect the capacities of new instrumentation including machine learning.

1.4. The drafting demonstrates little engagement with contemporary scientific understanding of ecosystems, environmental pollution, or the scale and complexity of modern risk. It is notably disconnected from advances in scientific capability, including systems modelling, machine learning, and data integration, that could materially improve the identification, interpretation, and governance of environmental hazards. As a result, the legislation is not merely inadequate for the future; it is already out of step with present scientific reality.

1.5. International pollution treaties are sector specific and historically defined. They do not extend to most modern agricultural and industrial emission of concern and do not supply general principles for assessing new or complex emission risks. In effect, any reliance on treaty implementation will and can not cure the Bills evidential gaps that are discussed in PSGRNZ's response.

1.6. The functions and powers of the Minister and the Ministry for the Environment are decoupled from the capacity to undertake in-depth scientific research for the purpose of the undertaking its functions and powers, outlined in the image below, because there is no explicit directive in the Bill for scientific research and the corresponding funding which is required to be ring-fenced for such purposes over the long term.



**Functions and powers of central and local government**

*Minister*

Central government has a broader and more active role in shaping and overseeing the new system. The Minister is responsible for—

- recommending, making, and approving national instruments, including developing nationally standardised overlays, provisions, and methodologies, and monitoring their implementation and effect:
- setting through national standards, limits to protect human health for freshwater coastal water, land and soil, and air and methodologies for regional councils to follow when setting ecosystem health limits through natural environment plans:
- recommending issue of, and monitoring the implementation of, water conservation orders:
- monitoring:
- system performance and the effect and implementation of this Bill.

The Minister has the power to specify minimum levels for ecosystem health limits.

*Figure 1 Natural Environment Bill, Government Bill 234—1. Explanatory note. General policy statement.*

1.7. The Bill fails to create an authorising environment for anticipatory governance. There is no language requiring horizon scanning by officials at local, regional and central government so as to ensure that the scientific information they rely on is scientifically up to date in the year that they are working.

1.8. The Bill does not impose an obligation to invest in long-term scientific capacity, and there is no provision for developing sustained expertise in national and regionally specific pollutants and their risk and degradation routes within agencies, communities, or tāngata whenua that would support informed governance across all tiers. Instead, the Bill underspecifies any duty to inquire, effectively entrenching structural disincentives to exploratory analysis and reinforcing institutional conservatism.

1.9. Many anthropogenic pollutants exhibit environmental persistence, with degradation governed by compound-specific physicochemical properties and context-dependent biotic and abiotic processes. Substances may partition between aqueous phases, sediments, and soils, with sorption, resuspension, and long-range transport influencing spatial and temporal exposure profiles. Persistence is frequently coupled with bioaccumulation and trophic transfer, leading to biomagnification in higher-order organisms. Degradation pathways, photolytic, hydrolytic, microbial, or oxidative, can yield transformation products with distinct and, in some cases, greater toxicological relevance than parent compounds. These processes are further modulated by cofactors such as redox conditions, temperature, organic matter content, microbial community structure, and interactions with co-occurring contaminants. Consequently, robust risk assessment requires integrated consideration of environmental pathways, transformation dynamics, and system-level interactions rather than single-compound or static exposure assumptions.

1.10. For decades, local, regional and central government decision-makers have not had the scientific expertise to evaluate the potential for toxic, persistent and bioaccumulative contaminants to cause harm to ecosystems over time, including particularly – as a cumulative adverse effect.

1.11. Another point of concern regards the Disclosure Statement which frames the system as a 'funnel' of tightly *defined goals*, producing *national instruments* and resulting in *one combined plan per region*. This is aimed at ensuring consistency and while reducing risk for 'relitigation'.

1.12. The Bill (and disclosure statement) claims that a goal of the Bill is to:

*'manage the effects of natural hazards associated with the use and protection of natural resources through proportionate, risk-based planning'.. That [13] 'A person exercising or performing functions, powers or duties under this Act must take all practicable steps to act in a timely and cost-effective manner: act proportionately to the scale and significance of the matter, ensure they have enough information to understand the implications of their decision (if any), after considering—*

- *the cost and feasibility of obtaining the information; and*
- *the scale and significance of the matter to which the decision relates*

The scale and significance of environmental risks cannot be adequately understood on the basis of the current knowledge base held by the Environmental Protection Authority, the Ministry for the Environment, New Zealand research institutes, or academic institutions.

## 2. NO SCOPE IN THE BILL TO STRATEGICALLY EVALUATE ANTHROPOGENIC RISKS

2.1. Although the stated policy intent is to protect the environment and human health, this intent is contradicted by the practical infeasibility for Ministry staff to commission or undertake the scientific

research necessary not merely to 'consider the effects of an activity', but to understand the interacting and dynamic processes that determine harm. The Ministry for the Environment is required to set standards that underpin decision-making on the effects of activities, yet the Bill contains no explicit directive to support the generation of new scientific knowledge, nor any provision for ring-fenced funding to evaluate risks arising from man-made chemical contaminants and environmental emissions, including radiofrequency electromagnetic fields (RF-EMFs).

2.2. Longstanding under-resourcing by the Ministry of Business, Innovation and Employment (MBIE), which controls public research funding, and by Treasury, has entrenched structural barriers that make sustained, long-term research technically and institutionally unachievable for scientists in both academia and government agencies. As a consequence, decision-makers lack the data required to scientifically assess the nature of discharges, the sensitivity of receiving environments, and the cumulative effects of contaminant mixtures over time. This includes an inability to evaluate persistence, bioaccumulation, and delayed or system-level impacts, leaving regulatory decisions fundamentally disconnected from the known complexity of environmental risk.

2.3. This is not feasible if the status quo persists. No national instruments are yet to be developed that would enable an evaluation of the potential for toxic, persistent and bioaccumulative man-made contaminants to cause harm to ecosystems over time, there is no policy text, and no scientific resourcing for such work to be carried out in New Zealand.

## 3. UNCERTAINTY IS CENTRAL IN RISK MANAGEMENT – THE KEY ROLE OF PRECAUTION

3.1. In effect, the Bill codifies a governance model that manages known problems narrowly, while remaining silent on emerging, complex, and cumulative risks. Hence the Bill effectively neutralises uncertainty, rather than recognises that the juggling of uncertainties and risk might require that the precautionary principle be considered at a high level. Yet uncertainty is part-and-parcel of decision-making in environments where man-made technologies impact and interact with biological systems.

3.2. The Bill somewhat unscientifically restricts 'best obtainable information' as something that is attached to a specific decision and which can be 'reasonably obtained at the time'. While this may be appropriate for a single resource decision in a region, it is not reasonable for the Ministry of Environment, when assessing national standards.

3.3. Furthermore, there is no obligation to interrogate why information may be incomplete, nor any direction to treat scientific uncertainty itself as a risk at local, regional or central government level. Officials are neither empowered nor incentivised to ask difficult questions that fall outside established work programmes, and the legislation does not provide a statutory framework to encourage systems-based or forward-looking reasoning, despite an increasing knowledge base and increased technological capacity.

3.4. This restricted application means that Ministry for the Environment officials, when exercising higher-level functions such as developing policy, national standards, and guidance relating to environmental chemicals and emissions, are not required to integrate the precautionary principle into decision-making. In practice, this confines precaution to a narrow, late-stage permitting context and excludes it from the upstream governance settings where systemic risks are framed and prioritised. PSGRNZ emphasises that any reliance on 'proportionality'in this context is inherently under-specified, as it operates against a background of incomplete knowledge and institutional ignorance regarding both discrete and combinatory chemical effects. As we reiterate, ignorance is not incidental; it reflects the

longstanding absence of resourcing within New Zealand's research and academic institutions to generate the evidence base and expertise necessary for informed risk evaluation.

3.5. From a scientific risk-analysis perspective, this creates a structural bias toward Type II errors, the failure to detect or act on real but uncertain harms, while giving a false sense of protection against Type I errors , or acting prematurely on uncertain risks (Kriebel et al 2001), (Scott 2016) . Where effects are early classified as legally irrelevant, 'less than minor', or outside regulatory scope, the trigger for further investigation and information-gathering may never be activated.

3.6. Yet precautionary decision-making can only operate where uncertainty is acknowledged as material to the decision at hand. In this way, proportionality and precaution are placed in tension: proportionality limits inquiry on the basis of incomplete evidence, while precaution is deferred until a level of certainty that the system itself is structurally incapable of producing. The result is a governance framework that systematically under-detects cumulative and emerging risks and normalises false negatives in environmental and public-health protection.

## 4. PRECAUTIONARY PRINCIPLE DOWNGRADED AND SIDELINED

4.1. The Precautionary Principle was an important proclamation in the 1992 Rio Declaration on Environment and Development, and the Natural Environment Bill concerns both.

4.2. PSGRNZ urge that the precautionary principle placed at high level in the Bill text.

> *In order to protect the environment, the precautionary approach shall be applied widely by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. (UNCED 1992)*

4.3. It is alarming that any prescribed use of the Precautionary Principle for decision-making in uncertain environments is confined to a lower clause [166] which restricts the extent of application:

'*When deciding whether to grant or refuse an application for a natural resource permit*' where information uncertain or inadequate: the permit authority 'must favour caution and environmental protection' if information is uncertain/inadequate.

**166 Precautionary principle where information uncertain or inadequate**

(1) When deciding whether to grant or refuse an application for a natural resource permit, a permit authority must favour caution and environmental protection if the information available to determine the application is uncertain or inadequate.

(2) However, if applying **subsection (1)** means that the application is likely to be refused, the permit authority must consider whether including a condition that requires, or conditions that form, an adaptive management approach would address the concerns arising from the uncertainty or inadequacy of the information.

4.4. This restricted application means that Ministry for the Environment officials, when reviewing higher level risks including the establishment of policies, national standards and guidelines relating to environmental chemicals and emissions, their hazards and risks, are not required to integrate the precautionary principle into any decision-making or policy development.

4.5. PSGRNZ are well aware of the failure of government officials to produce a guideline document that may support official use of the precautionary principle in decision-making. For example, even though the Environmental Protection Authority have been required to take a precautionary approach [7] since the Hazardous Substances and New Organisms Act 1996 received royal assent in 1996, there is no public facing policy document to suggest that officials have a formal decision-making process to support the integration of precaution into official decision-making.

4.6. We discussed the role of the precautionary principle and it's role in environmental regulation in our submission to the *Inquiry on the Natural and Built Environments Bill: Parliamentary Paper*.

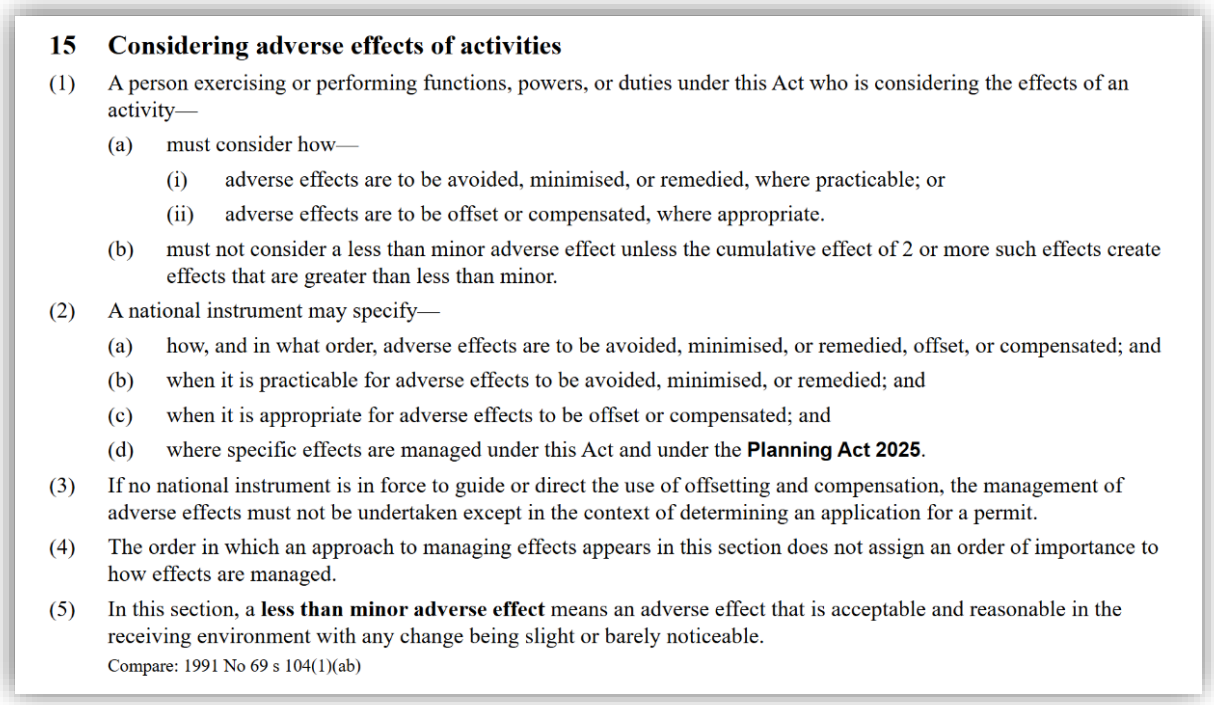
4.7. PSGRNZ emphasis that in relation to the Natural Environment Bill, any discussion on 'proportionality' will inevitably lack context because of the lack of knowledge, and hence ignorance of discrete and combinatory chemical effects across all layers of New Zealand government, and because of the absence of resourcing in New Zealand's research and academic institutes for such work, that would then produce the institutional expertise. We are also aware that when the prevailing institutional ignorance is taken into account, further cascading problems and potential errors can arrive. Somewhat contradictorily, 'proportionate information' and 'precaution under uncertainty' can pull in opposite directions. If the system classifies many effects as legally irrelevant, or 'less than minor' early on, the trigger for investing in deeper information-gathering may never arrive. Yet precaution only bites when the permit decision-maker accepts that uncertainty/inadequacy matters for the decision in front of them.

4.8. In similar fashion, the proposed 'adaptive management approach' lacks sufficient transparency to ensure monitoring data is publicly accessible, scientifically robust for the future and can serve the purpose of protecting the environment for future decades. Current legislative and guideline texts (such as National Policy Statements and Environmental Protection Authority reviews are structured), do not sufficiently require that new chemicals and their metabolites are clearly registered and documented and that any monitoring and reporting activities would be publicly disclosed to ensure that the public, including expert scientists might understand not only the results of any monitoring and reporting, but the timeliness (e.g. seasonality of when a chemical is primarily used), frequency and quality of reporting (e.g. lowest detectable level). New Zealand historically has not triangulated the evidence of risk from a chemical, metabolite or its commercial formulation in the scientific literature, with monitoring data. Monitoring data is conventionally irregular.

4.9. Likewise, the proposed adaptive management approach [104], which can apply to natural environment plans, lacks sufficient transparency to ensure that any monitoring data (including the monitoring protocols and lowest detectable level disclosures for the instrumentation used by actors) are publicly accessible, scientifically robust, and capable of protecting the environment over the long term. Current legislative and guideline frameworks, such as National Policy Statements and Environmental Protection Authority reviews, do not adequately require that new chemicals and their metabolites are systematically registered, documented, and monitored, nor that associated monitoring and reporting data are publicly disclosed.

4.10. As a result, the public, including independent scientific experts, is unable to assess not only monitoring outcomes, but also the timeliness, frequency, and quality of data collection, including matters such as seasonality of use and analytical detection limits. Historically, New Zealand has not consistently triangulated evidence of risk from chemicals, metabolites, or commercial formulations in the scientific literature with environmental monitoring data, which itself is often irregular and incomplete.

4.11. Evaluation of risk characteristics via scientific literature review, through machine learning and AI – is now possible. Yet the Bill is not structured to demand that such work is undertaken at a high level, and consistently updated, and therefore that an independent agency has long-term funding to do this work, to ensure that any adverse effects – particularly to vulnerable and juvenile systems or organisms, may be '*avoided, minimised, or remedied, offset, or compensated*'.



**15 Considering adverse effects of activities**

(1) A person exercising or performing functions, powers, or duties under this Act who is considering the effects of an activity—

(a) must consider how—

(i) adverse effects are to be avoided, minimised, or remedied, where practicable; or

(ii) adverse effects are to be offset or compensated, where appropriate.

(b) must not consider a less than minor adverse effect unless the cumulative effect of 2 or more such effects create effects that are greater than less than minor.

(2) A national instrument may specify—

(a) how, and in what order, adverse effects are to be avoided, minimised, or remedied, offset, or compensated; and

(b) when it is practicable for adverse effects to be avoided, minimised, or remedied; and

(c) when it is appropriate for adverse effects to be offset or compensated; and

(d) where specific effects are managed under this Act and under the **Planning Act 2025**.

(3) If no national instrument is in force to guide or direct the use of offsetting and compensation, the management of adverse effects must not be undertaken except in the context of determining an application for a permit.

(4) The order in which an approach to managing effects appears in this section does not assign an order of importance to how effects are managed.

(5) In this section, a **less than minor adverse effect** means an adverse effect that is acceptable and reasonable in the receiving environment with any change being slight or barely noticeable.

Compare: 1991 No 69 s 104(1)(ab)

4.12. Therefore, for example, Clause 15(5): 'a less than minor adverse effect means an adverse effect that is acceptable and reasonable in the receiving environment with any change being slight or barely noticeable.'

... is demonstrably theoretical. No one can know when risks commence.

4.13. The Bill deprioritises less-than-minor effects unless they cumulate, the success of the safeguards depends heavily on cumulative-effects methods, monitoring, and enforcement, however the Bill does not structure in any policy pathway that would provide a structure for secondary legislation to hang on to that could address the impact of either crescive pollution and point source pollution.

4.14. PSGRNZ addressed the importance of navigating complexity, uncertainty and ambiguity in risk governance, and the prospective role of kaitiakitanga as a leading principle for the science system and health and environmental stewardship in our 2022 submission to the Future Pathways Policy Team, Ministry of Business, Innovation & Employment for the *Te Ara Paerangi* – Future Pathways Green paper.

Our submission emphasised that scientific ignorance and failure to regulate and restrict pollution and current and emerging technologies are the greatest drivers of existential risk. If we do not know, we cannot understand, then we cannot act protectively or preventatively. Our submission outlined the historic basis of a failure to allocate science funding for public good research and the decline, and failure to invest in expertise across New Zealand's public institutions. This paper emphasised that the principles that determine the scope and focus of New Zealand's research priorities should be informed by principles of stewardship and resilience (pages 9-12).

## 5. ABSENCE OF TECHNICAL EXPERTISE TO INFORM THE BILL.

5.1. The Regulatory Impact Statements and the Disclosure Statement demonstrates that Ministry officials and the drafters in the Crown Law Office did not consult with scientific experts that might more broadly inform the legislation, to ensure that it is future-proof, particularly when advances in technology are taken into account. Crucially, neither the disclosure statement nor the RIS identifies consultation with:

- Environmental toxicologists
- Ecotoxicologists
- Environmental chemists
- Systems ecologists
- Cumulative or mixture-risk scientists
- Public-health environmental exposure experts
- Anticipatory governance scholars
- Public-good facing independent environmental stewardship practitioners

5.2. There is no list of named experts, disciplines, or scientific advisory panels related to pollution, contaminants, cumulative effects, or ecological thresholds. Where 'technical advisory groups' are mentioned, their establishment is discretionary, forward-looking, and undefined in scope or composition

5.3. The Expert Advisory Group (EAG) that was established in September 2024 to prepare the Blueprint to replace the Resource Management Act 1991, focussed on Treaty interests, institutional architecture, and implementation sequencing, not scientific or technical risk assessment. Experts that could have been brought in who have demonstrated a regulatory and scientific interest in improving the long-term stewardship of anthropogenic chemicals, the problem of increasing pollution and the challenge of decision-making amid uncertainty include Catherine Iorns and Louis Tremblay.

## 6. DISCLOSURE STATEMENT – BILL TEXT CONCERNS

6.1. Disclosure Statement is explicit that the reform is meant to unlock development capacity (housing, business, infrastructure, renewable energy, and primary sector growth) while also safeguarding the natural environment and human health. The practical mechanism for 'getting things done' is also stated plainly: reduce the number of consents/permits by narrowing the effects that are regulated, standardising rules, and shifting engagement "upstream".

6.2. The effect is to narrow what is assessed is not a neutral 'efficiency' move: it is a substantive redefinition of what counts as legally relevant harm. The Bill operationalises that by directing decision-makers not to consider less than minor adverse effects, except where multiple such effects cumulate into something more than minor.

6.3. The effect is an inconsistency that reduces the potential for policy-makers and decision-makers to ensure that the future Act can protect and enhance the natural environment.

6.4. The current legislative text cannot claim to safeguard' health/environment but system can be simultaneously more permissive. There is no capacity to ensure that: (i) cumulative effects are reliably

detected, attributed, and managed, and (ii) monitoring/enforcement capacity is strong enough to make "cumulative effects" real rather than rhetorical.

6.5. The current process of arriving at National Policy Statements (NPS) which act as guideline recommendations, as we will demonstrate below, fails to provide sufficient regulatory architecture as to ensure that cumulative effects are detected and that monitoring and enforcement activity is sufficiently rigorous.

6.6. In addition, the Disclosure Statement outlines that community engagement is intended to occur primarily during spatial and plan development rather than at the permitting level. It also states that only those "materially affected" should participate in permitting, by raising the threshold for being an affected person to "more than minor", and that public notification is generally reserved for significant adverse effects where affected persons cannot be identified (or the applicant requests notification).

6.7. The Bill reflects this intention, placing a high bar on participation:

'Affected person' status is triggered only where adverse effects on the person are more than minor.

Public notification is tied to the authority's finding of significant adverse effects, and even then can be precluded by plan/rule settings.

6.8. The Bill cannot protect the environment if it front-loads contestation into plan-making and constrains it at the permit stage. That may reduce transaction costs, but it can also reduce error-correction where real-world effects diverge from what planners anticipated, especially for diffuse harms or emerging science.

6.9. The Disclosure Statement does not directly address uncertainty and precaution and does not discuss 'toxic' other than 'toxic or hazardous waste'. There is no reference to bioaccumulation nor persistence as primary factors that increase risk for cumulant pollutant effects that can degrade environmental systems.

6.10. The Bill narrowly confines any reference to toxicity as being a toxic waste product:

> **'toxic or hazardous waste** means any waste or other matter prescribed as toxic or hazardous waste by regulations.'

6.11. In the Bill, national policy direction can be used not only to guide but to restrict how goals may be achieved, including potentially making its directives the 'only ways' a goal may be achieved. The effect is that 'consistency' becomes a constitutional-style trade-off: uniformity and speed versus local autonomy, adaptive management, and the ability to respond to region-specific ecological thresholds, culture, and community risk tolerance.

6.12. The Disclosure Statement describes a system performance framework and three-yearly public reporting, designed for 'regular strategic oversight' and evidence-based improvement. But it also notes ministerial intervention powers where councils fail to perform functions, including appointing others to do so.

6.13. PSGRNZ emphasise that while performance reporting is valuable, but it is not the same as independent scientific/constitutional accountability.

6.14. The Disclosure Statement indicates that while there is some analysis of costs/benefits, there is no analysis available on whether any group might suffer a 'substantial unavoidable loss of income or wealth'.

6.15. Current staffing, scientific expertise and policy guidelines and frameworks in ministries and environmental agencies are absent expertise and knowledge that might be put in place to recognise whether claimed 'less-than-minor effects' may present a greater risk than formally acknowledged.

6.16. The Bill deprioritises less-than-minor effects unless they cumulate, the success of the safeguards depends heavily on cumulative-effects methods, monitoring, and enforcement. Yet there is no expertise across the government or scientific community that can address this.

## 7. NATURAL ENVIRONMENT BILL MIMICS RMA FAILURE TO SUPPORT LOCAL GOVERNMENT.

7.1. Neither the Bill nor the Departmental Disclosure Statement meaningfully engages with the Local Government Act 2002, despite the fact that the proposed regime is to be implemented primarily through regional and territorial authorities. While the Disclosure Statement acknowledges that councils operate under multiple statutory regimes and obligations, including the LGA, this recognition remains superficial.

7.2. There is no substantive analysis of how councils' core obligations under the LGA, which encompass financial prudence, democratic accountability, long-term planning, and community wellbeing, are to be reconciled with the Bill's nationally imposed limits, standards, and technically complex requirements. The Bill itself contains no explicit cross-referencing to clarify how councils might lawfully prioritise, fund, or justify decisions where LGA duties intersect with centrally determined environmental obligations. In this respect, the LGA is acknowledged implicitly but not integrated, leaving a significant governance gap unaddressed.

7.3. This omission directly reflects decade old concerns presented by Sir Geoffrey Palmer in the keynote address *Ruminations on the Problems with the Resource Management Act 1991 (2015)*. Palmer has criticised the way Parliament imposed ambitious and technically demanding environmental obligations on local authorities without providing adequate national direction, empirical evidence, monitoring frameworks, or institutional support, effectively shifting responsibility without ensuring capability. I.e. that the 'job' could be done well. Parliamentary Commissioner for the Environment, Sir Simon Upton has reflected on the failures of the RMA and the difficulties for local government, as well.

7.4. Palmer (2015) pointed to the lack of research to recognise whether the legislation producing the intended effect of its central purpose of 'sustainable management.:

> 7.4.1. With the Resource Management Act over the years I have seen little empirical research that convinces about how the law is actually working out. No doubt empirical research is expensive but before changes are made it is really necessary to find out what is actually happening. Only that way can meaningful improvements be made. Far too many of the changes to the RMA have been driven by anecdote, prejudice and interest rather than evidence. The Ministry does not seem to be funded for empirical research to any significant degree and in that situation vested interests have had a great deal of latitude to influence policy outcomes. Reform needs to be evidenced based.

7.5. The Bill risks repeating this pattern, and, as this submission outlines lacks the proper scrutiny, an historic problem that has plagued the development of legislation in New Zealand. It imposes new and increasingly complex obligations relating to environmental limits, monitoring, compliance, data systems, and scientific interpretation, yet offers no guarantee of funding, cost recovery, or ring-fenced resources. This increases the risk that the legislative objectives cannot be achieved: councils may be legally required to deliver outcomes under the Bill that they are simultaneously constrained from

funding or prioritising under the LGA. That inconsistency is neither acknowledged nor resolved in the Bill or its supporting materials.

7.6. The autonomy of local jurisdictions is key to having the scope and capacity to address local risks, yet the Bill risks removing such autonomy while simultaneously failing to fund the operations necessary to carry out such work that would ensure local regions can understand and appreciate local risks.

7.7. The Local Government Act was enacted to ensure democratic accountability, transparent trade-offs, and responsiveness to local communities, particularly through long-term planning and consultation. The Bill, by contrast, centralises risk framing through national policy direction and standards, significantly constraining local discretion once limits are set. At the same time, it provides few mechanisms for councils to justify precautionary or anticipatory action where evidence is incomplete, uncertain, or evolving. This places councils in an untenable position: acting cautiously may expose them to legal challenge or unfunded cost pressures, while acting minimally risks environmental harm without necessarily breaching explicit statutory duties. The Bill offers no guidance on how councils are to reconcile this tension between local democratic accountability and top-down environmental constraints under conditions of scientific uncertainty.

7.8. Although the Disclosure Statement acknowledges uneven capability across councils and reliance on central guidance, the Bill nevertheless assumes that councils can absorb highly technical scientific, monitoring, and compliance functions (again without explicit reference to funding such activities). There is no alignment with LGA realities relating to staff capability, shared services, or long-term funding strategies, an omission that is particularly acute for smaller or rural councils. In governance terms, the Bill is not formally inconsistent with the Local Government Act, but appears to undermine the LGA's funding logic, accountability framework, and capability assumptions.

## 8. NOT ADDRESSED: SENSITIVITY OF ORGANISMS TO TOXIC RISKS

8.1. Kaitiakitanga refers to the enduring responsibility of guardianship and care for the natural environment, grounded in Māori worldviews that recognise the interdependence of people, land, water, and all living systems. It encompasses not only protection and sustainable use of resources, but also obligations of stewardship across generations, requiring decisions that maintain the health, mauri (life force), and integrity of ecosystems over time. Kaitiakitanga is therefore an active, ethical duty that integrates environmental knowledge, cultural values, and long-term responsibility, rather than a passive or purely managerial concept.

8.2. However, the drafters display no deep understanding of the vulnerability of soil, water, air and organisms to man-made chemicals. The drafters of the Bill display through the text that they have no knowledge of the fact that, for example, aquatic ecosystems are highly sensitive, interconnected systems in which disturbances at the microscopic level can propagate rapidly through the food chain. Microorganisms such as bacteria, algae, and plankton respond quickly to chemical exposures, altering nutrient cycling, oxygen dynamics, and primary productivity.

8.3. These changes affect invertebrates that form the base of aquatic food webs, with consequences for growth, reproduction, and survival. Bioaccumulative and persistent contaminants can then magnify through trophic levels, affecting fish health, behaviour, and reproductive success. Native fish species are particularly vulnerable, as they integrate exposure across multiple pathways, water, sediments, and prey, over time. Even low-level or intermittent contamination can therefore result in

disproportionate ecological effects, underscoring the need for precautionary and system-wide approaches to aquatic risk assessment.

8.4. A substantial international body of evidence demonstrates that cumulative, low-dose exposure to endocrine-active chemicals can disrupt hormonal signalling across species, with effects that manifest throughout the food web. In aquatic organisms, such exposures are associated with altered sexual differentiation, impaired reproductive development, and reduced fertility, effects that can propagate to higher trophic levels, including birds.

8.5. Documented outcomes include weakened eggshell strength, compromised offspring viability, changes in cognitive function, and altered hunting and predatory behaviours. These effects often arise from mixtures of contaminants rather than single substances and may occur at exposure levels previously considered benign. Despite the strength of this evidence internationally, comparable endocrine-focused, ecosystem-level research is not being systematically undertaken in New Zealand.

## 9. NOT ADDRESSED: RESOURCING FOR SCIENCE, RECIPE FOR A HAMSTRUNG MINISTRY

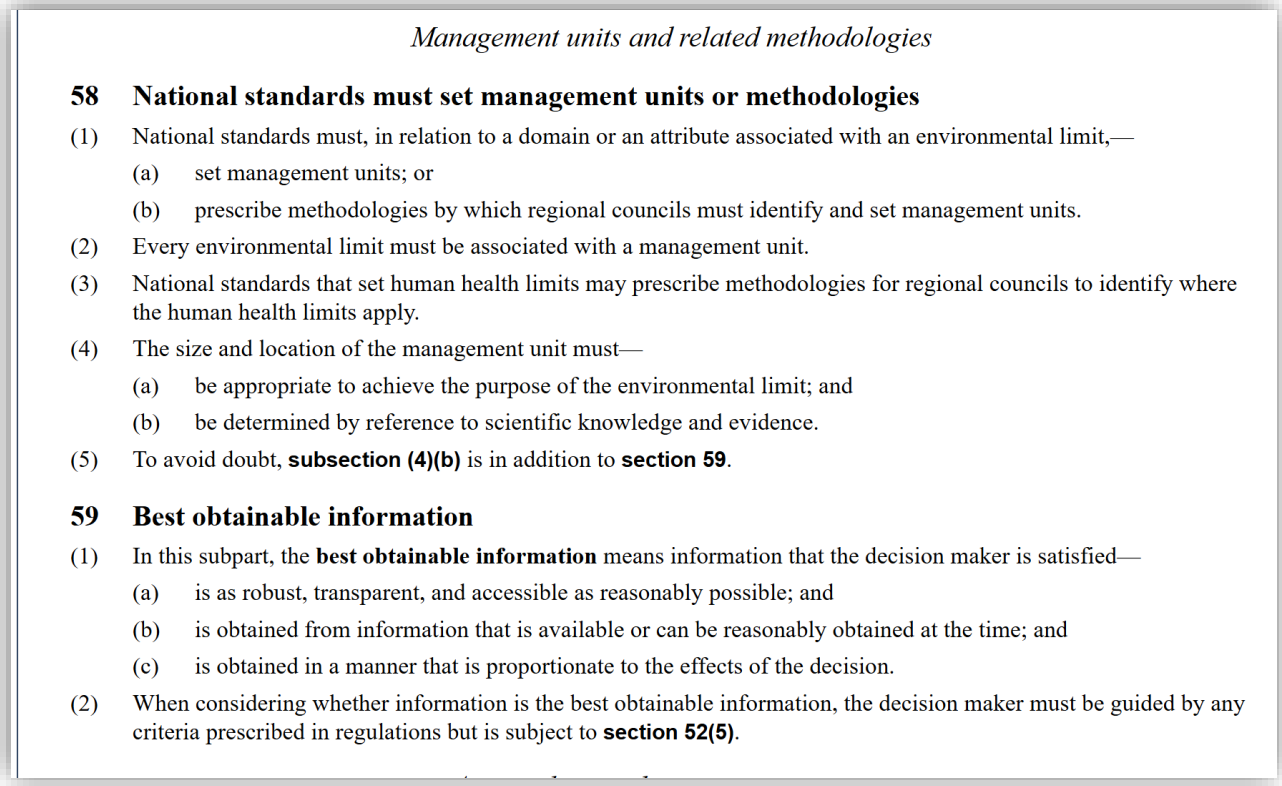
9.1. The Minister is responsible for—

- recommending, making, and approving national instruments, including developing nationally standardised overlays, provisions, and methodologies, and monitoring their implementation and effect:
- setting through national standards, limits to protect human health for freshwater coastal water, land and soil, and air and methodologies for regional councils to follow when setting ecosystem health limits through natural environment plans:
- recommending issue of, and monitoring the implementation of, water conservation orders:
- monitoring:
- system performance and the effect and implementation of this Bill.

9.2. The Minister has the power to specify minimum levels for ecosystem health limits.

9.3. Current contaminant risks of greatest concern include several well-established classes of man-made chemicals that are widely used yet poorly captured by routine environmental monitoring. These include agricultural pesticides and herbicides, many of which are biologically active at low concentrations and may persist or transform in soils, sediments, and water; industrial oils, solvents, and hydrocarbons, including polycyclic aromatic hydrocarbons (PAHs), which can accumulate in sediments and are toxic to aquatic organisms; per- and polyfluoroalkyl substances (PFAS), which are highly persistent, mobile, and bioaccumulative, with documented impacts on ecological and human health; and surfactants and detergents, including breakdown products, which can disrupt aquatic ecosystems and interact with other contaminants.

9.4. Individually, these substances pose recognised risks; collectively, their co-occurrence raises the prospect of cumulative and mixture ('cocktail') effects that may amplify toxicity across the aquatic food chain. The diffuse nature of their sources, spanning agricultural, urban, and industrial activities, combined with persistence and sediment binding, makes these contaminant classes particularly challenging to detect, attribute, and regulate under existing monitoring and decision-making frameworks.



*Management units and related methodologies*

**58 National standards must set management units or methodologies**

(1) National standards must, in relation to a domain or an attribute associated with an environmental limit,—

(a) set management units; or

(b) prescribe methodologies by which regional councils must identify and set management units.

(2) Every environmental limit must be associated with a management unit.

(3) National standards that set human health limits may prescribe methodologies for regional councils to identify where the human health limits apply.

(4) The size and location of the management unit must—

(a) be appropriate to achieve the purpose of the environmental limit; and

(b) be determined by reference to scientific knowledge and evidence.

(5) To avoid doubt, **subsection (4)(b)** is in addition to **section 59**.

**59 Best obtainable information**

(1) In this subpart, the **best obtainable information** means information that the decision maker is satisfied—

(a) is as robust, transparent, and accessible as reasonably possible; and

(b) is obtained from information that is available or can be reasonably obtained at the time; and

(c) is obtained in a manner that is proportionate to the effects of the decision.

(2) When considering whether information is the best obtainable information, the decision maker must be guided by any criteria prescribed in regulations but is subject to **section 52(5)**.

9.5. Despite the scale and complexity of these contaminant risks, the frameworks provided in clauses 58 and 59 of the Bill are inadequate to support anticipatory and scientifically robust regulation.

9.6. While clause 58 requires national standards to define management units or prescribe methodologies for doing so, the focus remains spatial and attribute-based, rather than contaminant-based or pathway-based. Management units may be determined by reference to existing scientific knowledge and evidence, but there is no requirement to identify emerging contaminant classes, to consider persistence, bioaccumulation, or sediment-bound pathways, or to account for mixture toxicity across water, sediments, and biota. As a result, the structure risks formalising management units around what is already measured, rather than around plausible and evolving sources of harm.

9.7. Clause 59 further constrains effective foresight by defining 'best obtainable information' in a manner that is explicitly limited to information that is reasonably available or can be reasonably obtained at the time, and that is proportionate to the effects of the decision.

9.8. This formulation does not require decision-makers to interrogate whether key contaminants are not being monitored, whether existing analytical methods are insufficient to detect low-dose or cumulative effects, or whether scientific uncertainty itself warrants precautionary investigation.

9.9. In practice, this risks entrenching reliance on incomplete datasets and established indicators, rather than driving the development of new monitoring, methodologies, or standards necessary to address persistent, bioaccumulative, or chemically complex pollutants. Taken together, these provisions provide a reactive rather than anticipatory framework, one that manages known attributes within defined units but lacks the scientific architecture required to identify and govern emerging chemical risks to aquatic ecosystems and the food chain over time.

9.10. Effectively, while the RIS and SAR had acknowledged persistent gaps in scientific knowledge and resourcing that undermine effective decision-making, the Natural Environment Bill provides no mechanism to remedy them.

## 10. NOT ADDRESSED: CUMULATIVE EFFECTS: BIOACCUMULATION, PERSISTENCE, TOXICITY.

10.1. While the Disclosure Statement and Bill claim to address data/technology and performance reporting at a high level, they don't (in the excerpts surfaced) spell out the minimum evidential/monitoring infrastructure needed to ensure that "cumulative effects" doesn't become a legal fiction.

10.2. The reform leans on national instruments and standardisation yet independent scientific assessment of the capacity for the proposal and consequent legislative text to achieve the object of the Bill are lacking. The Disclosure Statement also records that Ministry for Regulation did not provide an independent quality assessment of the RIS/SAR (instead cross-agency panels did).

10.3. The *Regulatory Impact Statement: Replacing the Resource Management Act 1991* (March 2025) (RIS) and *Supplementary Analysis Report* (December 2025) (SAR), recognise cumulative effects as a core, system-level problem, but treats these challenges as a governance / architecture issue (limits, thresholds, data, monitoring). The RIS quotes the current RMA definition of effects as expressly including "any cumulative effect which arises over time or in combination with other effects", as well as low-probability / high-impact potential effects.

10.4. The RIS argues the current system has "inadequate management of cumulative environmental effects" largely because environmental limits have not been defined, and because of lack of good data, evidence and ongoing monitoring (leading to risk-averse behaviour and case-by-case consenting). The SAR repeats this diagnosis at a high level (root causes include lack of defined limits, good data, evidence and monitoring).

10.5. The RIS does explicitly name 'pollution' and 'pollutants' as part of the kinds of adverse effects the system exists to manage, but again at a general level:

It describes adverse impacts of use/development as including the 'discharge of pollutants to air, land, and water'.

10.6. In its options analysis, it warns that narrowing effects / raising thresholds may lead to 'an increase in pollution and environmental degradation'.

10.7. The SAR includes 'human health' and (in the environmental limits context) recognises limits as protecting human health and life-supporting capacity, but it does not develop that into contaminant classes, bioaccumulation, sediment ecotoxicology, or mixture-toxicity treatment.

10.8. Neither document sets out resourcing and evaluation pathways that might evaluate, address and correct these deficits, based on the scientific knowledge and instrumentation (including machine learning) that might redress these deficits. For example, as a technical methodology for assessing cumulative chemical mixture effects based on active ingredient, class based and multi-class synergies, persistence and toxicities. The RIS/SAR are silent on how to treat persistence, bioaccumulation, sediment toxicity, or cross-media transfers as analytical problems. They largely frame 'cumulative effects' as something the system will manage through limits, monitoring and standardisation.

10.9. Should the Gene Technology Bill be passed into legislation, the similar knowledge gaps remain concerning the risks for persistence and bioaccumulation from a released genetically modified (this includes gene edited technology) in environmental systems. For example, from horizontal gene transfer and inter-generational contamination.

10.10. The RIS/SAR point to oversight being achieved indirectly through institutional mechanisms, especially environmental limits, indicators, monitoring, data systems, and system-performance reporting, rather than through a scientific 'how-to' on evaluating complex contaminant evidence.

10.11. Yet the skills across regulatory and scientific agencies do not exist that could 'fill this gap' do not exist. As a simple example, metsulfuron-methyl and glyphosate-based herbicides, as well as atrazine, and other herbicides, for example broad-leaf herbicides, may accumulate in cereal cropping regions, while insecticides, fungicides and miticides may accumulate in the sediment and waters of horticultural regions. Added to this may be urban runoff, or runoff from industrial sources. The SAR flags:

- national instruments (NPD, national standards, regulations)
- environmental limits as a framework to manage pressures, with national and regional components (including limits to protect human health being set nationally)
- a "best practice" approach to monitoring/oversight built around indicators, including for cumulative effects, and feedback loops for interventions; plus an explicit acknowledgement that this requires substantive investment and (at least at that point) no funding was proposed
- the SAR's emphasis that achieving benefits is contingent on robust, accessible environmental data and that the move toward more ex-post approaches makes high-quality, real-time data essential.

10.12. If we return to the above example of pesticides, glyphosate was grandfathered in, in the 1970s. No government agency or research cohort has assessed the persistence of glyphosate and it's primary metabolite aminomethylphosphonic acid (AMPA) in either agricultural or urban soils where it is commonly sprayed, or in regional lake, river and seashore sediment.

10.13. The 'review's and 'assessments' are based on industry data and outdated modelling. While e.g. drinking water limits, e.g. in New Zealand for glyphosate are based on World Health Organization levels, yet the limits, as PSGRNZ have described in a September 22, 2021 Submission: Call for Information on Glyphosate to the New Zealand Environment Protection Authority, are based on a 1981 Monsanto study.

> *The primary document that the 2018 DWSNZ relied on to assert that there is no need for a guideline value in drinking water is the World Health Organisation (WHO) 2017 drinking water guidelines. However, the WHO, in 2017, continue to rely on a 1981 Monsanto study, which identified harm at the 32 mg/kg level of exposure that was then declared 'safe' or the no observable effect level,149 to set the so-called safe level of 0.3mg/kg claim that 'establishment of a formal guideline value for glyphosate and AMPA is not deemed necessary'.150 The WHO assert a 0.9mg/L (900 µg/L) health based value based on a 60-kg adult consuming 2 litres of drinking-water per day, and allocating 10% of the ADI to drinking water.*

10.14. The consequence of the automatic delegation of inferred safe levels, is that drinking water suppliers are not equipped to correctly understand the cumulative risk of low-level, endocrinologically relevant risks from man-made chemical hazards in drinking water. This is because the guidelines default to old measures, and suppliers lack the institutional support and resourcing concerning 'double checking' claimed safe levels. Government agencies lack any capacity to evaluate whether currently, effectively grandfathered in presumptions around the safe level of toxicity is indeed safe, to a young toddler or child.

10.15. Drinking water suppliers directly lack any capacity to evaluate combinatory risks from regionally specific pollutant chemicals, in addition to e.g. cleaning residues from their own processes, as a toxic risk.

10.16. There is no environmental agency that is resourced, at length from political agencies, to do this work. The Ministry of Business, Innovation and Employment does not ringfence funding for this purpose, which to be effective, needs to be undertaken over the long term.

10.17. While the SAR and RIS therefore acknowledge pollution and cumulative effects as problems, they regard the solution as regulatory system design and monitoring infrastructure, not as a technical guide to evaluating complex contaminant evidence. Yet there is not the capacity for the system to understand and evaluate risk and hazard from manmade environmental contaminants.

## 11. CONTAMINANT MONITORING GAP: NATIONAL POLICY STATEMENTS

11.1. The Draft Natural Environment Bill expressly provides for national policy direction, which functionally replaces and subsumes the role previously played by National Policy Statements (NPS) under the Resource Management Act, including those relating to freshwater. This shift places even greater importance on the scope and content of national-level policy instruments in shaping how environmental risks are identified, monitored, and governed.

11.2. The existing National Policy Statement for Freshwater Management (2020) is effectively silent on risks posed by man-made chemical contaminants. The attributes with 'mandatory bottom lines' that must be monitored are limited to phytoplankton, periphyton, total nitrogen, total phosphorus, ammonia, nitrate, dissolved oxygen, suspended fine sediment, *Escherichia coli*, and cyanobacteria. These attributes focus on nutrients, sediments, and microbial indicators, but do not include classes of synthetic chemicals, industrial compounds, or agrichemicals, including those known to persist or bioaccumulate in aquatic environments.

11.3. As a consequence of this omission, investigatory research into chemical contamination pathways and effects has not been systematically undertaken, with the majority of funding and regulatory effort directed toward reducing nutrient inputs into water bodies. Chemical toxicology has remained largely outside consultation and policy development processes for environmental and human-health regulation. New Zealand's freshwater policy framework therefore continues to prioritise nutrients, sediments, and pathogens, while virtually ignoring man-made synthetic chemical contaminants.

11.4. This deficiency has been repeatedly identified. In 2019, Aotearoa New Zealand Policy Proposals on healthy waterways: Are they fit for Purpose? (2019) published by PSGRNZ and the Soil & Health Association of New Zealand, highlighted the exclusion of industrial, agricultural, and urban chemical contaminants from the proposed National Policy Statement on Freshwater discussion document (2019).

11.5. PSGRNZ has since consistently drawn attention to the ongoing exclusion, sidelining, and downplaying of risks posed by chemical contaminants, as well as radiofrequency electromagnetic field (RF-EMF) exposures, in proposed environmental regulatory frameworks.

11.6. The Draft Natural Environment Bill expressly provides for national policy direction, which functionally replaces and subsumes the role previously played by National Policy Statements (NPS) under the RMA, including those relating to freshwater.

11.7. The existing National Policy Statement for Freshwater Management (2020), is silent on man-made chemical risk. Attributes with 'bottom lines' that are required to be monitored are:

Phytoplankton, Periphyton, Total nitrogen, Total phosphorus, Ammonia, Nitrate, Dissolved oxygen, Suspended fine sediment, *Escherichia coli*, and Cyanobacteria.

11.8. Classes of chemicals outlined above, including where those classes may bioaccumulate, is not included in the 2020 NPS. As a consequence, investigatory research has not occurred, with most funding revolving around restricting nutrient ingress into water bodies.

11.9. Chemical toxicology is consistently left outside consultation processes for legislation and regulations relating to environmental and human health. New Zealand freshwater policy focuses on nutrients, sediments and pathogens and virtually ignores man-made synthetic chemical contaminants. A 2019 paper 'Aotearoa New Zealand Policy Proposals on healthy waterways: Are they fit for Purpose? (2019)' by 2019 PSGRNZ and the Soil and Health Association of New Zealand, drew attention to the exclusion of industrial agricultural and urban man-made chemical contaminants from the proposed National Policy Statement on Freshwater discussion document (2019). PSGRNZ have repeatedly drawn attention to the exclusion, sidelining and downplaying of the risk and hazards of chemical contaminants, as well as RF-EMF radiation in proposed environmental regulation.

11.10. Territorial and local authorities lack the resourcing, staffing capacity and the overall directives that would require them to regularly monitor broad suites of likely anthropogenic contaminants and emissions. Evidence from regional implementation of the National Policy Statement for Freshwater Management (NPS-FM), including the Bay of Plenty Regional Council's (BOPRC's) monitoring and reporting framework, demonstrates a persistent governance gap in the identification, monitoring, and evaluation of toxic man-made chemicals and heavy metals. The BOPRC clearly gives effect to the NPS-FM through contaminant accounting, monitoring, and trend analysis, this is largely operationalised via proxies (nutrients, sediment, microbial indicators), guideline exceedances, and sediment-based assessments.

11.11. However, a search through the BOPRC website demonstrates that entire classes of toxic contaminants, particularly emerging industrial chemicals, agricultural pesticides, and mixture ('cocktail') effects, are not widely screened for, nor routinely or systematically evaluated across water columns, silts, and seabeds, despite their potential to bioaccumulate and impact the aquatic food chain.

11.12. The BOPRC oversees the busiest port in New Zealand and the region is intensely agricultural, yet the specific chemical exposures that would be associated with these activities are only rarely and sporadically recognised. BOPRC's Estuary Health & Ecology module expressly monitors sediment heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, mercury, zinc) and also polycyclic aromatic hydrocarbons (PAHs) (at a selection of sites).

11.13. The River and Estuary Water Quality modules demonstrate extensive and frequent (monthly; plus 'impact sites' downstream of major direct discharges) testing practices, but they defer to the standard NPS-FM attribute list of turbidity/TSS, nutrients, dissolved oxygen, pH, *E. coli*, etc. the NPS-FM attribute list works more as an **indirect risk proxying** mechanism (nutrients, fine sediment, microbial contamination). For estuaries, 'toxics' are largely captured in the sediment module, not the routine water-column module.

11.14. The real world gap in toxic chemicals evaluation, following the establishment of the NPS was anticipated.

11.15. Our 2019 paper 'Aotearoa New Zealand Policy Proposals on healthy waterways: Are they fit for Purpose? (2019)' anticipated this problem, as neither the attributes and nor the NPS-FM directives

provided evidence nor a pathway to support officials to step into broader screening suites that might identify the drivers of system degradation signalled by attribute marker levels descending below the bottom line signalled in the NPS-FM.

11.16. The Natural Environment Bill does not correct this deficiency. We repeat, although the Bill recognises contamination and human health protection as system goals, and provides for national policy direction, environmental limits, and national standards, it does not impose clear statutory obligations requiring the identification, prioritisation, and monitoring of classes of man-made contaminants that are currently under-recognised. Nor does it require the development of methodologies or guidelines to address cumulative, low-dose, or mixture toxicity effects. Instead, the Bill defers these matters to discretionary future national instruments and regulations, without mandating their production, scope, or minimum evidential content.

11.17. As a result, the Bill, at this stage, perpetuates the under-recognition already evident in regional practice. In legal terms, it provides enabling powers without corresponding duties, principles without operational force, and pathways to secondary legislation without any obligation that those pathways be used to address known scientific and regulatory blind spots. This undermines the Bill's stated objective of protecting human health and safeguarding the life-supporting capacity of aquatic ecosystems, particularly in relation to diffuse and complex chemical contamination that cannot be adequately managed through nutrient-centric or threshold-based approaches alone.

11.18. Accordingly, the Bill does not currently provide a sufficient regulatory architecture to ensure that emerging chemical risks, entire contaminant classes, and toxic mixture effects are systematically identified, assessed, and governed. Without explicit statutory direction requiring the development of national contaminant frameworks and evidence-handling methodologies, the governance gaps evident under the current system are likely to persist under the proposed regime.

## 12. A PAUCITY OF RESEARCH AND EXPERTISE IN CHEMICAL CONTAMINANT SCIENCE

12.1. Accordingly, the Bill does not currently provide a sufficient regulatory architecture to ensure that emerging chemical risks, entire contaminant classes, and toxic mixture effects are systematically identified, assessed, and governed. Without explicit statutory direction requiring the development of national contaminant frameworks and evidence-handling methodologies, the governance gaps evident under the current system are likely to persist under the proposed regime.

12.2. The Bill is blind to such risks - the Bill does not discuss 'resourcing', 'funding', or 'research'. Rushing to pull an expert team with limited hours and other commitments, via short term contracts to busy external scientists that do what they can in a short space of time with a limited terms of reference and who are limited by their own research history does not work. The expertise lacking in the expert teams that are selected, stays out of scope.

12.3. The Ministry of Business, Innovation and Employment (MBIE) will not ring-fence such science funding, and they haven't done so since they were granted control of science funding. Most research is out of scope of the National Statement of Science Investment 2015-2025, which is the policy that guides decision-making in funding committees. PSGRNZ have discussed the barriers to scientists undertaking public-good research in New Zealand's science system in the When powerful agencies hijack democratic systems. Part II: The case of science system reform (2025) paper.

12.4. As a consequence, there is no stable research cohort in New Zealand that have studied man-made pollutant chemicals across the industry and agricultural sectors over a period of more than a five

year span. Policy framing relating to risk to water consistently diverts to risks from nutrients, sediments and bacteriological risk, yet the toxic chemicals and their degradant products which can effectively destroy the health of the sediment and the delicate biofilm that is the start of the aquatic food chain, are ignored.

12.5. MBIE's science budget for the 2025/2026 budget year amounted to just over $1.16 billion for science, innovation and related research funding. A supplementary MBIE briefing indicates that science, innovation, and technology (SI&T) funding overall totalled around $1.354 billion in 2024/25, combining *Vote Business, Science and Innovation* with the R&D tax incentive.

12.6. From 2015 to the present, only two New Zealand-based research programmes have had the scale, duration, and conceptual scope necessary to interrogate broad profiles of man-made chemical contaminants rather than single stressors: the Emerging Organic Contaminants (EOCs) programme led by Louis Tremblay at the Cawthron Institute (~$5.6m/ 5years) and the Aotearoa Impacts and Mitigation of Microplastics ($AIM^2$) programme led by Olga Pantos at the Institute of Environmental Science and Research Limited (ESR) (~$12.5m/5 years).

12.7. These two initiatives are distinctive because they were explicitly designed to deal with *classes* of anthropogenic substances, unknown or emerging compounds, transformation products, and cross-media pathways, rather than being constrained to pre-defined attributes or regulatory categories. Their multi-year funding, national coordination, and emphasis on prioritisation, methods development, and translation into monitoring and policy are what give them genuine capacity to engage with contaminant complexity.

12.8. There is historically no resourcing to ensure that, for example, the ongoing monitoring would occur at the end of such programmes that reflects the findings of the research cohort.

12.9. The exception is ESR's ongoing four-yearly groundwater survey programme. This programme is technically sophisticated in its analytical coverage, reporting hundreds of detections across many wells and providing detection limits/quantitation and class-based analytical methods, but it remains structured as presence/concentration reporting rather than an integrated mixture-risk evaluation.

12.10. This is the exception. In general, the ESR occupies a minor space with short term, contract-bound funding, rather than broader powers of review that would support officials.

12.11. ESR's Groundwater Research Impact report (2022) shows development of EOC + eDNA approaches and predictive modelling (machine learning) to better identify sources of contamination, i.e., fingerprinting and attribution, it does not consider mixture toxicology, including class based effects and broader contaminant synergies, or 'cocktail' effects.

12.12. ESR/PHF has produced at least one substantial high-level review (2023) of contaminants of potential human health concern in wastewater and stormwater. That review is explicitly literature-based and acknowledges limits in NZ-specific data coverage. The authors acknowledged the knowledge gap around additive, synergistic, or antagonistic effects from exposure to multiple contaminants, noting that much health-effects evidence is based on single chemicals in isolation. While these issues were recognised as important, they are not yet operationalised as a routine decision framework in the national groundwater survey reporting. The funding for such broader work, which the scientists would probably like to do, will be lacking.

12.13. The limitations faced by ESR staff, reflect the broader New Zealand research funding landscape. In the very least, it reveals a striking and historic absence of large, sustained investment aimed at

synthetic chemicals, mixtures, persistence, and bioaccumulation beyond the nutrient-and-sediment paradigm embedded in freshwater regulation.

12.14. Where contaminants are addressed, they are typically treated indirectly, as secondary variables within land-use, erosion, nitrogen, or catchment-management programmes, or confined to narrow technical questions. This reflects a systemic bias toward problems that are already legible within existing regulatory frameworks, rather than those that challenge them. As a result, the science base needed to understand cumulative chemical risk has not been systematically built.

12.15. Several programmes appear, at first glance, to engage with chemical pollution but in practice do not address the issues at stake. Large freshwater initiatives focus primarily on nutrients, sediments, and conventional pollutants, with 'contaminants' functioning as a residual category rather than the object of inquiry. For example, the *Our Land & Water National Science Challenge*: up to $96.9m (large), but its focus has concerned been land/water management (aligning to NPS standards) and conventional stressors, not a national EOCs/PFAS/mixtures monitoring duty.

12.16. Agricultural science programmes address pesticide or herbicide use mainly through productivity, resistance, or mitigation lenses, not environmental fate or ecosystem-level toxicity. For example, AgResearch's herbicide resistance programme focusses on supporting farmers in not spraying so much of a particular herbicide that the weed species evolve resistance to one or more 'sites of action' and reducing reliance on herbicides. The risk context (understandably) concerns weed management. AgResearch aren't concerned for example, with the synergistic toxicity of the formulant mixtures that are recommended to ensure that herbicide resistance is reduced or delayed.

12.17. Funding for research on PFAS, pharmaceuticals, and industrial chemicals are examined through short-term, project-specific grants or site-specific investigations, without a broader obligation or resourcing to develop national contaminant frameworks, mixture models, or longitudinal datasets.

12.18. Taken together, these patterns provide insight as to why the EOCs and microplastics programmes are the sole programmes in the past decade. They were exceptions that explicitly acknowledged uncertainty, emergence, and system-level risk, and were funded accordingly. The scarcity of comparable initiatives over the past decade is not accidental; it reflects funding structures, regulatory expectations, and institutional incentives that favour narrowly scoped, immediately actionable research over anticipatory science. In effect, New Zealand has invested heavily in managing known stressors, while largely neglecting the scientific infrastructure required to understand and govern the expanding universe of synthetic chemical contaminants now present in the environment.

12.19. No provision is made in the Bill for long term scientific resourcing to support decision-makers at local, regional and central government level to evaluate real world effects to human and environmental health from synthetic man-made chemicals and other emissions. This includes evaluating risk and hazard, - including by regional risk-types, climate and soil type. These resources do not currently exist.

12.20. Science coming out of regions is short term, and scientists cannot afford to routinely scan for attributes/determinants/chemicals/emissions outside those that are specified in the policy statement including chemicals that are routinely used by the surrounding agricultural and industry sectors. They certainly lack the equipment and capacity to analyse the sum of the pollutant matter to assess whether the cumulative burden carries a risk to drinking water, or natural ecosystems.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For 25 years, the
Physicians & Scientists for Global Responsibility New Zealand (PSGRNZ)
have provided scientific & medical information & analysis in the service of the public's right to be independently informed on issues relating to human & environmental health.