

The Queensland Water Directorate (**qldwater**) welcomes the opportunity to make a submission to the review of the statutory protections for wastewater treatment plants under the *Environmental Protection Act 1994*. **qldwater** provides this submission without prejudice to any submissions from our members or other urban water service providers.

We represent all 73 Queensland WSPs with domestic connections: including all Aboriginal Councils, the two Torres Strait Island Councils, the council-owned Statutory Authorities in south-east Queensland (Urban Utilities and Unitywater) and two state-government owned corporations.

Water and sewerage services are essential services that underpin public health, environmental protection and economic development in regional and remote Australia. Safe drinking water and effective wastewater management support community health, environmental protection and the achievement of international commitments such as the United Nations Sustainable Development Goals relating to water, sanitation and sustainable communities.

The Queensland Water Directorate is delighted that a long-standing issue for water service providers and advocacy issue is being recognised by the Queensland Government. We would like to thank the department for taking the time to speak with our members at the dedicated consultation session held on 29 July 2026 via Teams.

The directorate supports the submission by the Australian and New Zealand Biosolids Partnership (ANZBP) which holds the core position to protect receivers of environmental pollutants in wastewater and downstream and beneficial users when managed in compliance with relevant Environmental Authorities and/or End of Waste Codes.

The Queensland Water Directorate seeks:

1. targeted amendments to the EP Act and Regulation, not a policy-only response;
2. recognition of authorised wastewater systems as end-of-line or passive receivers;
3. a conditional statutory safe harbour covering legacy and future contaminants;
4. protection across regulatory enforcement, the duty to restore and civil claims;
5. corresponding protection for compliant recycled-water and biosolids pathways;
6. alignment with the *Waste Reduction and Recycling Act* and relevant End of Waste Codes;
7. stronger upstream source control; and
8. a joint technical and legal drafting process following the review.

The key matters addressing the four questions posed in the consultation paper have been identified through extensive consultation with our members over several years and are identified in the summary below.

Consultation question	qldwater response
Q1: Financial and operational challenges	Treatment limitations, capital and operating costs, residual management, insurance and long asset lives
Q2: Managing inputs	Trade waste improvements are supported but cannot control diffuse, lawful and imported sources
Q3: Regulatory measures	Source control, statutory protection, transition arrangements and aligned end-of-waste settings
Q4: Adequacy of settings	Current settings are inadequate; targeted legislative amendments are required

1. The consultation paper does not address the central issue

The consultation paper acknowledges the challenges wastewater treatment plant (WWTP) operators face in managing persistent contaminants. However, its questions are largely framed around measures that could help operators manage incoming contaminants and meet their existing environmental obligations.

This framing risks obscuring the central issue before the review. The question is not whether water service providers should improve their management of wastewater quality and trade waste. Water service providers take their environmental obligations seriously and continue to strengthen their monitoring, source-control programs and operational practices.

Recent sector initiatives supported by **qldwater** demonstrates this commitment. These include development of a Model Trade Waste Plan tailored to regional communities; launch of the Trade Waste Foundation Lime Card practical guidance to help frontline staff recognise, record and escalate potential trade waste issues; support for ARC Linkage Project LP230200469, *Identifying sources of contaminants of concern entering Australian sewers*; and sector-wide collaboration through the July 2026 Wastewater Quality and Trade Waste: Out of Sight, Top of Mind workshop and regional Trade Waste Interest Groups.

These measures improve the sector's capacity to identify and manage contaminants within its control. They cannot, however, prevent every persistent or emerging contaminant from entering sewerage systems. Many contaminants arise from diffuse household and commercial sources, imported products, lawful consumer uses, landfill leachate and legacy contamination. Some cannot be reliably identified, controlled or removed using currently available treatment processes.

The consultation paper's focus on operational improvement and compliance therefore does not resolve the more fundamental question of how responsibility and liability should be allocated across the contaminant supply chain:

How should responsibility for persistent and emerging contaminants be allocated when wastewater utilities did not create the contaminants, cannot reasonably prevent all of them from entering sewerage systems, cannot necessarily remove them through treatment, and may nevertheless inherit both current and future liability?

This question extends beyond day-to-day compliance. It concerns the potential application of the polluter pays principle, general environmental duty, duty to restore, enforcement provisions and civil liability to essential service providers that receive contaminants introduced by others.

Further improvements in trade waste management, monitoring and treatment should continue, but they cannot correct an inequitable allocation of liability. The review must therefore consider whether targeted statutory amendments are required to ensure that an authorised and compliant WWTP operator is not treated as the default polluter, remediator or insurer for contaminants it did not create and could not reasonably control.

2. Source control must be the primary regulatory response

The consultation paper recognises that persistent contaminants originate from across the supply chain and may remain in WWTP discharges where treatment is ineffective or unavailable. It also acknowledges that WWTPs have limited control over pollutants entering their systems. These findings should lead to a clear regulatory conclusion: source control must be the primary response to persistent and emerging contaminants.

Trade waste controls cannot address contaminants entering wastewater through imported products, consumer goods, diffuse household use, legacy contamination or products whose chemical composition is not disclosed. Nor can end-of-pipe treatment compensate for inadequate controls on the manufacture, importation and use of persistent chemicals.

Without effective upstream controls, the practical application of the polluter pays principle is inverted: the essential service provider managing society's waste is required to pay, while those introducing or profiting from contaminating products may avoid responsibility.

The polluter pays principle should be strengthened and clarified so that liability follows meaningful control over the source of contamination. An authorised WWTP should not be treated as the primary polluter merely because it receives, treats or transfers contaminants introduced by others. This would not remove the obligation for WWTP operators to operate lawfully, comply with their environmental authorities and take reasonably practicable measures. It would ensure that these obligations do not displace the responsibility of upstream parties to prevent contamination at its source.

The Senate Select Committee identified practical source-control measures

The final report of the Senate Select Committee on PFAS¹ contains several recommendations that would reduce PFAS entering Australian products, waste streams and sewerage systems, including:

Restrictions and phase-outs: banning or severely restricting PFAS-containing firefighting foams and accelerating implementation of IChEMS and Stockholm Convention restrictions (Recommendations 11 and 43).

Import controls and product testing: identifying PFAS in imported textiles, furnishings and other articles, supported by business reporting and independent product testing (Recommendations 34 and 40).

Disclosure and product-specific controls: mandatory PFAS labelling and stronger controls on food-contact packaging, cosmetics, personal-care products and period products (Recommendations 35, 41 and 42).

Implementation, enforcement and funding: properly resourcing chemical assessment, enforcement of PFAS restrictions and support for water service providers facing additional testing and treatment requirements (Recommendations 32, 39 and 43).

Collectively, these recommendations recognise that effective control must begin before persistent chemicals enter products, households, workplaces and waste streams. They also recognise the particular importance of border controls. For a country heavily reliant on imported consumer and industrial products, domestic restrictions will be ineffective unless prohibited or restricted chemicals can be identified and intercepted at importation.

The committee also recommended that the Australian Government work with state and territory governments to develop funding mechanisms to support water service providers with upgraded PFAS testing and removal requirements (Recommendation 32). This is important, but funding for downstream monitoring and treatment should complement (not substitute for) measures that prevent PFAS entering wastewater in the first place.

¹ Australian Senate 2025. The Senate Select Committee on PFAS Inquiry into the extent, regulation and management of PFAS. Final report. November 2025.

Queensland Government must advocate upwards on behalf of the sector

Responsibility for industrial chemical management is distributed across Commonwealth, state and territory frameworks. IChEMS establishes nationally agreed environmental management standards, but those standards depend on implementation and enforcement through state and territory legislation. Queensland also regulates the environmental consequences of chemical use, waste management and releases through the EP Act.

The Queensland Government therefore has responsibilities in both directions. It must effectively implement and enforce industrial chemical controls within Queensland, while also advocating to the Australian Government for stronger national controls where the relevant regulatory levers, particularly importation, product regulation, chemical assessment and national phase-outs, sit at the Commonwealth level.

Individual water service providers cannot achieve these reforms on their own. They have neither the jurisdiction nor the market power to regulate imported products, mandate chemical disclosure, establish national product bans or impose producer-responsibility schemes. The Queensland Government must represent the collective interests of its essential water and wastewater service providers through national chemical-management, environmental and intergovernmental forums.

Queensland has previously demonstrated that state-based action can precede and encourage stronger national controls, including through its restrictions on PFAS-containing firefighting foams². That leadership should continue, both through effective controls within Queensland and sustained advocacy for source control measures.

Statutory protection for WWTPs and stronger upstream source control are complementary measures. Protection is required because legacy and diffuse contamination cannot be eliminated immediately. Source control is required to prevent the same liabilities and treatment burdens from continuing indefinitely.

Until the regulatory system places primary responsibility on those who manufacture, import, supply and intentionally use persistent contaminants, the polluter pays principle will not operate as intended.

3. WWTP operators need protection from liability for legacy contamination

Wastewater treatment plant operators should not face retrospective liability for contaminants that could not reasonably have been known, detected or managed when the relevant activities occurred. This protection is particularly important where recycled water or biosolids were produced and beneficially reused:

- in accordance with the legislation, approvals, guidelines and accepted practices applying at the time;
- consistently with government policies encouraging water recycling and resource recovery; or
- through projects directly funded, subsidised or endorsed by government.

The general environmental duty requires consideration of the state of technical knowledge and what reasonably ought to have been known by a person undertaking an activity. It also recognises that

² Miles, S. (Queensland Minister for Environment and Heritage Protection and Minister for National Parks and the Great Barrier Reef) 2016, media statement announcing the *Environmental Management of Firefighting Foam—Operational Policy*, Queensland Government, 8 July 2016.

technical knowledge and appropriate risk controls evolve over time. This principle should apply equally when determining responsibility for legacy contamination. Conduct that was lawful, authorised and considered environmentally beneficial should not retrospectively become the basis for regulatory action, an open-ended duty to restore or civil liability because scientific knowledge or contaminant standards subsequently change.

This does not mean that operators should be protected from liability for unlawful conduct, failure to comply with an environmental authority, or failure to take measures that were reasonable and practicable in light of the knowledge available at the time. Rather, the legislation should distinguish between poor environmental performance and the later discovery of a contaminant that an operator neither introduced nor had a reasonable capacity to identify or remove.

Case study: when government-supported reuse becomes a legacy liability

From 2000, Queensland's principal water legislation, the Water Act 2000, expressly recognised recycling and sequential reuse as components of efficient water use. During the Millennium Drought, Queensland Government policy also treated recycled wastewater as a legitimate resource for conserving drinking water and maintaining schools, recreation grounds, landscaped areas, plantations and other community assets.

This policy was supported by direct government investment and ministerial endorsement. Examples include:

- In 2007, the Queensland Government provided \$70,000 towards a recycled-water irrigation system at Eatons Hill State School. The government stated that the project had preserved the school's oval, playing areas and landscaped areas during drought. Approximately 40,000 litres of recycled water from the Brendale Treatment Plant was used each night rather than being discharged to the South Pine River³.*
- In 2006, the Queensland Government committed more than \$49 million to the Pimpama recycled-water project on the Gold Coast. The project was promoted as an innovative response to drought and future water demand, providing recycled water for toilet flushing and outdoor uses including gardens and car washing⁴.*
- In 2008, the Queensland Government committed approximately \$3.34 million to the Fraser Coast Regional Council's Vanderwolf Road Farm Recycled Water Project. Ministers described irrigating council-owned hardwood plantations with treated effluent as more cost-effective and environmentally preferable to upgrading treatment plants to enable ocean discharge⁵.*

These were not unauthorised or marginal activities undertaken despite government policy. They were projects encouraged, funded and publicly promoted by the State because they reduced potable-water demand, maintained community assets and reduced discharges to receiving waters.

At that time, the association between treated wastewater and PFAS was not widely understood. PFAS were not routinely monitored in recycled water, and conventional wastewater treatment plants were

³Queensland Government, "Premier Bligh opens Prep facility at Waterwise Eatons Hill", joint statement by Premier Anna Bligh and Minister for Education and Training and Minister for the Arts Rod Welford, 14 September 2007.

⁴ Queensland Government, "\$49 million for state-of-the-art Gold Coast water recycling project: Fraser", Minister for Local Government, Planning and Sport Andrew Fraser, 24 October 2006 (statement dated 18 October 2006).

⁵Queensland Government, "Fraser Coast recycled water scheme gets first subsidy instalment", Minister for Main Roads and Local Government Warren Pitt, 26 June 2008.

not designed to remove them. More recent research has established that PFAS and other emerging contaminants can be present in both incoming wastewater and treated effluent⁶.

This creates a significant legacy risk. Land managed in accordance with approved recycled-water schemes and the standards applying at the time may later be reassessed against new contaminants or substantially lower thresholds. Without appropriate statutory protection, activities previously encouraged by government could expose water service providers and landholders to retrospective investigation, management or remediation obligations for impacts that could not reasonably have been anticipated or prevented.

The uncertain regulatory landscape also creates significant commercial and financial risks for water businesses. Where future PFAS standards, monitoring requirements and liability pathways remain unclear, utilities cannot confidently assess their exposure or make long-term infrastructure and beneficial-reuse decisions, which carry commensurate water security implications. Discussions within **qldwater** member forums have noted that this uncertainty can prevent investment. The risk is compounded by the increasing difficulty of securing insurance that responds to PFAS contamination claims. The absence of effective insurance does not reduce the underlying risk; it transfers that risk directly to utilities and, ultimately, their customers and communities.

The legislation should expressly provide that lawful historical activities do not give rise to liability solely because:

- a contaminant was not known, routinely detectable or regulated at the time;
- later scientific knowledge identifies a risk associated with the contaminant;
- environmental or health thresholds are subsequently introduced or reduced; or
- the contaminant is later detected in land, water, recycled water or biosolids associated with an historically authorised activity.

Where State policy encouraged, approved or financially supported an activity, it has an additional responsibility to ensure that operators and participating landholders are not left carrying the consequences of later regulatory change. Any investigation or remediation response should identify the upstream sources and parties with meaningful control over the contaminant, rather than defaulting to the WWTP operator as the most visible party in the chain.

4. WWTP operators also need protection from liability for emerging contaminants

Statutory protection must apply prospectively. It cannot be limited to contaminants already identified or regulated because scientific knowledge, analytical capability and environmental standards will continue to change over the operating life of wastewater infrastructure.

A substance that is lawful and largely unregulated today may later be found to be persistent, bioaccumulative or harmful. Analytical improvements may allow it to be detected at lower concentrations, while new classifications or thresholds may alter the regulatory significance of activities previously considered acceptable. Replacement chemicals may also emerge as contaminants of concern after becoming embedded in consumer products, buildings and long-lived waste streams.

The safe harbour must therefore remain effective as knowledge and regulatory standards develop. An authorised operator should not become liable merely because:

⁶Environment Protection Authority Victoria, Emerging contaminants in recycled water, publication no. 2054, 5 June 2023.

- a previously unregulated substance is subsequently found to present environmental or human-health risks;
- analytical improvements allow a substance to be detected at lower concentrations;
- regulatory thresholds or classifications are introduced or tightened after infrastructure and management decisions were made;
- a contaminant is present in lawful influent from domestic, commercial, industrial or landfill sources outside the operator's reasonable control; or
- a contaminant passes through treatment or partitions into recycled water or biosolids despite the operator taking all measures that were reasonably practicable at the relevant time.

This protection should extend to regulatory enforcement, the duty to restore and civil liability, including compliant management and beneficial use of recycled water and biosolids. It should not depend on a fixed list of contaminants, as such a list would become incomplete as new substances and risks emerge.

Guidance or policy alone cannot provide this prospective certainty. It cannot conclusively determine statutory or civil liability, bind future decision-makers or protect long-term infrastructure and beneficial-use arrangements from the consequences of later scientific or regulatory change.

Table 1: Known contaminants of concern to water utilities as future management risks

Contaminant	Status	Source	Concern
Microplastics	Not controlled	Ubiquitous in textiles, food (packaging), consumer products → community wastewater.	Likely future regulation, inability to manage sources. Requirement for thermal treatment to manage in solids streams and membrane filtration in effluent streams.
PFAS	Controls on imports for some congeners (Sch.7 IChEMS, subject to implementation and enforcement limitations). Not regulated in consumer products, medicines, pharmaceuticals.	Consumer products currently in the marketplace, imported articles, municipal and commercial wastes (to landfill) → community wastewater.	Treatment technology for PFAS in WWTP solid and liquid streams is both immature and expensive.
HHCB (galaxolide)	Not controlled	Widely used in PPCP and consumer products → community wastewater.	Interstate regulation is telegraphing future regulation in Queensland. Treatment requirements for WWTP solid and liquid streams are similar to PFAS.
Triclosan	Not controlled	Widely used in PPCP and consumer products → community wastewater.	Interstate regulation is telegraphing future regulation in Queensland. Treatment requirements for WWTP solid and liquid streams are similar to PFAS.
PBDE (Polybrominated diphenyl ethers)	Long standing controls on imports and manufacturing (Sch. 7 IChEMS, subject to implementation and enforcement limitations). Some	Flame retardants in electronics, furniture foam, plastics, and textiles →	Interstate regulation is telegraphing future regulation in Queensland. Treatment requirements

essential uses remain for nona- and deca-BDE until 1 January 2027 (Sch. 6 IChEMS), including polyurethane building-insulation foam; specified electrical-appliance housings and parts; and flame-retardant textiles other than clothing and toys.	community wastewater and landfill leachates.	for WWTP solid and liquid streams are similar to PFAS.
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The implications of the general environmental duty and duty to restore

Section 319 of the *Environmental Protection Act 1994* establishes a general environmental duty requiring a person not to carry out an activity that causes, or is likely to cause, environmental harm unless all reasonably practicable measures are taken to prevent or minimise that harm. In determining what is *reasonably practicable*, consideration is given to matters including the nature and likelihood of the harm, the sensitivity of the receiving environment, the current state of technical knowledge, the likelihood that available measures will succeed and their financial implications⁷.

The Department's guidance makes clear that the duty is dynamic. Duty holders are expected to actively seek and maintain knowledge about environmental risks, and the response required may change as technical knowledge, technologies and risk controls develop⁸. This is appropriate for managing contemporary operational risks, but it creates significant uncertainty for WWTP operators receiving contaminants they did not manufacture, import, select or intentionally use.

A substance that is lawful and largely unregulated today may later be classified as persistent, bioaccumulative or hazardous. At that point, the operator may be expected to investigate its sources, monitor its presence and consider additional controls. Unless the legislation clearly distinguishes the upstream source from the end-of-line receiver, evolving scientific knowledge could also expose the operator to allegations that continuing to discharge treated effluent or manage biosolids causes environmental harm.

The duty to restore under section 319C creates an additional risk. The consultation paper states that the duty requires the person responsible for environmental harm to take proactive steps to restore the environment and operates alongside the general environmental duty. Although it does not apply where the activity causing the harm was authorised under an environmental authority, the consultation paper also observes that an environmental authority does not authorise harm from a contaminant where the authority does not address its release. Emerging contaminants are, by definition, unlikely to have been expressly addressed when existing environmental authorities were issued.

This creates the potential for open-ended restoration liability whenever new knowledge changes the risk attributed to a previously lawful discharge or reuse activity. The fact that restoration measures are assessed by reference to current technical knowledge, their likely success and financial cost does not resolve the underlying question of who should bear responsibility. WWTP operators should not be required to restore contamination caused by substances lawfully manufactured, imported and

⁷Queensland Government, Department of the Environment, Tourism, Science and Innovation, Consultation paper: A review of statutory protections for wastewater treatment plants under the Environmental Protection Act 1994, July 2026, sections 5.2–5.3 and 6.

⁸Queensland Government, Department of the Environment, Tourism, Science and Innovation, General Environmental Duty, Information Sheet ESR/2024/6837, version 1.03, last reviewed 9 December 2025, sections 3.1.3 and 3.2.

used throughout the community merely because the sewerage system became their final pathway to the environment.

The legislation should therefore provide a statutory safe harbour where an operator:

- holds and complies with the relevant environmental authority;
- complies with applicable trade waste, recycled water, biosolids and End of Waste requirements;
- maintains appropriate systems for identifying and responding to emerging risks;
- takes measures that are reasonable and practicable having regard to the knowledge, technology and regulatory requirements available at the relevant time; and
- did not manufacture, import or intentionally introduce the contaminant into the wastewater system.

This would not excuse poor performance or prevent action where an operator knowingly fails to take reasonable measures. It would ensure that duties evolve prospectively as knowledge develops, without retrospectively transferring responsibility for the use of unregulated chemicals across the wider economy to essential service providers.

Case study: The future risks associated with regrettable substitutions

Decabromodiphenyl ethane (DBDPE) is a novel brominated flame retardant that was developed and marketed as a major replacement for legacy polybrominated diphenyl ethers, including deca-BDE, as those substances became subject to global restrictions and bans.

DBDPE is now recognised as very persistent and very bioaccumulative and has been proposed for listing as a persistent organic pollutant under the Stockholm Convention, with the proposal due to be considered in September 2026. Australia has begun phasing out most uses through its listing in Schedule 6 of the Industrial Chemicals Environmental Management Standard from 1 January 2027. However, the scheduling decision permits its continued use in certain finished articles that must meet fire-retardancy standards where no viable alternative is available, including articles used in:

- *aerospace, defence and transport;*
- *electrical and electronic equipment;*
- *building and construction materials;*
- *agricultural, construction, manufacturing and mining equipment;*
- *garden, forestry and outdoor power equipment; and*
- *industrial machinery and stationary power equipment⁹.*

These articles will eventually enter waste and recycling streams. Where DBDPE-containing material is disposed of to landfill, contaminated leachate may subsequently be received by sewerage systems. Other releases may arise through the use, wear, washing or disposal of products. Research at a municipal WWTP found that DBDPE strongly partitioned into sludge, demonstrating that wastewater treatment transfers much of the contaminant into the solid stream rather than destroying it¹⁰.

⁹Australian Government, Department of Climate Change, Energy, the Environment and Water, Industrial Chemicals Environmental Management Standard—scheduling decision for decabromodiphenyl ethane (DBDPE), Schedule 6 requirements commencing 1 January 2027.

¹⁰Wang et al. 2020, Occurrence and mass balance of emerging brominated flame retardants in a municipal wastewater treatment plant. <https://doi.org/10.1016/j.watres.2020.116298>.

Given its persistence and bioaccumulation profile, DBDPE may in future be treated as a hazardous contaminant under the EP Act or become subject to more stringent controls. A WWTP could then face new monitoring, treatment, biosolids-management or restoration expectations even though:

- *DBDPE was introduced as a lawful substitute for another regulated flame retardant;*
- *its ongoing use was permitted under national chemical regulation;*
- *the operator had no control over its manufacture, importation or use in finished articles;*
- *relevant environmental authorities and wastewater infrastructure were developed before the risk was fully recognised; and*
- *conventional wastewater treatment does not destroy the substance.*

In this case, the WWTP is plainly the receiver, not the originator, of the pollution. The polluter-pays principle should direct responsibility towards the parties that manufacture, import, specify, use or profit from the chemical and can control its entry into the market. It should not make water customers and ratepayers responsible for the downstream consequences of a substance whose continued use is permitted by governments.

DBDPE demonstrates why statutory protection cannot be limited to a fixed list of known contaminants. By the time a regrettable substitute is regulated, it may already be embedded in long-lived products, buildings, vehicles and waste streams that will continue releasing it for decades. The legislation must anticipate this cycle and protect compliant WWTP operators from liability for future contaminants received through lawful waste streams and outside their reasonable control.

5. Treatment technology cannot remove the underlying liability

Treatment technology is an important part of contaminant management, but it cannot provide a complete or universally available solution to persistent and emerging contaminants in wastewater.

Wastewater treatment plants are principally designed to remove organic matter, nutrients, suspended solids and pathogens. They were not designed to destroy the diverse and continually changing range of persistent chemicals entering sewerage systems from industrial, commercial, domestic, landfill and legacy sources. The Queensland Government's consultation paper acknowledges that advanced treatment capable of removing some persistent contaminants may be costly, energy-intensive or not yet widely implemented, and that contaminants may consequently remain in treated wastewater.

The limitations are more fundamental than the performance of any individual technology. Treatment may:

- remove only particular contaminants or chemical classes;
- perform differently depending on contaminant concentration, wastewater characteristics and plant configuration;
- be less effective for replacement chemicals or short-chain compounds;
- generate transformation products that are not routinely monitored;
- concentrate contaminants into another waste stream rather than destroy them;
- require further treatment of contaminated sorbents, concentrates, gases, liquors, ash or char;
- introduce substantial energy, chemical, carbon and financial costs; and
- depend on output markets and regulatory approvals that are not yet established.

There is no single treatment process capable of reliably removing and destroying all known and emerging contaminants across the liquid, solid and gaseous streams produced by a WWTP. A

technology selected for one contaminant may be ineffective against another. A requirement to install increasingly advanced treatment at WWTPs would therefore not eliminate the underlying pollution.

PFAS illustrates this problem. Wang et al.¹¹ identified thousands of PFAS that were or had been placed on the global market, while research and regulation remained concentrated on a comparatively small number of well-known long-chain compounds. Processes such as activated carbon adsorption and membrane filtration can remove certain PFAS from water, but they produce contaminated sorbents or concentrates that require subsequent management, potentially including high-temperature destruction. Wang et al. also noted that some advanced technologies have limited applicability to short-chain PFAS and can entail substantial financial and resource requirements problems¹¹.

This uncertainty is particularly significant for emerging contaminants because analytical methods, reference standards and knowledge of transformation pathways are still developing. A treatment process cannot be demonstrated to remove substances that have not yet been identified, cannot be measured or are not included in the monitoring program.

High capital and operating costs for treatment

Advanced treatment imposes substantial capital and operating costs. These include dewatering and drying equipment, reactors or furnaces, air pollution controls, energy and chemical use, monitoring systems, specialist operators, maintenance, residuals management and the eventual decommissioning of the facility.

A recent study by the Water Services Association of Australia¹², conducted a comparative analysis of 20 biosolids management approaches. This study ranked established options such as advanced anaerobic digestion and pelletisation alongside emerging advanced thermal conversion processes including pyrolysis and gasification. Each technology was assessed for its environmental outcomes, affordability and value, ease of implementation and market and community support. WSAA's analysis provided indicative costs for the available biosolids management options. Its national central estimates, expressed in constant 2025 Australian dollars per tonne of dry solids, were:

- approximately \$250/t DS for Class B land application;
- \$400/t DS for Class A composting;
- \$550/t DS for landfill disposal;
- \$575/t DS for thermal drying and pelletisation;
- \$650/t DS for pyrolysis;
- \$725/t DS for gasification; and
- \$900/t DS for incineration.

These figures are indicative rather than project estimates. WSAA cautions that actual outcomes will depend on site conditions, biosolids characteristics, energy prices, transport distances, market access and regulatory requirements. Its calculation also excludes societal and non-financial externalities, including the value of carbon sequestration, the cost of greenhouse gas emissions and public-acceptance risks¹². The total community and environmental cost may therefore be higher than the financial comparison suggests.

¹¹Wang et al. 2017. A Never-Ending Story of Per- and Polyfluoroalkyl Substances (PFASs)? <https://doi.org/10.1021/acs.est.6b04806>.

¹²Water Services Association of Australia, Weighing Up the Options: Sustainable Biosolids Management across Australia & New Zealand, WSAA, 2025, ISBN 978-1-922808-47-9.

A related analysis was undertaken by Urban Utilities¹³ in 2023, which provided a first-order capital cost estimate of removing PFAS from the liquid stream at Queensland's 184 wastewater treatment plants of \$13.2 billion in 2023 dollars¹⁴.

- For 102 small plants serving fewer than 5,000 equivalent persons, the estimated average capital investment is \$19 million per plant, totalling approximately \$1.9 billion.
- For 63 medium-sized plants serving 5,000 to 50,000 equivalent persons, the estimated average capital investment is \$69 million per plant, totalling approximately \$4.3 billion.
- For 19 large plants serving more than 50,000 equivalent persons, the estimated average capital investment is \$367 million per plant, totalling approximately \$7.0 billion.
- Although large plants represent only around 10% of the plants assessed, they account for approximately 53% of the estimated statewide capital cost.

These figures are a first approximation of capital investment only. They do not include ongoing operating, energy, maintenance, monitoring, waste-management or disposal costs associated with PFAS treatment. The scale of the estimated investment demonstrates that attempting to remove PFAS at wastewater treatment plants would impose substantial costs on water service providers and, ultimately, their customers.

The long lead time for planning, approving, financing and constructing major infrastructure also prevents technology from being an immediate response to a new contaminant standard. A utility could invest in a facility with an expected operating life of several decades only to find that future scientific knowledge, regulatory thresholds or replacement chemicals require a different process. Customers should not be expected to fund successive generations of treatment infrastructure in an attempt to manage an unrestricted and changing contaminant load at the end of the pipe.

The availability of a treatment process in a research paper, pilot plant or overseas installation does not mean that its use is reasonably practicable at every Queensland WWTP. Nor does evidence that a technology removes a contaminant from biosolids establish that it destroys the contaminant across the entire treatment system.

When applying the general environmental duty, the assessment of *reasonably practicable* measures should expressly consider:

- whether the technology has been demonstrated at the scale and for the wastewater or biosolids characteristics concerned;
- its effectiveness against the full contaminant group, including precursors and transformation products;
- the fate of contaminants across all solid, liquid and gaseous outputs;
- the availability of validated analytical methods;
- energy, chemical and greenhouse gas implications;
- capital and whole-of-life operating costs;
- the availability of specialist skills, residual-disposal facilities and output markets;
- infrastructure planning, approval and construction timeframes;
- the environmental benefits forgone by displacing beneficial reuse; and
- whether upstream manufacture, importation or use restrictions would provide a more effective and proportionate response.

¹³ Urban Utilities 2023 Submission to the consultation on the PFAS NEMP 3.0.

¹⁴ Since 2023 the cost of civil infrastructure works has increased substantially and is forecast to increase further. Queensland Major Contractors Association, *Queensland Major Projects Pipeline 2025*. <https://qmca.com.au/>

Treatment is a supporting control, not a substitute for source control. Without restrictions on the manufacture, importation and use of persistent contaminants, increasingly complex end-of-pipe treatment will continue to transfer financial responsibility to water customers while failing to eliminate the contaminant from the broader material cycle.

6. Long-term infrastructure decisions must remain affordable and proportionate

Wastewater infrastructure is typically planned and financed over asset lives of 30 to 50 years. Facilities designed today cannot reasonably be expected to remove every contaminant that may be identified or regulated, or become subject to more stringent thresholds, over that period. Even for known contaminants, the investigation, design, approval and construction of new treatment processes cannot necessarily be completed within the timeframes in which regulatory requirements may change.

The general environmental duty appropriately requires operators to take all *reasonably practicable* measures, not every technically conceivable measure. The Department's guidance recognises that financial implications must be considered and that measures should be cost-effective and not disproportionate to the significance of the environmental risk. For essential public infrastructure, this assessment must also account for treatment effectiveness, technological maturity, energy and residual-waste impacts, whole-of-life costs, alternative risk controls and the resulting burden on customers and ratepayers.

Statutory protections should therefore ensure that compliant wastewater treatment plant operators are not exposed to open-ended liability for failing to anticipate contaminants or treatment requirements that were not reasonably foreseeable when infrastructure decisions were made. New obligations should be risk-based and proportionate, supported by regulatory impact assessment, realistic transition periods and funding arrangements. Where effective treatment is unavailable or would impose costs disproportionate to the risk, source control and action against those introducing contaminants should remain the primary response.

7. A fair and sustainable framework for statutory protection

Targeted amendments to the EP Act and Regulation are needed to provide durable and effective protection. Guidelines or policies alone cannot deliver sufficient legal certainty, bind future decision-makers, or adequately address civil and downstream biosolids and recycled water liability, enforcement risks and the resulting uncertainty for long-term infrastructure investment.

Queensland needs a targeted statutory safe harbour for authorised wastewater service providers, not merely guidance about who is a "polluter". The protection should operate across the general environmental duty, duty to restore, enforcement powers, offences and civil liability, while preserving liability for unlawful, negligent or unreasonable conduct.

Concomitant changes need to be considered under the *Waste Reduction and Recycling Act 2011* which provides the head of power for the End of Waste Codes for Biosolids and Biochar.

Example: The Lummis bill

Senator Cynthia Lummis introduced the Water Systems PFAS Liability Protection Act 2023 (S.1430) in the US Senate on 3 May 2023. It formed part of a package of five bills intended to protect “passive receivers” of PFAS, including water utilities, waste facilities, farmers, airports and organisations historically required to use PFAS-containing firefighting foam.

The bill responded to the US Environmental Protection Agency’s proposal to designate PFOA and PFOS as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act 1980 (CERCLA), which can impose substantial remediation liability and enable potentially responsible parties to seek contributions from other parties associated with a contaminated site.

The policy concern was that drinking water and wastewater utilities could become liable merely because they received, treated, discharged or disposed of PFAS introduced by manufacturers, industrial users, households and other upstream sources.

How the protection operated

S.1430 would have prevented any party from recovering CERCLA costs or damages from a “protected entity” arising from the environmental release of a covered PFAS.

Protected entities included:

- *public water systems;*
- *publicly or privately owned or operated wastewater treatment works;*
- *municipalities holding stormwater discharge permits;*
- *state or local government bodies acting as wholesale water agencies; and*
- *contractors undertaking relevant management or disposal activities for those entities.*

The protection expressly covered:

- *treatment and conveyance of water and wastewater;*
- *lawful management and disposal of biosolids;*
- *permitted effluent discharges;*
- *treatment residuals and by-products, including activated carbon, filter media and processed waste streams; and*
- *conveyance or storage for water conservation or reclamation.*

The exemption was conditional. The entity had to act consistently with all laws applicable at the time of the activity. Protection was unavailable where the entity engaged in gross negligence or wilful misconduct.

This is therefore a statutory safe harbour, rather than a complete deregulation of utilities. It preserves normal operational and permit obligations but prevents compliant utilities from being used as substitute defendants for contamination they did not create.

The EP Act should distinguish between causing pollution and receiving pollution while performing an essential statutory service. Wastewater service providers should remain responsible for lawful operation, compliance with environmental authorities, source-control measures within their powers and reasonably practicable environmental management. They should not, however, be made the default polluter, remediator or insurer for contaminants manufactured, imported, used or discharged by others and conveyed to them through the sewerage system.

This requires targeted amendments to the EP Act and Environmental Protection Regulation 2019. Guidance alone cannot resolve the operation of sections 24, 319, 319C and 493A, the environmental enforcement-order provisions, Schedule 1 or civil liability. The statutory protection should apply to legacy and future emerging contaminants, but remain conditional on lawful, compliant and reasonable operation.

Legislative location	Required outcome
EP Act, s 6A	Clarify that receiving and managing pollution created by others does not, by itself, make an authorised wastewater service provider the polluter
Sections 319 and 319C	Protect compliant receivers from retrospective or open-ended duties for contaminants outside their reasonable control
Section 493A and authorising instruments	Clarify the protection provided by an EA where individual emerging contaminants are not expressly listed
Enforcement provisions	Prevent enforcement being directed to a WWTP merely because it is the identifiable end-of-line receiver
Schedule 1, Part 2	Consider an appropriately conditioned exclusion for authorised wastewater reception, treatment, discharge and resource-recovery activities
EP Regulation and ERA 63	Establish operational boundaries and conditions for the protection
WRR Act and End of Waste Codes	Preserve protection through compliant biosolids, biochar and other resource-recovery pathways

qldwater does not propose that the detailed statutory wording be settled through this submission alone. We invite the Department to establish a focused legal and technical drafting process involving **qldwater**, representative water service providers, the ANZBP and suitably experienced government and sector lawyers. That process should examine coordinated amendments to the EP Act, Environmental Protection Regulation 2019, ERA 63 settings, the *Waste Reduction and Recycling Act 2011* and the relevant End of Waste Codes. **qldwater** would welcome the opportunity to provide an initial drafting framework and assist with that work.