Department of Environment and Science



Broadening and enhancing Reef protection regulations

Decision Regulatory Impact Statement

February 2019

Queensland Government

Prepared by:
Office of the Great Barrier Reef
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February 2019

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Executive summary

The Queensland Government released a Consultation Regulatory Impact Statement (Consultation RIS) outlining the regulatory proposals to reduce nutrient and sediment pollutants from land based activities within catchments adjacent to the Great Barrier Reef. This was proposed as part of a mix of tools to accelerate progress toward meeting the Queensland and Australian Governments' Reef water quality targets under the Reef 2050 Long-Term Sustainability Plan (Commonwealth of Australia, 2015).

The Consultation RIS proposed two options for accelerating improved Reef water quality:

- Option 1 – The current approach – no additional legislation
- Option 2 – Enhance and broaden Reef protection legislation

Following the consideration of feedback on the Consultation RIS, and further targeted stakeholder consultation and analysis, this Decision Regulatory Impact Statement (Decision RIS) recommends further regulatory intervention over the alternative option of maintaining the existing Reef protection regulations. Figure 1 outlines the regulatory impact process for the Reef regulatory package, and further consideration of the recommended package by Parliament.

Feedback through various consultation processes, including the Consultation RIS, consistently showed stakeholder views were divided on further Reef protection regulation. Agricultural stakeholders prefer voluntary approaches for meeting Reef water quality outcomes. The industrial sector (point source nutrient and sediment contributors) believe they are already heavily regulated, and additional requirements are disproportionate to the risk posed from the sector compared to the agricultural sector. The conservation sector supports regulation as a necessary step to meet the water quality targets. The Queensland Government believes the recommended Reef regulatory package reflects feedback from stakeholders, while also achieving significant water quality benefits.

Strengthened regulations are an important part of the comprehensive effort underway to improve Reef water quality to help preserve the high values held for the Reef and increase the resilience of the Reef to other pressures, such as impacts from climate change.

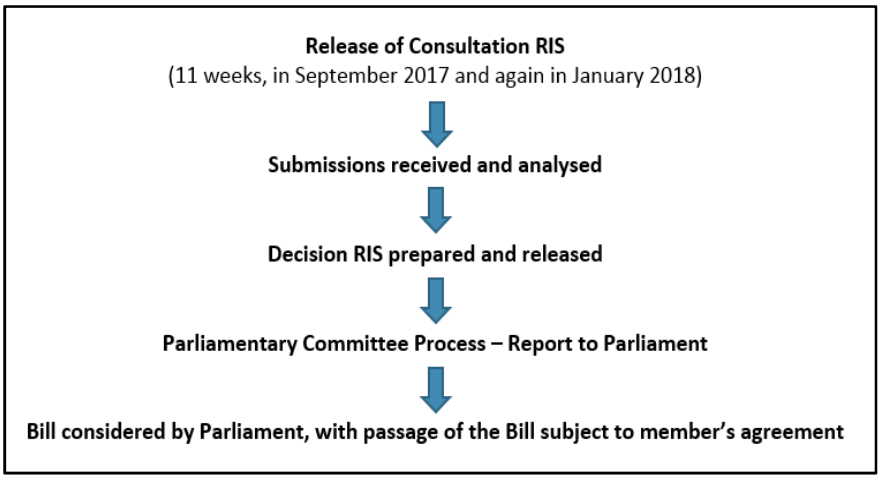


Figure 1: Regulatory impact assessment process

Together, the recommended regulatory proposals strengthen the existing Reef protection provisions under the *Environmental Protection Act 1994* for the improved management of diffuse pollution from agricultural activities, and point source pollution from industrial activities (e.g., sewage

treatment, waste disposal, certain mining activities, and aquaculture) within catchments adjacent to the Great Barrier Reef, that may have an impact on Reef water quality.

Identification of the problem

The Great Barrier Reef is the world's largest coral Reef ecosystem, stretching some 2,300 km along the Queensland coast. Considered an Australian and global icon, the Great Barrier Reef is a unique ecosystem hosting one of the most diverse range of species on the planet. The Outstanding Universal Value of the Reef was recognised by the World Heritage Committee in 1981, when it was listed as a World Heritage property. The Reef is critical to the cultural, economic and social wellbeing of the more than one million people who live in its catchment, and to Australians generally. A 2017 Deloitte Access Economics report assesses the Reef's total asset value as $56 billion. The World Heritage site added $3.9 billion to the Queensland economy in 2015-16 and supported more than 33,000 full-time Queensland jobs (Deloitte Access Economics, 2017).

Successive reports since the late 1990s have identified that Reef ecosystems are showing declining trends in condition. The *2017 Scientific Consensus Statement: Land use impacts on Great Barrier Reef water quality and ecosystem condition* (the 2017 Scientific Consensus Statement) confirms that improving water quality remains a key priority for improving Reef health (Waterhouse et al, 2017b). The latest science provides an unprecedented level of certainty that the main cause of poor Reef water quality is cumulative contributions of nutrient, sediment (and pesticide) runoff from agriculture in the Reef catchments, with locally significant contributions from industrial land uses.

The latest 2016 Reef Report Card (State of Queensland, 2017) as well as the 2017 Scientific Consensus Statement show that the uptake of improved land management practices is still too slow, not widespread enough and the present trajectory of pollutant reduction will not meet the Reef water quality targets (Waterhouse et al, 2017b). This is despite significant government investment, as well as industry efforts to increase the voluntary adoption of improved practices to reduce nutrient and sediment runoff over more than 10 years. The imperative to accelerate the uptake of improved practices through regulation has also been reiterated by the UNESCO World Heritage Committee (2017). While a number of voluntary mechanisms and policy tools are also being used to improve Reef water quality, regulation is expected to provide the step change required to achieve the steep reductions in pollutant loads needed to improve water quality.

The proposal to strengthen the existing Reef protection regulations seeks to eliminate high risk practices, attributed as the main source of poor Reef water quality and entrench standards considered to have a low to moderate water quality risk. The regulations will also address pollutant loads from new agricultural and industrial development to ensure new activities don't result in further degradation of Reef water quality.

Further detail on the problem of poor Reef water quality and previous efforts to address this can be found in the Consultation RIS available online[1].

Objective of government action

Protecting the Great Barrier Reef is one of the Queensland Government's six priorities under its plan, *Our Future State: Advancing Queensland's Priorities* (State of Queensland, 2018). Progress towards this priority will be measured against the following targets for water quality at the end of Great Barrier Reef catchments:

By 2025, contribute to a:

- 60% reduction in anthropogenic end-of-catchment dissolved inorganic nitrogen loads

[1] https://www.qld.gov.au/environment/agriculture/sustainable-farming/reef-regulations

- 25% reduction in anthropogenic end-of-catchment sediment loads.

These Reef-wide targets reflect Queensland's commitments under the Reef 2050 Water Quality Improvement Plan 2017-2022 (State of Queensland, 2018) (nested under the Reef 2050 Long-Term Sustainability Plan (Commonwealth of Australia, 2015)). The plan also includes end-of-catchment load reductions for each of the 35 river basins, ranging from zero to 70% of existing anthropogenic loads, depending on location, for what is required to achieve ecological health for the Reef.

In its final report (2016), the Great Barrier Reef Water Science Taskforce (the GBR Water Science Taskforce) recommended the Queensland Government implement staged regulations as one key component of a mix of instruments to reduce water pollution throughout the Reef regions. The GBR Water Science Taskforce concluded that all key industries should play their part. A re-invigorated regulatory approach should include a broader range of agricultural activities, and additional measures for the industrial sector, to address the cumulative impacts of multiple pollutant sources on Reef water quality.

The objective of the proposed regulatory package is to address poor water quality from pollutants derived from the land-based activities of key industries across Reef catchments by ensuring that:

- The Reef water quality targets for nutrients and sediments are taken into account in regulatory decision-making.
- The broad application of minimum regulated standards to eliminate high risk practices that contribute to excess nutrient and sediment run off.
- Producers move to standards that align with recognised benchmarks for agricultural industries under the Paddock to Reef Water Quality Risk Framework (Australian and Queensland governments, 2013), while maintaining productivity and profitability.
- New development can occur without compromising the water quality gains made to date, while also minimising regulatory burden on existing activities.
- Good performers that utilise practices with low water quality risks are recognised and rewarded.
- Existing industry-led best management practice (BMP) programs or the development of new programs can provide participants with an alternative pathway for meeting regulatory requirements.

Consultation

This Decision RIS follows ongoing consultation on Reef regulatory proposals with key stakeholders, including the agricultural and industrial sectors, conservation groups, other government departments, local governments and Natural Resource Management bodies since August 2016.

The Consultation RIS was released for public consultation for 11 weeks in total. The RIS was initially released between 7 September and 3 November 2017, and again between 22 January and 19 February 2018, due to the 2017 Queensland State election interrupting the original consultation period. Fifty-one submissions were received from across the agricultural, industrial and conservation sectors, and the community. Further targeted stakeholder consultation occurred over May-November 2018.

Recommended regulatory proposals – at a glance

Table 1 outlines the recommended regulatory proposals following consideration of feedback on the Consultation RIS, additional targeted stakeholder consultation and further analysis. More detail on the justification for the recommended proposals is outlined in Tables 5 and 6 in the main body of this Decision RIS.

Table 1: Recommended regulatory proposals following further consultation and analysis

Consultation RIS	Revised in Decision RIS
Set nutrient and sediment **pollution load limits** for each Reef catchment (at the river basin scale) to target responses for managing risks to water quality.	No change.
Provide the ability to **apply minimum practice standards** targeting nutrient and sediment pollution from key industries – sugarcane, grazing, bananas, other horticultural crops, and grains production – in all Reef catchments through commodity specific, staged implementation timeframes.	Changes made to the requirements of the minimum standards, and the timing for when the standards commence.
Remove the current requirement for an Environmental Risk Management Plan for agricultural activities.	No change.
Provide producers with an **alternative pathway for meeting regulatory requirements** through accreditation against a recognised BMP program (or like program).	No change.
Require **fertiliser sellers to keep and produce records** on request, of sales data and nutrient application advice provided to their clients to improve nutrient management outcomes.	**Require advisers** (e.g. agronomists and fertiliser sellers) **to provide advice that is not false or misleading, and to keep and produce records of the advice request** for 'tailored advice' about regulated agricultural activities.
Not proposed.	Create a **regulation making power to require data from the agricultural sector** for various purposes that may assist in determining where over application of fertiliser, and therefore high rates of nutrient runoff, may be occurring.
As a mechanism to **achieve 'no net decline' in water quality from new development** – establish a **water quality offset framework** that can apply across industry sectors to manage water quality impacts from new development in the context of the new catchment pollution load limits.	The following approach will be used to achieve a **'no net decline' in Reef water quality from new development.** • **Allow for further detailed regulations to be developed in the future, to support the use of water quality offsets for new development**. • Require **farm design standards for new cropping activities through an environmental authority (i.e., a permit).** Higher-risk agricultural development will be subject to a land based water quality risk assessment for the new activity. In addition to implementing farm design standards, new cropping activities will be required to meet the minimum practice standards (where a standards exists). • Require **new resource and prescribed environmentally relevant activities (ERAs under the legislation) to meet a 'no net**

Consultation RIS	Revised in Decision RIS
	decline' standard regarding nutrient and sediment releases. Where these ERAs (e.g., sewage treatment, waste disposal, mining, and aquaculture) cannot avoid or mitigate their water quality impacts through the design and operation of the development, they will be able to meet this standard through a voluntary offset condition informed by the Point Source Water Quality Offsets Policy under the *Environmental Protection Act 1994.*

Costs and benefits

The Queensland Government is of the view that the benefits of the Reef regulatory package justify the costs, and generate the greatest net benefit to the community compared to the option of maintaining the current regulatory approach. This is on the basis that:

- Significant investment by government and industry to date to facilitate the uptake of improved practices has not resulted in widespread adoption; many producers have not engaged with these initiatives and continue to use high-risk practices.
- Maintaining existing arrangements will mean Queensland will not meet the Reef water quality targets for a healthy Reef.
- Compliance results in existing regulated Reef regions demonstrates that the improved uptake of standards can occur where regulated standards are supported by compliance effort.

Table 2 summarises the overall monetised costs and benefits of the revised Reef regulatory package in comparison to the Consultation RIS.

Table 2: Differences between the Consultation and Decision RIS costs and benefits

Monetised costs and benefits	Consultation RIS	Decision RIS
Present value* cost ($)	852,815,638	609,857,252
Present value benefit ($)	355,605,307	285,817,474
Equivalent annual value# cost ($/year)	130,895,662	93,604,837
Equivalent annual value benefit ($/year)	54,580,603	43,869,115

* *Present value is the total value of the future benefit stream (ten years) in present day terms - this allows costs and benefits to be compared at the point where decisions are made.*

Equivalent annual value shows the net present value as an equivalent annual value over ten years.

Removal of the agricultural offsets framework is a key difference between the Consultation and Decision RIS, reducing the cost of the recommended Reef regulatory package by $210 million in present value over ten years ($32 million in equivalent annual value).

Although it is not possible to monetise the water quality benefits of the regulatory proposals, improved practice standards for a broader suite of agricultural industries – cane, grazing and bananas – across all Reef regions, are anticipated to result in significant reductions in pollutant loads. Other efforts, such as extension and incentives that support practice adoption will also have a contributing effect. The estimated nutrient load reduction is 37 per cent out of the 60 per cent 2025 Reef wide reduction target; representing approximately 61 per cent progress toward this target. The estimated sediment load reduction is 19 per cent out of a 25 per cent reduction target; representing

approximately 76 per cent progress toward this target. There will be time lags between implementation of the regulatory proposals, the anticipated realisation of pollution load reductions, and the response of ecosystems to these reductions. Such reductions will however, improve Reef water quality, which is essential for recovering and maintaining a healthy Reef.

There will also be water quality benefits from the regulation of new cropping, as well as industrial development that seeks to achieve a no net decline in Reef water quality.

These reductions will contribute to the resilience of the Great Barrier Reef to recover from other impacts, such as those related to climate change. This in turn helps to protect the valuable commercial benefits derived from the Great Barrier Reef to the Queensland economy, particularly from tourism and fishing industries estimated at $3.9 billion per year (Deloitte Access Economics, 2017). It also helps protect the large non-use and recreation values supported by the Reef, that contribute to its combined social, economic and iconic asset value recently estimated at $56 billion (Deloitte Access Economics, 2017). The large size of these monetised values indicates the magnitude of the value of the Great Barrier Reef. This helps give confidence that the gap between monetised costs and benefits in this Decision RIS is a worthwhile investment to protect these values.

Table 3 shows the present value financial benefits over 10 years for the agricultural sector and government from strengthened Reef protection regulations.

Table 3: Financial benefits for the agricultural sector and government

Sector	Present value benefits ($) over 10 years	Equivalent annual value benefits ($)
Agriculture	285,188,661	43,772,601
Government	628,813*	96,514
TOTAL	**285,817,474**	**43,869,115**

* The majority of this benefit relates to the estimated fees for administering the environmental authorities for new cropping activities. This benefit is offset by the cost of administering these authorities.

The present value of quantified benefits to the agricultural sector is approximately $286 million over 10 years, or an equivalent annual value of $43 million per annum. However, financial outcomes for producers will vary based on climate, markets and differences between a property's business structure, the biophysical characteristics of a property, and other adoption barriers that may include accessing the necessary capital to initiate change. Transitional funding of approximately $10 million will be made available to producers to assist them meet the minimum practice standards.

It is acknowledged that the regulations are not without costs. Table 4 shows the present value costs over 10 years for the agricultural sector, industry (banana industry and sewage treatment plant operators) and government from strengthened Reef protection regulations.

Table 4: Costs for the agricultural sector, industry and government

Sector	Present value costs ($) over 10 years	Equivalent annual value costs ($)
Agriculture	536,609,628	82,362,318
Industry (sewage treatment plants and banana industry)	41,595,913	6,384,410
Government	31,651,711	4,858,109
TOTAL	**609,857,252**	**93,604,837**

The present value costs are estimated to be $610 million over 10 years, $94 million per year to government, agricultural producers and industry (banana industry and sewage treatment plant operators). To limit the impact of grazing minimum standards on graziers with land in good to fair condition, the grazing standards are now outcome based, rather than the more prescriptive approach originally proposed. Graziers will be required to maintain land in good to fair condition, and meet certain requirements where the land is in a poor or degraded condition.

This improved flexibility should help reduce regulatory costs and burden for graziers as they will only be required to act if land condition is poor, and will be able to choose the most appropriate path to improve outcomes for affected areas of their property. Further research has not identified alternative costings data that can be extrapolated across the whole Reef region to that presented in the Consultation RIS at this time to quantify this. The standards for graziers promote matching stocking rates to available forage, and maintaining land condition for pasture and business resilience. The costing assumes that this may result in lower stocking rates for improved land condition. Various economic assessments suggest that long-term profitability and sustainability for grazing enterprises is maximised by low to moderate stocking rates across most land types (Moravek et al, 2016). This is due to the subsequent higher pasture production, higher market premiums for animals in better condition, and lower costs of production. Sediment run-off is also reduced under a lower stocking rate. While these benefits are likely to be realised outside of the 10 year timeframe for the Consultation RIS assessment, it is still likely that graziers will benefit and face lower ongoing costs, in the medium-long term.

The grazing practice standards align with recommended grazing land management strategies for managing climatic variability including drought preparedness, management and recovery. Due to climatic and economic conditions, it is acknowledged that it will be difficult for some areas to be returned to fair or good condition during or immediately following drought or other natural disasters. Active enforcement of the regulations in these circumstances will be moderated on a case-by-case basis, and follow standard departmental practice in response to natural disasters.

The government will also provide producers with an alternative pathway for complying with regulated standards. The Queensland Government acknowledges the substantial efforts that many producers have made to improve their practices and continues to support industry-led BMP programs. Producers accredited against recognised BMP or like programs will be deemed as complying with the minimum regulatory standards. This will recognise and reward those producers that are already meeting these standards. The Queensland Government also acknowledges the efforts of local councils within Reef regions to support improved land management for water quality outcomes.

The Queensland Government encourages continued economic growth in the Reef catchments and believes these opportunities can and must be realised in an environmentally sustainable way. This includes new industry opportunities such as biofuels, and preparation of a North Queensland Regional Plan, to support sustainable growth in the agricultural sector as a key regional opportunity.

Section 8 of this Decision RIS provides more detail on the overall costs and benefits of the revised Reef regulatory package in comparison to the Consultation RIS, as well as updated costs and benefits by sector.

1. Introduction

This Decision Regulatory Impact Statement (Decision RIS) outlines the outcomes from consultation on the proposal to strengthen existing regulations to further protect the Great Barrier Reef from catchment sources of water quality pollution.

The Department of Environment and Science (the department) released a *Consultation Regulatory Impact Statement for broadening and enhancing Reef protection regulations* (Consultation RIS) in September 2017. The Consultation RIS was released for public consultation for 11 weeks in total. Consultation initially occurred between 7 September and 3 November 2017, and again between 22 January and 19 February 2018, due to the 2017 Queensland State election interrupting the initial consultation period. The department also undertook a further 23 targeted stakeholder consultation meetings on the proposed regulatory package, many of these occurring throughout regional areas (refer to Appendix 1).

The Consultation RIS proposed two options for accelerating improved Reef water quality:

- Option 1 – The current approach – no additional legislation
- Option 2 – Enhance and broaden Reef protection legislation

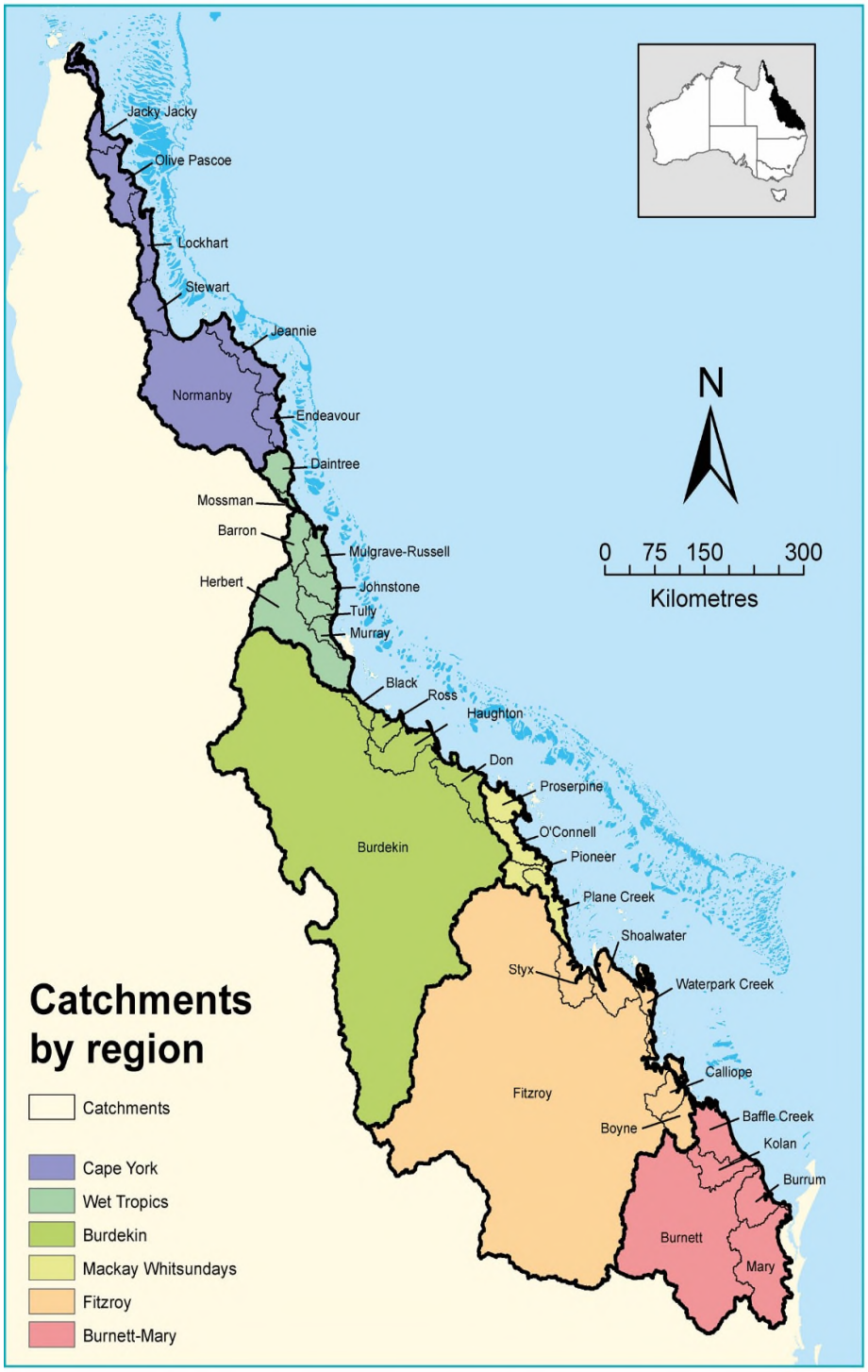
Option 2 included the following regulatory proposals:

- Set nutrient and sediment **pollution load limits** for each Reef catchment (at the river basin scale) to target responses for managing risks to water quality.
- Provide the ability to **apply minimum practice standards** targeting nutrient and sediment pollution from key industries – sugarcane, grazing, bananas, other horticultural crops, and grains production – in all Reef catchments through commodity specific, staged implementation timeframes.
- Remove the current requirement for an Environmental Risk Management Plan for agricultural activities.
- Provide an **alternative pathway for producers to meet regulatory requirements** through accreditation against a recognised BMP program (or like program).
- Require **fertiliser sellers to keep and produce records** on request, of sales data and nutrient application advice provided to their clients, to improve nutrient management outcomes.
- Establish a **water quality offset framework** that can apply across industry sectors as a measure to manage water quality impacts from new development in the context of the new catchment pollution load limits.

The Consultation RIS recommended Option 2, as this option is anticipated to result in significant reductions in nutrient and sediment pollutant loads in Reef catchments. It is more likely to achieve improved Reef ecosystem health over time, compared to Option 1. The options and impact analysis are outlined in detail in the Consultation RIS available online[2]. Figure 2 shows the geographical extent of the Reef catchments.

[2] https://www.qld.gov.au/environment/agriculture/sustainable-farming/reef-regulations

Great Barrier Reef regions and catchments



The Great Barrier Reef stretches more than 2300 kilometres along Queensland's coastline. It receives run-off from 35 catchments which are spread over six natural resource management regions.

Cape York
- Jacky Jacky Creek
- Olive Pascoe
- Lockhart River
- Stewart River
- Normanby River
- Jeannie River
- Endeavour River

Wet Tropics
- Daintree River
- Mossman River
- Barron River
- Mulgrave-Russell River
- Johnstone River
- Tully River
- Murray River
- Herbert River

Burdekin
- Black River
- Ross River
- Haughton River
- Burdekin River
- Don River

Mackay Whitsunday
- Proserpine River
- O'Connell River
- Pioneer River
- Plane Creek

Fitzroy
- Styx River
- Shoalwater
- Waterpark Creek
- Fitzroy River
- Calliope River
- Boyne River

Burnett Mary
- Baffle Creek
- Kolan River
- Burnett River
- Burrum River
- Mary River

Figure 2: Geographical expanse of the Great Barrier Reef region

Following the consideration of feedback received on the Consultation RIS, and further targeted stakeholder consultation and analysis, this Decision RIS recommends refinements to the proposals

under Option 2. It also provides an update of the costs and benefits for implementing the recommended regulatory package.

The Decision RIS has been prepared by the Office of the Great Barrier Reef, with technical assistance from the Science Division, both of which are within the department. Where possible, information contained in the Consultation RIS that remains current has not been repeated in the Decision RIS. This includes, for example information about the problem of poor water quality, its impact on the Great Barrier Reef, and why government intervention is proposed. This also includes the detailed costs and benefits for regulatory proposals that are unchanged or where proposals have changed, but the estimated costs and benefits remain relevant.

Section 2 outlines the recommended proposals under Option 2. Sections 3 to 8 outline each key component of the proposals, and a summary of revised costs and benefits. Appendix 1 provides key feedback received in submissions on the Consultation RIS. Other feedback through additional targeted consultation is referred to where relevant, in the main body of the Decision RIS.

2. Recommended proposals following the Consultation RIS

Following consideration of the feedback received in submissions on the Consultation RIS, and additional targeted stakeholder consultation and analysis, further regulatory intervention is recommended through amendments to the *Environmental Protection Act 1994* to:

- Set nutrient and sediment **pollution load limits** for each Reef catchment (at the river basin scale) to target responses for managing risks to water quality.
- Provide the ability to **apply minimum practice standards** to agricultural environmentally relevant activities (ERAs under the legislation) targeting nutrient and sediment pollution from key industries – sugarcane, grazing, bananas, other horticultural crops, and grains production – in all Reef catchments through commodity specific, staged implementation timeframes.
- Remove the current provisions requiring Environmental Risk Management Plans for agricultural activities.
- Provide an **alternative pathway for producers to meet regulatory requirements** through accreditation against a recognised BMP program (or like program).
- **Require advisers** (e.g. agronomists and fertiliser sellers) **to provide advice that is not false or misleading, and to keep and produce records of the advice provided upon request** for 'tailored advice' about agricultural ERAs.
- Create a **regulation making power to require data from the agricultural sector** that may assist in determining where over application of fertiliser and therefore high rates of nutrient runoff, may be occurring.

Proposals specifically related to achieving a **'no net decline' in Reef water quality from new development**:

- **Allow for further detailed regulations to be developed in the future to support the use of water quality offsets for new development**.
- Require **farm design standards for new cropping activities through an environmental authority (i.e., a permit).** Higher-risk agricultural development will be subject to a land based water quality risk assessment for the new activity.
- In addition to implementing farm design standards, new cropping activities will be required to meet the minimum practice standards.
- Require **new resource and prescribed ERAs to meet a 'no net decline' standard regarding nutrient and sediment releases**. Where these ERAs (e.g., sewage treatment, waste disposal, mining, and aquaculture) cannot avoid or mitigate their water quality impacts through the design and operation of the development, they will be able to meet this standard through a

voluntary offset condition informed by the Point Source Water Quality Offsets Policy under the *Environmental Protection Act 1994.*

Table 5 and 6 below summarises the recommended regulatory proposals.

Table 5: Recommended proposals following feedback on the Consultation RIS – excluding proposals for regulating new development

Reforms	Regulatory proposals – Consultation RIS	Regulatory proposals – Decision RIS	Rationale for recommended regulatory proposals
Set catchment pollution load limits	Catchment load limits to apply in all Reef catchments (at the river basin scale) for nutrients and sediments based on the 2025 Reef water quality targets for these pollutants in the Reef 2050 Water Quality Improvement Plan 2017-2022 (State of Queensland, 2018). The catchment load limits to be included in the Environmental Protection (Water) Policy 2009. This policy guides regulatory decision-making under the *Environmental Protection Act 1994* to manage the impacts of environmentally relevant activities (ERAs) on Queensland waters. The catchment load limits will be reviewed every five years to correspond with the five year review cycle for the water quality targets. The minimum practice standards and farm design standards for agricultural ERAs – sugarcane, grazing, bananas, other horticultural crops, and grains production – are important measures for supporting the achievement of the catchment load limits.	No change from the Consultation RIS.	Submissions from the agricultural sector dispute the scientific basis for the water quality targets. The Local Government Association of Queensland, the Queensland Water Directorate (*qldwater*) and conservation groups support end-of-catchment water quality targets. The science supporting the setting of the targets, and therefore the load limits, provides an unprecedented level of certainty regarding the sources of water quality pollution from Reef catchments and the relative risk of these pollution loads on Reef health. The catchment load limits are based on the water quality targets in the Reef 2050 Water Quality Improvement Plan 2017-2022. They were derived from the 2017 James Cook University report, "Development of basin specific ecologically relevant pollutant load reduction targets for the Reef" (Brodie et al., 2017). Given the strength of the science, no change is proposed.

Reforms	Regulatory proposals – Consultation RIS	Regulatory proposals – Decision RIS	Rationale for recommended regulatory proposals
	The load limits will also be used when considering the application of site-specific conditions for new development for prescribed and resource ERAs that release nutrients and sediments to waters (e.g., sewage treatment, waste disposal, certain mining activities, and aquaculture).		
Apply minimum practice standards	Implement commodity specific minimum practice standards across the Reef regions and remove the requirement for an Environmental Risk Management Plan. The practices targeted for regulation include fertiliser application, irrigation management, maintaining ground cover, soil and erosion control strategies, and keeping records. Regulated standards can be reviewed at any time, and at a minimum every five years, in alignment with timeframes for the review of the catchment load limits. Initially, minimum standards will be established for commercial sugar cane, grazing and banana production. Minimum standards for commercial horticulture and grain production will also be developed. No commencement date was specified.	The proposal to implement commodity specific minimum standards across the Reef regions and remove the Environmental Risk Management Plan hasn't changed from the Consultation RIS. The proposed grazing standards have changed to take an outcomes based approach rather than the prescriptive approach originally proposed. Minor technical changes have been made to the cane and banana standards. Minimum standards for commercial horticulture and grain production are to be developed. On commencement of the regulation, graziers and sugarcane and banana growers in all Reef regions will be required to keep records of fertiliser and chemical use. It was originally proposed that record keeping requirements would be aligned with the staged commencement of minimum standards. However, this would result in record keeping requirements for graziers in	The department has consulted extensively on the development of the standards with key stakeholders. This includes the department's compliance experts, and other relevant government departments including the Department of Agriculture and Fisheries and the Department of Natural Resources, Mines and Energy. The agricultural sector disputes the assertion that voluntary action isn't happening fast enough to meet the water quality targets, and that producers aren't operating at best practice. Concerns were raised about the cost and profitability of the standards, and that the original implementation timeframes of 12 months for grazing and bananas, and two years for sugarcane for refined nutrient management, were too short. Agricultural stakeholders also provided comments on the technical details of the standards. Some growers and graziers

Reforms	Regulatory proposals – Consultation RIS	Regulatory proposals – Decision RIS	Rationale for recommended regulatory proposals
	Record keeping requirements will align with the implementation of minimum standards. Staged commencement within two years of commencement of the legislation: <u>Sugarcane standards</u>: • *Stage 1* – growers in already regulated regions (Wet Tropics, Burdekin, and the Mackay Whitsunday regions) to meet minimum standards from commencement of the regulation for nutrient application, as well as soil and erosion control measures. • *Stage 2* – growers in all Reef regions to implement a more refined nutrient management plan approach (at the management zone scale) within 2 years. <u>Grazing standards</u>: minimum practice standards to be met within 12 months. <u>Banana standards</u>: minimum practice standards to be met within 12 months.	the already regulated Wet Tropics, Burdekin and Mackay Whitsunday regions switching off and on again with the staged implementation of the grazing standards. This record keeping approach affects cane growers in the Burnett Mary, Fitzroy and Cape York regions as well as banana growers in all regions, as they will be required to meet these record keeping requirements in advance of the staged implementation of standards. All other record requirements come into effect when the relevant minimum standards commence. On commencement, the minimum standards are proposed to commence through a staged approach within three years. The proposed staging is also more aligned to the catchment priorities for water quality improvement identified in the Reef 2050 Water Quality Improvement Plan 2017-22 (State of Queensland, 2018) as follows: <u>Sugarcane standards</u>: • *Stage 1* – growers in already regulated regions (Wet Tropics, Burdekin, and Mackay Whitsunday regions) to meet minimum standards from commencement, for nutrient	stated in regional consultation their frustration with poor operators tarnishing the good name of those who strive for best management practice. The conservation sector commented that the proposed minimum standards needed to be clear, prescriptive, enforceable and of a high standard. They also prefer minimum standards for all agricultural sectors to be met within 12 months in all Reef regions, with compliance focused on high-risk practices and areas. They believe staging the requirements compromises the contribution of minimum standards to meeting the 2025 water quality targets. The conservation sector supports refined nutrient management planning. They would also like grazing properties with land in poorer condition to be regulated to achieve good land condition. The broad application of minimum standards continues to be recommended as a mechanism to bring producers up to a standard of practice that will accelerate progress toward meeting the Reef water quality targets. However, the recommended standards and the revised staging for implementation of the

Reforms	Regulatory proposals – Consultation RIS	Regulatory proposals – Decision RIS	Rationale for recommended regulatory proposals
		application, as well as soil and erosion control measures. • *Stage 2* – growers in the Wet Tropics, Burdekin and Mackay Whitsunday regions to implement a more refined nutrient management plan approach (at the management zone scale) within 2 years • *Stage 3* – growers in the remaining Reef regions (Burnett Mary, Cape York and Fitzroy) to meet the nutrient management plan approach within three years. <u>Grazing standards</u>: • *Burdekin region* (highest priority) – to meet the standards within 12 months of commencement • *Fitzroy region* (high priority) – within two years of commencement • *Remaining regions* – Wet Tropics, Burdekin, Mackay Whitsunday and Cape York regions (lowest priority) within three years of commencement <u>Banana standards</u>: minimum practice standards to be met within 12 months in the Wet Tropics region. All other regions provided with an additional two-year implementation period (i.e., three years to meet standards).	standards, seeks to reflect feedback from both the agricultural sector and conservation groups, while also achieving significant water quality benefits. The minimum standards will be in place in all Reef regions within three years of commencement of the legislation. A staged approach aligns with the GBR Water Science Taskforce recommendations, and with the catchment priorities for water quality improvement (in the Reef 2050 Water Quality Improvement Plan 2017-2022 (State of Queensland, 2018)). Staged implementation addresses concerns from industry about the costs of the regulations, and the time it will take producers to become compliant. Staging will also better manage government compliance costs and capacity in response to thousands of producers being regulated for the first time. The revised grazing standards seeks to limit the impact of minimum standards on well managed properties, responding to feedback from graziers that the minimum standards should be targeted at those who consistently manage their land in a way that results in poor land condition. Changes

Reforms	Regulatory proposals – Consultation RIS	Regulatory proposals – Decision RIS	Rationale for recommended regulatory proposals
		Horticultural and grains standards: minimum practice standards to be met within three years in all Reef catchments.	to the minimum standards for cropping commodities are minor technical clarifications.
Alternative pathway for producers to meet regulatory requirements	Provide producers with an alternative pathway for meeting regulatory requirements through accreditation against a recognised BMP program (or like program).	No change from the Consultation RIS.	This proposal received mixed feedback from stakeholders, with the cane sector and conservation groups supporting the proposal. The grazing sector was concerned that the alternative compliance pathway would lead to inferior programs, which they believe would undermine the existing industry-led Grazing BMP program. This proposal continues to be recommended. It seeks to reward those producers who are already meeting or exceeding minimum standards that have water quality benefits, through accreditation against industry BMP programs. It will also encourage producers to continue to engage with industry programs, which have additional benefits, such as providing dedicated technical assistance for other aspects of farming.
Advisers to provide advice in alignment with minimum standards and	Fertiliser sellers would be required to keep and produce records of fertiliser sales and nutrient application advice to their clients. This advice would be used as a 'second line of evidence' to identify where producers may have been given incorrect advice or have not followed the advice given. A fertiliser seller is defined as a person or	In response to stakeholder feedback, the original proposal has been revised. Advisers (e.g. agronomists and fertiliser sellers) will be required to provide advice that is not false or misleading, and to keep and produce records of the advice provided, upon request for 'tailored advice' about agricultural ERAs.	Producers have access to a wide variety of information, but still look to advisers in their local community for advice. There is currently no relevant industry body to oversee the professional conduct of agricultural advisers.

Reforms	Regulatory proposals – Consultation RIS	Regulatory proposals – Decision RIS	Rationale for recommended regulatory proposals
farm design standards	business that sells, for commercial gain, fertiliser containing nitrogen and or phosphorus to an operator of an agricultural ERA. A large proportion of agricultural producers receive their soil testing and fertiliser advice from fertiliser sellers. Advice and recommendations received by producers can have a significant impact on what practices, particularly regarding fertiliser rates, are applied on-farm and their subsequent water quality risk. Many producers accept this advice and trust that it is accurate and aligned with best practice for their farm.	In contrast to general advice, which is considered to be more broadly applicable, tailored advice is specific to the particular objectives and circumstances that the person carrying out an agricultural ERA wants to achieve by carrying out the activity. It also considers the circumstances under which the activity is being carried out. An adviser is defined as a person who gives advice about carrying out an agricultural ERA as a service for a reward, such as agronomists. An adviser can also include a person who provides advice about carrying out an agricultural ERA in conjunction with providing goods or another service for a reward, such as a fertiliser distributor or agent.	In response to stakeholder feedback this provision has been broadened to recognise that this sort of advice can play a significant role in the land management decisions made by all producers, not just those producers that apply fertilisers. The regulation of sales data from fertiliser sellers will be considered in the context of data requirements to support the regulation. The creation of a regulation making power to require data from the agricultural sector for various purposes is a separate regulatory proposal.
Regulation making power to require data from the agricultural sector	There was no data collection proposal outlined within the Consultation RIS. However, data collection to better inform regulatory and non-regulatory decision-making was discussed with stakeholders during consultation on the Reef regulatory package.	It is proposed that a regulation making power is created to provide the Minister with the ability to require data from the agricultural sector, particularly the sugarcane industry, which may assist in determining where over application of fertiliser, and therefore high rates of nutrient runoff, may be occurring.	This proposal directly responds to conservation sector feedback that additional data requirements outlined in the Consultation RIS were limited to producers and fertiliser sellers for compliance purposes. In addition, the GBR Water Science Taskforce and the Queensland Audit Office (State of Queensland, 2018) have also recommended obtaining additional industry data to support informed decision-making on Reef water quality matters.

Reforms	Regulatory proposals – Consultation RIS	Regulatory proposals – Decision RIS	Rationale for recommended regulatory proposals
			Consultation with the conservation and agricultural sectors has revealed conflicting views on the existence, availability, ease of access and likely burden of providing data related to fertiliser use, and whether the data could be used to determine high nutrient runoff. The results of an independent assessment commissioned by the department and further analysis, including stakeholder consultation will inform any data requirements.

Table 6: Recommended proposals following feedback on the Consultation RIS – for new development

Reforms	Regulatory proposals – Consultation RIS	Regulatory proposals – Decision RIS	Rational for recommended proposals
No net decline in water quality – from new development **Mandatory water quality offsets – new agricultural, and industrial development required to offset significant residual releases**	A water quality offsets framework would apply to new, expanding or intensifying agricultural, prescribed and resource ERAs that could not otherwise avoid or mitigate significant residual nutrient and sediment releases.	In response to stakeholder feedback, and further analysis, the original proposal has been revised. Stakeholders commented on the costs and complexities with developing a mandatory offsets framework. Such a framework may also be underutilised as a result of minimal anticipated growth in new development that releases nutrients and sediment in Reef catchments. For these reasons, a mandatory offsets framework will not be pursued at this time. Instead, it is proposed that the *Environmental Protection Act 1994* will allow for further detailed regulations to be developed in the future to support the use of water quality offsets for new	Consultation has revealed conflicting views on the viability of a mandatory offsets framework. Industry and local government stakeholders are generally unsupportive of the proposal, believing it would be an impediment to new agricultural growth, and impact local economies and rate payers. The Queensland Water Directorate (*qldwater*) believe it is premature and unreasonable to require mandatory offsets with unreliable and unknown outcomes for point source discharges. Cairns Regional Council states that councils are more likely to take up offsets if they are

Reforms	Regulatory proposals – Consultation RIS	Regulatory proposals – Decision RIS	Rational for recommended proposals
		development. This allows a framework to be established where the complexities associated with applying mandatory water quality offsets may be resolved, if it is determined that this would provide additional benefit.	delivered through a collaborative rather than a mandatory framework due to the significant risks involved. Most conservation groups strongly support the proposal for mandatory offsets, believing it to be a cost-effective solution to water quality pollution from new development. The Consultation RIS shows that mandatory offsets are not cost effective at this stage. They cannot be implemented without significant additional costs to stakeholders. In addition, it is anticipated that there will be limited offsets due to minimal anticipated growth in new development that releases nutrients and sediment in Reef catchments. There are also technical difficulties concerning the measurement or modelling of nutrient and sediment releases at the property scale, and for mitigation impacts of offsetting activities, such as stream bank restoration. However, achieving no net decline in water quality from new development is still a desirable objective to support progress toward the Reef water quality targets. Any additional loads will add more pressure on
	New agricultural development – cane, bananas and grazing – related to expansion (e.g., an increase in the area under crops) and intensification such as a change from grazing to cropping) will be required to meet higher standards than existing growers, through farm design standards. These standards will be applied through a self-assessment, compliance driven approach. Producers will also be required to meet minimum practice standards.	A requirement to apply for an environmental authority (i.e., a permit) is proposed for new cropping activities (cane, banana and other horticultural crop cultivation, and grains production). Application fees will apply. New cropping activities will also have to meet minimum practice standards. An application will be required where: • An expansion (e.g., an increase in the area under crops) and intensification (e.g., a change from grazing to cropping) is greater than a cumulative 2ha threshold; and • A continuous cropping activity can't be demonstrated (i.e., the land hasn't been used for cropping for at least three separate years in 10 years, with at least one of those years being in the past five years). Standard approvals (generic farm design standards) will apply for lower-risk activities, while high-risk activities (>30ha) will require a land-based water quality risk	

Reforms	Regulatory proposals – Consultation RIS	Regulatory proposals – Decision RIS	Rational for recommended proposals
		assessment. Applications may be refused where water quality risks cannot be effectively managed. Farm design standards are not applicable to grazing. Due to the vegetation clearing laws, it is not anticipated that significant new areas will be developed in future for grazing.	existing businesses to achieve nutrient and sediment reductions and would also likely be at the expense of government to fund reductions. An alternative approach is recommended which seeks to address additional pollutant loads from new development at lower administrative cost.
		It is proposed that new prescribed and resource ERAs are required to meet a 'no net decline' standard regarding nutrient and sediment releases, which can include the use of voluntary offsets (informed by the Point Source Water Quality Offsets Policy under the *Environmental Protection Act 1994*).	For agriculture this involves the implementation of farm design standards through a more rigorous government assessment process (through an environmental authority rather than self-assessment as originally proposed). The environmental authority process will provide the ability to tailor farm design standards to landscape characteristics, and to refuse new agricultural development where water quality risks can't be adequately conditioned. This proposal aligns with conservation sector feedback that the previous self-assessable approach is not appropriate as it would be very difficult for government to address non-compliance, resulting in sub-optimal outcomes. An assessment approach will also allow unsustainable cropping

Reforms	Regulatory proposals – Consultation RIS	Regulatory proposals – Decision RIS	Rational for recommended proposals
			proposals to be identified and refused from a water quality perspective. The revised approach for prescribed and resource ERAs provides more flexibility to meet release standards through voluntary rather than mandatory offsets, where offsets are a viable proposition for meeting release limits. While industrial activities are more heavily regulated than agriculture, the GBR Water Science Taskforce recommended their inclusion within an enhanced regulatory approach as they can have locally significant releases.

3. Catchment pollution load limits – nutrients and sediments

The proposal to set nutrient and sediment pollution load limits for each of the catchments (at the river basin scale) in the Reef regions hasn't changed from the Consultation RIS. Catchment load limits will be derived from the water quality targets in the Reef 2050 Water Quality Improvement Plan 2017-2022 (State of Queensland, 2018). The targets are expressed as percentage and tonnage anthropogenic (or human derived) load reduction amounts (from the 2013 total anthropogenic baseline load) to be met by 2025 for each catchment. These targets form the basis of the regional and whole of Reef scale targets, and reflect progress already made since earlier targets were set.

The catchment load limits will be outlined in the Environmental Protection (Water) Policy 2009 as maximum annual end-of-basin volumes of dissolved inorganic nitrogen and fine sediments. This policy informs regulatory decision-making in relation to water quality outcomes for Queensland waters, supporting the objective of ecologically sustainable development under the *Environmental Protection Act 1994*.

This proposal received less feedback from stakeholders than other proposals, with the majority of feedback from the agricultural sector. This sector generally disputes the scientific basis for the water quality targets. They also dispute the reported impacts of the sector on Reef water quality and required transparency on the link between management practices and catchment load limits. The Local Government Association of Queensland, the Queensland Water Directorate (*qldwater*) (representing water service providers, including local councils as sewage treatment service providers) and conservation groups support the need for broad based regulation of pollution runoff entering Reef catchments, and support end-of-catchment targets. Further comments on load limits made in submissions on the Consultation RIS can be found in Appendix 1.

The catchment load limits won't result in direct limits on the amount of fertiliser that can be applied at the farm scale. Rather, the minimum practice standards and farm design standards for the agricultural sector are important measures for supporting the achievement of the catchment load limits. The minimum standards incorporate a prescribed methodology for calculating fertiliser application rates. The catchment load limits will be reviewed every five years. This will correspond with the five year review cycle for the water quality targets. Where load limits are updated, this may result in updated standards. The catchment load limits will also be used when considering an application for new development, and amendments to existing activities for prescribed and resource ERAs that release nutrients and sediments to waters.

This proposal directly responds to the GBR Water Science Taskforce recommendation to set catchment load limits in legislation as a measure to drive pollutant load reductions. The science supporting the setting of the water quality targets, and therefore the catchment load limits provides an unprecedented level of certainty regarding the sources of water quality pollution from Reef catchments and the relative risk of these pollution loads on the Reef. The targets were derived from the 2017 James Cook University report, "Development of basin specific ecologically relevant pollutant load reduction targets for the Great Barrier Reef" (Brodie et al, 2017). They take into account agricultural, urban and industrial sources of water pollution; how local rivers and catchments individually affect an area of the Reef; and progress made since earlier targets were set. The process for setting the targets was peer reviewed by an Independent Science Panel. As with the Consultation RIS, there are no direct costs on industry and government from related to including catchment load limits in legislation.

4. Minimum standards – key agricultural industries

The proposal to implement minimum practice standards for key agricultural industries – sugarcane, grazing, bananas, other horticultural crops and grains production – across the Reef regions hasn't

changed from the Consultation RIS. However, some technical changes have been made to the standards based on stakeholder feedback, as well as changes to the timeframes for when standards commence. Also unchanged is the proposal to remove the requirement for an Environmental Risk Management Plan to reduce regulatory burden.

There are approximately 13,000 producers (consisting of approximately 8,500 graziers and 4,500 growers i.e., sugarcane, horticulture, bananas and grains) operating in the catchments adjacent to the Reef. The broad application of minimum standards is required to bring producers up to a standard of practice that will accelerate progress toward the Reef water quality targets. Only those practices that pose the greatest risk for water quality due to the potential movement of nutrients and sediments off-farm are targeted by regulation.

Feedback received from the peak industry groups (e.g., CANEGROWERS, Australian Sugar Milling Council, AgForce) on the Consultation RIS and re-iterated through additional consultation disputes the need for regulation. These groups also dispute the assertion that voluntary action is not happening fast enough and could still deliver the reductions needed to meet the water quality targets. There were concerns about the cost and profitability of the standards. Concerns were also raised about the implementation timeframes of 12 months for grazing and bananas and two years for sugarcane for refined nutrient management, which were considered too short. Agricultural stakeholders also provided comments on the technical details of the standards. In regional consultation, some individual growers and graziers stated their frustration with poor operators tarnishing the good name of those who strive for best management practice.

Despite significant government investment, as well as industry efforts to increase the voluntary adoption of improved practices, the latest 2016 Reef Report Card (State of Queensland, 2017) as well as the 2017 Scientific Consensus Statement shows progress is too slow, not widespread enough and that the Reef water quality targets will not be met (Waterhouse et al, 2017b).

While there has been a notable increase in producers benchmarking their practices through BMP programs over the past two years, accreditation – which independently verifies producers are implementing practices with water quality benefits – has been slow.

As at February 2019, there are 336 cane growers (82,695 ha) out of approximately 3,600 growers, and 73 graziers (over 841,076 ha) out of approximately 7,100 graziers accredited (in Burnett Mary, Dry Tropics and Fitzroy regions) under the BMP programs. (Office of the Great Barrier Reef, February 2019).
The Queensland and Australian governments have made significant investments to support the agricultural industry to adopt improved practices. The Queensland government is investing $261 million over five years from 2017, building on an annual investment of $35 million over many years. This has included investment in voluntary and incentives programs, and support such as extension. Since 2009, the Queensland Government has invested over $70 million in industry-led BMP programs, science and other on-ground programs to support sustainable agriculture to assist landholders in Reef catchments to improve their agricultural practices.

The department's existing Reef compliance program demonstrates that a regulatory approach can deliver increased uptake of practices known to limit pollutant run-off. Activities under this program will be expanded to support the new regulations, with effort prioritised based on information such as hot spots for high pollutant loads. The Environmental Protection Act provides a range of tools that the department can use to assist producers return to compliance. However, it is acknowledged that climatic events may have a direct impact on the ability of some landholders to maintain compliance.

Active enforcement of the regulations in these circumstances will be moderated on a case-by-case basis, and follow standard departmental practice in response to natural disasters.

The conservation sector commented that the proposed minimum standards needed to be clear, prescriptive, enforceable and of a high standard. They also prefer minimum standards for all agricultural sectors to be met within 12 months in all Reef regions, with compliance focused on high-risk practices and areas. They believe staging the requirements compromises the contribution of minimum standards to meet the 2025 water quality targets.

The conservation sector supports refined nutrient management planning. They are also seeking prohibition of high risk activities (e.g., fertiliser application, vegetation clearing, tillage and harvesting) in high risk areas (e.g., leaky soils, riparian areas, steep slopes), and high risk areas to be converted to less intensive uses. The conservation sector would also like grazing properties with land in poorer condition to be regulated to achieve good land condition. This includes erosion prone and riparian areas to be fenced off and stock excluded, including the implementation restoration plans. Further feedback on minimum standards made in submissions on the Consultation RIS can be found in Appendix 1.

Minimum practice standards will commence in a staged way through commodity specific agricultural ERA standards, according to catchment priorities for water quality improvement (identified in the Reef 2050 Water Quality Improvement Plan 2017-22 (State of Queensland, 2018). Standards will be in place in all regions for all key agricultural activities within three years from commencement of the legislation. This includes standards for horticulture and grains, which are yet to be developed. A timeframe as to when these crops would be regulated was not outlined in the Consultation RIS.

A staged approach aligns with the GBR Water Science Taskforce recommendations and with catchment priorities for water quality improvement. Staged implementation addresses concerns from industry about the costs of the regulations, and the time it will take producers to become compliant. Staging will also better manage government compliance costs and capacity in response to thousands of producers being regulated for the first time. A key component of implementing the regulated standards will be an enhanced risk based compliance program using a range of information, such as catchment monitoring and satellite imagery to target compliance.

The standards align with recognised benchmarks for agricultural industries under the Paddock to Reef Water Quality Risk Framework (Australian Government and Queensland Government, 2015), while maintaining productivity and profitability. The framework refers to management practices as A, B, C and D practices or equivalent low to high water quality risk categories. The minimum regulated management practices are considered to be low to moderate water quality risk practices.

The grazing regulated standards have been revised to take an outcome based approach for all graziers, requiring them to maintain land in good or fair (B to A) land condition and to take certain actions where land is in a poor or degraded condition (C to D). This approach responds to feedback from graziers that standards should be targeted at those who consistently manage their land in a way that results in poor land condition.

More minor technical changes were made in response to stakeholder feedback to the other commodity standards for cane and bananas. The re-invigorated vegetation management laws provide enhanced protection measures for riparian and natural wetlands in all Reef catchments, complementing the proposed minimum standards.

To assist graziers as well as cane and banana producers to meet minimum regulatory practices, approximately $10 million will be provided as part of this regulatory package for access to professional advice, such as agronomists. This is in addition to over $70 million invested by the Queensland government since 2009 for various programs to improve practice standards, including industry-led BMP programs, and trialling projects aimed at improving Reef water quality. Investments under the Commonwealth Government Reef Trust program also supports farmers to adopt best practice standards. These government costs are not included in the estimated costs and benefits for the Reef regulatory package.

4.1 Sugarcane production – minimum practice standards

It is proposed that the current standards in the *Environmental Protection Act 1994*, with some minor modifications to the prescribed nutrient application methodology, will apply immediately in the already regulated Wet Tropics, Burdekin and Mackay Whitsunday regions, with additional soil and erosion control requirements. A more refined nutrient management approach (at the management zone scale) will be required within two years of commencement of the legislation in these regions. This is consistent with the Consultation RIS.

In response to concerns raised by growers in the currently unregulated Burnett Mary region about the contribution of this region to nutrient runoff, these growers will have three years instead of the originally proposed two years to meet the nutrient management planning requirement and soil and erosion control measures. This recognises that in comparison to other regions, this region has a lower nutrient impact on Reef water quality. According to the 2017 Scientific Consensus Statement, sugarcane delivers the most nutrient to coastal and marine ecosystems, in order of contribution from the Wet Tropics, Burdekin, Mackay Whitsundays and Burnett Mary regions (Waterhouse et al, 2017a).

The delayed application of minimum standards in the Burnett Mary region also aligns with the proposed commencement of standards for horticulture and grains production. Compared to other regions, the Burnett Mary has more of a mixed agricultural base, which includes cane, horticulture, citrus and tree crops, grain crops, viticulture, dairy and grazing (Burnett Mary Regional Group, 2018). Cane growers in the Fitzroy and Cape York regions will also have three years to implement minimum standards. There are currently very limited areas of land under sugarcane in these regions.

While the Burnett Mary region is a lower priority for water quality improvement than other areas, the low adoption of improved practices in this region also supports regulatory intervention. As at February 2019, 38% of the sugarcane area in the region has completed a self-assessment, and 8% of the region accredited (an independent assessment that the grower meets industry standards) against the SmartCane BMP program. Within the Burnett Mary region, 18% of the Isis sugarcane area, 11% of the Maryborough sugarcane area and 0% of the Bundaberg sugarcane area are accredited (Office of the Great Barrier Reef, 30 September 2018). Regulation is anticipated to increase uptake of practice standards that reduce pollutant runoff.

Industry also had concerns that soil and erosion control measures may compromise commercial opportunities for selling cane biomass and cane trash (for e.g., for biofuel or electricity production, animal feedstock, etc.). The risk of sediment loss from cane land has been effectively managed since the widespread adoption of green cane trash blankets, particularly in the higher risk regions of the Wet Tropics, Mackay Whitsundays and Burnett Mary. Trash blankets are the preferred approach to managing sediment loss from cane fields, and this is reflected in the minimum practice standards.

In Queensland biobased petrol is currently produced from molasses, however cane trash can potentially be used as feedstock for some methods of ethanol production. The biobased petrol

mandate in Queensland requires 4% of the total volume of regular unleaded petrol sales and ethanol-blended fuel sales by liable fuel retailers to be biobased petrol (ethanol). Research by the department shows that the current footprint of the sugarcane industry in Queensland could service a mandate of up to 6%.

This suggests that although there is currently not a strong economic signal from the Queensland biofuels market for landholders to sell their cane trash, incentive may develop in the future as the biofuels industry in Queensland matures, depending on whether market forces make this an attractive option to growers. To account for this, the minimum practice standards will include alternative practices for ensuring risks to water quality from sediment loss are managed, while allowing for harvesting and selling of cane trash, which will also allow for flexibility in circumstances when growers are not able to keep a green cane trash blanket (e.g. when trash must be destroyed due to pests or disease).

While industry advocates for nutrient management planning as a beneficial tool for tailored, finer-scale nutrient application, they don't support the requirement being regulatory. They argue that voluntary efforts will achieve the same outcomes (although within longer timeframes). While they argue that there is insufficient capacity to meet the requirement within two years, they are concerned that the approach will compromise the SmartCane BMP program, resulting in a tick and flick exercise, as opposed to quality planning to support improved nutrient management.

Nutrient management practice standards in the cane sector are based on rigorous evidence and science within the industry accepted Six Easy Steps method, led by the sugar industry's research provider, Sugar Research Australia, which is the basis of the SmartCane BMP program. Six Easy Steps is also promoted in partnership with CANEGROWERS, the peak agricultural body for the sugar industry in Queensland, and is focused on improving Reef water quality, while also improving and maintaining grower productivity and profitability.

The results of many field trials (e.g., RP20 Burdekin Nitrogen Project and RP161 Complete Nutrient Management Planning for Cane Farming), and information outlined in the 2014 sugarcane nutrient use efficiency review by Sugar Research Australia (Bell et al, 2014), justify the current minimum standards for nutrient use. In addition, research trials and the Sugar Research Australia review also show that finer scale nutrient management (e.g., addressing yield constraints, soil health issues, and improving irrigation efficiency) can be applied to improve nutrient use efficiency beyond that achieved through adopting current standards, while reducing costs without impacting on productivity and profitability.

This approach is consistent with the full implementation of the sugarcane industry's Six Easy Steps program for nutrient management. Some producers have gained up to $50,000 in profitability in one season as a result of improved nutrient management and associated farm management changes. The department is expanding the RP161 project into other catchments, such as within the Burnett Mary region.

The proposed finer-scale nutrient management planning requirement allows growers to tailor fertiliser use across their farms, taking account of different soil types and constraints so they can optimise fertiliser use, and maximise profitability. Growers will be required to calculate nutrient rates for farm management zones using the existing regulated method. Together, these rates would effectively create a 'whole of farm' annual nutrient allowance. Rates could be adjusted in different management zones, however the annual allowance must not be exceeded. Figure 1 provides an example of management zones across a farm that may require different application rates that together must not exceed the annual application rate.

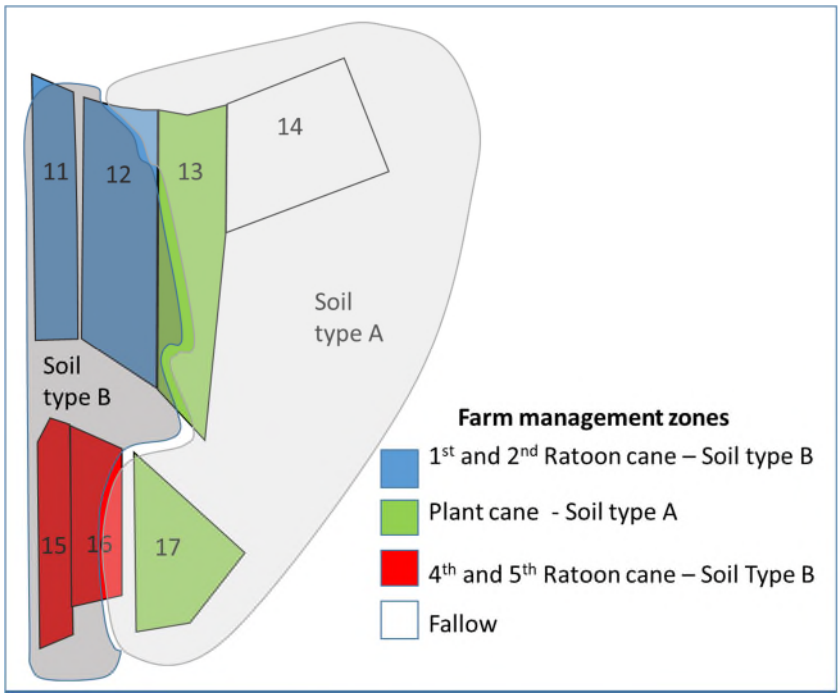


Figure 3: Example of management zones across a farm that may require different nutrient application rates that together must not exceed the annual farm application rate

Approximately 500 growers have already been supported to undertake improved nutrient management planning through Queensland and Australian government programs, such as Reef Trust reverse auction grants. Those growers will be able to use these existing nutrient management plans to satisfy the proposed regulatory requirements, as long as a whole of farm allowance is calculated using the required methodology, and this allowance isn't exceeded.

Costs and benefits

The cost and benefit estimates for cane minimum standards have not changed since the Consultation RIS. The regional cost to growers for moving from D-C (high to moderate risk) management practices is estimated to be $680,000 for the first year and $170,000 for subsequent years. This is just for the Burnett Mary region, as the other regions have been regulated previously. The total capital cost for growers moving from C-B (moderate to low risk) management practices in all Reef regions is estimated at $142 million with ongoing maintenance costs of $14 million a year to implement finer scale nutrient management planning. However, these are expected to be more than offset by increased profits estimated at $63 million a year.

The one-off capital costs of moving from C-B management practice are estimated at $14.7 million for the Wet Tropics, $28.4 million for the Burdekin, $29.8 million for the Mackay Whitsunday, and $69.6 million for the Burnett Mary region. Implementing C-B management practices is expected to generate profits for cane farmers. The per annum net savings (i.e. profit minus expected maintenance costs) are $6.3 million for the Wet Tropics, $2.8 million for the Burdekin, $28.2 million for Mackay Whitsunday, and $11.6 million for the Burnett Mary region.

Some minor technical changes were made to the proposed minimum standards based on stakeholder feedback, including the removal of the calibration requirement. This results in the removal of a $19,500 cost across all operators who are estimated at D management practice.

For more information on the assumptions underpinning costs and benefits for cane minimum standards, refer to Section A.3.1 of the Consultation RIS available online.[3]

4.2 Banana production – minimum practice standards

No significant changes have been made to the banana production minimum practice standards since the Consultation RIS, however the staging of the standards across the Reef catchments has been revised. While standards will still commence in the Wet Tropics 12 months after the legislation commences, all other regions will have an additional two years (or a total of three years) to meet the standards. This responds to industry feedback that lower risk banana producing areas should be given more time than the originally proposed 12 months to meet the standards. Outside of the Wet Tropics region, banana growing also occurs in the Mackay Whitsunday and Cape York regions.

Costs and benefits

Many of the proposed practices for banana farming concern appropriate nutrient application rates (and supporting practices such as soil and leaf testing, calibration of fertiliser equipment and application to beds and not inter-rows), as well as sediment control measures. Some additional costs associated with record keeping, auditing and soil and leaf testing have been included in the Decision RIS for banana minimum standards based on further consultation with the Australian Banana Growers' Council. Other costs and benefits did not change from the Consultation RIS. A mix of C and A-B (moderate to lowest risk water quality) practices are proposed for banana production.

There has been less economic analysis carried out on practices that have lower water quality risks for bananas than for the sugarcane and grazing industries, and robust estimates of costs for an average property do not exist. A recent assessment by the Department of Agriculture and Fisheries showed that in general practices that benefit water quality improve farm profitability (Holligan et al, 2017). This is consistent with the research reported in the Consultation RIS. The RIS found that many practices could be expected to generate a positive financial outcome, though the evidence is less clear for practices around sediment control.

Record keeping is now assumed to take growers an hour a week. This is a total cost of $667,239 a year across the industry. It has been assumed that most banana growers will incorporate the minimum standards into their current regulatory programs, such as those related to Freshcare. Adding the water quality minimum standards to these programs is assumed to add another hour to their annual audits. This is a cost of $12,832 per year across the industry. Soil and leaf testing is necessary if banana growers choose the adjustment method of nutrient management. It is assumed a third of the industry will choose this method. This testing will cost around $500 per property. This is a total cost of $39,000 a year across the industry. These costs are a total $719,000 to all banana growers.

The Queensland Government will continue to invest in initiatives to support the banana industry adopt improved practices. Over $970,000 has been invested since 2015 in research and extension projects to support the development of Banana BMP Guidelines for growers in the Wet Tropics. This funding has also supported research on the optimal application of phosphorus in banana crops in the Wet Tropics and an analysis of the economics involved in adopting banana growing best management practices.

It has also been estimated that development of the Banana BMP program to meet the recognition framework is $15,793, which is unchanged from the Consultation RIS. The Queensland Government has recently entered into an agreement with the Australian Banana Growers' Council investing

[3] https://www.qld.gov.au/environment/agriculture/sustainable-farming/reef-regulations

approximately $1.9 million over the next four years. This funding will support the development of a grower accreditation pathway under the Banana BMP program to meet the minimum standards. It will also continue the support for training and extension for growers in the Wet Tropics, and for research to establish an optimal application rate of nitrogen and phosphorus for commercial banana crops in the Wet Tropics.

For more discussion on the estimated costs and benefits of minimum standards for banana growing, refer to Section A.3.3 in the Consultation RIS available online.[4]

4.3 Grazing – minimum practice standards

To limit the impact of grazing minimum standards on graziers with land in good to fair condition (i.e. A or B land condition), it is proposed that the standards are outcomes based approach rather than the more prescriptive approach originally proposed in the Consultation RIS. This includes having sufficient residual pasture at the start of the wet season to protect soil from erosion. Where cattle grazing is being carried out on land in poor or degraded land condition (i.e. C or D land condition), graziers will be required to take steps to improve land condition and record the measures taken. These steps could include, and are not limited to developing a property map, revising stocking rates, wet season spelling, managing preferential grazing, excluding stock from high erosion areas, and monitoring and recording changes in land condition. This improved flexibility should help reduce regulatory costs to graziers as they will only be required to act if land condition is poor, and will be able to choose the most appropriate path to an improved outcome for their property.

Feedback from regional consultation with graziers on minimum standards stated that the draft standards outlined in the Consultation RIS were reasonable. However, they argue, estimated costs and benefits lack credibility, a 12-month implementation timeframe is unreasonable, and the additional burden is not justified for graziers that already maintain their land in good to fair condition. It was also stated that minimum standards should be applied in a way that targets graziers who consistently manage their land in a way that results in poor land condition. Some individuals are frustrated with operators that consistently 'flog' their land, tarnishing the good name of those who strive for best management practice.

Stakeholders, including AgForce, support tools such as the Queensland Government's FORAGE and VegMachine, which provide land managers with access to the latest satellite imagery, pasture modelling and climate information for a property. These tools help track ground cover, pasture growth and climate, and will help graziers respond to the minimum practice standard requirements. Remote sensing techniques and existing tools, such as Long Paddock FORAGE, will be used to identify land consistently in poor or degraded condition.

Also, in response to industry capacity concerns, the standards will be staged across Reef regions over three years, according to the catchment priorities for water quality improvement (identified in the Reef 2050 Water Quality Improvement Plan 2017-22 (State of Queensland, 2018)). Minimum standards will commence in the Burdekin (highest priority) within 12 months, followed by the Fitzroy (high priority) within two years, and then the remaining Cape York, Wet Tropics, Mackay Whitsundays, and Burnett Mary regions (lowest priority) within three years from commencement of the legislation.

Due to the current climatic and associated economic conditions, it is acknowledged that it will be difficult for parts of the grazing industry in drought or flood-affected areas in the Reef regions to undertake actions to meet the grazing standards. To address this, in the short-term it is proposed

[4] https://www.qld.gov.au/environment/agriculture/sustainable-farming/reef-regulations

that Government prioritise enforcement effort in areas that are not affected in order to lessen the potential impact of the new regulations. However, transitional funding will still be available for producers in these areas during this period, enabling them to access expert advice regarding meeting the minimum standards.

Costs and benefits

While the revised outcomes based approach should reduce the costs to graziers for implementing minimum standards, there is no alternative data available at this time across all Reef regions to quantify this. As such, the Consultation RIS provides an indication of the total costs to the grazing industry for the originally proposed more prescription standards for favourable land condition outcomes.

The Consultation RIS estimated the costs for a shift from D-C (high to moderate water quality risk) management practices would be $6.8 million across Reef regions. The total capital cost for moving from C-B (moderate-low water quality risk) management practices is estimated at $148 million with ongoing maintenance costs estimated at $32.5 million a year across Reef regions. These total figures are high due to the large land area subject to grazing. For more information on the assumptions underpinning these costs refer to Section A.3.2 in the Consultation RIS, which can be found online.[5]

As discussed in the Consultation RIS the D-C costs do not include capital costs and as such are likely to be an underestimate. However, the C-B costs are considered to be an overestimate in relation to the revised outcomes based approach for grazing minimum standards. The standards for graziers promote matching stocking rates to available forage, and maintaining land condition for pasture and business resilience. The costing assumes that this may result in lower stocking rates for improved land condition. Various economic assessments suggest that long-term profitability and sustainability for grazing enterprises is maximised by low to moderate stocking rates across most land types (Moravek et al, 2016). This is due to the subsequent higher pasture production, higher market premiums for animals in better condition, and lower costs of production. Sediment run-off is also reduced under a lower stocking rate. While these benefits are likely to be realised outside of the 10 year timeframe for the Consultation RIS assessment, it is still likely that graziers will benefit and face lower ongoing costs, in the medium-long term. Graziers whose land is in good condition with high levels of ground cover prior to the commencement of the wet season should not be significantly impacted by the regulatory requirements.

This suite of benefits is clearly illustrated by the Wambiana grazing trial, which has been running on a large grazing property in the Burdekin since 1997 (O'Reagain et al, 2018; O'Reagain et al, 2011). This trial has tested five different grazing strategies including a moderate and a heavy stocking rate. The high stocking rate on Wambiana initially had higher returns than the moderate stocking rate, but by year five, the moderate stocking rate had a higher gross margin per hectare than the high stocking rate (O'Reagain et al, 2011). Wambiana was most likely in a B+ management practice category when the trials started (Personal communication DAF, 2018). The average difference in gross margins between the two strategies was $2.57/ha over the first seven years, $7.82/ha over the first eight years, and $10.14/ha over the first nine years. It is likely that the combination of relatively good pasture condition and good climatic conditions were what made the heavy stocking rate profitable in the short term (O'Reagain et al, 2018).

Although there is a great variation in physical attributes and business characteristics between different properties in Queensland, the overall conclusion that moderate stocking rates are likely to be more profitable and sustainable should hold true for most enterprises. Bio-economic modelling using Wambiana data has been carried out to investigate the applicability of the trial data at a

[5] https://www.qld.gov.au/environment/agriculture/sustainable-farming/reef-regulations

property level and for various climatic and pasture conditions. The modelling suggested that "under typical climate conditions and on poor to average pasture condition, low to moderate stocking rates give higher gross margins and result in better pasture condition than heavy stocking" (O'Reagain et al, 2018). These results did not include any capital costs. If a property required fencing, watering points or other infrastructure to change their stocking rates, then this cost would need to be taken into account when calculating the net return.

Other significant government investment is also occurring on properties in the Burdekin, Fitzroy and Upper Herbert catchments that demonstrates productivity, sustainability and water quality outcomes associated with improved practices. Another project in the Fitzroy and Mackay Whitsunday regions is supporting graziers to identify and respond to factors through a business planning approach to deliver both economic and environmental returns. The 'Better Beef for the Reef' project will also drive change through a targeted extension approach to accelerate adoption of improved grazing management practices in the Burnett Mary region.

The revised grazing standards align with recommended grazing land management strategies for managing climatic variability including drought preparedness, management and recovery. The standards promote matching stocking rates to available forage, and maintaining land condition for pasture and business resilience. This supports Queensland Government's drought policy, which is based on 'self-reliance' for managing climate variability.

5. Alternative compliance pathway – for producers to meet minimum standards

The proposal to establish a framework to recognise industry BMP or like programs as being consistent with regulated practice standards, and providing an alternative pathway for producers to achieve compliance against these standards, remains unchanged from the Consultation RIS. Achieving and maintaining program recognition will be subject to meeting certain criteria and conditions. Producers accredited against recognised programs will be deemed to be meeting the minimum regulated standards and will also be a low priority for compliance activities. This recognition rewards those producers who are already meeting or exceeding minimum standards for reducing risks to water quality. This initiative will also encourage producers to continue to engage with industry programs, which have additional benefits such as providing dedicated technical assistance for many aspects of farming.

Costs and benefits

As outlined in the Consultation RIS, there would be a small additional cost in time for producers seeking accreditation against a recognised BMP program. However, producers may choose to participate in programs to lower their risk profile and probability of being targeted for compliance, or for the broader benefits associated with BMP programs. Producers who join BMP programs may also be seeking to meet other outcomes, such as the sustainability criteria for supplying biofuels.[6] As it is not possible to determine how many producers will choose to participate in recognised BMP or like programs to meet the regulatory requirements, this has not been costed.

6. Data collection

It is proposed to create a regulation making power within the *Environmental Protection Act 1994* for data collection from the agricultural sector for various purposes that may assist in determining

[6] Biobased petrol and biobased diesel sold under the Queensland Government's biofuels mandate must meet the sustainability criteria for biofuels. Under this criteria, sugarcane feedstock for domestically produced biobased petrol must be derived from sugarcane produced under accredited Smartcane BMP or an approved equivalent standard.

where over application of fertiliser and therefore high rates of nutrient runoff, may be occurring. It is intended that this provides access to better information for improved decision-making about managing agricultural ERA's in Reef regions in the future.

The GBR Water Science Taskforce recommended that in order for both industry and government to make good decisions about regulation, extension and investment programs for improved Reef water quality outcomes, and to support improved on-farm nutrient management, data is needed. A recent Queensland Audit Office Report (State of Queensland, 2018) also highlighted the need for more industry information to support informed decision-making on Reef water quality matters. The proposal to insert into legislation a regulation making power for industry data collection also responds to conservation sector concerns that additional data requirements outlined in the Consultation RIS were limited to producers and fertiliser sellers for compliance purposes.

While this is a new proposal since the Consultation RIS, data collection from the agricultural industry to better inform regulatory and non-regulatory decision-making has long been discussed with industry including numerous times during consultation on the Reef regulatory package. In general, stakeholders hold conflicting views on the existence, availability, ease of access and likely burden of providing data related to fertiliser use, and whether the data could be used as a proxy to determine high nutrient runoff.

Agricultural sector stakeholders hold concerns around data confidentiality and its intended use. Conservation groups support collecting sales data from fertiliser sellers and block and farm yield data from mills, believing that together, this data will assist with verification of nitrogen use efficiency. Fertilizer Australia and fertiliser sellers argue that the use of sales data is problematic due to the possibility of multiple suppliers, and other complexities such as the fertiliser purchased being used on multiple farms and multiple crop types across and within farms. This means that what is ultimately applied to land cannot be easily derived from fertiliser purchase data.

The results of an independent assessment commissioned by the department and further analysis, including stakeholder consultation will inform any data requirements. Potential sources of data may include farmers, fertiliser sellers, agronomists, wholesalers, sugar mills and industry extension officers.

The requirement for fertiliser sellers to keep and produce records of nutrient application advice outlined in the Consultation RIS has been replaced with the requirement that 'tailored' advice to all regulated producers is not false or misleading, and that this advice is kept and produced upon request. In contrast to general advice, which is considered to be more broadly applicable, tailored advice is specific to the particular objectives and circumstances that the person carrying out an agricultural ERA wants to achieve by carrying the activity out. It also considers the circumstances under which under the activity is being carried out.

An adviser is defined as a person who gives advice about carrying out an agricultural ERA as a service for a reward, such as agronomists. An adviser can also include a person who provides advice about carrying out an agricultural ERA in conjunction with providing goods or another service for a reward, such as a fertiliser sellers.

This proposal responds to feedback from Fertilizer Australia and recognises that the advice and recommendations provided by other advisers – such as agronomists and other farm management technical specialists, as well as fertiliser sellers – can play an influential role in the land management decisions made by producers. There is currently no relevant industry body to oversee the professional conduct of agricultural advisers.

Costs and benefits

The costs and benefits of mandating data from the agricultural sector to industry and government are not included in the overall Reef regulatory package in Section 8 of this document. This is because the proposals won't be decided until after the results of the independent assessment are analysed, and consulted on with stakeholders.

7. New development – standards and water quality offsets

The GBR Water Science Taskforce recommended regulation for a 'no net decline' in water quality from new development, and establishing a water quality offsets framework as a measure to address additional nutrient and sediment run-off. Consultation with stakeholders has revealed conflicting views on the viability of a mandatory offsets framework. Industry stakeholders are generally unsupportive of the proposal, while conservation groups are generally strongly supportive.

Industry believe mandatory offsets would be an impediment to new agricultural growth, as well as impact regional economies and rate payers. The Queensland Water Directorate (*qldwater*) consider it premature and unreasonable to require mandatory offsets with unreliable and unknown outcomes for point source discharges. Cairns Regional Council states that councils are more likely to take up offsets if they are delivered through a collaborative rather than a mandatory framework due to the significant risks involved. Conservation groups believe mandatory offsets are a cost-effective solution to water quality pollution from new development.

While offsets can provide a means for new development to address pollution at least cost, at this stage requiring mandatory offsets has been found to have low cost effectiveness. As such, mandatory offsets for new development will not proceed at this time. However, achieving a no net decline in water quality from new development is still desirable to avoid making the Reef water quality targets more difficult to meet. Additional loads will add more pressure on existing businesses to achieve nutrient and sediment reductions and would also likely be at the expense of government to fund reductions.

An alternative approach for addressing additional loads from new development is outlined below. This approach seeks to deliver an alternative approach to address additional pollutant loads from new development at lower administrative cost. This involves requiring new cropping activities (cane, bananas, grains and horticulture) to apply for an environmental authority (i.e., permit) for the application of farm design standards. As with all applications for an environmental authority for an ERA, an application can be refused where environmental risks cannot be effectively managed.

In addition, new prescribed and resource ERAs will be required to meet a 'no net decline' standard regarding nutrient and sediment releases, which can include the use of voluntary offsets (informed by the Point Source Water Quality Offsets Policy under the *Environmental Protection Act 1994*). This provides these ERAs with more flexibility to meet release standards through voluntary rather than mandatory offsets, where offsets are a viable proposition for meeting release limits.

Feedback from stakeholders showed that mandatory offsets cannot be implemented without significant additional costs. In addition, it is anticipated that there will be limited offsets due to low predicted growth for new development that release nutrients and sediments in Reef catchments. Forecasting agricultural growth over the next 10 years is very difficult. There are a wide variety of factors that can influence the viability of agricultural businesses, such as world commodity markets, input costs, availability of infrastructure, water, appropriate soils and supply chains. While there are potentially large amounts of water available to allow expansion of irrigated agriculture into new areas, it is difficult to predict whether this future development can overcome significant economic barriers, including the cost of gaining access to water for irrigation.

In addition, research by the department suggests there isn't currently a strong economic signal for increasing sugarcane land use to meet demand for biofuel production, under current national and state policy frameworks. This is based on the assumption that the current sugarcane industry footprint can supply sufficient feedstock for ethanol for up to a 6% biobased petrol mandate (currently set at 4%).

The Consultation RIS estimates a 1% expansion in the area each year under sugarcane cropping by 2021/22 (ABARES, 2017). This seems likely to be an overestimate, as recent Australian Bureau of Statistics environment accounts showed a large decrease in the area under sugarcane production of -4.1% between 2011 and 2016 (ABS, 2017). However, this is the only known official forecast of the sugar area. Similarly, horticulture (which includes bananas) showed an increase in area of 0.5% over five years, or 0.1% (ABS, 2017). It is difficult to predict whether future development can overcome significant economic barriers, including the cost of gaining access to water for irrigation.

Costs are exacerbated by the agricultural industry needing to move from having largely unregulated releases, to being regulated for the first time for land management practices to achieve a high release standard, as well as mandatory offsets. Achieving cost effectiveness is more problematic when attempting to address diffuse sources of pollution. There are technical complexities concerning the inability to adequately measure or model nutrient and sediment releases at the property scale. In addition, it remains similarly technically difficult to measure or model the mitigation impacts of offsetting activities such as stream bank restoration.

Further to the alternative approach for addressing additional loads from new development, it is proposed that amendments to the *Environmental Protection Act 1994* allow for further detailed regulations to be developed in the future to support the use of water quality offsets for new development. This allows a framework to be established where the complexities associated with applying mandatory water quality offsets may be resolved if it is determined that this mechanism can provide additional benefits.

The costs and benefits of mandating water quality offsets to the agricultural sector, industry and government are not included in the overall Reef regulatory package (in Section 8 of this document).

Before a mandatory offsets framework is introduced it is also prudent to allow time for other related policy mechanisms to emerge. This includes the development of a Reef Credits market mechanism, cheaper water quality monitoring, and the establishment of the Land Restoration Fund. Reef Credits are being trialled as a voluntary market based mechanism for water quality offsets or 'credits' as part of the Wet Tropics 'Major Integrated Project'.[7] Reef Credits are proposed as a way to provide an income stream for landholders that can demonstrate water quality benefits from activities undertaken on their property. This could include wetland or gully restoration, or committing to higher farm practice standards than the proposed regulated minimum practice standards for nutrient application.

The Queensland Government is also establishing a $500 million Land Restoration Fund. Once established, this fund will facilitate carbon offset projects that deliver additional environmental, social and economic co-benefits such as nitrogen and sediment reduction, coastal resilience, improved fish habitat areas, and enhanced biodiversity outcomes.

[7] The Queensland Government has committed up to $33 million over four years to implement two major integrated projects (MIPs) in the Wet Tropics and Burdekin regions. The MIPs will pilot a range of activities with producers and the communities in each region to reduce nutrient, pesticide and sediment loads into local waterways and ultimately the Great Barrier Reef.

The next review of the Reef water quality targets and the Scientific Consensus Statement will provide an opportunity to re-assess the effectiveness of the regulatory proposals for new development and its impact on stakeholders.

7.1. New agricultural development – farm design standards applied through an environmental authority

In support of achieving no net decline in water quality, it is proposed that new cropping activities meet farm design standards, as well as minimum practice standards under an environmental authority (i.e., a permit). The requirement to have an environmental authority applies a more rigorous government assessment process, instead of the previously proposed self-assessment approach in the Consultation RIS. This approach will provide the ability to tailor farm design standards to landscape characteristics, and to refuse new development where water quality risks can't be adequately managed. As such, it will significantly contribute toward limiting potential additional runoff from new cropping activities.

The requirement to obtain an environmental authority will be limited to new intensive cropping that reaches a cumulative 2ha threshold, including sugarcane, bananas, grains and horticulture crops. Generic farm design standards in the form of standard conditions will apply to lower-risk new cropping activities. Higher-risk activities (those at or over 30ha) will require a site-based assessment. The 30 hectare threshold is based on the median size of 70 recent vegetation clearing approvals for high value agriculture and irrigated high value agriculture for new sugarcane, horticulture and banana activities (the ability to get approval for these activities has now been repealed).

Farm design standards for horticulture and grains were not proposed in the Consultation RIS as they were intended to commence later. However, it is considered appropriate to bring the requirement in for all cropping industries at the same time. One consideration for this is that the proposed standard conditions for low risk developments can be applied generically across all cropping industries, which will result in the water quality benefit being realised sooner.

Farm design standards won't apply to grazing. Due to the vegetation clearing laws, it is not anticipated that significant new areas will be developed in future for grazing. The requirements also won't apply to cropping on land that has a cropping history (where cropping has occurred three out of the last ten years, with at least one of those years being in the last five years). This limits the need to retrofit these requirements on existing farms.

A mapping tool will be developed from existing spatial data and intellectual property held by government including soils data, to determine land-based water quality risks from new cropping activities (for example, soil characteristics, such as permeability, dispersiveness, drainage, and leaching, as well as slope characteristics, etc.). The map would be used as part of the decision-making process for imposing farm design standards. The mapped information would be verified through the application assessment process.

This proposal aligns with conservation sector feedback seeking a permitting approach allowing for high risk activities to be refused in high risk areas, from a water quality perspective. The agricultural industry raised concerns that the costs of implementing farm design standards will be too high and stifle industry growth. They also oppose an environmental authority for new cropping activities.

Costs and benefits

As with the Consultation RIS, the costs of farm design standards have not been estimated as the variability between farms both within and across industries is too great. The additional costs that can

be attributed to the water quality requirements of the farm design standards will vary depending on the industry, farm size and proximity to waterways, farm business model and numerous other factors.

To estimate the costs for environmental authority applications, the number of high value agriculture and irrigated high value agriculture clearing approvals for new sugarcane, horticulture, grains and banana activities have been used as an indication of the number of applications for new activities. The applications for the past five years were split into commodity groups and an average annual figure for each created (Table 7). The proportion of standard versus complex (site-specific) applications is based on the split between applications that were above or below 30 hectares for each commodity. These are maximum figures, and assumes none of the land has been cropped recently (i.e. the new activity would not pass the cropping history test and would require an environmental authority).

Table 7: Forecast number of applications for environmental authorities

Commodity	HVA and IHVA application in one year	% below 30ha	% above 30ha	Expected number of new standard applications	Expected number of new site specific applications
Sugar	3.6	45%	55%	1.6	2.0
Bananas	0.4	100%	0%	0.4	0
Horticulture	3.6	100%	0%	3.6	0.0
Grains	5.8	21%	79%	1.2	4.6

The costs associated with making a standard or a site-specific application for an environmental authority have been modelled on the current process for prescribed and resource ERAs. Making a standard application involves the applicant filling out an online form, which is assumed to take an hour, and submitting it to the Department of Environment and Science. Applicants would also have to pay a one-off application fee of $652. Ordinarily a standard annual fee would also apply. However, this is proposed to be waived as existing agricultural ERA operators would not be subject to any annual fee.

There is a 7% fee to apply online, and this has been applied to the estimated 25% of applications that are completed online. Based on past applications, it has been assumed 75% of applications will be done in hard copy rather than online.

The assessment process is considered to be substantially less complicated than assessing a vegetation clearing application, which has a maximum cost of $12,518. Making a site-specific application will attract a fee of not more than $8,500 which will recover costs associated with processing the claim. This fee amount is based on the average cost of an application processed by the department in 2016 (Queensland Government, 2015).

The time component has been increased to three days to account for the complexity of preparing the application and for a potential site visit, as part of the assessment process. The total costs for each commodity per year are shown in Table 8. These come to approximately $68,000 per year for all four industries for both simple and complex environmental authority applications.

Table 8: Cost per industry for environmental authority applications

Industry	Time cost ($/year)	One-off cost ($/year)	Total ($/year)
Sugar	2,425	17,834	20,259
Bananas	20	248	268
Horticulture	178	2,231	2,408
Grains	5,487	39,702	45,189
Total	**8,110**	**60,014**	**68,124**

Costs to government

The cost of one hour for processing simple applications has been applied to the 75% of simple applications that are submitted in hard copy rather than online. The total cost for administering these standard applications is $219 a year. The cost to process site-specific applications for prescribed and resource ERAs is $8,500 per application. This is based on the cost of applications processed by the department in 2016. The total cost of administering these applications is $55,777 a year. This is a total of $55,996 a year.

The department already holds the necessary data to create the mapping, but it is estimated that approximately 2 weeks is required to develop the maps. This is a one-off cost of $4,275.

Water quality benefits

The fees charged to landholders are received by the government to administer the assessment and decision-making process for issuing environmental authorities. These figures are included in the benefits figures for the Decision RIS.

The proposal to require an environmental authority for new cropping activities setting farm design standards and requiring a land based water quality assessment for high risk proposals is expected to effectively achieve a 'no net decline' outcome from new agricultural development. It is noted, however, that there are uncertainties in measuring run off at the property scale. These measures are intended to allow for future development in regional Queensland that is compatible with the protection of the Reef.

7.2. New industrial point-source development

The Consultation RIS originally proposed that new resource and prescribed ERAs avoid, mitigate or offset significant residual nutrient or sediment loads. This approach, and the revised requirement to achieve a 'no net decline' standard related to nutrient and sediment releases, both seek to address additional loads through improved standards for release limits. However, the revised approach provides more flexibility to meet release limits through voluntary offsets (in alignment with the department's *Point Source Water Quality Offsets Policy*) rather than mandatory offsets. Prescribed and resource ERAs that do not release to waters within a Reef catchment, such as dredging for maritime port facilities will not be impacted by the proposed regulatory package.

In feedback received from industrial stakeholders on the Consultation RIS, and through earlier consultation, this sector is generally unsupportive of further regulation. They believe they are already heavily regulated and the cost of additional requirements would be disproportionate to the risk posed from the sector compared to the agricultural sector.

However, the Reef Water Quality Independent Science Panel noted in the 2017 Scientific Consensus Statement that point sources in the Reef catchments (e.g. urban, industrial and ports) require more information to understand the level of risk of these activities to Reef water quality (Waterhouse et al, 2017b). Work is underway to improve the Queensland Government Water Tracking and

Electronic Reporting System (WaTERS) to capture and make available point source release monitoring and tracking data and information. This includes confirming the total contribution of point source pollution from ERAs in Reef catchments to the nitrogen load, with an initial focus on sewage treatment plants.

Licenced point source loads have been estimated at approximately 1,400 tonnes per year if all operators are discharging at their maximum licensed amounts. These loads are significant, being almost a quarter of the dissolved inorganic nitrogen load modelled for all diffuse sources (anthropogenic) for Reef catchments for 2013. These findings suggest that nutrient pollutant loads from point sources could be higher proportionally than the contribution reported in the 2017 Scientific Consensus Statement. These preliminary findings were not available at the time of the Consultation RIS.

Costs and benefits

Although water quality offsets are no longer mandatory for sewage treatment plants, offset costs are still a sound indicator of the maximum possible costs that treatment plants might face when upgrading their treatment processes. These are maximum costs because if plant operators can make the changes in a cheaper manner under the proposed regulations they will be able to do so. If changing their plant costs more than the offset amount, they will be able to choose to use offsets.

The dissolved inorganic nitrogen component of total nitrogen is assumed to be 100%, whereas this figure may be much lower for individual treatment plants (Personal communication DES, 2018). Although the actual contribution would be assessed on a case-by-case basis, it is more conservative to assume the maximum contribution, and thus maximum costs in this analysis.

Forecast population growth has been taken from Queensland Government estimates (Queensland Government Statistician's Office, 2015). Where local government areas straddle more than one Great Barrier Reef region, or are not completely within one region, the proportion in each region has been applied to the population growth estimates (for example, 28% of Barcaldine Shire is within the Burdekin region, so it has been assumed that 28% of the Burdekin population growth will occur in the Burdekin region). As this process is not precise, the population figures are estimates. An approximate total population growth of 148,698 people is expected over the next ten years in the Great Barrier Reef regions.

Based on the formula for calculating the peak design capacity of sewage treatment works in the Environmental Protection Regulation 2008, it has been estimated that each additional person generates 200 litres of wastewater a day. At the industry best practice release limit of 5mg/l this results in 1 gram of residual nitrogen pollution per day (Personal communication, EHP and DSITI 2017). This means, overall, that the additional population growth is expected to generate approximately 0.6 million grams (6 tonnes) of nitrogen per year. Using the risk-adjusted cost of offsets from the Reef Trust calculator as a guide ($232,500/tonne), this is $1.4 million a year. The Reef Trust calculator utilises benchmarked estimates in Rolfe and Windle (2016), which in turn were based on evaluations of Reef Rescue grants, water quality tenders, water quality improvement plans, and bio-economic modelling.

As discussed in the Consultation RIS, the real costs of offsets are unknown as they depend on a range of factors, including market demand and supply. However, the Reef Trust offset cost estimates are based on a range of sources and provide an indicator of possible costs. These costs are presented for each region in Table 9.

Table 9: Expected increase in pollution from population growth and possible offset costs

Region	Annual population growth	Annual residual nitrogen pollution (tonnes)	Indicative offset cost ($/year)	Indicative offset cost ($) year 9
Cape York	60	0.02	5,092	45,826
Wet Tropics	3,274	1.19	277,840	2,500,558
Burdekin	5,534	2.02	469,629	4,226,662
Mackay Whitsundays	1,567	0.57	132,980	1,196,816
Fitzroy	3,482	1.27	295,491	2,649,421
Burnett Mary	2,605	0.95	221,067	1,989,601
TOTAL	**16,522**	**6.03**	**1,402,098**	**12,618,884**

The cumulative costs in year nine are also presented and total around $13 million in that year (the requirement commences 12 months after the legislation commences).

These costs represent the sewage treatment plants offsetting their load contribution every year over the time period, as the population increases each year and creates additional residual pollution. A one-off discounted payment is likely to be required based on the projected pollution load over a defined period of time. However, the real (non-discounted) cost in year nine is presented in Table 9 as an indication of the total cost.

Any voluntary offsets will use the current procedures for offsets within the environmental authority assessment process and will not incur noticeable additional administrative costs to government.

The water quality benefits of this avoided pollution is 271 tonnes of dissolved inorganic nitrogen over ten years.

8. Revised costs and benefits

Table 10 summarises the overall monetised costs and benefits of the revised Reef regulatory package in comparison to the Consultation RIS, following consideration of feedback on the Consultation RIS, additional targeted stakeholder consultation and further analysis. The updated costs and benefits by sector are shown in Tables 11 and 12. The difference in the estimates of costs and benefits is due to:

- revised staged commencement of minimum regulated standards
- the removal of calibration costs from sugarcane minimum standards
- the addition of modified costs for the banana sector related to record keeping, auditing and soil and leaf testing
- removing offset requirements for new agriculture
- the addition of an environmental authority (i.e., permit) process for new cropping development, and
- increased compliance cost estimates for the government and communication costs related to education and awareness raising activities related to the new regulatory requirements

Table 10: Differences between the Consultation and Decision RIS costs and benefits

	Consultation RIS	Decision RIS
Present value* cost ($)	852,815,638	609,857,252
Present value benefit ($)	355,605,307	285,817,474

	Consultation RIS	Decision RIS
Equivalent annual value[#] cost ($/year)	130,895,662	93,604,837
Equivalent annual value benefit ($/year)	54,580,603	43,869,115

* *Present value is the total value of the future benefit stream (ten years) in present day terms - this allows costs and benefits to be compared at the point where decisions are made.*

[#] *Equivalent annual value shows the net present value as an equivalent annual value over ten years.*

The removal of the proposed offsets framework for agriculture was a key difference between the Consultation and Decision RIS. This saved approximately $210 million in present value over ten years ($32 million in equivalent annual value).

Table 11: Summary of estimated benefits from strengthened Reef protection regulations

Benefits

Present value of benefits over ten years: **$286 million**

Benefits by sector

Sector	Present value benefits ($) over 10 years	Equivalent annual value benefits ($)
Agriculture	285,188,661	43,772,601
Government	628,813*	96,514
TOTAL	**285,817,474**	**43,869,115**

* The majority of this benefit relates to the estimated fees for administering environmental authorities (i.e., permits) for new cropping activities. This benefit is offset by the cost of administering these authorities.

Sugarcane, most likely benefits of minimum regulatory standards for an average property to move from D to B class management practice

Region	Average size (ha) [#]	Annual change in profit ($)
Wet Tropics	150	$9,000
Burdekin	106	$7,844
Mackay Whitsunday	150	$44,100
Burnett Mary	200	$49,000

[#]The average sizes used in this table come from Alluvium (2016) and are indicative of a typical property in the region, rather than a simple average of the total area divided by the number of properties.

Total and regional dissolved inorganic nitrogen reduction from minimum regulatory standards

Region	Dissolved inorganic nitrogen load reduction (t)
Wet Tropics	961
Burdekin	286
Mackay Whitsunday	465
Burnett Mary	140
TOTAL	**1,852**

Total and regional sediment reduction from minimum regulatory standards

Region	Fine sediment load reduction (t)
Wet Tropics	95,100
Burdekin	531,000
Mackay Whitsunday	54,000

Benefits

Fitzroy	324,000
Burnett Mary	162,000
TOTAL	**1,166,100**

Percentage contribution towards the 2025 Reef wide targets

Improved practice standards for a broader suite of agricultural industries – cane, grazing and bananas – across all Reef regions, are anticipated to result in significant reductions in pollutant loads. Other effort, such as extension and incentives that support practice adoption will also have a contributing effect. The estimated nutrient load reduction is 37 per cent out of the 60 per cent 2025 Reef wide reduction target; representing approximately 61 per cent progress toward this target. The estimated sediment load reduction is 19 per cent out of the 25 per cent 2025 Reef wide reduction target; representing approximately 76 per cent progress toward this target.

These estimates are based on more recent modelling than that used to inform the 2016 Alluvium Report: Costs of achieving the water quality targets for the Great Barrier Reef. The Alluvium Report used the 2013 baseline of the Reef Source Catchment Models combined with the achievements for practice adoption reported in the 2014 Reef Report Card (State of Queensland, 2015). The estimated load reductions above are based on 2015 modelling from the Reef Source Catchment Models under the Paddock to Reef Monitoring and Modelling Program.

Profitability – implementation of minimum standards

The benefits to the agricultural sector include improved profitability and productivity associated with operating under improved management practice standards. However, not all producers are guaranteed to make these profits. Improved land condition from implementing the minimum regulatory standards is expected to lead to improved profitability for the grazing sector in the long term. While these benefits are likely to be realised outside of the 10 year timeframe for the Consultation RIS assessment, it is still likely graziers will benefit and face lower ongoing costs, in the medium-long term.

Other water quality benefits – from regulating new development

There is expected to be averted water quality pollution from the requirements for new prescribed and resource ERAs contributing toward meeting the Reef water quality targets by meeting a 'no net decline' standard related to nutrient and sediment releases . Averted pollution from sewage treatment plants is estimated to be around 271 tonnes of dissolved inorganic nitrogen over ten years. In addition, the new environmental authority (i.e., permit) for new cropping activities will most likely result in avoided dissolved inorganic nitrogen and sediment that would otherwise be exported to the Great Barrier Reef.

Table 12: Summary of estimated costs from strengthened Reef protection regulations

Costs

Present value of costs over ten years: **$610 million**

Sector	Present value costs ($) over 10 years	Equivalent annual value costs ($)
Agriculture	536,609,628	82,362,318
Industry (sewage treatment plants and banana industry)	41,595,913	6,384,410
Government	31,651,711	4,858,109
TOTAL	**609,857,252**	**93,604,837**

The regulatory proposals are estimated to cost $94 million per year over ten years to government, agricultural producers and industry (banana industry and sewage treatment plant operators).

Costs

Government compliance costs have been updated since the Consultation RIS. They are now estimated at $1.65 million in the first year, $2.6 million in the second year, $3.5 million in the third year, and $5 million per year in subsequent years. Communication costs estimated at $230,000 over four years have also been included, for education and awareness raising activities related to the new regulatory requirements.

Sugarcane, most likely costs of minimum regulatory standards for an average property to move from D to B class management practice (including learning and record keeping)*

Region	Average size (ha) #	Total ($ one-off)	Total ongoing ($/year)^
Wet Tropics	150	$17,495	$1,710
Burdekin	106	$39,827	$3,343
Mackay Whitsundays	150	$42,545	$4,215
Burnett Mary	200	$184,395	$18,550

*Please note there are net savings expected for cane properties – benefits for an average property outlined earlier outweigh these ongoing costs.

#The average sizes used in this Table come from Alluvium (2016) and are indicative of a typical property in the region, rather than a simple average of the total area divided by the number of properties.

^ This table in the Consultation RIS incorrectly included the net savings figures rather than ongoing costs.

Grazing, most likely costs of minimum regulatory standards for an average property to move from D to B class management practice (including learning and record keeping)

Region	Average size (ha)*	Total ($ one-off)	Total (ongoing) ($/year)
Cape York	20,000	$112,379	$29,082
Wet Tropics	2000	$55,579	$11,995
Burdekin	20,000	$112,379	$29,075
Mackay Whitsunday	2000	$55,579	$17,395
Fitzroy	7000	$40,359	$14,080
Burnett Mary	5000	$136,579	$21,502

The ongoing grazing costs are based on the value of stock removed to reduce grazing pressure. Improved land condition from implementing the minimum regulatory standards is expected to lead to improved profitability for the grazing sector in the long term. While these benefits are likely to be realised outside of the 10 year timeframe for the Consultation RIS assessment, it is still likely that graziers will benefit and face lower ongoing costs, in the medium-long term.

Glossary

Terms	Meaning
ABCD framework	ABCD management practice frameworks were first developed in 2008 to represent different levels or standards of management practice within different industries for different water quality parameters (i.e. sediment, nutrients and chemicals). The Paddock to Reef Water Quality Risk Frameworks for agricultural industries replace the ABCD frameworks with an equivalent risk to water quality: A = Lowest risk; B = Moderate-Low risk; C = Moderate risk; D = High risk.
Agricultural ERA	Carrying out any of the following on a commercial basis, on land that is in the Great Barrier Reef catchment shown on a map prescribed by regulation: • cattle grazing; • horticulture (for e.g., banana cultivation); • cultivation of another crop (for e.g., sugarcane or grains cultivation)
Agricultural ERA Standards	A document developed in accordance with the *Environmental Protection Act 1994* and prescribed by regulation, which provides the minimum practice standard for an agricultural ERA.
Best management practice (BMP)	Best management practices articulate a reasonable best practice level which can be expected to result in a moderate-low water quality risk.
Catchment	An area of land bounded by natural features such as hills, from which drainage flows to a common point, usually ending in a river or creek and eventually the sea. Reef catchments are any terrestrial areas that drain into the Great Barrier Reef Marine Park.
Catchment loads	Catchment loads are an estimated measurement of the amount of a pollutant, e.g., nutrients or sediments, flowing past a defined end point of a catchment.
End-of-catchment water quality targets (river basin scale)	Set in the Reef 2050 Water Quality Improvement Plan 2017-2022 for the catchments (river basins) that flow to the Great Barrier Reef, they can also be referred to as 'catchment scale water quality targets', 'river basin targets' or water quality targets. They are reduction goals for nutrients and sediments for the Great Barrier Reef, represented as both a percentage and in tonnes or kilo tonnes and are based on the Great Barrier Reef Marine Park Authority's Water Quality Guidelines for the Great Barrier Reef Marine Park.
Chemical	Also referred to as an agricultural chemical product, means an agricultural chemical product under the Agvet Code of Queensland as applying under the *Agricultural and Veterinary Chemicals (Queensland) Act 1994.*
Diffuse pollution	Non-point pollutant sources (i.e. without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by stormwater or overland flow.
Environmental authority	An approval (i.e., permit), issued under the *Environmental Protection Act 1994*, for an environmentally relevant activity.
Environmentally relevant activity (ERA)	An activity which, when carried out, may release a contaminant that may cause environmental harm. A list of ERAs is contained in Schedule 2, 5 and 6 of the Environmental Protection Regulation 2008.

Terms	Meaning
Environmental Risk Management Plans	Under current provisions in the *Environmental Protection Act 1994* a person who carries out certain agricultural ERAs is required to keep an Environmental Risk Management Plan. This requirement is being removed with the new regulations.
Adviser	A person who gives advice about carrying out an agricultural ERA as a service for a reward (such as agronomists) or who provides advice about carrying out an agricultural ERA in conjunction with providing goods or another service for a reward (such as a fertiliser distributors or agents).
Great Barrier Reef Report Card	An annual report card which measures progress towards the goals and targets in the Reef Water Quality Protection Plans and now the Reef 2050 Water Quality Improvement Plan 2017-2022. The 2016 Great Barrier Reef Report Card is the latest progress report.
Land-based water quality risk assessment	An assessment process based on attributes and constraints of the land (based on soil information) using a land suitability framework, which identifies the risk to water quality caused by a cropping activity.
Minimum standards	The minimum practice standards that are acceptable when carrying out an activity, which will be contained in agricultural ERA standards.
Nutrients	Nutrients are the natural chemical elements and compounds that plants and animals need to grow. Carbon, hydrogen and oxygen are abundant nutrients in nature, but nitrogen and phosphorus are not always so freely available. They promote plant growth, making increased levels (e.g. from excess fertilisers) an issue for the Great Barrier Reef. Dissolved inorganic nitrogen is the key concern for Reef water quality impacts.
Paddock to Reef Integrated Monitoring, Modelling and Reporting Program	The Paddock to Reef Integrated Monitoring, Modelling and Reporting Program (Paddock to Reef program) provides the framework for evaluating and reporting progress towards Reef 2050 Water Quality Improvement Plan 2017-2022 targets through the Great Barrier Reef Report Card.
Point source pollution	Any discernible confined and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, discrete fissure, or other discrete source where pollutants are or may be discharged. For example a sewage treatment plant is a source of point source pollutants.
Point Source Water Quality Offsets policy	A Queensland Government policy that offers an alternative option for regulated point source operators to manage waste water discharge requirements under the *Environmental Protection Act 1994*, while improving water quality.
Pollutant loads	A measurement of land-based run-off entering the Great Barrier Reef lagoon, for example nutrients and sediments.
Queensland Reef Water Quality Program	The Queensland Government's five year program of actions until 2022 to implement the actions under the Reef 2050 Water Quality Improvement Plan 2017-2022.
Reef 2050 Long-Term Sustainability Plan	The Reef 2050 Long-Term Sustainability Plan is a joint Australian and Queensland government overarching strategic document. The plan states tangible outcomes, objectives and measurable targets identified across seven themes: biodiversity; ecosystem health; heritage; water quality; community benefits; economic benefits and governance, to

Terms	Meaning
	form an integrated management framework. The plan was released in 2015 and updated in 2018 through a mid-term review.
Reef 2050 Water Quality Improvement Plan 2017-2022	The Australian and Queensland Government five year plan to improve the quality of water flowing from the catchments adjacent to the Reef (formerly the Reef Water Quality Protection Plan). The plan is nested under the Reef 2050 Long-Term Sustainability Plan addressing the water quality theme.
Region	The Great Barrier Reef receives runoff from six natural resource management regions: the Cape York, Wet Tropics, Burdekin, Mackay Whitsundays, Fitzroy, Burnett Mary regions.
Reef Water Quality Independent Science Panel	A panel which provides the Australian and Queensland Governments with independent scientific expertise to guide reporting, monitoring and evaluation on water quality programs.
Regulatory Impact Statement	A systematic approach to critically assess the expected impacts of proposed regulatory policy options. Regulatory Impact Statements are prepared in accordance with *The Queensland Government Guide to Better Regulation* and assessed by the Office of Best Practice Regulation.
Scientific Consensus Statement	The *2017 Scientific Consensus Statement: Land use impacts on Great Barrier Reef water quality and ecosystem condition* is a foundational document which provides the scientific understanding underpinning the Reef 2050 Water Quality Improvement Plan 2017-2022. It was collated by a multidisciplinary group of scientists, with oversight from the Reef Water Quality Independent Science Panel. The 2017 Scientific Consensus Statement provides an update to the last statement published in 2013. The Scientific Consensus Statement is updated every five years.
Sediments	Sediments in water are measured as 'total suspended solids' or 'total suspended sediment', and are characterised by different particle sizes, for example, clay, silt and sand. It is the fine fraction (silt and clay) that is of greatest concern to marine ecosystem health. Fine (<16 µm) sediment moves furthest into the marine environment. This leads to increased turbidity and reduced light for seagrasses and coral, reducing their growth. When this sediment settles, it can have detrimental effects on the early life stages of corals, and in more extreme conditions, can smother corals and seagrass.
Standard conditions	Standard conditions are the minimum operating requirements an environmental authority holder must comply with.
Water quality	The chemical, physical, biological and radiological characteristics of water. It is a measure of the condition of water relative to the requirements of one or more biotic species and/or to any human need or purpose.
Paddock to Reef Water Quality Water Quality Risk Frameworks	The Paddock to Reef Integrated Monitoring, Modelling and Reporting Program (Paddock to Reef program) has developed water quality risk frameworks for each agricultural industry based on the ABCD framework.

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Appendix 1 – Consultation Report – Consultation RIS

1. Consultation methods

Since August 2016, the Reef regulation package has been subject to extensive consultation with the agricultural and industrial sectors, conservation groups, other government departments, local councils and Natural Resource Management bodies. In March 2017, the discussion paper, *Enhancing regulations to ensure clean water for a healthy Great Barrier Reef and a prosperous Queensland*, was released for broader public consultation over a nine-week period. A webinar and 17 information sessions were held during this time, many in regional areas, attended by representatives from the agricultural, and industrial sectors as well as local government and grower organisations.

The *Consultation RIS for broadening and enhancing Reef protection regulations*[8] was released for pubic consultation on 7 September 2017, with feedback invited until 3 November 2017. On 29 October 2017, consultation was put on hold due to the Queensland state election. To ensure stakeholders had adequate time to make a submission, consultation was re-opened on 22 January 2018 and closed 19 February 2018. No changes were made to the RIS for the second round of consultation. Previous submissions, which were made before the original consultation process was put on hold, remained valid and were not required to be re-submitted.

Fifty-one submissions were received on the Consultation RIS from the agricultural, and industrial sectors, as well as conservation groups and the general public (Table 13). Feedback from submissions marked confidential have not been included in this report. Twenty-six submissions were received from industry stakeholders, nine from non-government organisations (including conservation groups and Natural Resource Management bodies), five from local governments and one from the Local Government Association of Queensland), one from a research institute, nine from individual community members, some with connections to research institutions and one from a federal government body.

This Appendix outlines the key feedback received on the Consultation RIS. Following analysis of the feedback, an addition 23 consultation meetings were undertaken with key stakeholders between May-November 2018 (Table 14). Issues raised during these meetings have also informed the regulatory proposals in the Decision RIS.

The Consultation RIS was published on Queensland Government websites:
www.qld.gov.au/environment/coasts-waterways/reef
www.qld.gov.au/environment/agriculture/sustainable-farming/reef-regulations
www.getinvolved.qld.gov.au

The submission period was advertised through various eNewsletters, such as Queensland Reef Water Quality Program, EHP News and EHP Environmental Regulatory Update newsletter. The submission period was also advertised in various regional newspapers and on social media. A Ministerial media release was issued on the Queensland Government media statements portal. Targeted emails were released through various stakeholder networks, and a webinar on the regulatory proposals was posted on Government websites. A factsheet was distributed through the Department of Agriculture and Fisheries network of agricultural extension officers.

Consultation submissions were accepted in writing and were received by email to OfficeoftheGBR@ehp.qld.gov.au. Extensions were provided upon request.

[8] https://www.qld.gov.au/environment/agriculture/sustainable-farming/reef-regulations

2. Summary of feedback received on the Consultation RIS

Catchment pollution load limits – nutrients and sediments

This proposal received less feedback from stakeholders than other proposals. The majority of feedback on setting catchment load limits for the 35 Reef catchments – to target responses for managing risk to water quality – came from the agricultural sector. The Australian Sugar Milling Council stated that cane industry stakeholders remain cautious about the use of load limits. They seek transparency and understanding around the methodology to be used to establish the limits, the links between improved farm practices and impacts on pollution loads, and how catchment load limits will inform regulatory decision-making about Reef water quality.

Agricultural stakeholders such as CANEGROWERS Brisbane, CANEGROWERS Isis, CANEGROWERS Bundaberg, Sugar Services Proserpine Limited, Pioneer Cane Growers Organisation Ltd and AgForce stated that the impacts of the agricultural sector on Reef water quality are overstated. There was also concerns raised over the reliance on modelling to reflect on-ground influences of management practices on pollutant loads. They also believe there is inadequate water quality monitoring across the Reef regions. CANEGROWERS Isis and Bundaberg believe the reported modelled data is not reliable, stating that there are low levels of dissolved inorganic nitrogen in rivers in the Bundaberg district. Further, they claim regulation will do little to achieve the water quality targets, further demonstrating that the targets are unrealistic and unachievable.

The Australian Sugar Milling Council stated that it is important that links between improved farm practices and pollutant loads are transparent. Cane industry stakeholders were concerned that the catchment load limits would result in direct limits on the amount of fertiliser that could be applied on farm. The agricultural sector generally supports increased localised monitoring to assist more accurate outputs from modelled data. The Australian Cane Farmers Association Limited and Sugar Services Proserpine Limited support the provision of monitoring data to growers to provide a clearer picture of the effect of farms on water quality, and improved decision support tools for farmers to better understand nutrient, chemical and sediment dynamics.

The Queensland Water Directorate (*qldwater*) supports the need for broad based regulation of pollution runoff entering Reef catchments, end-of-catchment water quality targets to better define environmental limits for overloaded catchments, and regulatory responses that are proportionate to the pollutant sources and risks to the Reef. The Queensland Water Directorate represents water service providers, including local councils as sewage treatment service providers. This sector believes further regulation is disproportionate to the risk posed from the sector compared to the agricultural sector.

The Local Government Association of Queensland representing local councils acknowledged support for the Queensland Water Directorate submission. The majority of comments from individual councils and the Queensland Water Directorate were made about water quality offsets. The Whitsunday Regional Council stated that they acknowledge the need to regulate nutrient and sediment runoff, and the development of catchment targets. The Cairns Regional Council raised concerns about the application of catchment load limits to sewage treatment plants that need to significantly expand.

The Queensland Resources Council stated that assessing officers should consider existing licencing conditions when considering catchment load limits. Where an operator can demonstrate that no residual impact on water quality is to occur with existing mitigation and management measures, relevant conditions should not be affected.

Conservation sector stakeholders (WWF, the Environmental Defenders Office, Queensland Conservation Council, and Australian Marine Conservation Society) support catchment load limits and how they were outlined in the Consultation RIS in terms of how they would apply to regulatory decision-making.

Minimum standards – key agricultural industries

In response to the proposal to apply minimum practice standards to target nutrient and sediment pollution for key agricultural industries, agricultural stakeholders prefer a voluntary approach, through industry initiatives such as BMP programs. These sectors, as well as other submitters such as WWF and CHRRUP support greater access to incentives, and improved education and extension capacity. Some agricultural stakeholders dispute the assertion made in the Consultation RIS that voluntary action is not taking place fast enough, and believe that growers are already operating at best practice. There were concerns across the agricultural sector about the cost and profitability of implementing the minimum standards. The cane, grazing and banana sectors all commented that implementation timeframes were too short. The cane and banana sector supported the development of an alternative compliance pathway allowing growers accredited against recognised BMP or like programs to be deemed as meeting the minimum regulatory standards.

The cane sector in the Burnett Mary region oppose the introduction of regulation. Bundaberg CANEGROWERS state that growers in this region already embrace farm management practices that minimise the offsite movement of dissolved inorganic nitrogen and fine sediment, which is a view also held by CANEGROWERS ISIS, the Burnett Mary Regional Group and the Bundaberg Regional Council. These stakeholders also believe they are being unfairly targeted due to the emergence of competing tree cropping activities such as macadamias and avocados that won't be subject to regulated minimum standards, and that there is insufficient scientific evidence for regulating sugarcane in this region.

The Australian Sugar Milling Council supports 'best management practices' for the cane industry stating that the industry needs to do more to reduce the impact of farming activities on Reef water quality. However, they agree with CANEGROWERS Brisbane, CANEGROWERS Isis, and CANEGROWERS Bundaberg that any regulated standards must be responsive to growers in different geographic and climatic conditions. Pioneer Cane Growers Organisation Ltd stated that increased profits and the ability of growers to ameliorate costs relies on growers being able to access and afford limited agronomic services. Other stakeholders, such as the Australian Cane Farmers Association Limited also state that farmers will need assistance to implement nutrient management planning, and that this cost hasn't been fully addressed.

Cane sector stakeholders and others such as the Queensland Farmers Federation believe the costs and benefits of minimum standards, including the transition to nutrient management planning lacks scientific and economic credibility, appearing to ignore the implications on grower viability through reduced farmed area or reduced yields, and flow on impacts on regional economies. The Australian Sugar Milling Council also claims that the consequential impact on other industries in the supply chain, including mills, hasn't been taken into consideration. They believe the proposed requirement for growers to refine their nutrient approach within two years may result in fertiliser rates being cut for land deemed as 'low producing'. The Australian Sugar Milling Council believe this could drive these areas out of production, creating the potential for a drop in cane supply to local sugar mills affecting the viability of local mills.

The Local Government Association of Queensland stated that they were unable to support the regulatory proposals presented in the Consultation RIS due to concerns about impacts on small, family run business and the sustainability of small rural communities. However, Hinchinbrook Shire

Council stated that the proposed standards for cane growers largely reflect the current farming practices in the district.

AgForce is opposed to regulated standards for graziers and grains producers. They believe the focus should be on high risk, erosion hotspots (gullies, scalds, rills and streambank erosion). They believe the grazing BMP program and the level of program adoption adequately addresses hillslope erosion, which is the focus of the proposed minimum standards. AgForce support improved decision tools (such as FORAGE and erodible soil erosion hazard maps) for targeting areas of persistent and vulnerable low grazing land condition on erodible soils. AgForce expressed concern that the 'alternative compliance pathway' will lead to other programs emerging, which they believe would undermine their program and could result in watered down versions of programs being offered that only focus on achieving minimum standards and not on broader benefits.

Conservation groups (WWF, the Environmental Defenders Office, Queensland Conservation Council, and Australian Marine Conservation Society) supported the immediate, broad application of minimum standards across all Reef catchments. They further support incentives such as low interest loans, improved education and extension and a strong government compliance presence focused on high risk practices and areas. Extension services should only be provided by accredited providers. While conservation interests also support the industry BMP programs, they believe the voluntary rate of adoption of improved management practices has been insufficient in delivering water quality improvements, and immediate intervention through regulation is necessary. A number of individuals with connections to research organisations also believe voluntary adoption of improved practices through accreditation against cane and grazing BMP programs is still too slow to meet the water quality targets.

The Queensland Conservation Council and the Environmental Defenders Office commented that strong compliance and enforcement provisions would be required for program delivery that meets government objectives. WWF believe that BMP program participation data must be provided to the community so that the contribution of BMP programs to pollution reductions can be reported. The Environmental Defenders Office state that more evidence is required to support the efficacy of BMP programs in achieving water quality outcomes, and recognised programs should be subject to government auditing and monitoring.

Record keeping requirements for fertiliser sellers

In general, feedback from the agricultural sector (including fertiliser sellers) was that the proposal to require fertiliser sellers to keep and produce sales data is not practical, and would be more costly than the Consultation RIS suggests.

The Australian Sugar Milling Council believe that the requirement to keep and produce sales data would result in drawn out transactions between land managers and fertiliser sellers. BGA Agriservices believe maintaining a database would be more complicated and time consuming than suggested, thereby increasing the cost of doing business. BGA Agriservices also suggested the proposal would result in fertiliser sellers inside Reef catchments losing business to sellers outside of the catchments that aren't subject to the reporting requirements, which would impact on their profits.

Fertilizer Australia and fertiliser sellers argue that the use of sales data is problematic due to the possibility of multiple suppliers, and other complexities such as the fertiliser purchased being used on multiple crop types. Fertilizer Australia also recommended that the proposal to require fertiliser sellers to keep records of fertiliser application advice be modified to include all third-party providers to ensure all advice is consistent with the regulations.

The conservation sector believes the data requirements outlined in the Consultation RIS are insufficient, and that mandated data is required from key sugar supply chain entities. This includes sales data from fertiliser companies to verify farm based data on fertiliser application and overall levels of use, and block and farm yield data from sugar mills to assist with verification of appropriate nitrogen use efficiency.

New development – standards and water quality offsets

Agricultural stakeholders were generally unsupportive of the requirements for new agricultural development. These stakeholders stated that additional costs from farm design standards and offsets would be an impediment to new agricultural growth. The Local Government Association of Queensland raised concerns about impacts on small, family run business and the sustainability of small rural communities. Local councils and sewage treatment plant operators raised concerns on the likelihood of the additional costs being borne by local rate payers. Concerns were also raised about the scientific validity and workability of the proposed framework, and that there was not yet sufficient detail about how the offsets regime would work in practice.

Conservation groups strongly support regulating to ensure that there is no net decline in water quality as a result of new industry and development in Reef catchments. Most conservation groups supported water quality offsets as the most cost effective way to achieve this. Despite minimal predicted agricultural growth (less than 1% annually, based on the Consultation RIS), they believe there is a genuine risk of new development and that it would be significant enough to undo the gains made in reducing nutrient and sediment runoff that would be achieved through the broad scale implementation of regulated minimum practice standards. Conservation groups also believe new agricultural development must meet higher standards, particularly around farm design and should not be approved in inappropriate, high risk areas – such as on dispersive or leaky soils. They support new activities being required to apply for a permit.

Pioneer Cane Growers Organisation and MSF Sugar stated that mandatory offsets would lock in current land use and make expansion economically impossible. They also stated that their agricultural expansions are managed with best practice farming techniques. The Queensland Farmers Federation stated that the regulatory requirements would stifle the ability of several established agricultural industries including sugarcane, grazing, grains and horticulture to respond to changing markets. SunWater also raised concerns about the impact on local agricultural sectors. The Australian Banana Growers Council, the Australian Sugar Milling Council and a number of other stakeholders commented that the definition for new activities, which would trigger the requirement for farm design standards, required further clarification.

The Local Government Association of Queensland and the Queensland Water Directorate believe the costs of additional regulation are disproportionate to the risk posed from the sector, and offset costs will be directly borne by rate payers. The Queensland Water Directorate consider that it is premature and unreasonable to require mandatory offsets with unreliable and unknown outcomes for point source discharges. Whitsunday Regional Council state that the already large local government investment in sewerage treatment will become even more expensive with the requirement for mandatory offsets. They believe that offsets shouldn't be applied until current approved peak design capacity is exceeded.

Cairns Regional Council doesn't support a mandatory offsets framework. They state that councils, due to the significant risks involved, are more likely to take up offsets if they are delivered through a collaborative rather than a mandatory process. SunWater commented that regulations and offset requirements in Reef catchments may have the potential to impact on the viability of future water infrastructure projects supporting expansion and development. This also creates uncertainty for any

projects which are currently being assessed for feasibility. The Australian Prawn Farmers Association and the Australian Barramundi Farmers Association reinforced the importance of a water quality offset framework which is practical, economically viable and will manage real risks to water quality.

Table 13: List of submissions made on the Consultation RIS

	Respondent Type	Sub-Respondent Type	Respondent Name
1.	Industry Group	Freight rail	Aurizon
2.	Industry Group	Sugarcane Growing	CANEGROWERS Isis
3.	Industry Group	Ports	Cairns Port Development
4.	Individual	Ports	Kathy Brenton
5.	Individual	-	Russell Clements
6.	Industry Group	Sugarcane Growing	Mackay Area Productivity Services
7.	Industry Group	Fertilisers	Fertilizer Australia
8.	Industry Group	Sugarcane Growing	Sugar Services Proserpine Ltd.
9.	Federal Government	Authority	Great Barrier Reef Marine Park Authority (GBRMPA)
10.	Individual	Grazing	Marie Vitelli
11.	Industry Group	Resources	Queensland Resources Council
12.	Individual	University Research	Dr. Felicity Deane, Evan Hamman (QUT – International Law & Global Governance Research Program)
13.	Industry Group	Ports	Qld Ports Association
14.	Industry Group	Sugarcane Growing	CANEGROWERS Bundaberg
15.	Industry Group	Urban Water	Queensland Water Directorate
16.	Industry Group	Sugarcane Growing	Australian Sugar Milling Council
17.	Industry Group	Sugarcane Growing	Farmacist
18.	NGO	Conservation Group	WWF-Australia
19.	Industry Group	Sugarcane Growing	BGA Agriservices
20.	Research Agency	Conservation Group	Australian Institute of Marine Science (AIMS)
21.	Individual	Horticulture	Luke Hargreaves
22.	Industry Group	Property	Property Council of Australia
23.	Industry Group	Sugarcane Growing	CANEGROWERS
24.	NGO	Conservation Group	Wide Bay Burnett Environment Council
25.	Individual		CONFIDENTIAL RESPONDENT
26.	Individual	Bananas	Peter Inderbitzen
27.	NGO	Conservation Economics	Green Collar

	Respondent Type	Sub-Respondent Type	Respondent Name
28.	Industry Group	Sugarcane Growing	CANEGROWERS Isis (re-submission)
29.	Local Government	-	Cairns Regional Council
30.	Local Government	-	Whitsunday Regional Council
31.	Industry Group	Sugarcane Growing	Pioneer Cane Growers Organisation
32.	Industry Group	Chemicals & Biotech	CropLife Australia
33.	Industry Group	Property	Property Rights Australia
34.	NGO	NRM Body	NQ Dry Tropics
35.	Industry Group	Water	SunWater
36.	Industry Group	Agriculture	Queensland Farmers Federation (QFF)
37.	Industry Group	Water	Queensland Water Directorate (re-submission)
38.	Local Government	-	Hinchinbrook Shire Council
39.	NGO	NRM Body	Central Highlands Regional Resources Use Planning Cooperative Limited (CHRRUP)
40.	Industry Group	Grazing and Grains	AgForce
41.	Local Government	-	Burdekin Shire Council
42.	NGO	Conservation Group	WWF (re-submission)
43.	NGO	Conservation Group	Environmental Defenders Office (EDO)
44.	NGO	Conservation Group	Australian Marine Conservation Society (x2) (AMCS)
45.	NGO	Urban Water	Healthy Land and Water
46.	Industry Group	Bananas	Australian Banana Growers Council (ABGC)
47.	Individual	Consultant	Jane Waterhouse (C2O)
48.	Local Government	-	Local Government Association of Queensland (LGAQ)
49.	Individual	-	Diane Tarte
50.	Industry Group	Sugarcane Growing	Australian Canefarmers Association
51.	Industry Group	Sugarcane Growing	MSF Sugar

Table 14: Targeted stakeholder consultation undertaken following submissions on the RIS

	Stakeholder	Organisation	Subject	Date
1.	Conservation groups	WWF, Australian Marine Conservation Society, Environmental Defenders Office, Queensland Conservation Council.	Regulatory proposals	9 May 2018
2.	Industrial Stakeholders	Local Government Association Queensland, Master Builders Queensland, North Queensland Bulk Ports Corporation, Property Council Australia, QRC, QLD water, UDIA QLD, Housing Industry Association, Sunwater	Regulatory proposals	11 May 2018
3.	Agricultural Stakeholders	AgForce, Australian Sugar Milling Council, Australian Sugar Cane Farmers Association, CANEGROWERS, Fertilizer Australia, Growcom, Sugar Research Australia, Australian Banana Growers Council, QFF.	Regulatory proposals	14 May 2018
4.	Agricultural Stakeholders	CANEGROWERS, QFF, Sugar Research Australia, Australian Sugar Cane Farmers Association.	Cane Minimum Standards	14 May 2018
5.	NRM Groups	Burnett Mary Regional Group, Cape York NRM, Fitzroy Basin Authority, NQ Dry Tropics, Reef Catchments, Terrain	Regulatory proposals	15 May 2018
6.	Agricultural Stakeholders (Bowen)	Individual graziers, Eberhard Consulting, C2O,	Grazing Minimum Standards	21 May 2018
7.	Agricultural Stakeholders	Australian Banana Growers Council, Red valley, Tropical Landscapes, Grower	Bananas Minimum Standards	23 May 2018
8.	Agricultural Stakeholders (Mackay)	Sugar Research Australia, CANEGROWERS, ACFA Mackay, Farmacist, Sugar Productivity Services, ACFA Proserpine, Mackay mill, Mackay Area Productivity Services, Plane Creek Productivity Services Limited.	Cane Minimum Standards	23 May 2018
9.	Agricultural Stakeholders (Cairns)	Canegrowers Mossman, CANEGROWERS, ACFA Mossman, Bronwyn Dwyer, Canegrowers Innisfail, MSF Sugar, Sugar Research Australia, Canegrowers Tully, Tully Cane Productivity Services, Tully Sugar, TRAPS, Canegrowers Herbert River, Australian Sugar Cane Farmers Ingham Herbert Cane Productivity Services (HCPSL), Terrain,	Cane Minimum Standards	23 May 2018
10.	Agricultural Stakeholders	AgForce, QFF	Grazing Minimum Standards	25 May 2018
11.	Conservation groups	WWF, Australian Marine Conservation Society, Environmental Defenders Office, Queensland Conservation Council.	Minimum Standards	28 May 2018

	Stakeholder	Organisation	Subject	Date
12.	Industrial Stakeholders	Australian Prawn Farmers Association, Australian Barramundi Farmers Association	Regulatory proposals	28 May 2018
13.	Agricultural Stakeholders (Ayr)	Wilmar, CANEGROWERS Burdekin, Burdekin Productivity Services, Farmacist, Invicta Cane Growers, Kalamia Canegrowers, Sugarfix Consultancy Group, Pioneer Cane Growers, Australian Sugar Cane Farmers (ACFA) Burdekin, Wilmar, Sugar Research Australia.	Cane Minimum Standards	29 May 2018
14.	Agricultural Stakeholders (Ingham)	CANEGROWERS, Australian Sugar Cane Farmers Ingham, Herbert Cane Productivity Services (HCPSL), Northern Agri, Terrain, Liquaforce, Sugar Research Australia, Wilmar, individual growers	Cane Minimum Standards	30 May 2018
15.	Agricultural Stakeholders (Innisfail)	CANEGROWERS, Terrain, individual growers.	Cane Minimum Standards	30 May 2018
16.	Agricultural Stakeholders (Childers)	CANEGROWERS (Maryborough and Bundaberg), Isis Productivity Limited, Burnett Mary Regional Group, Isis Central Mill, Individual growers.	Cane Minimum Standards	31 July 2018
17.	Agricultural Stakeholders (Rockhampton)	Fitzroy Basin Association, Individual graziers.	Grazing Minimum Standards	7 August 2018
18.	Agricultural Stakeholders (Emerald)	Fitzroy Basin Association, CHRRUP, Emerald Agricultural College, individual Graziers.	Grazing Minimum Standards	8 August 2018
19.	Agricultural Stakeholders (Bigenden)	Burnett Mary Regional Group, Mary River Catchment Coordination Committee, Bunya beef grazing, individual graziers.	Grazing Minimum Standards	28 August 2018
20.	Conservation groups	WWF, Australian Marine Conservation Society, Environmental Defenders Office.	Regulatory proposals	15 October 2018
21.	Industrial stakeholders	Queensland Water Directorate (*qldwater*), Queensland Local Government Association, Australian Prawn Farmers Association, Australian Barramundi Farmers Association, Queensland Resource Council	Regulatory proposals	17 October 2018
22.	Agricultural stakeholders	AgForce, Australian Sugar Milling Council, Australian Sugar Cane Farmers Association, CANEGROWERS, Fertilizer Australia, Growcom, Sugar Research Australia, Australian Banana Growers Council, QFF	Regulatory proposals	17 October 2018
23.	Conservation groups	WWF, Australian Marine Conservation Society, Environmental Defenders Office.	Regulatory proposals	1 November 2018