

Black Ross Water Quality Improvement Plan

Reasonable Assurance Statement

Background

This Reasonable Assurance Statement (RAS) addresses issues that will help provide confidence that, if the Black Ross Water Quality Improvement Plan (WQIP) is adequately resourced (funded) and subsequently implemented then the defined pollutant load reduction targets can be achieved. Achievement of the targets defined in the Black Ross WQIP will provide a greater degree of protection for the receiving waters of the Great Barrier Reef from the pollutants of concern covered by the WQIP than currently exists.

This RAS addresses the uncertainty associated with the:

1. Setting of water quality targets;
2. Adoption of identified management actions; and
3. Effectiveness of the proposed management actions in reducing pollutant loads.

Statement

The ability to meet the targets identified in the Black Ross Water Quality Improvement Plan (WQIP) relies on the implementation of identified management actions in a coordinated and timely manner. This will require adequate resourcing and a responsive monitoring and evaluation strategy, the results from which will be used to adapt and refine management strategies for improvements into the future.

The Black Ross WQIP covers the expanding coastal urban centre of Townsville and includes heavy industry and rural (mostly grazing) catchments. The WQIP was developed in consultation with partners and contains a set of management actions to be implemented over the next 4 years (2013), 12 years (2021) and 36 years (2045).

Utilisation of the best available science

Maintaining or improving water quality and protecting ecosystem health of the receiving waters of the Black Ross WQIP area can be achieved by reducing the loads of identified pollutants discharging to receiving waters. This in turn will help to achieve identified receiving water quality objectives.

The WQIP uses a two-part approach in setting water quality targets:

- Identification of the reduction in the current modelled annual load resulting from the implementation of achievable and cost effective actions (short term targets); and
- Identification of the reduction in the current modelled annual load required to achieve a sustainable pollutant load to meet water quality objectives as a benchmark for identifying the required actions (long term targets).

The National Water Quality Management Strategy (NWQMS) process was followed to determine water quality objectives for all receiving waters covered by the Black Ross WQIP. Achievement of these water quality objectives will help protect the environmental values and uses, which our community attributed to the waterways as part of the consultation process undertaken in conjunction with the former Queensland Environmental Protection Agency (EPA).

Catchment modelling was undertaken to ascertain the current (2005 landuse) nutrient and sediment loads and to predict the reductions in loads required to meet water quality objectives. It is acknowledged that models have inherent uncertainty however several steps were implemented to ensure this uncertainty was minimised including:

- Undertaking modelling over a 58 year period to account for the seasonal and annual variations in Townsville rainfall and therefore variations in flow and pollutant generation rates;
- Utilising locally collected event based water quality monitoring data to calculate Event Mean Concentrations (EMCs) for different landuses, which were then used as input data to the model;
- Utilising a model (WaterCAST/E2) with the flexibility to account for variations in pollutant load generation rates from urban landuses and predominantly flat coastal floodplain topography; and
- Accounting for projected population increase (based on accepted population predictions) in Townsville and the resultant changes in;
 - The extent of landuses, especially expanding urban landuse, and their respective contributions of diffuse pollutants, and
 - Point source pollutant loads from wastewater treatment plants.

Improving decision support tools

Several decision support tools (numerical and probability based models) were developed to inform this WQIP including:

1. A numerical catchment water quality model i.e. WaterCAST;
2. Simple 'box' models for the estuarine reaches of the main waterways covered by the WQIP;
3. A two dimensional near coastal advection-dispersion model for Cleveland Bay and Halifax Bay; and
4. A probability based Bayesian Belief Network model for sediment transport within the Bohle catchment.

In addition to these tools, the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) was identified as a priority decision support tool for use in quantifying load reductions from urban landuses where Water Sensitive Urban Design (WSUD) management measures are proposed or have been implemented to improve stormwater quality runoff.

These tools, individually and combined, provide some certainty through provision of multiple lines of evidence. A greater degree of certainty is provided when these models are populated and validated with locally collected water quality monitoring and other input data. As it is planned to use these and other decision support tools in the implementation phase of the WQIP it is imperative that the input parameters of these models are tested and validated over time to provide greater certainty around the model outputs i.e. pollutants loads and potential load reductions. In particular models are required to better demonstrate the link between catchment loads and ecosystem health of fresh, estuarine and marine receiving waters.

Locally relevant management guidelines

Locally relevant and appropriate guidelines for Water Sensitive Urban Design (WSUD) have been developed to suit the Coastal Dry Tropics region of Townsville. These guidelines have been developed using the best available science, knowledge and experience from around Australia with adaptations to reflect the characteristics of our local soils, vegetation types, rainfall patterns and other climatic conditions. These guidelines inform the construction of WSUD management measures such as constructed wetlands and are essentially untested in our local conditions.

To ensure optimal performance it is imperative that the efficacy of these measures is tested and results used to refine the technical design guideline documents. In addition, these results should be used to validate and/or inform the improvement of the MUSIC decision support model.

Implementation of no-regrets actions

The Black Ross WQIP contains several significant 'no regrets' actions, which will achieve significant water quality improvement and assist achievement of the water quality targets. These actions include the upgrade of Council managed wastewater treatment plants, investigation and implementation of 'fit for purpose' water reuse strategies for treated effluent, introduction of WSUD principles and improved erosion and sediment control measures.

Other actions include ensuring that relevant information, including water quality targets are incorporated where appropriate into local and regional planning processes including the new Townsville City Council Planning Scheme, Townsville Urban Stormwater Management Plan, NQ Dry Tropics Regional NRM Plan and other relevant statutory and non-statutory plans.

Sustaining management practice adoption

Influencing personal behaviours is important in initiating, accelerating and sustaining the adoption of identified water quality improvement practices. Success in eliciting positive behavioural outcomes is the key to sustaining management practice adoption beyond short-term policy and incentive interventions. In addition to helping achieve water quality objectives positive behavioural outcomes can also reduce the need for 'new' structural management interventions, thereby saving valuable resources.

The Black Ross WQIP proposes to utilise and test the effectiveness of social learning and behaviour change approaches to assist with water quality improvement. The information collected using these methods can be used in several ways including:

- Program, project and management intervention design;
- Monitoring and evaluation of outcomes;
- Informing adaptive planning and management processes; and
- Providing another line of evidence, or form of certainty, around the likelihood of achieving identified water quality objectives.

Reporting of progress toward WQIP outcomes

A comprehensive Monitoring and Modelling Strategy, aligning with the cross-regional monitoring and evaluation activities, will underpin the implementation of the Black Ross WQIP (assuming adequate funding for implementation). This strategy will:

- Update our current understanding of a complex and dynamic environment and help to define and reduce the uncertainty;
- Allow for refining of existing, and designing additional, management actions;
- Assess the effectiveness of different management strategies;
- Provide input to improve decision-making through the adaptive management and learning framework;
- Help prioritise information and knowledge gaps; and
- Demonstrate through reporting to stakeholders and the community, progress toward achieving water quality targets.