

Healthy Waters Management Plan Guideline

Under the
Environmental Protection (Water and Wetland
Biodiversity) Policy 2019

Prepared by:

Healthy Waters Policy and Strategy, Department of Environment and Science.

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1 Introduction

Healthy Waters Management Plans (HWMPs) are environmental plans about water established under section 16 of the Environmental Protection (Water and Wetland Biodiversity) Policy—the EPP (Water and Wetland Biodiversity)¹.

Key elements to be included in an HWMP include:

- environmental values (EVs)²
- water quality objectives (WQOs) to protect identified environmental values for the waters
- ways to protect the environmental values for the waters.

The HWMP process allows for EVs and WQOs to be established in partnership with the local community through a recognised entity, e.g. a regional natural resource management body, local government, or the department.

EVs and their supporting WQOs can inform, guide and provide a common goal for water planning and management. HWMPs address water quality improvement within areas that may range in scale from a local area, or whole of catchment, to river basin or subregions.

1.1 Legislative requirements of a healthy waters management plan

HWMPs help achieve the objectives of the EPP (Water and Wetland Biodiversity), namely ecologically sustainable development in relation to Queensland waters. Section 16 of the EPP (Water and Wetland Biodiversity) establishes that:

(3) A healthy waters management plan for water must:

- a) describe the water to which the plan applies*
- b) include an assessment of the following for the water:*
 - i. any threats to water-dependent ecosystems*
 - ii. any matters that may adversely affect the use of the water as a supply of drinking water*
 - iii. any matters that may adversely affect the natural flows of the water*
- c) if environmental values and water quality objectives for the water are stated in a document mentioned in Schedule 1, column 2—include the environmental values and water quality objectives*
- d) if environmental values and water quality objectives have not been established for the water—include proposed environmental values, management goals and water quality guidelines for the water*
- e) if a water resource plan under the Water Act 2000 applies to the water—include the environmental flow objectives for the plan and ecological outcomes stated in the plan for the water*
- f) identify ways to protect the environmental values for the water, and to monitor and assess the effectiveness of the protection.*

(4) In developing and implementing the plan, the chief executive or entity must have regard to any guideline published by the department about healthy waters management plans.

This document is a relevant guideline under the EPP (Water and Wetland Biodiversity).

¹ The EPP (Water and Wetland Biodiversity) is available at www.legislation.qld.gov.au.

² **Environmental values** (EVs) of a water are the qualities that make it suitable for supporting aquatic ecosystems or for public amenity, safety or health. EVs require protection from the effects of habitat alteration, waste releases, contaminated runoff, siltation and changed flows to ensure aquatic ecosystems are healthy and waterways are safe for community uses and values. Several EVs may be designated for a particular water.

Water quality objectives (WQOs) are long-term goals for water quality management. They are quantitative measures, levels or narrative statements for indicators established to protect the EVs of waters, and may be defined (e.g. as concentrations, loads, or other) for a range of physical, chemical and biological parameters. WQOs are based on scientific water quality guidelines (e.g. Queensland water quality guidelines, Great Barrier Reef Marine Park Authority (GBRMPA) water quality guidelines, and national water quality guidelines (ANZG, 2018)), but may be adapted for local relevance and taking into account social or economic considerations).

1.2 Who may prepare a healthy waters management plan?

HWMPs can be developed by the following parties:

- The chief executive of the Department of Environment and Science (DES) may develop and implement environmental plans about waters.
- A recognised entity may develop and implement an HWMP in cooperation with the chief executive. Recognised entities include local governments, regional natural resource management (NRM) bodies and other entities listed in the EPP (Water and Wetland Biodiversity).

HWMPs should be developed in collaboration with the local community.

1.3 Why prepare a healthy waters management plan?

HWMPs are prepared and implemented to improve water quality—supporting the achievement of the object of the *Environmental Protection Act 1994* in relation to Queensland waters. That is, protecting Queensland’s water environment whilst allowing for development that is ecologically sustainable.

The chief executive, or a recognised entity in cooperation with the chief executive, may develop an HWMP to establish environmental values and water quality objectives for waters, or to decide ways to improve the quality of a particular water.

An HWMP prepared by a recognised entity, or an equivalent plan such as a Water Quality Improvement Plan prepared under the Australian Government’s policy framework for marine and estuarine water quality protection, may be accredited under the EPP (Water and Wetland Biodiversity)—see below.

1.4 Ways to improve water quality and protect environmental values

Ways to improve water quality must be evidence-based, and include:

- waterway restoration programs that address regional targets and outcomes, including reduced contaminant loads (of nutrients, sediments, toxicants including pesticides and heavy metals, pathogens, salinity, etc.) to receiving waters from point and diffuse pollution sources (both urban and rural)
- improving urban stormwater quality and flow through best-practice erosion and sediment control during construction, and applying water-sensitive urban design techniques to new and existing urban land development for the operational phase of development
- addressing waterway³ stability, riparian and non-riverine freshwater wetland condition and environmental flows
- retaining connectivity of aquatic systems in the landscape
- adopting sustainable land management practices, particularly for pesticide and fertiliser management and soil conservation measures
- establishing and implementing management responses (targets, actions, monitoring, evaluation and reporting) and governance arrangements within adaptive management frameworks
- improving knowledge and understanding through research and capacity building.

1.5 Where does a healthy waters management plan apply?

The EPP (Water and Wetland Biodiversity) has application to all Queensland waters. Under the *Acts Interpretation Act 1954*, ‘Queensland waters’ means all waters that are within the limits of the state, or coastal waters of the state. Waters include the bed and banks of waters. Watercourses and bed and banks are defined in the *Water Act 2000*; for tidal waters and boundaries refer to the *Land Act 1994*.

HWMPs apply to all non-tidal and tidal waters within an applicable project area. These can include riverine, estuarine and coastal waters, non-riverine freshwater wetlands, lakes and swamps and groundwaters. HWMPs apply within spatially defined geographic planning areas that may range in scale from local (sub-catchment), to whole of catchment, to river basin (multiple catchments) or subregions (multiple basins).

³ **Waterway** means a natural drainage feature along which surface water flows, including the tidal and non-tidal reaches of rivers, creeks and streams, and excluding minor drainage features such as gullies and spoon-drains. A waterway would be a feature that is assessed using a stream ordering classification system as being order one or larger.

1.6 What is the status of water quality improvement plans?

Water Quality Improvement Plans (WQIPs), prepared consistent with the Australian Government Framework for Marine and Estuarine Water Quality Protection⁴, identify the most cost-effective and timely projects for investment by all parties, including the Australian Government, state and local governments, and community and environment groups. They provide an ecosystem-based approach to integrated water cycle management.

WQIPs seek to deliver significant reductions in the discharge of pollutants to agreed hotspots through:

- identifying the environmental values of water
- determining water quality objectives and load targets for pollutants of concern
- developing environmental flow objectives and environmental water provisions
- implementing catchment-based management actions, including controlling point and diffuse sources, market-based instruments and adaptive management
- applying predictive models and ambient monitoring programs.

WQIPs may build on the existing water quality management components of regional natural resource management (NRM) plans. WQIPs, or equivalent natural resource management plans (NRM Plans), developed by a recognised entity having regard to this guideline, may be accredited under section 16 of the EPP (Water and Wetland Biodiversity).

1.7 Where to start?

In addressing the form and content of an HWMP, and the guidelines that apply to its development, the initial enquiry should include scoping, mapping and assessing the environment. This should be undertaken together with identifying existing, future and potential stakeholders, including government agencies, industry (e.g. mining, agriculture, grazing) commerce, the community and their respective areas of interest within the proposed management unit, and the technical information sources.

Questions to consider:

- why develop an HWMP: what is its purpose—its aim, objective, outcome?
- how will it be used, and by whom?
- who needs to be involved—identify key stakeholders
- decide and define the water (spatial delineation of management unit)
- what legislation and other planning instruments are operating in the study area, and how do these affect or link to the plan?
- what has been done in the area of interest—is there any overlap or potential overlap in planned activities, does one party or the other have exclusive jurisdiction, are the activities/uses compatible?
- monitoring and modelling—where, how (methods to be used) frequency, data collection standards etc.
- resources—financial, human, scientific and technical etc.
- is a steering committee or sub-committees required to undertake specific activities?

1.8 Other matters for consideration

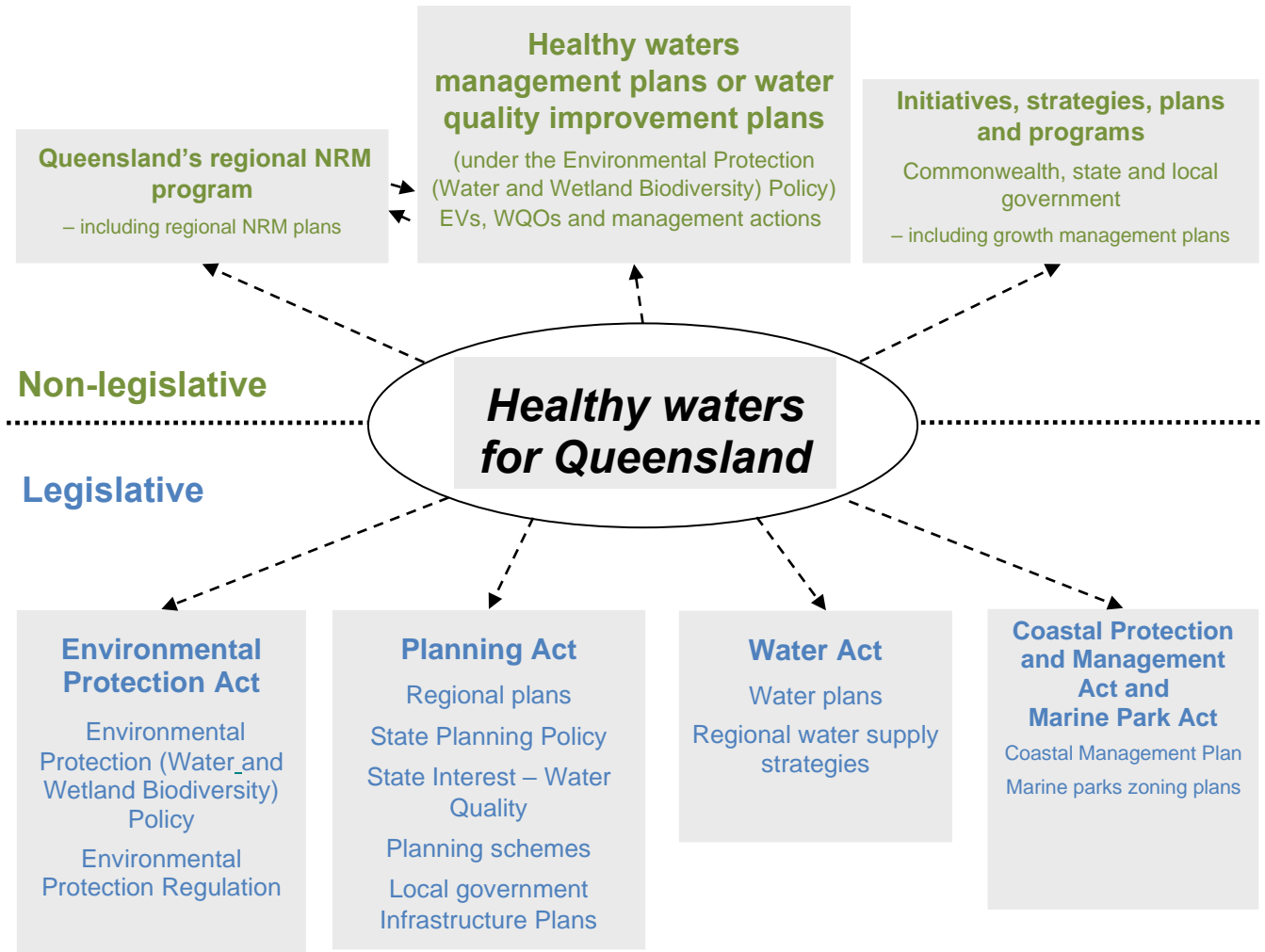
- Transparency—the data and model(s) used in assessing the options and the underpinning science must be referenced.
- Environmental assessment—what environmental assets or ecosystem services might be affected by the option and how might these impacts be mitigated?
- Economic and social assessment—consider the impacts of protecting environmental values for the water.
- Reliability of the knowledge base—how reliable is the data, sources and understanding?

⁴ The Framework for Marine and Estuarine Water Quality Protection is available from www.waterquality.gov.au.

1.9 Legislative, policy and planning framework

The relationships between HWMPs and regional and state policy and planning frameworks in advancing the Queensland Government policy goal of healthy waters for Queensland are depicted in Figure 1.

Figure 1:



2 Structure and content of a healthy waters management plan

A suggested structure for an HWMP is outlined below. The order of parts is flexible (e.g. some entities may wish to firstly outline current condition/water quality issues/threats to aquatic ecosystems prior to reporting on environmental values).

Part A—Executive summary

Part B—Introduction

Part C—Environmental values, management goals and water quality objectives

Part D—Condition assessment and water quality issues

Part E—Management responses

Part F—Governance arrangements

Part G—Monitoring, reporting and evaluation program

Part H—Appendices

Advice on the content for each section is outlined below.

Part A—Executive summary

A succinct overview including the geographic scope of the study area, water quality issues, aquatic assets and the key management actions to protect or enhance the environmental values of waters through water quality improvements.

Part B—Introduction

Brief description of the land and waters to which the plan applies including:

- delineating the study area, river basin(s), catchment(s), sub-catchments, sub-sections, coastal and wetlands to the limit of Queensland waters
- maps or plans of the area
- stating the management units for planning and management purposes
- briefly summarising the historical and current major land and water uses, activities and key industry sectors
- connection to relevant NRM plans, State/Commonwealth plans and policies, planning schemes, Local Government Infrastructure Plans, etc.

Part C—Environmental values, management goals and water quality objectives

Necessary components include the environmental values (EVs), management goals and water quality objectives (WQOs) for the waters of each management unit, the spatial identification of the various tidal and non-tidal water types, and the management intent for the waters—including high ecological value waters, slightly disturbed waters, moderately disturbed and highly disturbed waters.

The first step is to review whether there are any applicable EVs, management goals and WQOs already established in the EPP (Water and Wetland Biodiversity), including

- schedule 1 of the EPP (Water and Wetland Biodiversity): scheduled documents and accompanying plans are available for a number of catchments and coastal waters throughout Queensland from the department's [website](#)
- Great Barrier Reef Basins [End of basin annual load water quality objectives](#): these have been established for sediments and dissolved inorganic nitrogen pursuant to section 11(4) of the EPP (Water and Wetland Biodiversity), and are available from the department's website.

Additionally, the department releases draft EVs materials (reports, mapping) for public comment on the policy consultation page of its website. The status and suitability of these for use in the HWMP process can be confirmed with the department before use.

If EVs, management goals and WQOs have not been established in the EPP (Water and Wetland Biodiversity), then there is a need to identify them for all tidal and non-tidal waters (including non-riverine freshwater wetlands and groundwaters) within each management unit, in accordance with provisions of the EPP (Water and Wetland Biodiversity). The Australian Government Framework for Marine and Estuarine Water Quality Protection provides

further guidance. Additional technical guidance on the process of developing aquatic ecosystem guidelines as a basis for WQOs is available from the DES EPP (Water and Wetland Biodiversity) draft guideline: '[Deciding aquatic ecosystem indicators and local water quality guidelines](#)' (PDF, 1.4M). This guideline should be read as a companion document to this HWMP guideline.

Part D—Condition assessment and water quality issues

Establish, collect, collate and assess information on current risk(s) and condition and trend, quantify key point source and diffuse source contaminants released to waters, and identify the water quality issues impacting on the receiving waters in each management unit. Also identify reaches, locations and species recognised as having high ecological value to assist with assigning levels of protection to all waters, based on the aquatic ecosystems' values and condition.

Specific matters to be assessed should include:

Catchment characteristics

- climatic assessment—climatic zones, rainfall (seasonality), evaporation and consideration of impacts of climate change
- landscape divisions, stream order mapping, slope and drainage, land stability issues, land and soil types and condition
- waterway physical stability (stream type classification, channel/bed stability—extent of streambank, gully and sheet erosion)—identify reaches and catchment zones of concern
- the extent and condition of riparian zones and all wetlands systems⁵ (including riverine, freshwater non-riverine, estuarine and marine wetlands)
- identify areas of environmental/conservation significance recognised in legislation, agreements, technical assessments⁶
- condition of connectivity within the catchment and processes within the catchment
- the terrestrial biodiversity for the management unit, including any assessment using the biodiversity assessment and mapping methodology (BAMM⁷)—identifying areas of high significance
- reaches and locations having high primary, secondary and aesthetic recreational values.

Surface and groundwater assessment—for all tidal and non-tidal waters

- current condition and trend from monitoring results for key contaminants including nutrients, sediments, toxicants (including chemicals, heavy metals, pesticides and herbicides), salinity and pathogens. Refer to 'water quality and ecosystem health' page (including links to monitoring and sampling guidelines) on the department's [website](#), the Queensland Water Monitoring Information Portal, and the Queensland Government open data portal.
- identification of the sources and location of point and diffuse source (urban and rural) key contaminants emissions, including natural background sources. Estimate the key contaminant loads from those sources⁸, identify release locations to receiving waters and seasonal variations. Identify permitted point source and urban diffuse key contaminant loads and concentrations from any development approvals or environmental authorities under the *Environmental Protection Act 1994*.
- aquatic ecosystems risk and condition, including:
 - locations of water quality reference sites identified in relevant monitoring programs and Queensland water quality guidelines (as amended)
 - using assessment of aquatic ecosystem monitoring as identified through the integrated waterways monitoring portal
 - the identification of reaches and locations assessed as having waters with high ecological value and waters

⁵ Wetland information ('WetlandInfo') and mapping is accessible from www.wetlandinfo.des.qld.gov.au.

⁶ Published on the department's [website](#).

⁷ The biodiversity assessment and mapping methodology (BAMM) has been developed to provide a consistent approach for assessing biodiversity values at the landscape scale in Queensland using vegetation mapping data generated or approved by the Queensland Herbarium.

⁸ See Framework for Marine and Estuarine Water Quality Protection (parts 6 and 7), available from www.waterquality.gov.au.

that are slightly disturbed and highly disturbed

- aquatic fauna assessment—including native fish and macro invertebrate assemblages (include any Australian River Assessment System [AUSRIVAS] bioassessments)
- biological assessment—aquatic macrophytes, measures of ecosystem productivity, measures of nutrient assimilation, etc.
- results from any aquatic conservation assessment (ACA)⁹ prepared by the department—identify spatial units with high/very high aquatic naturalness criterion score, high/very high catchment naturalness criterion score, good connectivity, high and very high aquascore. If practical, review indicator/measure results that form the basis for these overall scores, including water quality indicators and measures. Sub-sections used in these assessments may provide the basis for spatial delineation within the planning area.
- hydrology and stream flow, including the hydrological assessment from any water plan under the *Water Act 2000* for the management unit and the associated technical reports—including hydrology (flow volume and seasonality of flow), measures of the level of surface and groundwater extraction, existing and approved infrastructure and environmental flow objectives/ecological outcomes
- groundwater assessment—desktop summary from available monitoring results, relevant provisions for groundwater under the *Water Act*, including any water plan or other groundwater management provisions, or reports published or under preparation by Queensland Government agencies.

Water quality issues

Matters to be addressed should include:

- the loads¹⁰ and concentrations of the key contaminants to achieve the WQOs for receiving waters:
 - comparing the results with the current estimated loads and measured concentrations of key contaminants from each source (point source and diffuse (urban and rural) sources)
 - estimating the maximum key contaminant loads to achieve the WQOs (sustainable loads)
 - estimating the required load reductions by source type (point, urban diffuse and rural diffuse) and location for each key contaminant, to ensure the sustainable contaminant loads and concentrations will be met
 - recognising initiatives from key pollution sources to reduce loads
- urban stormwater management—address erosion and sediment control, stormwater quality, flows and loads relative to the design objectives for managing urban stormwater under the best practice environmental management erosion and sediment control guidelines for both construction and development phases of urban land development
- land management practices that may impact rural diffuse loads and concentrations of key contaminants, for example, the implementation of industry based best management practices
- the biological integrity of aquatic ecosystems
- threats to water-dependent ecosystems including:
 - any matters that may adversely affect the natural flows of the water
 - physical connectivity—assess the impacts of any connected surface and groundwater systems
 - maintaining or restoring wetland and floodplain inundation
- the restoration requirements of key riparian zones and the stabilisation of key reaches impacted by streambank or gully erosion. Identify any key sheet erosion zones and any river bank or bed erosion issues from commercial or recreational activities
- sand and gravel extraction, including under any riverine management plan published by the Queensland

⁹ Aquatic conservation assessments (ACA), available from WetlandInfo, have been developed by DES using the aquatic biodiversity assessment and mapping methodology (AquaBAMM). ACAs are derived from existing information and expert input. The criteria for assessment of conservation values, each of which may have variable numbers of indicators and measures, include naturalness aquatic, naturalness catchment, diversity and richness, threatened species and ecosystems, priority species and ecosystems, special features, connectivity and representativeness.

¹⁰ This stage identifies the maximum load of a contaminant that can be emitted to receiving waters whilst meeting its WQOs (and protecting the environmental values). See Framework for Marine and Estuarine Water Quality Protection: (parts 6 and 7), available from www.waterquality.gov.au. Pursuant to the EPP (Water and Wetland Biodiversity), Great Barrier Reef River Basins [End-of-Basin Load Water Quality Objectives](#) have been finalised for sediments and dissolved inorganic nitrogen. These are published on the department's website.

Government that is applicable to the management unit

- relevant matters under any regional water supply strategy or land and water management plan published by the Queensland Government that is applicable to the management unit
- future growth and estimates of likely increases in key contaminants (from point sources and urban and rural diffuse sources) released to receiving waters
- maintaining or enhancing recreation and aesthetic values (include major recreational sites)
- for drinking water, any matters that may adversely affect the use of the water as a supply of drinking water
- the likely impact of climatic change—e.g. changed rainfall and runoff and possible adaptation scenarios.

Consideration should be given to the relevant local planning scheme, including whether they ‘appropriately reflect’ the State Planning Policy State Interest for Water Quality, and if they include innovative and locally appropriate solutions for urban stormwater management to achieve the relevant urban stormwater management design objectives.

Part E—Management responses

This section should identify the management programs and actions to improve water quality at the management unit scale, the targets to be achieved by management actions, the performance measures to assess against targets, the costs and timelines to achieve the WQOs that protect the environmental values for the waters, and the responsibilities for implementing the actions.

Planning horizon

The HWMP should have a long-term planning horizon—achieving the outcome of protecting the environmental values either by maintaining the WQOs for waters that currently meet the objectives, or achieving the WQOs for other waters. The HWMP should address management programs and actions on a five-year timeframe towards the achievement of the outcomes, and be updated on a five-yearly basis. The planning horizon may reflect relevant longer-term water quality plans (for example, the Reef 2050 Long Term Sustainability Plan).

Identifying management actions

Management actions may be either embedded within specific implementation programs (e.g. the Reef 2050 Long Term Sustainability Plan; [Reef 2050 Water Quality Improvement Plan 2017-2022](#)) or as individual actions, and should include at management unit (geographic planning areas) scale:

- managing activities releasing key contaminants to waters to achieve the required load or concentration reduction to meet the sustainable key contaminant loads and concentrations for the receiving waters—addressing:
 - point source contaminant loads, e.g. upgrading sewage treatment plants and industrial discharges
 - diffuse contaminant loads for urban development areas, e.g. erosion and sediment control, capacity building and compliance enforcement programs, implementation of water sensitive urban design for new and existing development and waterways restoration programs
 - diffuse contaminant loads from the rural (non-urban) landscape
- protecting or enhancing the biological integrity and connectivity of the waters (riverine, estuarine and coastal waters, wetlands—riverine, freshwater non-riverine, estuarine and marine—and groundwaters)
- identifying and prioritising disturbed reaches and areas for improvement—addressing structural stability, riparian extent and condition, and wetland restoration
- identifying programs and actions to advance improved land and water management practices—towards best management practice¹¹ for the sector or activity particularly for maintenance of groundcover, soil conservation and nutrient and pesticide management.

Implementing management actions

The HWMP should include a range of initiatives to implement the management actions, such as land use and planning (rural and urban), best management practice, efficiency measures, source controls, treatment and

¹¹ Includes intensive agricultural activities Best Management Practices (BMPs). See the department’s [website](#); the Queensland Government [sustainable farming](#) website; and the [Reef 2050 Water Quality Improvement Plan 2017-2022](#).

discharge, removal of barriers to connectivity—through works programs, community partnerships, grants, market-based incentives and community-based education.

It should also include:

- a schedule of peer-reviewed costs for implementation (five-year timeframe)
- an outline of agreed responsibilities for implementation
- an enabling program that builds stakeholder knowledge and understanding
- where relevant, detail of how decision-support systems will be developed and applied to evaluate the likelihood of success of the plan, and the degree and timeliness of reductions in key contaminant loads.

Including targets and performance measures for management actions

The HWMP should detail:

- short and longer term management action targets that have measurable performance indicators, and who has responsibility for implementation
- interim management action targets to demonstrate shorter term improvements
- milestones that indicate when the proposed management actions are to be implemented and targets achieved
- timelines—from commencement to completion
- review and evaluation points that allow for implementation of adaptive management.

Part F—Governance arrangements

The governance arrangements to manage the HWMP implementation should be described, including the program of works, funding sources, strategies for managing risks and the relationship to other programs. An important aspect of governance is developing strategies or arrangements for co-investment in implementing the various actions.

The governance section should address the issue of reasonable assurance that projected reductions in the total contaminant loads will be achieved.

Part G—Monitoring, reporting and evaluation

This section should describe proposed monitoring, reporting and evaluation program for the HWMP—enabling assessment of the short and longer term effectiveness of the control actions and the management measures, and whether contaminant loads and concentrations reductions are being met. Water monitoring, reporting and evaluation should be undertaken in accordance with the [Queensland Monitoring and Sampling Manual 2018](#), published by the Queensland Government.

Monitoring

Monitoring should be designed:

- to build upon existing programs
- to assess risk, condition and trend of specific water quality indicators and key contaminant loads—to demonstrate the achievement of longer term targets
- to support use of reporting mechanisms such as annual report cards.

Reporting and evaluation

Reporting and evaluation should:

- be specifically linked to management outputs and outcomes, and address progress against actions, performance indicators and timelines
- be integrated and linked to related reports where possible (e.g. annual report cards)
- be web based and updated annually
- address the outcomes of any review processes undertaken and any updates or improvements made to the plan
- include social and economic factors

Decision support models should be used, if available, to help evaluate progress and possible management

intervention scenarios.

Part H—Appendices

Include any relevant appendices and referenced sources.

Notes:

For HWMPs developed by a recognised entity

- the HWMP is a product of, and copyright is owned by, the recognised entity
- the frontispiece should include a disclaimer stating that the healthy waters plan does not commit, or pertain to commit, government agencies to implement, fund or otherwise resource specific activities or programs, excepting as stated in Part E (Management responses) of this guideline. Acknowledgment of any assistance in preparation should be attributed to recognise funding and other partners.

3 Key resources

EPP (Water and Wetland Biodiversity) documents and plans – available from the department's [website](#)

- EPP (Water and Wetland Biodiversity) schedule 1 documents and accompanying plans for catchments throughout Queensland
- EPP (Water and Wetland Biodiversity) Great Barrier Reef Basins End-of-Basin Load Water Quality Objectives

Guidelines and fact sheets on Environmental Values (DES) – available from the department's [website](#)

- Guideline—Deciding aquatic ecosystem indicators and local water quality guidelines
- Fact sheet—Healthy Waters for Queensland: Environmental Values, Management Goals and Water Quality Objectives: Frequently Asked Questions
- Fact sheet — Environmental values and water quality objectives: Under the Environmental Protection (Water and Wetland Biodiversity) Policy 2019
- Technical guideline—Waste water release to Queensland waters (2016)

Monitoring guidelines

- Queensland Government (2018) Monitoring and Sampling Manual 2018, available from the department's [website](#)

State Interest in Water Quality

- State Planning Policy – state interest guidance material – water quality (DSDMIP) July 2017, available from www.dsdmip.qld.gov.au

Great Barrier Reef

- Queensland and Australian Governments (2018) Reef 2050 Water Quality Improvement Plan 2017–2022, available from <https://www.reefplan.qld.gov.au/>

Water quality guidelines

- ANZG (2018) Australian and New Zealand guidelines for fresh and marine water quality, available from <https://www.waterquality.gov.au/anz-guidelines>
- GBRMPA (2010) Water Quality Guidelines for the Great Barrier Reef Marine Park. Revised edition. Available from www.gbrmpa.gov.au
- National Water Quality Management Strategy and accompanying national guidelines (including the Framework for Marine and Estuarine Water Quality Protection, implementation guidelines) available from www.waterquality.gov.au

Queensland Government (2009) Queensland Water Quality Guidelines 2009 (QWQG) version 3, re-published 2013, available from the department's [website](#)