



Baffle Creek Basin

draft water resource plan information report

October 2006

Prepared by

Water Planning Group

The Department of Natural Resources and Water (Queensland)

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Foreword

Queensland is setting international benchmarks in water planning, reform and management. In partnership with our clients and stakeholders, the Department of Natural Resources and Water (NRW) is committed to delivering a water reform agenda in line with the state's commitment to the National Water Initiative. This will ensure that the environmental integrity of our water resources is protected, while reliable water supplies are maintained into the future.

As part of Queensland's water planning process, this information report has been prepared to support the preparation of a draft water resource plan for the Baffle Creek Basin.

Less developed than its southern and northern neighbours, Baffle Creek is a small coastal catchment between Bundaberg and Gladstone, highly valued by the local community for its excellent condition, and well known to many Queenslanders who visit the area to enjoy an array of natural assets. These include nationally important wetlands, a comparatively undisturbed coast, significant cultural heritage assets and recreational amenities.

While water resources in the proposed plan area are not extensively developed, they support numerous uses important for the local economy. A structured water management framework is now needed to secure supplies for these uses, while providing for new opportunity, and the significant population increase. In addressing these goals, the draft plan must also provide for the health of the ecosystems that underpin the area's position within the regionally important tourism industry.

A catchment-wide framework, developed under the rigour of the water resource planning process, will become a cornerstone of the area's future growth and prosperity within the broader Central Queensland community. Following its completion, the Baffle Creek Basin Draft Water Resource Plan will be released for public review, providing the broader community with an opportunity to comment on its provisions prior to finalisation and implementation under a resource operations plan.

This information report provides the information needed to understand the key issues that will influence the process. I encourage everyone with an interest in this important process to study this document, contribute to the development of the draft plan through the formal submissions process, and consider nominating representatives for the community reference panel to provide input on the development of the plan.

Kerry Shine

Minister for Natural Resources and Water

October 2006

How to make a submission

Individuals, groups and other interested parties are invited to contribute to the development of the Baffle Creek Basin Draft Water Resource Plan. Submissions should focus on the issues pertinent to the development of the plan.

Submissions must be written and include the name, address and signature of each person making the submission. An authorised officer (such as the executive officer or secretary of a committee) must sign submissions made by entities or interest groups. Respondents should state the issues that their submission concerns and include facts that support the submission. Email and internet submissions will also be accepted and will be considered to have been 'written and signed'.

- A submission form is provided in Appendix E.
- A nomination form for membership of the community reference panel is provided in Appendix F.
- Submissions must be received by 11 December 2006.

Submissions can be addressed to:

Postal address

Chief Executive
Attention: Mark Pearson
Department of Natural Resources and Water
PO Box 1167
Bundaberg Qld 4670

Street address

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www.nrm.qld.gov.au/wrp/baffle_basin.html

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1. Overview

1.1 Purpose of the information report

This information report has been prepared as a requirement of the *Water Act 2000* and aims to promote an understanding of the water resource planning process proposed for the Baffle Creek Basin. It is intended to support public involvement in the process and help individuals and groups prepare submissions on the proposed draft plan.

The information report provides details about:

- the purpose of the draft plan
- the proposed plan area and the water resources that will be provided for
- characteristics of the Baffle Creek Basin catchment and current water resource development in the proposed plan area
- key water issues that will affect draft plan preparation
- how the public will be consulted—principally through a formal community reference panel
- proposed arrangements for the technical assessments of environmental, hydrologic, economic and social factors to support the planning process
- how to make a submission about the proposed draft plan.

All submissions will be considered in preparing the draft plan before its release, at which point a second period allowed for public scrutiny and comment will begin. All submissions received on the contents of the draft plan will be considered before the finalisation of the Baffle Creek Basin Water Resource Plan.

1.2 Background

In the initial stages of Australia's modern settlement, the development pressures generated by the small population were negligible and the effects of unstructured water resource allocation policies were correspondingly low. As growth increased and the limits to water availability emerged, it was clear that a more

coordinated approach to resource allocation and management was needed to sustain the community's future needs. Prolonged drought added further impetus to the case for a different approach.

Furthermore, it became evident that future decisions needed to address the links between a healthy economy and a healthy natural environment—an especially important consideration in a dry land like Australia, renowned for its extreme climatic variability. The need to address these factors is most pronounced in populous coastal regions such as the plan area, where a more holistic approach to sustainable management of water resources is required.

1.2.1 National water reforms and initiatives

In 1994 the Council of Australian Governments agreed on the need for a full restructure of water allocation and management approach, underpinned by efficiency objectives, to address the problems associated with managing Australia's limited water resources.

The states and territories agreed to introduce changes that would ensure water resource availability was properly assessed, with supplies sustainably allocated to support economic, social and environmental needs. Under such a structure, existing entitlements could be clearly specified, bringing a new level of confidence to the water-using community.

At the same time, additional water potentially available for allocation within a system could be identified once the needs of other interests, including those of the environment, had been addressed. To further promote efficiency, flexibility and diversification into higher-value uses, the reform agenda committed the states to converting, where practicable, existing water entitlements to tradable water allocations by separating a property's land and water assets.

Any existing surpluses held by an allocation holder, or new savings created through improved efficiency, could be sold and moved to new locations or new uses.

Now at an advanced stage of implementation, the water reform agenda has been reviewed and refined through new goals established under the National Water Initiative 2004.

1.2.2 The *Water Act 2000*—the Queensland approach

Queensland's commitments to the water reform agenda were principally met through the *Water Act 2000* (the Act), which obliges the minister to plan for the allocation and sustainable management of water to meet the state's future requirements. This includes provision for protecting natural ecosystems and security of supply for water users.

1.3 Purpose of a water resource plan

To support the minister's planning obligations, the Act provides for the preparation of water resource plans for any part of the state to provide a framework for sustainably allocating and managing water.

The basis for this framework is created by assessing:

- water availability in the context of climatic variability and community and environmental needs
- community response to the economic opportunities associated with water resources within a plan area, including consumptive uses such as agricultural, industrial and urban uses, and non-consumptive uses such as tourism, recreation and fisheries
- sources of future demand, including opportunities and needs arising from growth in existing and emerging activities, and the growing population associated with the state's diversifying and increasingly regionalised economy.

From these and other considerations the draft plan is developed to provide a framework to:

- secure supplies for existing users
- provide flow strategies that support stated ecological outcomes

- provide a water allocation and management strategy for the 10-year life of the plan
- provide a foundation for future planning.

To maximise the benefit to the community, the water resource planning process is underpinned by principles consistent with the National Water Initiative that aim to:

- promote water use and economic efficiency, notably by introducing trading, where practicable, to allow water to move to high-value uses
- improve security and certainty for water users to support confident forward planning through clearly defined entitlements that specify volume and probability of supply
- provide water to maintain healthy ecosystems.

1.4 Preparation of a water resource plan

The water resource planning process involves the following phases:

- pre-planning
- draft plan development
- public review and submissions
- refinement and finalisation
- implementation under a resource operations plan.

Water resource planning process milestones are shown in Figure 1

The water resource planning process

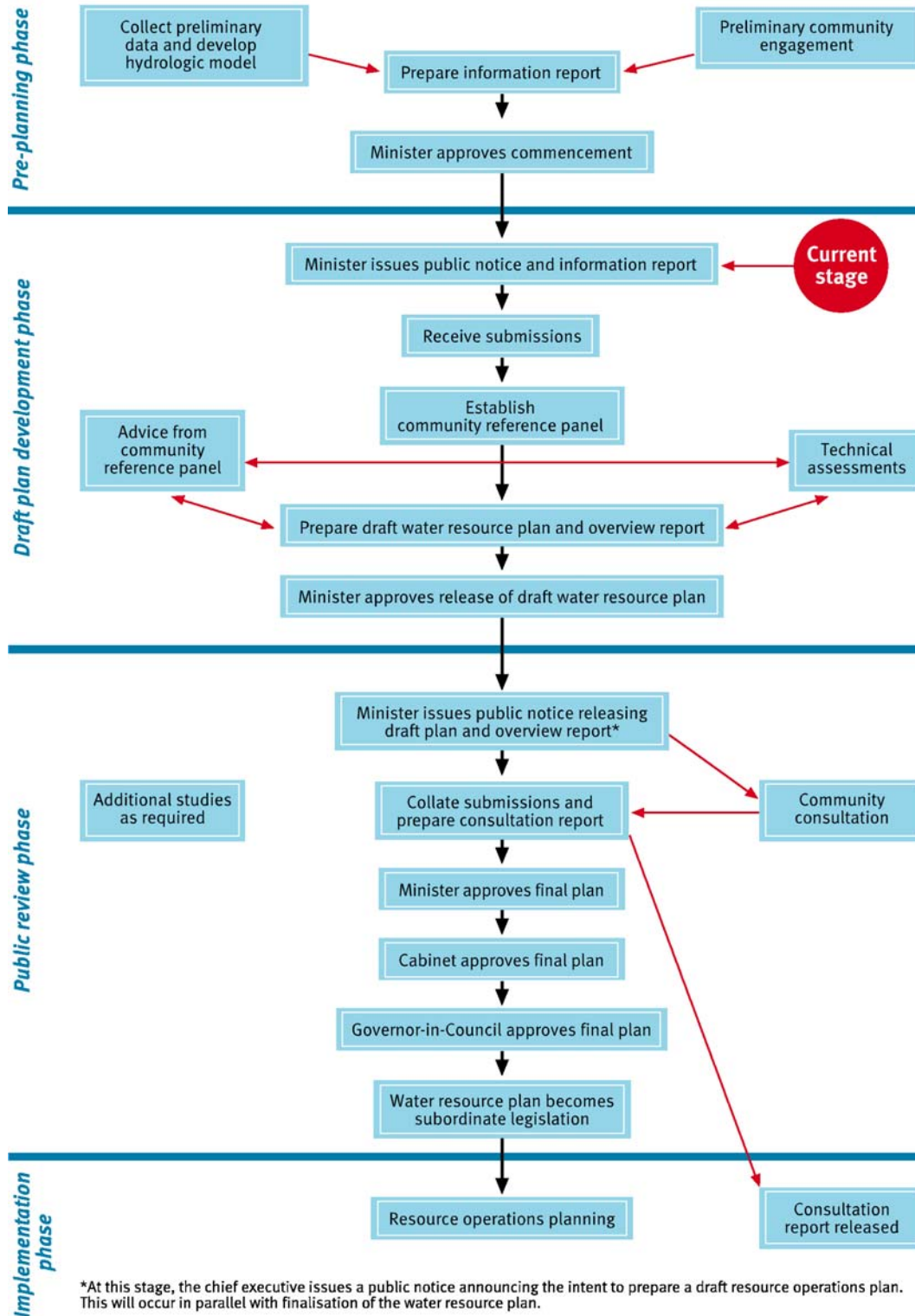


Figure 1 The water resource planning process

1.4.1 Preparation of the draft plan

Following a **pre-planning phase** (which involves initial data collection, preliminary community consultation and preparation of an information report), the draft plan **development phase** begins. This point has now been reached in the Baffle Creek Basin process.

The development phase is initiated when the minister announces the intention to prepare a draft water resource plan for the proposed area. At the same time, an information report is released and the initial public submissions process opens. The notice of intent to prepare a draft plan sets out:

- the reasons for the plan
- the proposed plan area
- the water referred to in the plan
- where copies of the information report may be obtained
- where submissions may be lodged.

During the development phase, important information from technical studies, including assessments of hydrologic, environmental and economic and social factors, is examined. The community reference panel, formed to advise the minister on matters relevant to developing the plan, also provides input and comment on this information.

When the draft plan is released by the minister for public scrutiny and comment, it is accompanied by an overview report that summarises findings of the technical assessments and outlines the provisions in the document, including any approaches, or scenarios, for sustainably managing the area's water resources.

1.4.2 Release of the draft plan

On release of the draft plan, a **public review phase** begins. Formal submissions are invited, all of which must be considered before the plan is finalised.

Within 30 days of the approval of the final plan, the minister must prepare a report that summarises the issues raised through the consultation process and how they were dealt with.

1.4.3 Release of the final plan

Once approved by the Governor-in-Council, the finalised water resource plan becomes subordinate legislation to the *Water Act 2000* and has a 10-year life.

The implementation phase occurs principally through the development of a resource operations plan. A resource operations plan sets out the day-to-day rules for taking water and operating water infrastructure within a plan area. The resource operations plan also deals with any requirements for water entitlements to convert to tradable allocations and establishes trading rules that will protect water resource plan goals. In addition, it details arrangements for monitoring the effectiveness of the implemented water resource plan.

At the end of the 10-year period, the plan is renewed. While water entitlement conditions may be reviewed as part of this process, water allocation title will be held in perpetuity.

2. Introduction to the draft plan

2.1 Proposed plan area

The proposed plan area is shown in Appendix A. The Baffle Creek Basin includes the following subcatchments:

- Baffle Creek
- Littabella Creek
- Deepwater Creek
- Eurimbula Creek
- Worthington Creek.

The major tributaries of the Baffle include the Lagoon, Three Mile, Round, Colosseum, Granite and Island creeks. Major estuarine tributaries of the Baffle include Murrays and Royal Gully, Bottle and Duck creeks, and the Captain, Oyster and Euleilah creeks. (See Appendix B.)

Issues that will be considered in developing the draft plan include:

- water availability in the plan area
- current water use levels and future demand
- managing increased demand for water
- water resource regulatory arrangements to promote
 - more consistent specification for water entitlements
 - provision of water to support riverine processes
 - a possible mechanism for establishing tradable water entitlements
- monitoring and reporting arrangements for assessing the effectiveness of the implemented water resource plan
- water-use efficiency.

2.2 Plan area characteristics

The plan area extends from the eastern slopes of the Dawes Range to the west, to eastern coastal lowlands, and contains extensive protected areas and nationally important wetlands, including the Bustard Bay Wetlands and Colosseum Inlet–Rodds Bay Wetlands.

The Baffle system is one of the few remaining waterways in the region, free

from structures like weirs, barrages or other infrastructure that disrupt fish migrations, flows or tidal movement (DPI, 1996).

Flows in the plan area are important for industries that consume water directly, and for the many non-consumptive industries whose interests are supported by water that remains in the system to perform its natural function.

Consumptive uses include urban supplies, met from groundwater and some stream supplies, beef grazing, plantations and irrigation, supported by stream extractions and, to a lesser extent, groundwater.

Non-consumptive uses include tourism and fisheries, which are increasingly important for the Baffle Creek Basin and are directly linked to the basin's status as a relatively undisturbed system (NRM 2003).

Irrigation is mainly confined to the Baffle and Littabella creek areas, and an area supplied by groundwater in the Three Mile Creek subcatchment near Bororen. In the Baffle Creek area, irrigation supports dairy farming, fodder, sugar cane and two paulownia (empress tree) plantations, while sugar cane predominates in the Littabella Creek area. Macadamia plantations are grown in the Deepwater and Blackwater creek areas.

The proposed plan area falls within the Miriam Vale and Burnett shires. Town water supplies are taken mainly from underground sources. Coastal sand aquifers supply Agnes Water and Seventeen Seventy, while the Elliott Formation meets the needs of Winfield. Granite and alluvial formations are important for Bororen and Miriam Vale, although the latter also takes water from Baffle Creek when this source is available.

2.3 Notice of intention to prepare a draft plan

On initiating the planning process, Section 40 of the *Water Act 2000* requires the minister must publish a notice of the intention to prepare a draft water resource plan. The Notice of Intent to Prepare a Draft Water Resource (Baffle Creek Basin) Plan was published on 25 October 2006 and a copy of this notice is provided in Appendix C of this report.

2.4 Moratorium

Under the *Water Act 2000*, the minister may, if necessary, publish a moratorium notice to protect:

- natural ecosystems
- existing water entitlements
- other authorisations to take or interfere with water.

The moratorium aims to maintain the status quo for water entitlements and developments while a water resource plan is being developed. This allows planning to proceed from a stable water-use base so that any potential for future development supported by the final plan will be consistent with plan goals.

A moratorium on water in watercourses, lakes and springs in the proposed Baffle Creek Basin plan area was published on 16 July 2004. The moratorium applies to all specified activities associated with water from these sources. The moratorium notice for the basin is shown in Appendix D.

3. Catchment characteristics

This chapter provides an overview of climatic and catchment characteristics associated with current water use that will influence development of the draft plan. These elements are also discussed in Section 6 through economic and social, environmental and hydrologic assessments.

3.1 Economic and social profile

The Baffle Creek basin plan area is located within parts of Miriam Vale, Calliope and Burnett shires. There has been significant population growth in recent years, particularly in the coastal resort towns of Agnes Water and Seventeen Seventy.

The area has a comparatively narrow economic base, with about two-thirds of registered businesses belonging to the agricultural and fisheries sector. The key industrial water resource consumers comprise irrigated dairy farming, irrigated fodder and horticulture.

Tourism and affiliated service industries have become increasingly important for the plan area, particularly in the towns of Agnes Water and Seventeen Seventy.

3.2 General characteristics

The proposed plan area includes the subcatchments of Littabella, Baffle, Deepwater, Eurimbula, and Worthington creeks. The Baffle Creek subcatchment is the largest of these. Table 1 lists the major subcatchments and their areas, while their boundaries are shown in Appendix B.

3.2.1 Rainfall

Mean annual rainfall recorded at the Rosedale station, located centrally in the catchment, is 1094 millimetres per annum (mm/a). Most falls occur from December to March, with the lowest recorded in winter. Monthly rainfall statistics for Rosedale are shown below in Table 2.

3.2.2 Stream flow

Records from the catchment's sole gauging station at Mimdale, at AMTD¹ 55.7 kilometres (km) on Baffle Creek, show a mean annual flow of 246 435 megalitres per annum (ML/a). This is generated from about 55 per cent of the area of subcatchment B (Appendix B). The estimated mean annual discharge for the Baffle Creek Catchment as a whole is 750 000 ML/a, an estimated 533 000 ML of which is contributed by Baffle Creek (DPI 1992). Monthly stream discharge data for the Baffle Creek gauging station at Mimdale are shown in Table 2.



Recreational fishing is increasingly important to the economy of the Baffle Creek Basin

(Photo Christine Schmalfluss)

¹ AMTD is the adopted middle thread distance in kilometres, measured along the middle of a watercourse from its mouth or downstream confluence with a main watercourse.

Table 1 Areas of catchments in the proposed plan area

Catchment	Area (km ²)
Littabella Creek	336.7
Baffle Creek	2 559.5
Deepwater Creek	324.7
Eurimbula Creek	342.4
Worthington Creek	550.5
Total	4 114

Source: Department of Natural Resources, Mines and Water Geographic Information System data, 2006

Table 2 Baffle catchment area hydrologic statistics

Station number period	Rosedale 039084 1889–2005			Baffle Creek at Mimdale 134001 1969–2005		
	Rainfall (mm)			Stream discharge (ML)		
Month	Max	Mean	Min	Max	Mean	Min
Jan	1 321	201	1	234 674	43 019	9
Feb	840	181	4	797 722	68 727	0
Mar	526	126	0	283 455	33 140	137
Apr	399	70	0	317 346	19 816	1
May	353	63	0	305 791	19 880	0
Jun	336	58	0	67 061	7 049	7
Jul	295	48	0	107 625	9 505	0
Aug	121	33	0	19 538	2 020	0
Sep	198	35	0	42 595	3 288	0
Oct	359	70	0	49 625	3 476	0
Nov	284	83	0	68 878	11 229	0
Dec	631	126	0	429 425	22 599	0
Annual	2 275	1 094	381	1 114 748	243 435	923

Source: Department of Natural Resources and Water 2006

3.3 Current water use

All water used in the basin is unsupplemented—that is, taken directly from stream flows, overland flows and subartesian sources, and not supplemented by releases of stored water managed in a water supply scheme.

The draft plan will provide for the management of surface water taken from streams, the most significant source of supplies. It will not apply to groundwater and overland flow water use, which is not considered a significant risk to existing entitlements and natural ecosystems.

Unsupplemented entitlements in the plan area are currently licensed on the basis of:

- the area irrigated in hectares
- volumetric limit
- flow threshold (water harvesting).

These entitlements were issued under an assortment of licensing arrangements that did not require unsupplemented licences to

be metered. The *Water Act 2000* provides for these many types of licence to be replaced by entitlements defined against common criteria—including volumetric limit.

In the absence of any records of water-use levels throughout the plan area, current overall usage can only be estimated. An audit of licensed works in the basin began in September 2006 in an endeavour to assess historic water-use patterns and demand.

A summary of unsupplemented surface water entitlements in the proposed plan area is shown below in Table 3.

Table 3 Summary of unsupplemented surface water entitlements

Subcatchment	Area-based licences		Riparian water access	Water harvesting	Roadworks	Order in council
	No. of licences	Area (ha)	No. of permits	No. of entitlements	No. of works	No.
Littabella Creek	15	289	8	1	0	0
Baffle Creek*	38	561	30	8	14	1
Deepwater Creek	5	331	0	1	3	0
Eurimbula	0	0	0	0	0	0
Worthington Creek	0	0	1	1	1	0
Total	58	1181	39	11	18	1

*There are an additional 4 volumetric based licences in the Baffle Creek subcatchment totalling approximately 8 ML.

Source: Department of Natural Resources and Water 2006

4. Planning considerations

This chapter outlines some of the issues, opportunities and challenges that will be central to preparation of the Baffle Creek Basin Draft Water Resource Plan.

4.1 The National Water Initiative

Under provisions of the National Water Initiative agreed to by the Council of Australian Governments (COAG) in 2004, Queensland has committed to:

- ensuring ecosystem health by implementing regimes to protect environmental assets at a whole-of-basin, aquifer or catchment scale
- improving the security of water access entitlements, including clear assignment of risks of reductions in future water availability and returning over-allocated systems to sustainable allocation levels
- ensuring water is put to best use by encouraging the expansion of water markets, involving clear rules for trading, robust water accounting arrangements, and pricing based on full cost recovery principles
- encouraging water conservation in our cities, including better use of stormwater and recycled water.

4.2 Ecological flow

Stream flows are essential for many riverine and ecological processes, and the associated life cycles and health of aquatic and other plants and animals. The flow management provisions in the draft plan aim to support these natural values.

There is a strong interrelationship between flows, the geomorphic processes that shape the riverine landscape, including estuarine and near-coast areas, and the health of aquatic ecosystems. These factors will be considered in developing the environmental provisions and stated ecological outcomes of the draft plan

A technical advisory panel, comprising independent scientists with relevant expertise, will advise on links between

flows and the health of the plan area's riverine natural assets.

The panel's advice will contribute to developing water management strategies, consistent with other goals, that favour identified ecological outcomes. Water users and other groups and individuals with an interest in environmental outcomes will also be consulted on how these provisions are formulated.

A major challenge will be to balance water taken for consumptive uses such as stock, domestic, urban and agricultural purposes, and water for the environment and other non-consumptive values.

It is important to note that provision for environmental needs involves more than simply reserving a volume or flow to support natural processes. The type, timing, frequency and variability of flows that promote environmental health are all significant.

Flow strategies are structured as much as possible to mimic natural patterns that would have occurred before water resource development.

At present, there are no defined rules that provide for environmental needs in the proposed plan area.



Waterhole near Lagoon Creek, north-west of Bororen—ensuring ecosystem health is part of provisions of the National Water Initiative

(Photo Christine Schmalfluss)

4.3 Securing performance of water entitlements

Under the *Water Act 2000*, the minister is obliged to secure water supply so that the allocation and sustainable management of water to meet the state's future requirements can be planned for.

To achieve this, water allocations are, where possible, defined in terms of volume and probability of supply.

The greatest demand for water entitlements to convert to allocations is likely to exist in the Baffle and Littabella creeks where current water use is most intensive. During the draft plan development phase, the potential for water allocations to be created in these priority areas will be considered.

A fundamental goal of the water resource planning process is to create clearly defined water entitlements with specified volumetric limits and access conditions. The enhanced security these will provide will improve business confidence and encourage forward planning in the water-using community.

4.4 Trading

Tradable water allocations are preferred under the National Water Initiative because they promote efficiency and high-value use by creating a water market subject to the same supply and demand forces that generate efficiency elsewhere in the economy.

Traditionally, water entitlements were tied to the location at which supplies were taken, and could not be sold separately from the land to which they were attached. This was seen as a hindrance to business flexibility and efficiency goals, such as the movement of water to high-value uses.

While these goals will be considered in developing the draft plan, the lack of detailed stream-flow and water-use records that support creation of tradable allocations may call for a different approach, and water trading may not be a viable option in the Baffle Creek Basin.

4.5 Titled assets

The case for improved entitlement specification is also underpinned by the recognition that tradable water allocations are assets with clear title that is recorded alongside land title on the state's resources register. This level of definition for a 'parcel of water' corresponds to the precise specification associated with a 'parcel of land'.

Importantly, it enables both seller and buyer to assess the value of the asset against its potential use, in much the same way as if it were land.

With a parcel of land, surveyed location and area provide the necessary specification; however, a water allocation is specified volumetrically, and in terms of its likely availability from year to year. These properties can only be determined by assessing water resources against the stream-flow patterns that are likely in the area, and this in turn relies on the availability of historical flow records.

Records of the historical water use associated with an entitlement are also important because they allow the hydrologic model to be calibrated to indicate how the entitlement can be expected to perform in the long term. This property is another essential element for establishing the volume that can be specified under a water allocation—again, important for attaching a monetary value to the asset.

4.6 Complementary objectives for enhanced security

The necessary level of specification is established under provisions of the *Water Act 2000* that require water allocation security objectives and environmental flow objectives to be stated wherever water allocations are created.

These twin sets of objectives are supported by hydrologic modelling based on stream-flow records and water-use data, which is used to establish a level of definition for both values.

Water allocation security objectives are expressed as performance indicators. These indicate the minimum expectations for any water allocations that may be established under a final plan. These are based on mathematical modelling of historical records, and therefore give only an indication of an entitlement's performance. They cannot be viewed as a 'guarantee' of supply.

4.7 Availability of records

The Baffle Creek plan area has only a single stream flow gauge at Mimdale, and water taken under licences is not metered. This contrasts with other areas where data from a broad base of gauges are supported by comprehensive water-use records.

The hydrologic assessment includes techniques to estimate stream flows for ungauged catchments and water-use data from surveys and industry standards.

4.8 Volumetric limits and metering

Under present arrangements, water entitlements are defined against a range of criteria, including volumetric limit, the number of hectares that can be irrigated, and the flow threshold at which pumping is allowed.

Under these arrangements, water use is not measured or properly accounted against overall water availability. Consistent licensing arrangements supported by water use measurement are needed to promote efficiency, state and national water accounting goals, and future planning activities.

All entitlements in the plan area—including any that convert to water allocations and those that do not—will be specified in terms of access conditions and assigned an annual volumetric limit. The volumetric limit is the maximum amount of water that can be taken in a year.

Proposals for establishing volumetric limits for each type of licence will be discussed in the draft water resource plan and implemented, along with metering requirements, in consultation with water users under the resource operations plan.

Metering provides the information needed to ensure water users comply with the conditions of their water entitlement and will therefore encourage water users to take no more than their share. Meters will also help users improve their water resource management, providing accurate data to help them use water more efficiently to maximise their production.

4.9 Future water requirements

Unallocated water is water that can be made available for future use without compromising the environment or the security of supply to existing water users.

The final water resource plan will contain provisions to address anticipated demand.

These may include the potential for demand to be met from efficiency gains within the existing supply base, along with other initiatives such as recycling.

When preparing the draft water resource plan, the minister will consider future water requirements including cultural, economic, environmental and social requirements.

Through the assessment process, the potential for streams in the plan area to support additional entitlements will be considered. Arrangements for this would be set out on the implementation of the final plan under a resource operations plan.

However, without the necessary comprehensive data, the precautionary principle should be adopted towards the creation of a reserve of unallocated water, consistent with the high conservation values of the plan area and the plan goals.

4.10 Monitoring the plan

Under the resource operations plan, a monitoring program will be established to assess whether the plan outcomes are being met. These outcomes include ecological outcomes and other water allocation and management outcomes stated in the plan. Monitoring and reporting will be the department's responsibility.

5. Consultation

5.1 Community input

A key component of the water resource planning process is the consultation that occurs between the government and the community.

In developing the draft plan, members of the community will have a formal opportunity to provide advice to the government through:

- submissions under the Notice of Intent about matters they would like the minister to consider in preparation of the draft plan
- a community reference panel formed during the draft plan development to represent cultural, economic and environmental interests in the proposed plan area
- further submissions after the release of the draft plan.

Additionally, the community will be able to contribute to the planning process at stakeholder meetings and information forums throughout the plan area.

5.2 Community reference panel

5.2.1 Appointment

A community reference panel must include representatives of cultural, economic and environmental interests in the proposed plan area. Typically, panel membership comprises water users, business representatives, Indigenous representatives, environmental and natural resource management interests.

The panel provides input on a range of issues relevant to development of the draft plan. It is formed to represent the breadth of interests associated with the water resources in question and promote, wherever possible, a shared understanding of differing viewpoints and aspirations.

While the panel does not have a decision-making role, it advises the minister on pertinent issues, provides important input and serves as a sounding board on community concerns, views and aspirations.

5.2.2 Panel selection process

It is proposed that the community reference panel will be drawn from existing stakeholder groups in the Baffle Creek Basin. In line with previous water planning processes, the department will invite nominations and possibly negotiate membership with stakeholder groups. It is proposed that the Burnett Mary Regional Group for Natural Resource Management (BMRG), as well as other identified groups, will be invited to nominate representatives. However, the minister will consider all nominations before deciding on panel composition.

A notice calling for nomination for representation on the panel will be published on 25 October 2006. Nominations will close on 11 December 2006. A copy of the notice is provided in Appendix C.

A nomination form for membership of the community reference panel is included in Appendix F.

5.2.3 Remuneration

Reasonable out-of-pocket expenses incurred by panel members associated with travel to and from meetings, including transport—for example, vehicle hire or mileage—will be met. Subject to prior approval, the cost of accommodation and meals will be reimbursed in line with the department's corporate standard. Panellists will not be remunerated for attending meetings.

6. Technical assessments

6.1 Introduction

The purpose of technical assessments is to obtain expert analysis of the hydrologic and environmental, and economic and social factors relevant to preparation of the draft plan. The technical assessments will be based on existing information, augmented by any additional work needed to address critical gaps.

6.2 Economic and social

The economic and social assessment will explore regional economic and social issues within their water resource context. The work will involve an assessment of current water-use patterns, including non-consumptive uses, and how they support economic and social values in the plan area. This will provide a basis for exploring future water demand, from which future needs can be assessed.

6.3 Environmental

A technical advisory panel, comprising independent scientists with relevant expertise, has been formed to undertake an ecological assessment of the draft plan area. The panel will:

- assess the current environmental flow condition of rivers within the proposed plan area
- identify critical aquatic ecosystems and areas of high conservation value that are dependent on surface water and connected subartesian water
- identify flow characteristics important for key ecological and geomorphological values.

The panel will also consider important links between stream flow, lake, wetland, estuarine and bay systems. Areas of significant groundwater–surface water interaction may also be considered.

6.4 Hydrologic

Hydrology, the study of water as it moves through the water cycle, is fundamental to learning about the relationship between flows and the environment. For the water resource planning process, hydrologic

assessment relies substantially on mathematical modelling of stream flows.

Nodes are connected by links, which represent stream reaches, and allow flow characteristics to be represented as closely as possible. Characteristics include the time it takes water to move through stream reaches, and the way the peak of a flow is smoothed as it progresses downstream.

The model is used to

- simulate flows as they might have been before current usage patterns occurred
- represent how flows have been affected by current use
- assess the effects of alternative approaches to future planning needs.

Together with the ecological assessment, the hydrologic assessment will provide the necessary understanding of how water movement in the hydrologic cycle links habitats and supports natural processes.

The information provided by the model can then be used in technical assessments to determine the possible implications of water allocation options, and how water might be shared between consumptive uses and the environmental flow needs of aquatic ecosystems.

7. Natural resource management activities

In developing the draft plan, the minister must consider sustainable resource management strategies and policies for the basin, including the coastal zone.

Examples of relevant strategies include:

- the Council of Australian Governments Water Reform Agenda, now incorporated in the National Water Initiative
- the Inter-Governmental Agreement on the Environment
- the National Principles on the Provision of Water for Ecosystems
- the Environmental Protection Policy (Water) 1997 under the *Environmental Protection Act 1994*.
- National River Health Program's report, *Environmental Water Requirements to Maintain Estuarine Process*
- *National Water Quality Management Strategy—Guidelines for Groundwater Protection in Australia*, a report by the Agriculture and Resource Management Council of Australia and New Zealand and the Australian and New Zealand Conservation Council
- the *State Coastal Management Plan* written by the Environmental Protection Agency (EPA), which provides coastal management policy directions and defines how these directions should be implemented
- *Wide Bay–Burnett Regional Plan*
- *Great Sandy Region Management Plan*
- the Australian and Queensland governments' *Reef Water Quality Protection Plan 2003*
- *Central Queensland Regional Water Supply Strategy*
- other planning processes such as those produced by government agencies, natural resource management bodies, and regional and local water supply strategies.

Submissions are invited detailing relevant strategies and plans that should be considered in the Baffle Creek Basin water resource planning process.

References

- Department of Natural Resources and Mines 2003, *State of the Rivers: Baffle Creek and Major Tributaries*, NRM, Queensland.
- Department of Primary Industries 1996, *A Fisheries Resource Assessment of the Baffle Creek System in the Wide Bay-Burnett Region of Queensland*, DPI, Queensland.
- Department of Primary Industries 1992, *Overview of Water Resources and Related Issues: The Curtis Region*, DPI, Queensland.
- Environment Australia 2001, *A Directory of Important Wetlands in Australia*, 3rd ed. Canberra.