



DEPARTMENT *of*
PRIMARY INDUSTRIES,
WATER *and*
ENVIRONMENT

ENVIRONMENTAL
MANAGEMENT
GOALS
for **TASMANIAN**
SURFACE WATERS

SOUTHERN MIDLANDS
CATCHMENTS

February 2000

Environmental Management Goals

For Tasmanian Surface Waters:

Southern Midlands Catchments

This discussion paper was used as the basis for community and stakeholder participation in the process of developing environmental management goals for the waterways which are located within the Southern Midlands Council boundaries.

It was prepared by the Environment Division, and the Land and Water Management Branch, of the Department of Primary Industries, Water and Environment; and the Southern Midlands Council.

Words and expressions used in this discussion paper have, unless the contrary intention appears, the same meaning as defined in the *State Policy on Water Quality Management 1997* and the *Environmental Management and Pollution Control Act 1994*. Ecosystem refers to physical, chemical and biological aspects of the aquatic environment.

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1 INTRODUCTION

1.1 Why do we need water reform?

A good supply of fresh, clean water is an essential requirement for human life, a healthy environment and a productive economy.

We need it for drinking, for recreational activities like fishing, swimming and boating, to provide the food we eat and export, to generate clean electricity, and to support mining and other industries.

We also expect our rivers and lakes to look healthy, and provide a healthy environment for a wide range of aquatic plants and animals.

We take for granted that our use of water resources is sustainable; that our hard-working water will still be there in a healthy state to provide the same benefits for future generations.

Tasmanian rivers range from relatively short, swiftly flowing rivers fed from mountain sources to slowly flowing rivers which may be reduced to a series of pools during dry periods. Our waterways are not immune from problems, however, and many of our river systems are showing signs of stress.

River health, and the health of the economies that depend upon them, is clearly linked to the way we use the waters; the degree of regulation we impose; the quantity of water we take out; and the quality of water we return.

In response to a general recognition across the community of the importance of having clean water and appropriate

river flows, the Tasmanian Government is currently finalising a range of reforms designed to ensure that these values are protected for the future of the State.

1.2 What are these reforms?

Two major aspects of the water reforms are water quality management and water quantity management.

(a) water quality management

The *State Policy on Water Quality Management 1997* is designed to maintain or enhance the quality of Tasmanian surface waters through the identification of values and uses which are considered worthy of protection.

The first purpose of this discussion paper was to explain the Policy and how the environmental values will be identified and used. Local communities have a key role in identifying these values in their catchments.

(b) water quantity management

The recent introduction of the *Water Management Act 1999* to replace the *Water Act 1957* provides for:

- major changes to the institutional arrangements for water management;
- the ready transfer of water rights between different users;
- enhanced stakeholder and community input into water allocation and management; and
- a more transparent and equitable water allocation system, including formal allocation of flows to maintain a healthy river environment.

The second purpose of this discussion paper was to encourage community

involvement in ensuring sustainable use of our water resources by identifying water quantity values for selected catchments. These values will of assistance to the Department in undertaking water quantity planning in your catchment.

1.3 What will this community input achieve?

The objective is to identify water management goals for the catchments within your municipal area. These water management goals will include Protected Environmental Values (PEVs) as defined under the *State Policy on Water Quality Management* and identified water quantity values.

1.4 What information did we receive from the community?

Local communities have a valuable understanding of their regional waterways. A series of workshops and public meetings were held throughout the region where we asked questions like: What uses or values do you have for surface waters in this area that rely upon maintaining or enhancing water quality? Which of your activities rely upon maintaining or enhancing the flow of water into catchment waterways? Are there certain places on your rivers that you traditionally use for swimming or other recreational activities? Do you fish in them? Are there specific features of your rivers and streams that are recognized scenic attractions, such as rapids or waterfalls? Do you know of rare or endangered animals or plants in, or adjacent to, specific areas of your rivers or streams? Do you use water for livestock watering? Does your river supply the local town water supply? Do you draw water from it to irrigate your farm? How often do you need to draw water from it, and when?

Answers to these questions were recorded as 'Community Values' These values are summarised in Section 2.2.

Planning to ensure sustainable use of these waters and protection of river health requires sound knowledge of local water quality and quantity issues. Community input to this process is important. Many of the community water values and other issues that were raised at the meetings could be best managed through integrated catchment management.

1.5 How will your input be used?

Information on water quality values from the community assisted the Board of Environmental Management and Pollution Control and the Southern Midlands Council to finalise the range of Protected Environmental Values for the surface waters of your municipal area. These values will be shown in council's planning scheme. Further details of what this means is given in section 3 below.

Information from you on water quantity values will be utilised along with advice from stakeholders, catchment groups and the public to better plan the water resources of your catchment. Water management planning will be closely linked with overall catchment management planning to put water resource management on a sustainable footing for the State.

2 SOUTHERN MIDLANDS CATCHMENTS OVERVIEW

2.1 Catchment description

The municipal area of Southern Midlands covers 2561 km² and includes areas of five major river catchments. These are:

- the Jordan River;
- the Coal River;
- subcatchments of the Macquarie River including the Blackman River, Tin Dish Rivulet and Kitty's Rivulet;
- the Little Swanport River; and
- the headwaters of the Prosser River and its major tributaries.

This area is entirely land-locked, with no estuarine or coastal waters within its boundaries.

Rainfall within the municipal area ranges between 500 mm and 800mm. There is considerable variation across the area, with around 500mm being average in the Tunbridge, Oatlands, Kempton and Campania areas, and over 800 mm being average in the Levendale area. River flows are generally highest in winter and spring, although summer low-pressure systems off the east coast may generate heavy run-off in the Prosser and Little Swanport catchments.

Town populations in the municipal area (total population 5600) are small, typically being less than a thousand residents. Semi-urban or rural residential communities are located from Bagdad south, and around Campania. There are no areas of intensive industry within the municipal area. Land uses are predominantly rural-based, comprising cattle and sheep

grazing, private forestry and State Forestry. Construction of Craigbourne Dam on the Coal River in 1986 has allowed the development of intensive irrigation farming within this catchment.

The most important lakes and dams in the municipal area are Lakes Tiberias and Dulverton within the Jordan catchment, and Craigbourne Dam (12,500 ML [megalitres] capacity) located on the Coal River south of Colebrook. There are two smaller dams near Interlaken at the head of the Blackman River, which supply filtered and treated (chlorine and fluoride) town water to Oatlands. An estimated 400 domestic connections are served with an annual water use of between 90 and 150 ML. Water is also drawn from the Blackman River at Tunbridge to supply 70 domestic connections with about 16 ML per year. A spring-fed (Stainers Spring) reservoir on the Jerusalem Creek subcatchment of the Coal River supplies filtered and chlorinated town water to about 70 users in Colebrook. Other centres in the municipal area - Bagdad, Mangalore, Kempton & Campania - are within the area served by the Hobart metropolitan water reticulation system.

A project to refill Lake Dulverton has been underway since 1995 when a bore with a six litre per second capacity was opened into a small 2 hectare section of the lake. Approximately 25 ML per year is drawn from the bore. Since 1998, Blackman River water has also been used to fill the lake, approximately one quarter of which has now been partitioned through the construction of a

new bund wall around Marys Island. Approximately 160 ML per year is now directed to the lake over the wetter months.

Regional agricultural productivity relies on maintaining and enhancing the municipal area's water resources. An estimated 20% of the South East Irrigation Scheme (SEIS) between Campania and Craighourne Dam lies within the Southern Midlands Municipal area. Water usage for the whole scheme in the 1997-98 season was approximately 3200 ML across 1300 hectares with intensive cultivation of crops such as peas and poppies. Further details of Commissioned Water Rights (CWR) allocated in the Southern Midlands municipal area are outlined below.

Table 1 : Catchment Water Allocation

Catchment	CWRs	Yearly Use
Jordan	72	3170 ML
Coal (non SEIS)	24	1360 ML
Little Swanport	8	3616 ML
Prosser	5	78 ML
Macquarie	12	1400 ML

2.2 Community Values ¹

The local community sees local wetlands and waterways as providing a valuable regional resource to support a range of activities, values and uses. There is widespread use for stock watering and irrigation (with intensive

irrigation within the South-East Irrigation Scheme) across the municipal area. The supply of town drinking water to Colebrook, Tunbridge and Oatlands is also seen to be a critical use. Access to sufficient supplies of water for fire-fighting purposes is also seen as an important requirement. Water extraction for domestic use (non- drinking) also appears to be widespread.

The waterways are important for primary recreation in some areas and secondary contact recreation across all areas. A range of recreational pursuits - fishing, duck hunting, canoeing, rowing, sailing and model-boating - are undertaken across the region. The Craighourne Dam has even been reported as occasional sea-plane landing site!

Regional wetlands and waterways provide important habitat for native flora and fauna. Information from the local community highlighted the importance placed on maintaining the integrity of the streambank zone (both in terms of soil stability and native vegetation cover) and instream habitat to support a diversity of native fauna across the municipal area. Some of the aquatic fauna cited includes larger animals such as the platypus and the native water rat (*Hydromys chrysogaster*), some species of Galaxiid fish and invertebrates such as the small shrimp in the family Atyidae. While these species are considered to be fairly widespread across the catchment, others such as the Swan Galaxias (introduced to the Rocka Rvt. in the upper Little Swanport River catchment waterway as part of an endangered species recovery plan) have only a restricted distribution. The slow-growing, native freshwater mussel (*Velesunio moretonicus*) inhabits 'north draining' waterways such as the Blackman River. While not endangered, poor water quality and over-fishing can significantly affect its

¹ Community workshop, Oatlands, 29/6/99.

viability. Two specific sites - Lake Dulverton and Lake Tiberias - were also highlighted for their general habitat values.

Physical features of the waterways are also seen to be important. The physical barriers provided by waterfalls on the upper Rocka Rvt. and the water supply impoundment on the upper Blackman River were seen to be critical in preventing the spread of trout into upstream areas containing Galaxiid fish. It is thought that trout would displace these native species. Maintaining a series of deep pools in waterways was also deemed important from an irrigation, stock watering, habitat preservation and purely aesthetic point of view. Sandstone bluffs on the upper Jordan are also a significant landscape feature within the municipal area.

Other nominated values include cultural values (streamside Aboriginal relics); economic values (intrinsic value adding to property aside from factors such as irrigation); and traditional use values (extension of recreational values developed over a long period of usage).

2.3 Characteristic water quality

A 'snapshot' summer survey of water quality in the **Jordan River**² provides an indication of characteristic water quality under low flow conditions. A longitudinal survey of the river showed great variation in dissolved oxygen, temperature and conductivity (as would be expected during low summer flows) and colour; generally low turbidity and suspended solids levels; slightly alkaline waters; low total phosphorus; and concentrations of total nitrogen at

which development of algal blooms may be a problem. Both point source discharges (from several sewage treatment plants on the river) and diffuse source inputs would contribute to Jordan River nutrient levels. Higher winter flows would be expected to produce some variation in these parameters.

Periods of high salinity for some surface waters and episodic algal blooms are two water quality concerns in the **Coal River**³ Catchment. Generally nutrient concentrations in the waterways are low with occasional turbidity and suspended solids peaks linked to rainfall events in the catchment. Other parameters – dissolved oxygen, pH, biological oxygen demand, cations, colour and metals – are typically within ANZECC guidelines. The Coal River is a highly regulated (controlled) stream below the Craighourne Dam, particularly during the summer irrigation season. The Dam also significantly influences winter flood flows in the Coal River. Flow regulation may impact upon the estuarine ecosystem at Pitt Water.

While there is little water quality data available for the **upper Macquarie River**⁴ tributaries, 'State of Rivers Reporting' on the upper Macquarie River itself gives some indication of tributary water quality. Turbidity and suspended solids concentrations are generally low. While waters are poorly buffered (i.e. resistance to changes in pH) because of low alkalinity, pH is generally within the lower limits of ANZECC guidelines. Although regional

² DPIWE unpublished data, State of Rivers Report program. Funded by NHT & State Government.

³ Coal River Catchment: Natural Resource Assessment. 1997. Pitt Water Catchment Management Project.

⁴ DPIF South Esk Basin State of Rivers Report. 1997. Funded by NHT & State Government.

nitrate levels are the lowest of the South Esk Basin, it is thought that low phosphorus concentrations may be the limiting factor in terms of algal growth. Flood events are the major cause of increased phosphorus loads in the upper Macquarie catchment. This is probably due to the overland flow of particulates (soil, faeces etc.) into waterways. Microbiological sampling has been undertaken on the Blackman River with limited results showing contamination at levels above the guideline for primary contact (i.e. swimming). This may relate to stock access to waterways. The upper Macquarie area, because of its location within the rain-shadow of both westerly and easterly weather systems, is one of the driest areas in Tasmania. Waterways within the region are thus typified by irregular flow over the summer months.

There is relatively little water quality data on surface waters in the upper reaches of the **Little Swanport River** catchment. Anecdotal information suggests the river has minimal (or no) flow during some periods of the year and is characterised by extensively modified riparian areas above the Gorge. A limited water quality 'snapshot' during spring⁵ indicates slightly alkaline waters of low turbidity and relatively high conductivity. Dissolved oxygen levels are indicative of a healthy aquatic ecosystem. Data are, however, too limited to provide a satisfactory picture of waterway health.

There is no available water quality information on the small area of the **Prosser River** catchment that is within the Southern Midlands Council municipal area.

2.4 Catchment environmental issues

As stream conditions are determined both by in-stream activities and surrounding land-use activities, waterways act as a touchstone of catchment health. Healthy waterways are indicative of sustainably managed catchments. There are a number of environmental issues relating to waterways in the Southern Midlands municipal area.

- Low flows, with some rivers ceasing to flow during particularly dry summers;
- Erosion from farmland within some catchments (impact of soil-type, overgrazing etc.);
- Replacement of native riparian vegetation by willows/weeds, and associated loss of aquatic and riparian habitat;
- Erosion through forestry activities (road construction, harvesting etc.) and associated loss of, or stress to, aquatic and riparian habitats;
- Erosion from land clearing, and associated loss of, or stress to, aquatic and riparian habitats;
- Nutrient-enriched runoff may occur from irrigated land;
- Algal blooms have been experienced in Craighourne Dam in recent years;
- Salinisation of soils and surface waters, particularly in the Coal River catchment;
- Unrestricted access to streams by stock (erosion, muddying, faecal contamination);

⁵ Unpublished data from Monitoring River Health Initiative (MRHI).

- Water extraction from uncontrolled streams may affect rivers at times of low flow;
- Some irrigation practices may be an inefficient use of limited water resources;
- Discharges from sewage treatment plants increase nutrient and bacterial loadings in streams;
- Expanding urbanisation in the southern catchments may increase the potential for environmental problems such as sewage contamination from septic tanks, pollution from urban run-off of soil,

nutrients and chemicals. Erosion from building sites and road construction/maintenance may also increase the potential for environmental problems

3

WATER QUALITY : THE STATE POLICY ON WATER QUALITY MANAGEMENT

3.1 Overview

The Policy is a major step forward in the management of water quality in Tasmania. The old *Environment Protection (Water Pollution) Regulations* focussed on setting limits on pollutants in discharges to water bodies. This approach does not take into consideration the number of discharges into a given water body, or the sensitivity or current condition of the water body.

The new Policy is not a prescriptive set of regulations. Rather, its objective as a management tool is to focus overall water quality management strategies on maintaining or, where practicable, improving the quality of the State's surface waters.

Other principal objectives of the Policy are to:

- further the objectives of Tasmania's Resource Management and Planning System **;
- ensure that diffuse source and point source pollution does not endanger the achievement of water quality objectives, and that pollutants discharged to waterways are reduced as much as possible by the use of best practice environmental management;
- facilitate and promote integrated catchment management.

The first step in the implementation of the Policy for a given catchment is the identification of Protected Environmental Values (PEVs).

PEVs are the values or uses of the water body for which it is determined that any given area of that water body should be protected.

As a starting point, the PEVs for a water body will be those values and uses which are clearly in evidence at the time of the implementation of the Policy. The Policy specifies a range of PEVs which may be applied to a given water body.

The Board of Environmental Management and Pollution Control will then specify a range of pollutant limits called Water Quality Objectives. These will be designed to determine whether the quality of water in that water body is maintained at a level which will allow the chosen values to be protected.

The Policy then sets out a range of strategies which are aimed at ensuring that waste water discharges from point sources (such as industrial or sewage treatment plant discharges) and diffuse sources (such as runoff from highways, urban areas, farms, forest harvesting etc.) will not endanger the achievement of the Water Quality Objectives.

The Board and councils will use these strategies in land use planning and approvals processes, and in ongoing regulation, to ensure that the PEVs for a given water body are maintained or enhanced over time.

**** NOTE:** The objectives of the Resource Management and Planning System are defined in the *State Policies and Projects Act 1993* as follows:

The objectives of the Resource Management and Planning System of Tasmania:

Schedule 1 - *State Policies and Projects Act 1993*

Clause 1:

- a) to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity; and
- b) to provide for the fair, orderly and sustainable use and development of air, land and water; and
- c) to encourage public involvement in resource management and planning; and
- d) to facilitate economic development in accordance with the objectives set out in paragraphs (a), (b) and (c); and
- e) to promote the sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in the State.

Clause 2:

In clause 1, "**sustainable development**" means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and their communities to provide for their social, economic and cultural well-being and for their health and safety while -

- a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; and
- b) safeguarding the life-supporting capacity of air,

water, soil and ecosystems; and

- c) avoiding, remedying or mitigating any adverse effects of activities on the environment.

3.2 Protected Environmental Values

The first step in the implementation of the Policy is the identification of Protected Environmental Values (the current values and uses) of the surface waters in your municipal area which should be protected under the Policy.

The Policy lists a range of PEVs which may be used to describe the identified values and uses of a given water body. More than one PEV may be applied to a water body. The PEVs are:

A: PROTECTION OF AQUATIC ECOSYSTEMS

- (i) Pristine or near pristine ecosystems;
- (ii) Modified (not pristine) ecosystems:
 - (a) from which edible fish, crustacea and shellfish are harvested, or
 - (b) from which edible fish, crustacea and shellfish are not harvested.

What does pristine mean?

"Pristine" means waters not subject to human interference through discharges or other activities within the catchment (Australian Water Quality Guidelines 1992).

B: RECREATIONAL WATER QUALITY & AESTHETICS

- (i) Primary contact
- (ii) Secondary contact

(iii) Aesthetics only

‘Primary contact’ means recreation involving bodily immersion / submersion where there is direct contact with water, & includes swimming, diving, surfing, water skiing.

‘Secondary contact’ means activities where there is some direct water contact, but it is unlikely that water will be swallowed (e.g. paddling, boating, and fishing).

‘Aesthetics’ means visual appearance of the water, being free from oil, grease, floating debris, unnatural colour, algal blooms etc.

The actual industry type must be specified in order to identify appropriate guidelines.

C: RAW WATER FOR DRINKING SUPPLY

(i) Subject to coarse screening only;

(ii) Subject to coarse screening and disinfection.

This PEV applies to water used as the intake source for public use (town water supply, in other words) and to registered private water supplies.

It does not apply to the taking of water from surface waters by individuals for private use for the purposes of drinking etc.

The Director of Public Health recommends that raw water from any surface waterbody should be boiled before use.

D: AGRICULTURAL WATER USES

(i) Irrigation

(ii) Stock watering

E: INDUSTRIAL WATER SUPPLY

4 WATER QUALITY : PROTECTED ENVIRONMENTAL VALUES FOR YOUR CATCHMENT

4.1 PEV Setting Process

The Environmental Management and Pollution Control Board and the Southern Midlands Council suggested, as a starting point, a range of proposed draft water quality PEVs suitable for surface waters of catchments within the Southern Midlands.

These proposed PEVs provided the basis for discussion with regional stakeholders and interest groups at a community values workshop in Oatlands (29th June 1999). The workshop covered both water quality and quantity issues in the region (refer section 2.2). Outcomes from this workshop were used to further develop PEVs for the separate catchments (Tables 2-6) and community water quantity values (section 5).

The general public within the municipal area was also invited via newspaper advertisement to comment on proposed PEVs at an Oatlands public forum (27th July, 1999) or during a subsequent submission period. A display outlining

PEVs was set up in council offices over a two-week period after the public meeting to encourage public involvement. No additional submissions requiring amendments to the PEVs were received.

The PEVs have now been endorsed by the Board of Environmental Management and Pollution Control and the Southern Midlands Council. The Protected Environmental Values for regional wetlands and waterways were shown in the Draft Southern Midlands Council Planning Scheme. The draft scheme is on display between February 7 and April 7, 2000. The PEVs are shown in Tables 2-6 and relate to planning scheme land classifications.

The PEVs chosen from the Policy are those values and uses that are currently in evidence and apply only for those areas of the respective catchments within the Southern Midlands municipal area.

PROTECTED ENVIRONMENTAL VALUES for surface waters of the Southern Midlands municipal area

The PEVs for the surface waters of the Southern Midlands municipal area are described in Table 2-6 below. The PEVs apply to all surface waters within each land tenure/use category, other than⁶:

- privately owned waters that are not accessible to the public and are not connected to, or flow directly into, waters that are accessible to the public; or
- waters in any tank, pipe or cistern.

“Privately owned waters” means any surface waters confined within the boundary of privately owned land and which do not flow into, or do not communicate with:

- (a) the sea or arm or creek of the sea;
- (b) a source of supply for a water district or irrigation water district;
- (c) any river, stream, watercourse, lake, pond or marsh.

Management of all surface waters within the catchment shall focus on the achievement of water quality objectives.

The water quality objectives will be determined by the Board of Environmental Management and Pollution Control in accordance with the *State Policy on Water Quality Management 1997*.

Achievement of these water quality objectives will maintain or enhance the water quality of those surface waters to ensure the protection of all of the following values and uses applying to each land use category. These values and uses are derived from the formal PEVs listed in Clause 7 of the Policy.

In general, diffuse source pollution can be managed to protect the PEVs by compliance with approved codes of practice, or by development and implementation of best practice environmental management guidelines where codes are not available.

In general, point source pollution should be managed to protect the PEVs by implementation of best practice environmental management, and by compliance with emission limits set by the regulatory authority. This may also require the setting of a mixing zone by the Board of Environmental Management and Pollution Control. For specific details refer to Part 4 of the *State Policy on Water Quality*.

Protected Environmental Values reflect current values and uses of a water body but do not necessarily imply that the existing water quality will support these values and uses.

⁶ State Policy on Water Quality Management 1997

TABLE 2: PROTECTED ENVIRONMENTAL VALUES - JORDAN RIVER CATCHMENT

LAND USE	Protected Environmental Values
State Forest (or forested Crown land)	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(ii) Secondary contact</p> <p>(iii) Aesthetics</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>
Mixed Rural (including forest on private land)	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(ii) Secondary contact</p> <p>(iii) Aesthetics</p> <p>D: Agricultural Water Uses</p> <p>(i) Irrigation</p> <p>(ii) Stock watering</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>

<p>Lake Dulverton & Lake Tiberias</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Modified (not pristine) ecosystems from which edible fish are harvested <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary Contact (ii) Secondary contact (iii) Aesthetics <p>D: Agricultural Water Uses</p> <ul style="list-style-type: none"> (i) Irrigation (ii) Stock watering <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in recreation activities such as swimming, paddling or fishing in aesthetically pleasing waters.</p>
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TABLE 3: PROTECTED ENVIRONMENTAL VALUES - COAL RIVER CATCHMENT

LAND USE	Protected Environmental Values
<p>Mixed Rural (including forest on private land)</p>	<p>A: Protection of Aquatic Ecosystems (ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics (ii) Secondary contact (iii) Aesthetics</p> <p>D: Agricultural Water Uses (i) Irrigation (ii) Stock watering</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>
<p>State Forest (or forested Crown land)</p>	<p>A: Protection of Aquatic Ecosystems (ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics (ii) Secondary contact (iii) Aesthetics</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>
<p>Intensive Agriculture</p>	<p>A: Protection of Aquatic Ecosystems (ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics (ii) Secondary contact (iii) Aesthetics</p> <p>D: Agricultural Water Uses (i) Irrigation (ii) Stock watering</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>

Craigbourne Dam	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(ii) Secondary contact</p> <p>(iii) Aesthetics</p> <p>D: Agricultural Water Uses</p> <p>(i) Irrigation</p> <p>(ii) Stock watering</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in secondary contact recreation activities such as canoeing or fishing in aesthetically pleasing waters.</p>
Water Catchment	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(ii) Secondary contact</p> <p>(iii) Aesthetics</p> <p>C: Raw Water for Drinking Supply in shaded area of “Jerusalem Creek Sub-Catchment”</p> <p>(ii) Subject to coarse screening and disinfection.</p> <p>D: Agricultural Water Uses</p> <p>(i) Irrigation</p> <p>(ii) Stock watering</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; that is acceptable for irrigation and stock watering purposes; which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters; and with the water quality in the shaded area of the “Jerusalem Creek Sub-Catchment” managed to provide water of a physical and chemical nature suitable to supply town drinking water (subject to coarse screening and disinfection).</p>

TABLE 4: PROTECTED ENVIRONMENTAL VALUES - MACQUARIE RIVER SUBCATCHMENTS

LAND USE	Protected Environmental Values
<p>Mixed Rural (including forest on private land)</p>	<p>A: Protection of Aquatic Ecosystems (ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics (ii) Secondary contact (iii) Aesthetics</p> <p>D: Agricultural Water Uses (i) Irrigation (ii) Stock watering</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>
<p>State Forest (or forested Crown land)</p>	<p>A: Protection of Aquatic Ecosystems (ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics (ii) Secondary contact (iii) Aesthetics</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>

Water Catchment	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(ii) Secondary contact</p> <p>(iii) Aesthetics</p> <p>C: Raw Water for Drinking Supply in shaded area of “Blackman River Catchment”</p> <p>(ii) Subject to coarse screening and disinfection.</p> <p>D: Agricultural Water Uses</p> <p>(i) Irrigation</p> <p>(ii) Stock watering</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; that is acceptable for irrigation and stock watering purposes; which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters; and with the water quality in the shaded area of the “Blackman River Catchment” managed to provide water of a physical and chemical nature suitable to supply town drinking water (subject to coarse screening and disinfection).</p>
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TABLE 5: PROTECTED ENVIRONMENTAL VALUES - LITTLE SWANPORT RIVER CATCHMENT

LAND USE	Protected Environmental Values
State Forest (or forested Crown land)	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(ii) Secondary contact</p> <p>(iii) Aesthetics</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>
Mixed Rural (including forest on private land)	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Modified (not pristine) ecosystems from which edible fish are harvested, and having particular regard to protection of the endangered Swan Galaxiias in the upper Rocka Rivulet.</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(ii) Secondary contact</p> <p>(iii) Aesthetics</p> <p>D: Agricultural Water Uses</p> <p>(i) Irrigation</p> <p>(ii) Stock watering</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; that safeguards the endangered Swan Galaxiias; that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>
Hobbs Lagoons (Big Lagoon & Murphy Marsh)	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Modified (not pristine) ecosystems from which edible fish are harvested having regard to wetland values.</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(ii) Secondary contact</p> <p>(iii) Aesthetics</p> <p>D: Agricultural Water Uses</p> <p>(i) Irrigation</p> <p>(ii) Stock watering</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified wetland ecosystem from which edible fish are harvested; that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>

TABLE 6: PROTECTED ENVIRONMENTAL VALUES - PROSSER RIVER CATCHMENT

LAND USE	Protected Environmental Values
<p>Mixed Rural (including forest on private land)</p>	<p>A: Protection of Aquatic Ecosystems (ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics (ii) Secondary contact (iii) Aesthetics</p> <p>D: Agricultural Water Uses (i) Irrigation (ii) Stock watering</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>
<p>State Forest (or forested Crown land)</p>	<p>A: Protection of Aquatic Ecosystems (ii) Modified (not pristine) ecosystems from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics (ii) Secondary contact (iii) Aesthetics</p> <p>That is, as a minimum, the water quality shall be managed to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish are harvested; which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>

5 WATER QUANTITY : WATER QUANTITY VALUES

5.1 Overview

While water quality is a very important part of any water management regime, the issue of how much water a river or stream carries, and how that flow is managed, is of equal importance. Water quality and quantity are closely linked.

The State Government proposes to re-organise the way water flow in our rivers and streams is managed, and one of the key understandings is that there needs to be a specific allocation of water for the river or stream itself. This is necessary not only to protect the aquatic life of the river, but also to maintain basic "river health". If there is insufficient flow at crucial times of the year, the overall quality of the remaining water may be badly affected. This will very likely have a negative effect on human uses of the water, as well as on the environment.

It is clearly recognised that there are competing uses for the available resource, and that there may need to be trade-offs to ensure a balanced sharing arrangement between human uses and the needs of the river environment.

The allocation of water for the environment must be based on scientific information and also on legitimate community values and uses. This community values information was collected as part of the community consultation process.

Community water values

Five broad categories of water quantity values have been identified, and as with the water quality PEVs, it is likely that

most rivers will attract more than one value/use category. The categories are:

- Ecosystem values;
- Physical landscape values.
- Consumptive and non-consumptive use values;
- Recreation values;
- Aesthetic landscape values;

From your input, specific water management objectives can be developed for your catchment, and incorporated into a regional or catchment-based water management plan that will be developed in close consultation with the community. These plans will be developed on a priority basis, with the most stressed rivers in the State being targeted initially.

In most cases, the government will weigh up the identified objectives with any available scientific data. Additional data may need to be obtained, and economic analyses done to determine what impact attempting to protect all the identified values may have. It is possible that, in some cases, there may simply not be enough water to go around, and a trade-off in values may then be necessary.

An explanation of the water quantity value categories and examples of specific values are given below:

Ecosystem values: The term is used to identify those values which are to be protected and / or enhanced in the current state of aquatic and adjacent land ecosystems. Specific water values associated with the ecosystem value category may be:

- protection of an endangered species (plant or animal);
- protection or improvement in native fish populations;
- protection of riverine vegetation;
- provision of adequate water for stream habitat for flora and fauna;
- provision of water for wetland and/or estuary ecosystems.

Physical Landscape values: These values are closely related to the physical nature of the catchment. This includes the nature and constitution of channels, the frequency of floods and droughts, soil and rock types, and vegetation coverage. These values are also closely associated with ecosystem function, and may overlap with the protection of ecosystem values. Specific water values associated with physical landscape values may include:

- provision of variable flows;
- prevention of erosion;
- protection or improvement of riparian zone.

Consumptive and non-consumptive use values: These are related to the current and potential human uses of water bodies. Consumptive use refers to the extraction of water from the water body, with no return of it to the waterbody. Examples may include:

- provision of water for irrigation;
- provision of water for town supply;
- provision of water for industry.

Non-consumptive use refers to extraction or use of water, where the water is eventually returned to the river. Examples may include:

- use of water for hydro-electricity generation;

- use of water for fish farming.

Recreational values: These include the range of direct human uses of water bodies for purposes such as kayaking, canoeing, sailing, swimming, fishing etc. This type of value is difficult to quantify, but is an essential part of our way of life in Tasmania. Water quality issues are also important, especially where primary contact occurs (swimming for example), or where the recreational activity relies on a base of good quality water, such as a recreational fishery. Examples may include:

- maintenance or improvement of the quantity (and quality) of water for recreational fishery (trout, blackfish etc);
- provision of sufficient water for whitewater rafting;
- provision of sufficient water (of adequate quality) for swimming.

Aesthetic Landscape values: These values relate to human appreciation of water and adjacent environments. It is often extremely difficult to address these types of values, or work out the flow requirements to ensure their protection. They are, however, legitimate values which must be acknowledged in any good management process. Examples may include:

- maintenance or improvement of flow through gorges or over waterfalls;
- protection of scenic features in a river.

Tabulated below is a range of community water values identified for local wetlands and waterways at the Oatlands regional community workshop.

Table 7: Community Water Values

Water Value Categories	Community Water Values for Local Waterways
1. Ecosystem values	<ul style="list-style-type: none"> ▪ Swan Galaxiias at Rocka Rvt. Threatened species. Physical features (waterfalls) in upper reaches act as barrier to trout and redfin which may displace galaxiias. ▪ Small unidentified fish on Table mountain (above Oatlands water supply) where there are no trout. Likely Galaxiid species. ▪ Platypus across the whole catchment ▪ Native water rat across the whole catchment. <i>Hydromys chrysogaster</i>. Partly protected species. Considered secure. ▪ Small shrimps of Family <i>Atyidae</i> Genus <i>Paratya</i>. Reasonably widespread in lowland dams & standing freshwaters. The Coal River near Campania is specifically mentioned. ▪ The native freshwater mussel (<i>Velesunio moretonicus</i>) of 'north draining' waterways such as the Blackman River. ▪ Instream habitat prevented from degradation. ▪ Maintain native riparian vegetation. Changed flows may expose beds, encourage silting and weed invasion. ▪ Native habitat values at Lake Dulverton. ▪ Maintaining series of pools for habitat across region. ▪ Natural flow regimes for all catchments and tributaries, except Coal River below Craighourne Dam which is designated irrigation channel. ▪ Wetland habitat at Lake Tiberias
2. Physical landscape values	<ul style="list-style-type: none"> ▪ Physical features (waterfalls) on Rocka Rvt. act as barrier to trout which may displace Swan Galaxiid. ▪ The integrity of stream bank is important to avoid soil loss and turbid water. ▪ Maintaining native riparian vegetation is important. Changed flows may expose beds, encourage silting and weed invasion. ▪ Sandstone Gorge & Bluffs on the upper Jordan are significant regional feature.

<p>3. Consumptive or non-consumptive values</p>	<ul style="list-style-type: none"> ▪ Maintaining series of pools for stock watering ▪ Domestic use (non-drinking) for all catchments. Coal River & Wallaby Rvt. specifically mentioned. ▪ Irrigation across all catchments ▪ Stock Watering across all catchments ▪ Town Water Supply on the Blackman Catchment (Oatlands & Tunbridge) and the Jerusalem Catchment (Colebrook) ▪ Ensure sufficient water for on-stream dams across catchments ▪ Ensure accessible water supply for emergency use (firefighting) across all catchments.
<p>4. Recreational values</p>	<ul style="list-style-type: none"> ▪ Duck Hunting across all catchments. Coal River & Craigbourne Dam specifically mentioned. ▪ Fishing across all catchments. Lake Dulverton specifically mentioned. ▪ Swimming & Rowing at Lake Dulverton ▪ Canoeing at Lake Dulverton and Craigbourne Dam ▪ Sailing, Model Boats, Sea Plane landing at Craigbourne Dam
<p>5. Aesthetic landscape values</p>	<ul style="list-style-type: none"> ▪ Coal River below Craigbourne is an attractive feature in intensive agriculture zone. ▪ Lake Dulverton is an important aesthetic feature for Oatlands when it has water. It is tourist spot. ▪ Maintain native riparian vegetation is important. Changed flows may expose beds, encourage silting and weed invasion – destroying aesthetic appeal ▪ Pool sequences or holes attractive feature of waterways.