



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

**ENVIRONMENTAL
MANAGEMENT
GOALS
for TASMANIAN
SURFACE WATERS**

SOUTH-EAST COAST CATCHMENTS

Final Paper

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Environmental Management Goals for Tasmanian Surface Waters:

SOUTH-EAST COAST CATCHMENTS

During 2002/2003 Protected Environmental Values (PEVs) were set for the South East Coast catchments. A discussion paper was prepared to facilitate public participation in setting the PEVs. This discussion paper was intended as a basis for community and stakeholder participation in the process of developing environmental management goals for surface waters in catchments of the South-East region of Tasmania.

This paper was prepared by the Environment Division, in consultation with the Tasmanian Parks and Wildlife Service, the Marine Resources Division and the Land and Water Management Branch of the Department of Primary Industries, Water and Environment and the Tasman, Sorell and Clarence Councils.

This paper has been modified into its current form to reflect that the process for setting PEVs for the South East Coastal Catchments is now complete. It was considered, however, that much of the information included in the discussion paper should remain as a

record of the PEV setting process. 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.

This paper is divided into six main sections:

- The first part discusses water reform in general.
- The second part provides a brief description of the catchments in the South-East region.
- Part three discusses the State Policy on Water quality Management.
- The fourth part discusses the Protected Environmental Values for the catchments of the South-East region.
- Water quantity values are discussed in part five.
- Part six discusses the community water values for the catchments.

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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 has introduced 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. Principal objectives of the Policy include:

- Move on from reliance on ‘end of pipe’ controls to take into consideration the number of discharges into a given water body, or the sensitivity or current condition of the water body.
- 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 using environmental best practice.
- Facilitate and promote integrated catchment management.
- Focusing on overall water quality management strategies by identifying those water quality values and uses that are considered worthy of protection.

The first purpose of this discussion paper is to explain how water quality values will be identified and used. Local communities have a key role in identifying these values in their areas.

(b) water quantity management

The 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 paper was to canvas the public's views on what was valued in the water resources from a water quantity perspective.

1.3 What did we want the public to do?

Local communities have a valuable understanding of their regional waterways. The following questions of the catchment stakeholders were asked. 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 recognised scenic attractions, such as rapids or waterfalls? Do you use water for livestock watering? Do you know of rare or endangered animals or plants in, or adjacent to, specific areas of your rivers or streams? Does your river supply the local town water supply? Do you draw water from it to irrigate your farm?

The catchment stakeholders/publics' answers to these questions then helped to develop the community water values for regional wetlands and waterways. People had different views on these questions. What was needed to do was to try to think about the "big" picture, and how our own objectives may impact on the whole catchment and the wider community.

Planning to ensure sustainable use of these waters and protection of river health requires sound knowledge of local water quality and quantity issues. Therefore the public submissions providing local knowledge was important.

1.4 How will the public input be used?

Information from the public on values particularly relating to water quality assisted the Board of Environmental Management and Pollution Control and the councils to finalise the range of Protected Environmental Values for the surface waters of the regional waterways. These values will be shown in management plans for the region.

Information from community stakeholders, catchment groups and the public on water quantity values will be utilised to better plan the water resources of the catchments. Water management planning will be closely linked with overall catchment management planning to put water resource management on a sustainable footing for the State. Water management planning will be undertaken on a priority basis, with stressed rivers in the State being targeted initially.

2 Catchment Description

2.1 Overview

This paper covers the surface freshwaters and estuarine waters of the Tasman Municipal Area, the Sorell Municipal Area and part of the Clarence Municipal Area (see attached map).

The largest catchments in this region are the lower part of the Coal River, Carlton River, Iron Creek, Orielton Rivulet, Duckhole Rivulet, Blackman Rivulet and Sorell Rivulet (see Table 1). In addition there are numerous smaller creeks and streams in the region which exit to the coast. Some streams and creeks in the region are intermittent or ephemeral, drying up in summer and periods of drought. Other surface freshwaters include small lakes or inland lagoons. This paper also covers estuaries and semi-enclosed water bodies such as Pitt Water/Orielton Lagoon, Swan Lagoon, Sloping Lagoon, Pipeclay Lagoon and Blackman Bay.

The South-East region includes areas of outstanding environmental, landscape, historic, social, commercial, and recreational values, many of which depend directly or indirectly on water.

The area of the Clarence municipality in the South-East region includes minor coastal streams flowing into Frederick Henry Bay, streams and the Duckhole Rivulet flowing from the eastern slopes of the Meehan Range into Pitt Water, and the bottom reach of the Coal River which flows through the historic town of Richmond and has the Pitt Water estuary at its mouth.

The Sorell Municipal Area includes Orielton Rivulet and other small streams which flow into Orielton Lagoon, Sorell Creek and other small

streams that flow into Pitt Water from the east; and the Carlton River and other small streams that flow into either Frederick Henry Bay, Blackman Bay or Marion Bay on the east coast. The Tasman Municipal Area includes Blackman Rivulet, which flows into Blackman Bay and several small streams or rivulets that flow into coastal areas around the Tasman and Forestier Peninsulas.

Table 1. Major Catchments in the South East Region¹

Catchment	Area (km ²)
Coal River	541.6*
Carlton River	141.4
Iron Creek	94.0
Orielton Rivulet	49.7
Duckhole Rivulet	46.4
Blackman Rivulet	41.5
Sorell Rivulet	40.8

* The upper part of the Coal River catchment is within the Southern Midlands Municipal Area, and is covered in a separate paper.

While the size and flow of waterbodies in the South-East region is small compared with other regions of Tasmania, they are critically important in sustaining internationally significant wetlands, agriculture, marine farms and recreational activities.

2.2 Climate

The region has a maritime-influenced cool temperate climate. The average maximum temperature at the Hobart Airport ranges from 22 C in January and February, to 12 C in June and July.² Temperatures on the Tasman Peninsula are slightly cooler, due to greater exposure to cold southerly winds. At

¹ Australian Coastal Atlas: www.atlas.tas.gov.au

² Bureau Of Meteorology website: <http://www.bom.com.au/climate/averages/tables>

Palmers Lookout (Port Arthur) the average maximum temperature in January and February is 19 C, and 11 C in June and July.

The western part of the South-East region, including the Coal River catchment, is one of the driest areas in Tasmania. The prevailing winds are from the west, but the region is in a rain shadow and most of the rain comes with south-easterly winds and is fairly evenly distributed throughout the year. The lowest rainfalls are experienced in the western part of the region, with higher rainfalls in the coastal eastern areas. The average rainfall is 631 mm in the Pitt Water catchment, 712 mm in the Carlton River catchment and 824 mm in the Blackman Bay catchment.³ Specific locations within the region will have lower and higher average annual rainfalls. For example the average annual rainfall at the Hobart Airport is 507 mm, with the minimum occurring in June (29 mm) and the maximum in December (56 mm); and the mean annual rainfall on the Tasman Peninsula at Port Arthur (Palmers Lookout) is 1159 mm with the minimum average rainfall occurring in February (65 mm) and the maximum in August (123 mm).

2.3 Geology

The predominant geological classes throughout the South-East region are sedimentary and dolerite.⁴ In the catchments draining into Pitt Water and those draining from the west into Frederick Henry Bay sedimentary rocks predominate with Jurassic dolerite intrusives forming the high ridges and

rounded hills. Sedimentary deposits are also dominant on the western half of the Tasman Peninsula.

In the northern part of the region, the Forestier Peninsula and the eastern part of the Tasman Peninsula dolerite intrusions predominate. The geological formations on the east coast of the Forestier and Tasman Peninsulas are within the Tasman National Park and are a significant part of the conservation values of this reserve. The cliffed coastline and formations such as the Blowhole, Tasman Arch, Devil's Kitchen and Tessellated Pavement form an impressive scenic landscape. These features and the historic sites on the peninsula, especially Port Arthur, attract large numbers of tourists to the region.

2.4 Flora

The majority of the land in the Clarence municipal area is private property and much of this land has been cleared for agriculture, townships, and rural-residential settlements. The spit of land which defines the southern edge of Pitt Water and which has Seven-Mile Beach on the coastal side is a large public reserve, but it is primarily covered by a *Pinus radiata* plantation. The vegetation types on the uncleared hilly areas of the Meehan Range and south to Rokeby in the western part of the region are grassy woodland, coastal grassy forest, and inland *Eucalyptus tenuiramis* dry forest⁵. There is *Eucalyptus obliqua* wet forest at Grasstree Hill. *Eucalyptus tenuiramis* dry forest is the predominant vegetation type on the area south of Lauderdale, with a smaller area of sclerophyll forest inland from the southern end of Gorrings Beach. There is a fresh wetland near Sandford (Rushys Lagoon) and a saline wetland at Calverts Lagoon. A population of the

³ 1997. Coal River Natural Resource Assessment. Coal River Catchment Committee.

⁴ Edgar, G. J., Barrett, N. S. and D. J. Graddon. 1998. A Classification of Tasmanian Estuaries and Assessment of their Conservation Significance. Report to Environment Australia from Parks and Wildlife Service, Hobart.

⁵ Tasmania Vegetation Map 1:500 000

Eucalyptus morrisbyi occurs near Rushy Lagoon. This is one of only two locations where this endangered species is found.

In the Sorell municipal area the majority of the land tenure is private property, but large areas have not been cleared. The main vegetation types are coastal grassy forest and sclerophyll forest. There are small areas of *Eucalyptus obliqua* wet forest, and an area of montane grassy forest inland from the northern part of Marion Bay. The vegetation type on the fringe of the southern area of Marion Bay is coastal complex. Areas of the forest in the northern part of the Sorell municipal area are state forest, and fall within the Derwent Forest District Area.⁶ Other areas of this forest are within a forest reserve and part is within the Cape Bernier Nature Reserve. The Pitt Water-Orielton Lagoon area, which lies across the boundary of the Clarence and Sorell municipal areas, is one of the most significant areas of saltmarsh in Tasmania.

The Tasman municipal area comprises the Forestier and Tasman Peninsulas. Approximately half of these peninsulas is private property, a large portion of which has not been cleared. The other main land tenures on the peninsulas are state forest, national park and nature reserve, with smaller areas of forest reserve, public reserves and conservation areas. The vegetation types on the Forestier and Tasman Peninsulas are *Eucalyptus obliqua* wet forest, montane grassy forest, coastal grassy forest, sclerophyll forest and *Eucalyptus delagatensis* forest. There are areas of heath, scrub and scrub-heath mosaic in southern coastal areas of the Tasman Peninsula. The flora of

the Tasman and Forestier Peninsulas is rich in species, with representatives of more than one-third of the plant species that occur in Tasmania, including several rare, vulnerable and endangered species.

2.5 Fauna

The region is home to numerous animal species including mammals, birds, reptiles, amphibians, fish and invertebrates.⁷ Mammals include platypus, echidnas, antechinus, quolls, Tasmanian devils, bandicoots, possums, bettongs, potoroos, wallabies, paddymelons, kangaroos, bats, native rats and seals. Reptiles include skinks and snakes. Seven of the ten frog species occurring in Tasmania are found in the region. The following freshwater fish are found on the Tasman and Forestier Peninsulas: *Mordacia mordax* (short-headed lamprey), *Geotria australis* (pouched lamprey), *Anguilla australis* (short-finned eel), *Galaxias brevipinnis* (climbing galaxid), *Galaxias clearveri* (Tasmanian mudfish), *Galaxias maculatus* (jollytail), *Galaxias truttaceus* (spotted galaxid), *Pseudaphritis urvillii* (sandy freshwater flathead) and two species native to Tasmania, *Retropinna tasmanica* (the Tasmanian smelt) and *Lovettia sealii* (Tasmanian whitebait). Invertebrates include sea-stars, crustacea, echinoderms, native snails and insects.

Threatened fauna in the region which are listed as either endangered, vulnerable or rare are: the grey goshawk, wedge-tailed eagle, swift parrot, hooded plover, eastern curlew, fairy tern, little tern, great-crested grebe, Australian grayling, green and gold frog, burgandy snail, broad-toothed stag beetle, Mt. Mangan stag beetle, spotted

⁶ Derwent Forest District Forest Management Plan. June 1999. Forestry Tasmania.

⁷ Tasman National Park Management Plan. 2000. Parks and Wildlife Service. DPIWE.

microcaddisfly, live-bearing sea star, eastern-barred bandicoot and New Zealand fur seal.

The Hooded Plover is also considered to have high conservation significance even though it is not listed under the Tasmanian Threatened Species Act.

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* now covers all the migratory birds which are found in the wetlands covered by this discussion paper.

2.6 Wetlands

There are a number of estuaries and lagoons with accompanying mudflats and saltmarshes in the South-East region. The Pitt Water-Orielton Lagoon is recognised as internationally significant under the Convention on Wetlands (Ramsar Convention). Pitt Water-Orielton Lagoon is the most southern major feeding area in Australia for a large number of species of migratory birds that fly from as far away as the Arctic. Six species of threatened plants are found at the Pitt Water/Orielton Lagoon site, as is the highest known concentration of the threatened star-fish *Patriella vivipara* that gives birth to live young. Orielton Lagoon is an important refuge for the threatened great crested grebe; and Pitt Water is important as a shark nursery area for the school shark and gummy shark.

Calverts Lagoon 10 km southwest of Cremorne at South Arm is listed as a wetland of national significance; and Rushys Lagoon, 2 km northwest of Cremorne and Yorky's Lagoon in the Lime Bay Nature Reserve on the Tasman Peninsula are listed as wetlands of state significance.⁸

⁸ A Wetlands Strategy for Tasmania: Draft Discussion Paper. DPIWE 2000.

Long Spit in Blackman Bay is also a feeding ground for migratory birds and a breeding area for resident shorebirds such as the hooded plover and pied oystercatcher. Blackman Bay is also a protected nursery area for school and gummy sharks.⁹ Pipe Clay Lagoon is utilised by migratory birds, and is a breeding area for resident shorebirds such as the red-capped plover and pied oystercatcher.¹⁰

Four estuaries in the region, Blackman Bay, Pipe Clay Lagoon, Pitt Water and Carlton River were included in a study classifying and assessing the conservation significance of Tasmanian estuaries using ecological and physical attributes, population and land use.¹¹ The four estuaries in the south-east region were classified as marine inlets. Blackman Bay was assigned moderate conservation significance (Class C), while Carlton, Pipe Clay Lagoon and Pitt Water were assigned low conservation significance (Class D) primarily based on the population densities in the catchment areas (10 – 100 people per km²). This study did not include an assessment of the significance of the birdlife or flora inhabiting these estuaries. Therefore the conclusions regarding conservation significance primarily reflected the degree of human impact. It is understood however that the bird life and flora has been covered by the "Pipeclay Lagoon Precinct

⁹ Marine Farming Development Plan, Blackman Bay. January, 2000. DPIWE

¹⁰ Marine Farming Development Plan, Pipe Clay Lagoon. 1998. DPIWE.

¹¹ Edgar, G. J., Barrett, N. S. and D. J. Graddon. 1998. A Classification of Tasmanian Estuaries and Assessment of their Conservation Significance: an analysis using ecological attributes, population and land use. Report to Environment Australia from Parks and Wildlife Service. Hobart.

Environmental Management Plan”
Clarence City Council, April 1999.

The Pitt Water-Orielton Lagoon area, in particular, has suffered from the impact of human activities. This waterbody is in adjacent to the Sorell and Midway Point townships as well as farms. Orielton Lagoon was artificially separated from Pitt Water by the building of the causeway between 1866 and 1874¹². Sewerage treatment discharge, stormwater discharge, and run-off from agricultural activities have all impacted the Pitt Water-Orielton Lagoon estuary. Some of these impacts have been ameliorated in recent years with additional culverts placed under the causeway to increase tidal flushing in Orielton Lagoon and improvement in sewerage treatment, including the progressive implementation of a plan to pipe treated wastewater to Penna for re-use as irrigation water. The natural flow regime of the Coal River was altered by the building and operation of the Craighourne Dam, resulting in decreased flows in winter and increased flows in summer.

An indication of human impact is the decline in seagrass beds, as this is believed to result from the growth of algae on seagrasses due to increased nutrient inputs from point and diffuse sources of pollution. It is estimated that over a 40 year period (from 1950 to 1990) seagrass declined by 94% in Pitt Water (a loss of 1201 ha), but declined only 11 % in Blackman Bay (a loss of 206 ha), where human impacts are less.¹³ The seagrass in Pipe Clay Lagoon disappeared completely (a loss

of 30 ha) between 1950 and 1990 but has regrown in some areas of the lagoon in recent years.¹⁴

2.7 Water Uses

Reticulated water for towns in the Clarence and Sorell municipalities is supplied by Hobart Water. A town water supply for Port Arthur on the Tasman Peninsula is taken from an unnamed creek near Port Arthur.

Water is used for a variety of recreation activities, whether as part of the scenic attraction of important tourism sites such as Richmond and Port Arthur, or as integral to many birdwatching and bushwalking activities. Water in the region is used directly for a number of primary contact recreational activities such as swimming and windsurfing, and secondary contact recreational activities such as boating and fishing.

Water supports the agricultural activities of the region. Grazing and dryland cereals have traditionally been the major agricultural activities in the region. A move toward intensive cropping in the lower reaches of the Coal River catchment has been possible since the mid-80's with the construction of the Craighourne Dam as part of the development of the South East Irrigation Scheme. Irrigated crops include vineyards, vegetable seeds, orchards, poppies and peas. An extended period of below-average rainfall over the past 20 years has placed pressure on farming activities and water resources in the region.

The sheltered, shallow areas of marine inlets in the region are used for the farming of shellfish. Marine Farming Development Plans are in place for Blackman Bay and Pipe Clay Lagoon,

¹² Terry, I. 1996. Municipality of Sorell Heritage Study – Stage 1 Thematic History. Austral Archaeology.

¹³ Rees, C. G. 1994. Tasmanian seagrass communities. Masters Thesis. University of Tasmania.

¹⁴ Pipe Clay Lagoon Marine Farming Development Plan. 1998. DPIWE

and a draft plan has been prepared for Pitt Water. Marine farming of shellfish requires high quality water to prevent impacts from pathogenic bacteria, viruses, and phytoplankton blooms. The Protected Environmental Values for the marine farming zones in Blackman Bay are shown in the Marine Farm Development Plan for the Bay, and have been proposed for the current and proposed marine farming zones in Pitt Water in the draft Marine Farm Development Plan for that area.

Protected Environmental Values for the Tasman National Park, Eaglehawk Neck Historic Site, Mount Arthur State Reserve, Palmers Lookout State Reserve, Safety Cove Reserve, Stewarts Bay State Reserve, Pirates Bay State Reserve and the Tessellated Pavement State Reserve are shown in the Management Plan for these areas.

2.8 Water Quality Issues

The Coal River catchment is moderately affected by salinity.¹⁵ The highest average salinity in the main stream of the river occurs in the lower part of the catchment, with a level of 950 $\mu\text{S}/\text{cm}$ at the Richmond weir. Very high conductivities occur in some tributaries such as in Duckhole Rivulet at Colebrook Road where the average conductivity is 2955 $\mu\text{S}/\text{cm}$. Salinity in this catchment is a natural phenomenon, but the presence of saline groundwaters only a few metres below the ground in some areas requires careful management of irrigation.

Water quality is impacted by a variety of human activities in the region. Specific issues include vegetation

clearance, soil erosion, stock access to streams, fertiliser run-off, septic-tank leachate, and urban pollution from sewage discharge and stormwater run-off. The reduction and the modification of flows from agricultural activities also has the potential to impact on water quality.

Riparian vegetation (on and adjacent to the banks of waterways) is particularly important to water quality and riverhealth as it shades water, provides streamline habitat, stabilises river banks, reduces erosion, absorbs water-borne nutrients and traps silts. Large areas of riparian vegetation have been removed in agricultural and urban areas in the region.

Increased siltation also arises from general land-clearing for agriculture and urban development, forestry and roading.

Stock access to streams contributes nutrients and microbial contaminants, as does leachates from septic systems in rural and rural-residential areas. Fertiliser run-off from rural land also contributes nutrients. The influx of nutrients from these sources has the greatest impact on streams with low flows. High levels of nutrients result in algal blooms, the growth of algae on rocks and a reduction in dissolved oxygen in waters. Contamination by microorganisms such as bacteria and viruses from faecal material can be hazardous to the health of humans and stock.

In urban areas nutrients enter waterways from the outflows of sewage treatment plants. Stormwater run-off channelled through urban drainage systems also contains high levels of nutrients from the faeces of domestic pets and garden fertilisers as well as contaminants such as oils, fuels, plastics, detergents, litter, pesticides and herbicides.

¹⁵ Berry, K. 2001. Water Quality in the Coal Catchment, Third Progress Report, Feb. 2001. *In*: Rowella and Coal River Valley Field Manual, 7th National PURSL Conference, Launceston 20-24 March, 2001.

3 Water Quality: Protected Environmental Values (PEVs)

3.1 Setting Protected Environmental Values

The first step in the implementation of the *State Policy on Water Quality Management 1997* is the identification of **Protected Environmental Values (PEVs)** of the surface waters in your region. **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.** These values and uses should be 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. More than one PEV may be applied to a water body. The PEVs are:

- A. Protection of Aquatic Ecosystems
- B. Recreational Water Quality and Aesthetics
- C. Raw Water for Drinking Water Supply
- D. Agricultural Water Use
- E. Industrial Water Supply

These values are described in more detail in Section 3.2.

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 ensure the quality of water in that water body is maintained at a level that 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 local planning authorities 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.

3.2 Protected Environmental Values Categories

The Policy lists a range of PEVs which are used to describe the identified values and uses of a given water body. These 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

‘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.

C: Raw Water for Drinking Supply

- (i) 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

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

3.3 Community Input

We asked the public to examine and provide comment on some water quality PEVs which the Board and regional planning authorities had, as a starting point, suggested may be suitable for surface waters in the South-East Catchment.

We wanted the community to tell us about specific areas of rivers that may need different or additional PEVs (traditional fishing areas, for example). Are there rare or endangered species in specific locations which need to be acknowledged? Are there specific locations or stretches of river which need different PEVs (traditional swimming holes, for example)? Other questions were whether existing values and uses are under threat from deteriorating water quality, or whether there is the potential for improving water quality to support new uses.

The Board and the regional planning authorities considered and took into account all submissions before coming to a decision on PEVs for these wetlands and waterways.

4 WATER QUALITY: PROTECTED ENVIRONMENTAL VALUES FOR THE SOUTH-EAST COAST CATCHMENTS

In 2002-2003 the State Government through the Board of Environmental Management & Pollution Control, in association with the Director of Tasmanian Parks & Wildlife Service, the Tasman Council, the Sorell Council and the Clarence City Council, set Protected Environmental Values for the surface waters of the South East Coastal Catchments, as required by the *State Policy on Water Quality Management 1997*.

The public discussion paper *Proposed Environmental Management Goals for Tasmanian Surface Waters: South East Coastal Catchments* was developed by the Department of Primary Industries, Water & Environment, local government and Parks officers, and approved for release to stakeholders and the general community by the Board, the Parks & Wildlife Service and South East Coastal Catchments last year. This paper explained the Policy and how the environmental values for water quality (PEVs) are identified and used.

The Discussion Paper was circulated amongst agencies and organisations having an interest in surface waters in the region. The identified stakeholders (105 people) and community were invited to participate in regional water values workshops at Richmond Town Hall (12/3/2002), Tasman Community Centre (13/3/02), Sorell Memorial Hall (19/3/02) and Rosny Library (20/3/02). The meetings were advertised inviting the general public to have input into the PEV setting process. The meetings were advertised in Tasmanian Country (8/3/02), the Mercury (9/3/02), Tasman FM (12/3/02-20/3/02), a letter drop to all residents within the post code area (11/2/02 to 15/2/02) and within the Tasmanian Rivers Network and the DPIWE weekly bulletin. 63 people

attended public meetings, whilst 25 public submissions were received. Information collected from the meetings and public representations was compiled, amendments were made to the PEVs and discussion paper and they were sent back to all stakeholders and workshop attendees and comment was invited on these changes until 25 June 2002.

The significant issues that were raised at the meetings included the possible impacts of expanded marine farming into southern Pitt Water being raised at the Sorell meeting and the possible impact that forestry activities would have on the water supply for ground/spring water in the Mt Clark and Mt Koonya area being raised at the Taranna meeting. There were also concerns raised in the public consultation process about Orierton Lagoon being recognised as a primary contact recreational water quality value and a place where edible fish can be harvested.

Information collected during the community consultation with regard to water quality was incorporated and reflected in the setting of the final PEVs. Other Community Water Values will be incorporated into the future development of water management and catchment management plans.

The major changes made to the PEVs as a result of the community consultation were as follows:

- The following location was designated as primary contact recreation areas (areas that are commonly recognised as primary contact sites) for the non estuarine waters occurring adjacent to or on private land: being Cooks Road.

- Land based fish farming facilities, chicken processing and chicken farms have been included under Industrial Water Supply.
- A protected environmental values category to cover Long Spit Private Nature Reserve was added to the document.
- Reference to Schedule 4 of the *National Parks and Wildlife Act, 1970* was changed to Schedule 1 of the *National Parks and Reserves Management Act, 2002*.
- The protected environmental values category for estuarine surface waters and semi-enclosed marine surface waters in National Parks, State Reserves, Nature Reserves, Historic Sites, Nature Recreation Areas, Game Reserves, or Conservation Areas has been expanded to clarify that it should not only refer to Orielton Lagoon but should also include Barilla Bay and Upper Pitt Water. Reference has also been made to the Pitt Water/Orielton Lagoon Ramsar Site (including the Pitt Water Nature Reserve) Management Plan.
- The protected environmental values category for surface waters in Southern Pitt Water was expanded to better define the area that Southern Pitt Water covers. Reference has also been made to the Pitt Water/Orielton Lagoon Ramsar Site (including the Pitt Water Nature Reserve) Management Plan. Minor changes had also been made to the bottom paragraph stating

“That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified (not pristine) ecosystem from which **wild** edible fish, shellfish and crustacea **may be**

harvested; which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.”

Other issues raised throughout the consultation process have been incorporated into the document.

Community water Values should be incorporated into the future development of water management and catchment management plans

South-East Coast Catchments

The South-East Coast Catchments includes the surface freshwaters and estuarine waters of the Tasman Municipal Area, the Sorell Municipal Area and part of the Clarence Municipal Area. The fresh surface waters and estuarine waters of these catchments have many varied uses including recreational, irrigation, drinking water, stock watering and basic river health values.

The PEVs for the catchments are described following:-

PROTECTED ENVIRONMENTAL VALUES

for surface waters of the South-East Coast Catchments

The PEVs for the surface waters of the South-East Coast Catchments are described in Table 1 under land use categories. The PEVs apply to all surface waters within each land tenure category, other than¹⁶:

- 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 Management, 1997*.

¹⁶ State Policy on Water Quality Management 1997

Table 2: PEVs for South-East Coast Catchments	
Land Tenure	Protected Environmental Values *(see note on page 27)
Surface waters on Private Land (including forest on private land)	<p>A. Protection of Aquatic Ecosystems</p> <p>(ii) Modified (not pristine) ecosystems</p> <p>(a) from which edible fish are harvested</p> <p>B. Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (Cooks road – freshwater swimming hole)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>C. Raw Water for Drinking Water Supply</p> <p>(i) Subject to coarse screening plus disinfection (Port Arthur offtake)</p> <p>D. Agricultural Water Uses</p> <p>(i) Irrigation</p> <p>(ii) Stock watering</p> <p>E. Industrial Water Supply (Land based fish farming facilities, chicken processing)</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish, crustacea and shellfish may be harvested; that is suitable as a raw water for drinking water supply subject to coarse screening plus disinfection at the offtake location for the Port Arthur township supply; that is acceptable for irrigation and stock watering purposes; which will allow people to safely engage in primary contact recreation activities such as swimming (Cooks road – freshwater swimming hole) and secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters; and is suitable for use for land based fish farming facilities and chicken processing.</p>

Table 2: PEVs for South-East Coast Catchments	
Land Tenure	Protected Environmental Values *(see note on page 27)
Surface waters on Long Spit Private Nature Reserve (freehold land)	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Modified (not pristine) ecosystem <ul style="list-style-type: none"> (a) from which edible fish, crustacea and shellfish are harvested <p>having regard for the management objectives for private nature reserves outlined in Schedule 1 of the <i>National Parks and Reserves Management Act, 2002</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a pristine or nearly pristine ecosystem; and which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.</p>
Surface waters with their headwaters in Forest Reserves .	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Pristine or nearly pristine ecosystems <p>having regard for the management objectives for forest reserves outlined in Schedule 3 of the <i>Forestry Act, 1920</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a pristine or near pristine aquatic ecosystem; and which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.</p>

Table 2: PEVs for South-East Coast Catchments	
Land Tenure	Protected Environmental Values *(see note on page 27)
Surface waters flowing through Forest Reserves from private land, state forest or unallocated Crown land.	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of modified (not pristine) ecosystems <ul style="list-style-type: none"> (a) from which edible fish are harvested <p>having regard for the management objectives for forest reserves outlined in Schedule 3 of the <i>Forestry Act, 1920</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; and which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.</p>
Surface waters with their headwaters in National Parks, State Reserves, or Nature Reserves, Nature Recreation Areas, Conservation Areas and Game Reserves..	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Pristine or nearly pristine ecosystems <p>having regard for the management objectives for national parks, state reserves and nature reserves outlined in Schedule 1 of the <i>National Parks and Reserves Management Act, 2002</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a pristine or nearly pristine ecosystem; and which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.</p>

Table 2: PEVs for South-East Coast Catchments	
Land Tenure	Protected Environmental Values *(see note on page 27)
<p>Surface waters flowing through National Parks, State Reserves, and Nature Reserves, Nature Recreation Areas, Conservation Areas and Game Reserves from private land, state forests or unallocated crown</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(iii) Modified (not pristine) ecosystem</p> <p>(a) from which edible fish, crustacea and shellfish are harvested</p> <p>having regard for the management objectives for national parks, state reserves, nature reserves and historic sites outlined in Schedule 1 of the <i>National Parks and Reserves Management Act, 2002</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (where permitted)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified ecosystem from which edible fish, crustacea and shellfish may be harvested; and which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.</p>
<p>Surface waters with their headwaters in Historic Sites.</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(i) Pristine or nearly pristine ecosystems</p> <p>having regard for the management objectives for historic sites outlined in Schedule 1 of the <i>National Parks and Reserves Management Act, 2002</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (where permitted)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a pristine or nearly pristine ecosystem; and which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.</p>

Table 2: PEVs for South-East Coast Catchments	
Land Tenure	Protected Environmental Values *(see note on page 27)
Surface waters flowing through Historic Sites from private land, state forests or unallocated crown	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Modified (not pristine) ecosystem <ul style="list-style-type: none"> (a) from which edible fish, crustacea and shellfish are harvested <p>having regard for the management objectives for historic sites outlined in Schedule 1 of the <i>National Parks and Reserves Management Act, 2002</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified ecosystem from which edible fish, crustacea and shellfish may be harvested; and which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.</p>
Surface waters with their headwaters in Public Reserves.	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (i) Pristine or nearly pristine ecosystems <ul style="list-style-type: none"> having regard for the management objectives for public reserves outlined in Schedule 4 of the <i>Crown Lands Act 1976</i>. <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a pristine or near pristine aquatic ecosystem; and which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.</p>

Table 2: PEVs for South-East Coast Catchments	
Land Tenure	Protected Environmental Values *(see note on page 27)
Surface waters flowing through Public Reserves (under the <i>Crown Lands Act 1976</i>) from private land, state forest or unallocated crown land.	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Modified (not pristine) ecosystems <ul style="list-style-type: none"> (a) from which edible fish, crustacea and shellfish are harvested <p>having regard for the management objectives for public reserves outlined in Schedule 4 of the <i>Crown Lands Act 1976</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish, crustacea and shellfish may be harvested; and which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.</p>
Surface waters on Unallocated Crown Land	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Modified not pristine ecosystem <ul style="list-style-type: none"> (a) from which edible fish are harvested <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support modified (not pristine) ecosystem from which edible fish are harvested; and which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.</p>

Table 2: PEVs for South-East Coast Catchments	
Land Tenure	Protected Environmental Values *(see note on page 27)
<p>Surface waters on Commonwealth Land</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Modified (not pristine) ecosystems <ul style="list-style-type: none"> (a) from which edible fish are harvested <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified ecosystem from which edible fish may be harvested; which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters; and which is also suitable for hydro-electric power generation.</p>
<p>Surface waters within State Forests (managed under the <i>Forestry Act 1920</i>)</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Modified (not pristine) ecosystems <ul style="list-style-type: none"> (a) from which edible fish are harvested <p style="padding-left: 40px;">having regard for Forestry Tasmania’s Management Decision Classification System</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support modified, but healthy aquatic ecosystems from which edible fish may be harvested; and which will allow people to safely engage in recreation activities such as swimming where permitted, paddling and fishing in aesthetically pleasing waters.</p>

Table 2: PEVs for South-East Coast Catchments	
Land Tenure	Protected Environmental Values <small>*(see note on page 27)</small>
Estuarine surface waters and semi-enclosed marine surface waters such as Orielton Lagoon, Barilla Bay and Upper Pitt Water in National Parks, State Reserves, Nature Reserves, Historic Sites, Nature Recreation Areas, Game Reserves, or Conservation Areas	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Modified (not pristine) ecosystem</p> <p>(a) from which edible fish, crustacea and shellfish are harvested (where permitted)</p> <p>having regard for the management objectives for national parks, state reserves, nature reserves, historic sites, nature recreation areas, conservation areas and game reserves outlined in Schedule 1 of the <i>National Parks and Reserves Management Act, 2002</i>.</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (where permitted)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>Having regard to the relevant management plans*</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified ecosystem from which edible fish, crustacea and shellfish may be harvested; and which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.</p> <p><small>* The Pitt Water/ Orielton Lagoon Ramsar Site (including the Pitt Water Nature Reserve) Management Plan is the relevant management plan for the Pitt Water/Orielton Lagoon Ramsar site</small></p>

Table 2: PEVs for South-East Coast Catchments	
Land Tenure	Protected Environmental Values *(see note on page 27)
<p>Surface waters in Southern Pitt Water (i.e. encompassing all waters to the south and east of the Sorell Causeway and the mouth of Frederick Henry Bay, at Sandy Point, and excluding the waters between the High Water Mark and the Low Water Mark adjacent to Barren and Woody Islands)</p>	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Modified (not pristine) ecosystems <ul style="list-style-type: none"> (a) from which edible fish, shellfish and crustacea are harvested (where permitted) <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>C: Industrial Water Supply (Holding facilities for fisheries products)</p> <p>Having regard to the relevant management plans*</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified (not pristine) ecosystem from which wild edible fish, shellfish and crustacea may be harvested; which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters.</p> <p>* The Pitt Water/ Orielton Lagoon Ramsar Site (including the Pitt Water Nature Reserve) Management Plan is the relevant management plan for the Pitt Water/Orielton Lagoon Ramsar site</p>

Table 2: PEVs for South-East Coast Catchments	
Land Tenure	Protected Environmental Values *(see note on page 27)
Estuarine surface waters and semi-enclosed marine surface waters such as areas of Northern Pitt Water, Pipe Clay Lagoon and Blackman Bay (but excluding estuarine surface waters and semi-enclosed marine surface waters in National Parks, State Reserves, Nature Reserves, Historic Sites, Nature Recreation Areas, Game Reserves, or Conservation Areas)	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Modified (not pristine) ecosystems <ul style="list-style-type: none"> (a) from which edible fish, shellfish and crustacea are harvested (where permitted) <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (where permitted) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>E: Industrial Water Supply (Aquaculture in Marine Farming Zones, On-land Abalone Farming and Shellfish Hatcheries)</p> <p>That is, as a minimum, water quality management strategies should seek to provide water of a physical and chemical nature to support a modified (not pristine) ecosystem from which edible fish, shellfish and crustacea are harvested; which will allow people to safely engage in recreation activities such as swimming where permitted, paddling or fishing in aesthetically pleasing waters; and which is suitable for the farming of shellfish in marine farming zones, abalone farming and shellfish hatcheries.</p>

* 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 Management, 1997.

5 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.

In some instances there may be competing uses for the available resource, and 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 on legitimate community values and uses.

5.2 Water quantity 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;

The information from the public's input and gathering water management values from stakeholders, community groups and government agencies will be utilised when water management planning for the catchment is undertaken.

An appraisal of water quantity values will be undertaken in order to develop water management goals for the catchment. This will be undertaken during the water management planning process.

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 artificial erosion whilst maintaining where appropriate natural processes of erosion and deposition;
- 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 water body. 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.

The Community Water values identified through the PEVs process can therefore be considered when making management decisions for water quantity.

6 Community Water Values for South-East Coast Catchments

Table 3: Community Water Values for South East Catchments collected at a public meeting held in the Richmond Town Hall on 12/3/02, and 12/7/99 and from written submissions

Water Value Categories	Specific Water Values, Richmond
1. Ecosystem values	<ul style="list-style-type: none"> • Platypus habitat (avoid excessive willow removal) • Uncontaminated water/minimal – estuary and fresh water • Plants and animals that live in streams and dams (frogs, water boatman, dragon flies, ducks and native hen) • Fauna land (native birds, marsupials etc) • Clear Water (but may not occur in areas where water is already degraded) freshwater • Banks – vegetation - freshwater • Native vegetation in and around streams • Buffers on streams • Good management of water quality • Eels • Flows for fish ladders to work • Crack Willow constrains ecosystem • Improve native riparian vegetation – freshwater and estuarine • Improve the quality of recreational fish species – fresh and estuarine waters • Improve water quality • Control of blue-green algae in the mainstream • Waterways free of excessive nutrients and bacteria • Enough flow in river to maintain estuary • Maintain minimum flows in the river • Waterways free of litter (above and below the Richmond weir) • Provision of adequate environmental flows • Minimise pesticides, residues in waterways • Improve seasonal (winter) flood flows for flushing in freshwater • Improve ponds and wetlands for fish and bird habitat in fresh and estuarine waters
2. Physical Landscape Values	<ul style="list-style-type: none"> • Estuarine landscapes • Ramsar sites • Public access to the estuary • Natural weirs • Maintain the current watercourse • Maintain and improve riparian vegetation for erosion protection • Management of exotic weeds in fresh and estuarine waters • Control of excessive sediment build-up in the river and estuary • Improve ponds and wetlands
3. Consumptive and Non-	<ul style="list-style-type: none"> • Irrigation • No irrigation

Consumptive Values	<ul style="list-style-type: none"> • Stock watering • Marine farming in estuary – northern Pittwater • Domestic consumption • Shellfish processing • Address salinity problems in groundwater through responsible use of irrigation water • Maintain a reliable supply of good quality water for irrigation and livestock • Encourage off-stream water storages • Provide a supply of good quality water for aquaculture purposes • Improve efficiency of current irrigation methods • Improve drainage (runoff) water quality
4. Recreational Values and Uses	<ul style="list-style-type: none"> • Boating, windsurfing and fishing in estuary • Birdwatching • Boating to Richmond (infrequent) • Picnicing • Aesthetic values of streams and rivers • Fishing • Maintain recreational fisheries • Maintain suitable wildlife species for nature appreciation • Maintain suitable conditions for windsurfing on Pitt Water • Maintain the aesthetic value of the portion of river flowing through Richmond for tourism purposes • Improve trout, redfin and eel fishery below Craighourne dam • Improve dam water quality for trout fishery • Maintain duck habitat for hunting purposes
5. Aesthetic Landscape Values	<ul style="list-style-type: none"> • Aesthetic values of estuary • Aesthetic values of Richmond Bridge • Coal River – Clear the trees from the water, snag free or if of any size fall across the river to have a bridge effect thus creating a higher supply up river and less wastage going over the spillway into open waters and this will get rid of a lot of the rubbish as well • Clean water – Coal river • Dam • Control of excessive sediment build-up in the upper estuary • Maintain suitable water levels for the pool environment above the Richmond weir • Where necessary improve or maintain native streamside vegetation • Suitably manage exotic vegetation around the Richmond section of the river • Improve appearance of river and its surrounds below the dam
6. Issues/concerns	<ul style="list-style-type: none"> • Management by government of streamside/coastal reserves (Crown Land) • Noxious Weeds • Investigate irrigation management alternatives such as micro-irrigation and remote monitoring of root zone soil moisture

Table 4: Community Water Values for South East Catchments collected at a public meeting held in the Tasman Community Centre, Taranna on 13/3/02, and from written submissions.

Water Value Categories	Specific Water Values - Taranna
1. Ecosystem Values	<ul style="list-style-type: none"> • Riparian vegetation • Requirements of native flora & fauna • Existing inland-based ecosystems • Rain forest reliant on Mt Clarke aquifer • Estuarine ecosystems • <i>Eucalyptus rodwayii</i> and <i>ovata</i> • Sea-grass beds e.g. Parsons Bay in Nubeena • Value estuaries not impacted by nutrient overload • Waterways free of pollutants such as pesticide sprays • Maintain frog populations • Birds, especially migratory • Balanced ecosystem • Aquatic life, Galaxia, eels, trout etc • Freshwater yabbies • Maintain natural levels for water temperature, water turbidity • Continuity and increase of seals and dolphins that presently pass through Frederick Henry Bay • wallabies
2. Physical Landscape Values	<ul style="list-style-type: none"> • Basis for tourism • Few permanent streams • Waterfall Bay – waterfall • Cascades at Koonya
3. Consumptive and Non-Consumptive Values	<ul style="list-style-type: none"> • Use of fresh water for getting rid of amoeba on farmed fish • Spring water as drinking water supply (Mt Koonya, Mt Arthur, Mt Raoul) also for irrigation and stockwater • Bore water at Mt Spaulding - drinking, irrigation and industrial (processing flowers) • Southern side of Mt Clarke - drinking, stock watering and irrigation • Few rivers in the peninsular region so reliant on springs and groundwaters • Water that's suitable for irrigating edible, medicinal, organic flora and fauna • Small scale hydro • Stock watering • Irrigation e.g. orchards • Potential for sale of bottled water • Water rights • Water to mix up sprays • Marine farms • Fire fighting • Domestic/tourist fresh water supply • Industrial – chickens at Cascade Rivulet

4. Recreational Values	<ul style="list-style-type: none"> • Duck shooting (not much access to free surface water) • Playing in streams • Swimming • Fishing and fly fishing in some creeks • Blackman Bay: boating, kayaking, sailing, swimming • Unpolluted water for fishing - fresh and estuarine water • Freshwater swimming hole at Cooks Road • Water supply for bushwalking - e.g. Tasman Tracks • Aesthetics as a recreational value (including meditation and spiritual) • Horse riding – adjacent to the rivulet at “Cascades” • Educational
5. Aesthetic Landscape Values	<ul style="list-style-type: none"> • Coastline free of industry, tourist ventures, houses – maintaining the natural. • Trees and ferns • Seascapes free of marine farms
6. Other values	<ul style="list-style-type: none"> • Tourism
7. Issues/concerns	<ul style="list-style-type: none"> • Monitoring of groundwater • Nutrient overload degrading coastal/estuarine ecosystem • Azolla in farm dams • Use of lead shot for duck shooting is a concern • Pollution at Suckling Creek • Value drip irrigation • Use of large quantities of water for washing parasites off farmed fish • Testing of impacts on water quality from marine farms • Impacts on water quantity from tree farming (compared with native forest) • Impacts of uncontrolled wild fire on water quantity/quality • Need for Statewide process for on-going monitoring of quantity and quality • Mt Clark and Mt Koonya springs – may be used as a town water supply for Nubeena – even though there is currently no plan at present

Table 5: Community Water Values for South East Catchments collected at a public meeting held in the meeting room of the Sorell Memorial Hall at Sorell on 19/3/02, and from written submissions.

Water Value Categories	Specific Water Values - Sorell
<p>1. Ecosystem Values</p>	<ul style="list-style-type: none"> • Maintain Environmental flows particularly over dry periods. • Freshwater habitat is important for birdlife, fauna, flora, • Pitt Water catchment is an important ecosystem for native fish such as eels and trout (no fish on Orielton Rivulet?) and fresh water yabbies, platypus etc • Fish passage • Clean and good quality water fresh and estuarine waters • Water quantity (fresh water) in relationship to estuary and value to estuary • Environmental requirement of “whole ecosystem” • Groundwater contribution • Healthy sediments in estuarine waters • Release of good quality water from dams • Natural springs (Townsend Lagoon) • Estuary – Ramsar wetlands and other wetlands, Okines, Dodges, Blue Lagoon, Primrose, Lewisham, Sorell and Iron Creek • Carlton River estuary • Shark nursery – supports shark and fishing – seals, squid (Frederick Henry Bay), dolphins, threatened sea star (Patiriella vivipara) • Bird breeding (Orielton Lagoon bird sanctuary) • Eastern Curlew, Golden Plover, Great-crested Grebe on Tasmanian Threatened Species Act. All the migratory shorebirds are listed under the EPBC Act • Flounder • Penguins and mutton birds • Sea grass and eagle rays – healthy ecosystem • Farming pollutants cause scum and impact ecology • Control and limit farm oysters • Sedbury marsh and Sedbury Creek important for bird habitat • Boomer Creek important for crustacean/mollusc and salt marsh, history • Wetlands significance depends on whether threatened therefore limited
<p>2. Physical Landscape Values</p>	<ul style="list-style-type: none"> • Sand bar movement – impact of bridge, oyster racks vs natural process • Foreshore change from sand to pebbles washing away of sand • Erosion (Tiger Head), Lewisham Foreshore • Riparian reserves/zones – management issues • Coastal Reserves/zones – management issues • Vegetation roles turbidity • Roles willow infestation • Rivers, streams, inlets and water edge intersected by bridges or broad sided by esplanades or car parks be designed to be sympathetic to the landscape. Eg Bridge at Iron Creek could have been designed more intimately. • Rubbish and rubble dumping eg off Penna road • Sorell Rivulet and estuary largely lost to industrial siting, over-bearing bridge and private property – needs correction

	<ul style="list-style-type: none"> • Removal of bridge across Carlton River at the flats island • Sandstone Cliffs at Midway point and Tasmania Golf Club facing Pitt Water
3. Consumptive and Non-Consumptive Values	<ul style="list-style-type: none"> • Dairying – freshwater • Fish holding pens and stock watering • Stock water • Irrigation - pasture irrigation, stone fruits, apricots, cherries, peach, and grapes, some broad acre • Riparian – stock and domestic garden toilet • Homestead – most of fresh water • Groundwater – particularly Lewisham, Dodges and Carlton • Domestic – washing, garden • Town water (Derwent) – Sorell, Midway Point • Other Centres – tanks or tanker when dry • Registered water supply Copping. Crown Land – non-potable • Re-use/recycled water – irrigation Orielton • Environmental flows – Orielton Lagoon including Frogmore Creek
4. Recreational Values	<ul style="list-style-type: none"> • Sailboarding - South Pitt Water and North Pitt Water, Lewisham and Pitt Water • Sailing – Club North, Private South, bridge will allow access to North and South also Carlton River • Pleasure boating - Pitt Water • Swimming -range of private water holes, fishing (floundering and boat) – Frederick Henry Bay, Pitt Water, Carlton River • Swimming Pitt Water estuary and beaches, Carlton Beach, Marion Bay • Picnicing at Carlton Beach • Carlton River and Iron Creek freshwater/saltwater fishing • Water skiing – mainly south, whole Pitt Water • Kayaking/canoeing – Whole Pitt Water/ Seven Mile Beach creek (also rafting), Carlton River • Bird watching, estuarine and freshwater • Horse riding (foreshore) 7 Mile and 5 Mile Beach • Walking foreshore, river bank (Carlton) estuarine and freshwater • Painting estuarine and freshwater • Camping (where permitted) • Snorkelling • Jet skiing • Surfing - 7 Mile, Park Beach and major beaches • Photography • Wading, paddling, walking • Duck shooting (where permitted) • Shore fishing • Improved water transportation Richmond to Midway Point, Sorell, Dodges Ferry (e.g barge or small craft) • Commercial fishing hire service needed at Pitt Water
5. Aesthetic Landscape Values	<ul style="list-style-type: none"> • Pitt Water - Picturesque, unspoilt stretch of water • Improved view of Park Beach from the bluff • Clear, clean looking water

	<ul style="list-style-type: none"> • Carlton River estuary and bluff (limit human impact) • Aesthetic value of whole landscape – land and water management back. • Limit view of oyster farms from Lewisham • Iron Creek Estuary (with Mt Wellington as backdrop) • Lewisham swamp
6. Other values	<ul style="list-style-type: none"> •
7. Issues/concerns	<ul style="list-style-type: none"> • Impact of Stormwater drains – failure of silt traps and trash racks • Need to recommission river flow gauge at Orierton Lagoon • Assessment of need to remove or adequate release of water from dams above Orierton Lagoon catchment • Need for proper regulation once river flows achieved • Need for a pristine Protected Environmental Value for Wetlands • Need for improved signage at Carlton River to protect Wetlands • Ribbon development along coast eg Carlton River • Improved swimming needed off swimming barges and jetties

Table 6: Community Water Values for South East Catchments collected at a public meeting held at Bligh Street, Rosny Park on 12/3/02, and from written submissions.

Water Value Categories	Specific Water Values Rosny Park
1. Ecosystem values	<ul style="list-style-type: none"> • Mutton birds - rookeries • Wetlands as filters purifying waters for coast • Wetlands on the southern side of the old Lauderdale tip (between Lauderdale and Sandford) • Adequate supply of water to maintain wetlands • Wetlands free of significant disturbance • Dirty Bridge Creek, Narrows Creek, Clarence Plains Rivulet Estuary, feeds Rushy Lagoon main waterway supports birdlife, Flora and Fauna. Most are ephemeral (dams and environmental flows) • Estuaries: shellfish, migratory birds, flora, sedges etc • Importance of water to whole of catchment processes • Thriving sea-life • Trees - salinisation, water table • Species list for Rushy fields subdivision and Pipeclay Management Plan
2. Physical Landscape Values	<ul style="list-style-type: none"> • Wetlands – Lauderdale, Rushy, Pipe Clay Lagoon, Clear Lagoon, Calvert Lagoon, Tollards,? other minor wetlands • Ralphs' Bay – foreshore • General coastal values – Roches Beaches etc • South Arm very dry, low rainfall – hence water + water quality very important • Water free of outside influences –rubbish coming down Derwent • Pristine beaches and dunes
3. Consumptive and Non-Consumptive Values	<ul style="list-style-type: none"> • Abalone, oyster nursery, land based at Pipe Clay • Oyster farms in Pipe Clay Lagoon • Stock watering – beef – bore water + creek water (Dirty Bridge Creek near Rushy) • Some orchard irrigation. • Hydroponics – tomatoes, strawberries at Roches Beach and Cambridge • Town supply Acton/Lauderdale. • Richmond and Sorell – Hobart Water (Derwent Supply) • Recycled water use. • Sand mining (c.w.r. for these activities?).
4. Recreational Values and Uses	<ul style="list-style-type: none"> • Swimming – primarily beaches and bays • Surfing • Fishing – coastal (Derwent river and estuaries, Frederick Henry Bay • Horseriding (Tangara) • Bushwalking (all over) – carry own water – South Arm and Cremorne • Windsurfing – Pipe Clay, Lauderdale, Pitt Water

	<ul style="list-style-type: none"> • Sailing • Lifesaving • Mooring (Pipe Clay) • Bird watching (Estuaries + mouth of creeks, wetlands) • Surfing and boating facilities
5. Aesthetic Landscape Values	<ul style="list-style-type: none"> • Pipe Clay – aesthetics of body of water & surrounding landscapes • Odourless wetlands and clean beaches
6. Issues/concerns	<ul style="list-style-type: none"> • Management by government of streamside/coastal reserves (Crown Land) • Noxious Weeds • Proper operation of septic systems