



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

ENVIRONMENTAL
MANAGEMENT
GOALS
for **TASMANIAN**
SURFACE WATERS

WEST COAST MUNICIPAL AREA
(Excluding the Gordon and Pieman River Catchments)

December 2000



**Environmental Management Goals
For Tasmanian Surface Waters:
West Coast Municipal Area**

This discussion paper was used as a basis for community and stakeholder participation in the process of developing environmental management goals for the waterways that are located within the West Coast municipal area. The Pieman River catchment and Gordon River catchments were not included in this paper because Protected Environmental Values had already been set for these areas.

The discussion paper was prepared by the Division of Environment, Planning, and Scientific Services in association with the Land and Water Management Branch, of the Department of Primary Industries, Water and Environment; and the West Coast 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, the *Environmental Management and Pollution Control Act 1994* and the *Water Management Act, 1999*. Ecosystem refers to physical, chemical and biological aspects of the aquatic environment.

1	INTRODUCTION.....	4
1.1	WHY DO WE NEED WATER REFORM?	4
1.2	WHAT ARE THESE REFORMS?	4
1.3	WHAT WILL THIS COMMUNITY INPUT ACHIEVE?.....	5
1.4	WHAT INFORMATION DID WE RECEIVE FROM THE COMMUNITY?	5
1.5	HOW WILL YOUR INPUT BE USED?	5
2	WEST COAST CATCHMENTS OVERVIEW	7
2.1	CATCHMENT DESCRIPTION	7
2.2	LAND USE	8
2.3	WORLD HERITAGE VALUES	10
2.4	CHARACTERISTIC WATER QUALITY	10
2.5	CATCHMENT ENVIRONMENTAL ISSUES	11
3	WATER QUALITY : THE STATE POLICY ON WATER QUALITY MANAGEMENT	14
3.1	SETTING PROTECTED ENVIRONMENTAL VALUES	14
3.2	PROTECTED ENVIRONMENTAL VALUES CATEGORIES	14
4	WATER QUALITY : PROTECTED ENVIRONMENTAL VALUES FOR CATCHMENTS WITHIN THE WEST COAST MUNICIPAL AREA	17
5	WATER QUANTITY VALUES FOR CATCHMENTS WITHIN THE WEST COAST MUNICIPAL AREA	29
5.1	OVERVIEW	29
5.2	WATER QUANTITY VALUES	29
6	COMMUNITY WATER VALUES FOR CATCHMENTS WITHIN THE WEST COAST MUNICIPAL AREA	31

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 water 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 sometimes 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. Our waterways are not immune from problems, however, and many of our river systems are showing signs of stress.

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.

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. 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 by the use of best practice environmental management;
- 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 was to explain how the water quality values will be identified and used. Local communities have a key role in identifying these values in their catchments.

(b) water quantity management

The Government has recently finalised new water management legislation to replace the *Water Act 1957*. The *Water Management Act, 1999* 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 catchments. These values will be of assistance to the Department in undertaking water quantity planning in your catchment.

1.3 What will this community input achieve?

Information on water quality values from the community assisted the Board of Environmental Management and Pollution Control and the West Coast council to finalise the range of Protected Environmental Values the surface waters of your municipality. These values will be shown in council's planing scheme.

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 recognised 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 6.

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 meeting could be best managed through integrated catchment management.

1.5 How will your input be used?

Information from you on values particularly relating to water quality assisted the Board of Environmental Management and Pollution Control, the Director of Parks and your council to finalise the range of Protected Environmental Values for the surface waters of your regional waterways. These values will be shown in management plans for the region, and in local council planning schemes. Further details of what this means is given in Section 4.

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. Water management planning will be

undertaken on a priority basis, with stressed rivers in the State being targeted initially.

2

WEST COAST CATCHMENTS OVERVIEW

2.1 Catchment description

The West Coast municipal area covers an area of approximately 9533 km². Major river catchments that are partially or fully within the municipal area include the Pieman; the Gordon; the King; the Henty; the top of the Davey; the Wanderer and Giblin. There are also several small coastal river catchments.

The region is characterised by a combination of high annual rainfall and low evaporation. Rainfall events generated by the prevailing westerly winds are typically of low intensity and long duration producing high surface runoff. Occasionally high intensity rainfall events and snowfall also contribute to runoff. Generally rainfall is evenly distributed throughout the year with an increase from west to east across the region from 1500 mm to 3000 mm.

The geology in the region is generally characterised by large areas of Precambrian quartzite and phyllites overlain by Ordovician and Devonian limestones, sandstones and siltstones. The vegetation is generally wet sclerophyll forest, rainforest, buttongrass moor and wet scrub.

Protected Environmental Values have been set for the Gordon and Pieman river catchments. The PEVs can be found in the following reports: *'Environmental Management Goals for Tasmanian Surface Waters – Catchments within the Circular Head and Waratah/Wynyard Municipal Areas, November 1999'* and *'Environmental Management Goals for Tasmanian Surface Waters – Gordon River System, February 2000'*. Public consultation regarding the values and uses of Princess Creek near Queenstown occurred as part of the

approval process for the commencement of operations of CMT in 1996. An opportunity now exists to revisit Princess Creek as part of the PEV setting process.

The King River catchment, which is approximately 816 km² is contained entirely within the West Coast municipal area. The headwaters of the catchment are within the Cradle Mountain Lake St Clair National Park and run through conservation areas, un-allocated crown land, hydro land, state forest and forest reserve before discharging at the north eastern end of Macquarie Harbour. The Queen River and Lake Burbury are within the King River catchment. Downstream of Lake Burbury the river has been regulated for hydro-power generation and downstream of the Queen River the river has been impacted by acid mine drainage.

The catchment that includes the Henty and Little Henty Rivers is approximately 831 km². The Henty River starts in the West Coast Range and runs west to the coast. Major tributaries of the Henty include the Yolande River, Tully River and Badger River. The Little Henty River lies north of the Henty River and runs west to the coast discharging south of Trial Harbour. The Little Henty begins in the Mt Dundas Regional Reserve and runs through state forest and un-allocated crown land.

The Davey River catchment, which is approximately 929 km² is entirely contained within the South West National Park and drains south to Port Davey. The headwaters of the catchment are within the West Coast municipal area. The river has a journey

of approximately 55 km before reaching the coast¹.

The Giblin River catchment (332 km²) is within the South West National Park and drains west to the coast. It starts with approximately 200 m elevation and travels for about 45 km before discharging. The Wanderer River catchment (371 km²) starts with approximately 600 m elevation and travels for about 45 km before draining to the west coast². It is contained within the South West Conservation area and also drains west to the coast.

2.2 Land Use

There are three major towns in the region covered by this discussion paper, namely Queenstown, Zeehan and Strahan. The largest employer in the region is mining, with approximately 33 % of the West Coast population employed in this industry³.

There are town drinking water supplies servicing Zeehan, Strahan, Queenstown, Gormanston and Linda. Drinking water is treated at Queenstown, Zeehan and Strahan. Council provides advice on the necessity to boil water before it is used for drinking at Linda, Gormanston and Queenstown. Water supplies at Granville Harbour and Trial Harbour are private water supplies that are, as yet, not registered with the Council.

There are wastewater treatment plants (WWTP) at Queenstown, Zeehan,

¹ SW Working Paper No 20 – Davey River Catchment (1981) South West Tasmania Resources Survey.

² SW Working Paper No 19 (1981). Wanderer-Giblin Catchment. South West Tasmania Resources Survey.

³ Sinclair Knight Merz (1999) Abt Railway – Summary of Proposal, Assessed Environmental Impacts and Proposed Environmental Management Measures.

Strahan, Granville Harbour and Trial Harbour. The facilities at Granville and Trial Harbour use in-ground absorption trenches. The Strahan WWTP discharges to a small creek on Macquarie Harbour, the Zeehan WWTP discharges to the Zeehan Rivulet and the Queenstown WWTP discharges to the Queen River. Smaller communities in the region use either septic tanks or enviro-cycle wastewater treatment systems. The upper reaches of Risby Cove, Macquarie Harbour, have in the past, been impacted by leachate from septic systems. This is predominantly a historical problem.

Mining has been fundamental to the social and economic development of the West Coast. The mineral rich geology of the area has resulted in extensive exploration and mining operations. Historical mining operations have significantly impacted the water quality and aquatic habitats in several rivers in the Zeehan and Queenstown areas. The impacts on the environment of some historical operations are still being felt today. A great deal of time and money, for example, is being spent on remediation of historical mining impacts associated with the Queen and King Rivers.

There are currently two level two mines (Henty Gold Mine and CMT) and two level one mines operating in the region covered by this discussion paper. There are also several other mines that have been approved but are not operating. A limestone quarry and crushing plant exist at Lynchford. A currently operating mineral concentrate transfer station exists near Zeehan.

Many of the major west coast rivers are regulated for hydro-electric power generation. The Gordon River and the Pieman River schemes have been discussed in the Environmental

Management Goals discussion papers for those catchments. Two other power schemes exist in the region of interest in this current discussion paper, namely the King River Power Development and the Anthony Power Development⁴. The King River Power Development commenced in 1983. The development consists of two dams, the Crotty Dam on the King River and the Darwin Dam which is at the southern end of Lake Burbury. The two dams created the 54 square kilometre water storage, Lake Burbury, east of Queenstown. Lake Burbury supplies water to the John Butters Power Station that is located south of Queenstown on the banks of the King River. The Anthony Power Development also commenced in 1983 and consists of dams and canals that divert water from the westerly flowing headwaters of the Henty River and its tributaries into the headwaters of the Anthony River. The Anthony River is in the Pieman catchment and the diverted water has increased flows through the three power stations of the Pieman River Power Development. The Tribute Power Station harnesses the 300 m fall of the Anthony River on its journey to the Pieman River. Another small power scheme exists on the Yolande River. The Lake Margaret power scheme originally consisted of two power stations. The first was bought on line in 1914 by the Mount Lyell Mining and Railway Company. The second was built downstream in 1934. After the Hydro took over the power schemes in 1985, the lower power station was closed for safety reasons. The power scheme is now considered to be a heritage asset.

Aquaculture is an emerging and important industry for the Strahan and Macquarie Harbour region. There are

⁴ Scanlon A. (1995) Water Power. Produced for the Hydro Electricity Corporation.

currently 10 marine farm leases and one exploratory licence within the harbour, accounting for a total of about 57 ha of marine farming waters. The Macquarie Harbour Marine Farming Development Plan identifies current and future areas in Macquarie Harbour that are important to the aquaculture industry⁵. The waters of Macquarie Harbour are suitable for finfish but not shellfish harvesting. This is primarily due to the copper loads entering the harbour from the King river and the bio-accumulation potential of shellfish. The Marine Farming Development Plan currently divides the harbour into three zones based on the future potential for finfish farming. These zones are reflected in the PEVs proposed for Macquarie Harbour. It is hoped that in future years, with the continued remediation of Mt Lyell and the King River, that the waters north of Yellow Bluff will one day be suitable for finfish harvesting. If this occurs the PEVs could be altered to reflect this change.

In past years Macquarie Harbour supported about 20 commercial fishermen but this has now declined to about 2-3 fishermen working the shallow sand flats of the harbour for flounder².

Land available for agriculture is not extensive within the West Coast municipal area. A large section of private land near Granville Harbour is used primarily for beef cattle.

Tourism in the west coast region has increased significantly over recent years. In 1995-96 approximately 26 % of all interstate and overseas visitors to Tasmania visited Strahan. This

⁵ DPIWE (1998) Marine Farming Development Plan, Macquarie Harbour. Prepared by the Marine Resources Division, Department of Primary Industries, Water and Environment.

percentage is expected to increase with further development and upgrading of visitor services in the region. Access to water plays a significant role in attracting visitors to the region. Cruises on Macquarie Harbour, rafting and fishing are popular visitor activities.

A significant proportion of the land within the West Coast municipal area is managed by Forestry Tasmania as multiple use forests. State forests within this region are covered by the Murchison Forest District – Forest Management Plan⁶. Forestry practices in State forests are required to operate in accordance with the Forest Practices Code and Forestry Tasmania Management Decision Classification System. State forests, although managed primarily for production logging, support other industries such as honey production, mineral exploration and mining. State forests are also managed to support a range of recreational activities including fishing, boating and swimming.

The west coast region is well recognised for its conservation values. Apart from the World Heritage Wilderness areas, which are discussed below, there are several large reserves managed primarily for their conservation values. Several of them are multiple use reserves with management objectives defined in the *National Parks and Wildlife Act 1970*, the *Forestry Act, 1920* and the *Regional Forest Agreement (Land Classification) Act, 1998*. Activities occurring within these reserves should be consistent with the management objectives.

2.3 World Heritage Values

⁶ Forestry Tasmania (1998) *Murchison Forest District – Forest Management Plan*

The World Heritage listing of a large portion of the West Coast is recognition of the unique natural and cultural values of the region. These features and other special values – recreational, economic, scientific, educational and inspirational – are identified in the *Tasmanian Wilderness World Heritage Area Management Plan*⁷. These values are briefly detailed below.

The region is characterised by outstanding landform features; a profusion of threatened, rare and endemic plants within a mosaic of plant communities; a unique assemblage of wildlife; and pristine catchments largely free of human impacts. There are also significant cultural sites both in terms of Aboriginal habitation and more recent activities since European settlement. The wide range of recreational opportunities within the region is also seen to have economic importance as a basis for sustainable nature-based tourism.

2.4 Characteristic Water Quality

Rivers and streams on the west coast are generally and naturally slightly acidic because of the large humic acid input from the button grass plains. In some areas on the west coast rivers are affected by acid mine drainage, further reducing the pH. Rivers are also naturally clear but coloured and have low salinity.

A 1997 study of key locations within Tasmanian Wilderness World Heritage areas found that surface waters were suitable for primary contact activities such as swimming but did not meet

⁷ *Tasmanian Wilderness WHA Management Plan 1999*. Tasmanian Parks & Wildlife Service.

microbiological standards for drinking water (without boiling)⁸.

The permanent, fast flowing rivers of the west coast have faunal communities and species differing from those found in lakes or slower moving rivers in other parts of the state. Much of the aquatic vegetation and fauna have adapted to low nutrient and low pH conditions. Several faunal species are listed under Tasmanian Threatened Species Protection Act, 1995. The Australian grayling is listed as vulnerable. A caddisfly (*Diplectona lyella*) and a freshwater snail (*Beddoneia zeehanensis*) are listed as rare. These species all rely on healthy riparian habitats, river flow and water quality.

Several of the larger rivers on the west coast have been modified due to water impoundment or through historic mining activities. Water impoundment can impact on water quality through flow regulation and physico-chemical changes while water is in storage. Acid mine drainage and increased heavy metal levels or high turbidity have resulted from historic mining in several areas on the west coast.

2.5 Catchment environmental issues

As stream conditions are determined both by in-stream activities and surrounding land-use activities, waterways act as a good indicator of catchment health. Healthy waterways are indicative of sustainably managed catchments.

There are several environmental issues associated with the rivers, lakes and

⁸ Davies P. and Driessen M. (1997) Surface Water Quality at three key locations in the Tasmanian Wilderness World Heritage Area.

wetlands of the West Coast municipal area.

Soils within the region are very susceptible to erosion by water. The principal areas of erosion are associated with past mining practices and in some instances forest logging on the highly erodible granite soils⁹. Sheet erosion is also widespread in the south west and is typically associated with areas of reasonably well drained peat supporting sedge/land/heath which is frequently burnt. Track erosion and stream-bank erosion are also common¹⁰.

Historical mining activities resulting in acid mine drainage (AMD) have probably had the most significant impacts on the regional waterways of the West Coast. Many creeks and rivers in the Zeehan and the Queenstown area have been impacted by AMD. Acid mine drainage and the elevated heavy metal concentrations that usually accompany AMD have severely impacted the ecosystems of rivers such as the Queen, the King (downstream of the Queen), Linda Creek and Peasoup Creek near Zeehan. Other rivers such as Comstock Creek near Queenstown, the Dundas River, Nike Creek, Silver Lead Creek and Zeehan Rivulet have also had their water quality and aquatic ecosystems impacted by AMD. A significant research and remediation effort is focusing on the rivers and creeks associated with historical mining in the Queenstown area. The Monitoring River Health Program has also investigated the impacts of AMD

⁹ Land Systems of Tasmania Region 3 -North West (1978). Department of Primary Industries, Water and Environment (formerly Department of Agriculture Tasmania)

¹⁰ Land Systems of Tasmania Region 7 – South West (1989) Department of Primary Industries, Water and Environment (formerly Department of Primary Industries Tasmania)

on other West Coast River ecosystems. There are, however, many more gaps in our knowledge regarding the general health of the west coast rivers.

The recently released Wilderness World Heritage Area Management Plan raises a number of issues related to water quality¹¹.

- Cool regional climate provides suitable conditions for water borne pathogens such as *Giardia* (present in the faeces of domestic and native animals).
- Even in areas of high wilderness quality, water doesn't necessarily meet the national drinking water quality guidelines. This is primarily due to bacterial contamination from native animals.
- In some high use world heritage areas, human waste is potentially a problem in terms of threatening water quality.
- Development of roads, mines and quarries may result in pollution of waterways due to the runoff of sediment and other pollutants.

The King River catchment is presently used for hydro-electricity generation as is the top of the Henty River catchment. There is a range of water management issues associated with the operation of these schemes including:

- Dams acting as barriers to the migration of aquatic species.
- Physico-chemical changes in the waters of large storages.
- Possible impacts of aesthetics, shoreline erosion and habitat due to variations in lake levels.
- Changes to the natural flow (through both storage and diversion

¹¹ Tasmanian Wilderness WHA Management Plan 1999. Tasmanian Parks and Wildlife Service. P111

of water) of rivers and the associated impacts on aquatic species.

- Possible links between varied discharge and bank erosion

The running of the power station on the King River has significantly altered the natural flow of the lower King River. This has altered the amount of dilution the King River provides for the metal-rich Queen River. Additionally, the reduction of large flood events in the King catchment has reduced the reworking of tailings banks which were deposited under the 'old' flow regime¹². The connection of Tasmania to the mainland electricity grid via the Basslink cable is likely to result in changes to the Hydro's systems operations, possibly affecting the King River power station. As part of the environmental impact assessment process for this development, studies will be undertaken to determine the potential impacts of changed flow regimes on the lower King River with respect to the metal rich sediment in the King River and at the delta at the mouth of the King River.

Other possible environmental issues for the region's waterways include:

- Threatened species protection;
- Erosion through forestry and other land use activities and associated loss of, or stress to, aquatic and riparian habitat;

¹² Koehnken L. (1997) Mount Lyell Remediation – Final Report. Mount Lyell Remediation Research and Demonstration Program.

- Lack of comprehensive water quality data in the region;
- Management of Aboriginal and European cultural heritage sites along waterways in the region;
- Cumulative impacts associated with the aquaculture industry in Macquarie Harbour;
- Cumulative impacts associated with water related tourism activities in the region;
- Water quality issues associated with septic tanks in some of the towns of the region.

3 WATER QUALITY : THE STATE POLICY ON WATER QUALITY MANAGEMENT

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) for the surface waters in your region. **PEVs are the current values and uses of a water body for which water quality 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 5.2.

The Board of Environmental Management and Pollution Control will then specify a range of 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 PEVs to be protected.

The Policy also 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 nearly 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 water quality
- (ii) Secondary contact water quality
- (iii) Aesthetics water quality

'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 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.

Water used for domestic purposes such as washing and cleaning is known as ‘homestead use’ and can be recognised as a community water value. A ‘homestead use’ does not include water for drinking.

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.

previously have used them for, and whether you strongly believe that they should be improved to support those uses again. For example, are there waters that you swam in as a child that you no longer are able to?

4 WATER QUALITY : PROTECTED ENVIRONMENTAL VALUES FOR CATCHMENTS WITHIN THE WEST COAST MUNICIPAL AREA

The Board, in association with the West Coast Council and Director of Parks, had, as a starting point, suggested some of the water quality PEVs that may be suitable for surface waters of the West Coast municipal area (Table 1). As indicated earlier, PEVs for the Gordon River Catchment and the Pieman River Catchment have already been determined.

These proposed PEVs provided the basis for discussion with regional stakeholders and interest groups at community values workshops in Zeehan (4th April 2000) and Strahan (5th April 2000). The workshops covered both water quality and quantity issues in the region (Refer Section 6). Outcomes from this workshop were used to further develop the PEVs for the West Coast Municipal Area (Table 2) and community water quantity values.

The general public were also invited via advertisement in the Western Herald to comment on the proposed PEVs in public forums at Zeehan (4th April 2000) and Strahan (5th April 2000) or during a subsequent submission period.

The PEVs detailed below have been endorsed by the Board of Environmental Management and Pollution Control and the West Coast Council and the Director of Parks.

The PEVs chosen from this Policy are those values and uses that are currently in evidence and apply on to the surface waters of the West Coast Municipal Area excluding those surface waters within the Gordon and Pieman River Catchments.

The final PEVs will be shown in Marine Farm Plans, Park Management Plans and used to assist with Water Management and Natural Resource Management Planning.

Remember - the Protected Environmental Values are those values and uses that are currently in evidence.

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.

Table 1: PEVs for waterways within the West Coast Municipal Area

PEVs for waterways within the West Coast municipal area excluding the Gordon and Pieman River Catchments	
Land Tenure/Zone	Protected Environmental Value *(see note page 28)
Surface waters on private land (including forest on private land)	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of modified (not pristine) ecosystems (a) From which edible fish are harvested <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (ii) Secondary contact water quality (iii) Aesthetic water quality <p>D: Agricultural Water Uses</p> <ul style="list-style-type: none"> (ii) Stock watering <p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; that is acceptable for stock watering purposes; which will allow people to safely engage in secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters.</p>
Surface waters in State forest	<p>A: Protection of Aquatic Ecosystems</p> <ul style="list-style-type: none"> (ii) Protection of modified (not pristine) ecosystems (a) From which edible fish are harvested <p>having regard for Forestry Tasmania 'Management Decision Classification System'.</p> <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality** (see note on page 28) (ii) Secondary contact water quality (iii) Aesthetic water quality <p>E: Industry Water Supply – Hydro electricity power generation (upstream of hydro impoundments)</p> <p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; which will allow people to safely engage in recreation activities such as swimming, kayaking, paddling or fishing in aesthetically pleasing waters. For surface waters up stream of hydro impoundments, water should be suitable for hydro-electric power generation (following impoundment).</p>

PEVs for waterways within the West Coast municipal area excluding the Gordon and Pieman River Catchments

Surface waters flowing through **forest reserves** from State forest, private land or un-allocated crown land

- A: Protection of Aquatic Ecosystems
 - (ii) Protection of modified (not pristine) ecosystems
 - (a) From which edible fish are harvested having regard for the management objectives for forest reserves outlined in Schedule 3 of the *Forestry Act, 1920*.
- B: Recreational Water Quality & Aesthetics
 - (i) Primary contact water quality** (see note on page 28)
 - (ii) Secondary contact water quality
 - (iii) Aesthetic water quality

E: Industry Water Supply – Hydro electricity power generation (upstream of hydro impoundments)

That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; which will allow people to safely engage in recreation activities such as swimming, kayaking, paddling or fishing in aesthetically pleasing waters. For surface waters up stream of hydro impoundments, water should be suitable for hydro-electric power generation (following impoundment).

Surface waters within **forest reserves** that have their headwaters within the reserve

- A: Protection of Aquatic Ecosystems ** (see note on page 28)
 - (i) Protection of pristine or nearly pristine ecosystems having regard for the management objectives for forest reserves outlined in Schedule 3 of the *Forestry Act, 1920*.
- B: Recreational Water Quality & Aesthetics
 - (i) Primary contact water quality ** (see note on page 28)
 - (ii) Secondary contact water quality
 - (iii) Aesthetic water quality

E: Industry Water Supply – Hydro electricity power generation (upstream of hydro impoundments)

That is, as a minimum, water quality management strategies should 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, kayaking, paddling or fishing in aesthetically pleasing waters. For surface waters up stream of hydro impoundments, water should be suitable for hydro-electric power generation (following impoundment).

PEVs for waterways within the West Coast municipal area excluding the Gordon and Pieman River Catchments

Surface waters within **national parks and nature reserves**, that have their headwaters within the parks or reserves

- A: Protection of Aquatic Ecosystems
 - (i) Pristine or nearly pristine ecosystems** (see note on page 28) having regard for the management objectives for national parks and nature reserves outlined in Schedule 4 of the *National Parks and Wildlife Act, 1970* and for world heritage areas having regard for the management objectives of the World Heritage Area Management Plan
 - B: Recreational Water Quality & Aesthetics
 - (i) Primary contact water quality** (see note on page 28)
 - (ii) Secondary contact quality
 - (iii) Aesthetics quality
 - E: Industry Water Supply – Hydro electricity power generation (upstream of hydro impoundments)
- That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a pristine or nearly pristine aquatic ecosystem and which will allow people to safely engage in recreation activities such as swimming, paddling or fishing in aesthetically pleasing waters. For surface waters up stream of hydro impoundments, water should be suitable for hydro-electric power generation (following impoundment).

Surface waters flowing through **national parks and nature reserves** from state forest, un-allocated crown land or private land

- A: Protection of Aquatic Ecosystems
 - (i) Protection of modified (not pristine) ecosystems
 - (a) from which edible fish are harvested
 having regard for the management objectives for national parks and nature reserves outlined in Schedule 4 of the *National Parks and Wildlife Act, 1970* and for world heritage areas having regard for the management objectives of the World Heritage Area Management Plan
 - B: Recreational Water Quality & Aesthetics
 - (i) Primary contact water quality** (see note on page 28)
 - (ii) Secondary contact water quality
 - (iii) Aesthetic water quality
 - E: Industry Water Supply – Hydro electricity power generation (upstream of hydro impoundments)
- That is, as a minimum, water quality management strategies should 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, paddling or fishing in aesthetically pleasing waters. For surface waters up stream of hydro impoundments, water should be suitable for hydro-electric power generation (following impoundment).

PEVs for waterways within the West Coast municipal area excluding the Gordon and Pieman River Catchments

Surface waters within **regional reserves and conservation areas**, that have their headwaters within the reserve or conservation area

- A: Protection of Aquatic Ecosystems ** (see note on page 28)
 - (i) Protection of Pristine or nearly pristine ecosystems having regard for the management objectives for regional reserves and conservation areas outlined in Schedule 4 of the *National Parks and Wildlife Act, 1970*
 - B: Recreational Water Quality & Aesthetics
 - (i) Primary contact water quality ** (see note on page 28)
 - (ii) Secondary contact water quality
 - (iii) Aesthetic water quality
 - E: Industry Water Supply – Hydro electricity power generation (upstream of hydro impoundments)
- That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a pristine or nearly pristine aquatic ecosystem and which will allow people to safely engage in recreation activities such as swimming, paddling or fishing in aesthetically pleasing waters. For surface waters up stream of hydro impoundments, water should be suitable for hydro-electric power generation (following impoundment).

Surface waters flowing through **regional reserves and conservation areas** from state forest, un-allocated crown land or private land

- A: Protection of Aquatic Ecosystems
 - (ii) Protection of modified (not pristine) ecosystems
 - (a) From which edible fish are harvested
 having regard for the management objectives for regional reserves and conservation areas outlined in Schedule 4 of the *National Parks and Wildlife Act, 1970*
 - B: Recreational Water Quality & Aesthetics
 - (i) Primary contact water quality ** (see note on page 28)
 - (ii) Secondary contact water quality
 - (iii) Aesthetic water quality
 - E: Industry Water Supply – Hydro electricity power generation (upstream of hydro impoundments)
- That is, as a minimum, water quality management strategies should 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, paddling or fishing in aesthetically pleasing waters. For surface waters up stream of hydro impoundments, water should be suitable for hydro-electric power generation (following impoundment).

PEVs for waterways within the West Coast municipal area excluding the Gordon and Pieman River Catchments

<p>Surface waters on hydro electric corporation land</p>	<p>A: Protection of Aquatic Ecosystems (ii) Protection of modified (not pristine) ecosystems (a) From which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics (i) Primary contact water quality (where permitted) ** (see note on page 28) (ii) Secondary contact water quality (iii) Aesthetics water quality</p> <p>E: Industrial Water Supply – Hydro Electric Power Generation</p> <p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; which will allow people to safely engage in recreation activities such as swimming, kayaking, paddling or fishing (where such activities are permitted) in aesthetically pleasing waters; and which is also suitable for hydro-electric power generation (following impoundment).</p>
<p>Surface waters on un-allocated Crown land</p> <p>In addition: water supply on Lynch Creek, West Queen River, East Queen River, Queen River, Comstock Creek and Henty River for mining ;</p> <p>and water supply on Lynch Creek and upstream of hydro-impoundments for hydro-electric power generation</p>	<p>A: Protection of Aquatic Ecosystems (ii) Protection of modified (not pristine) ecosystems (a) From which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics (i) Primary contact water quality** (see note on page 28) (ii) Secondary contact water quality (iii) Aesthetic water quality</p> <p>E: Industrial Water Supply - water for mining and mineral processing on specified creeks or rivers and for hydro-electric power generation on Lynch Creek and upstream of hydro impoundments.</p> <p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; which is suitable for mining and mineral processing in specified locations and hydro-electric power generation on Lynch Creek and upsteam of hydro-impoundments; and which will allow people to safely engage in recreation activities such as swimming, paddling or fishing in aesthetically pleasing waters.</p>

PEVs for waterways within the West Coast municipal area excluding the Gordon and Pieman River Catchments	
<p>Surface waters flowing through reserves dedicated under the <i>Crown Lands Act 1976</i> from private land, state forest or un-allocated Crown land.</p>	<p>A: Protection of Aquatic Ecosystems (ii) Protection of modified (not pristine) ecosystems (a) from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics (i) Primary contact water quality** (see note on page 28) (ii) Secondary contact water quality (iii) Aesthetic water quality</p> <p>E: Industry Water Supply – Hydro electricity power generation (upstream of hydro impoundments)</p> <p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish are harvested; which will allow people to safely engage in recreation activities such as swimming, kayaking, paddling or fishing in aesthetically pleasing waters. For surface waters up stream of hydro impoundments, water should be suitable for hydro-electric power generation (following impoundment).</p>
<p>Surface waters within reserves dedicated under the <i>Crown Lands Act 1976</i> that have their headwaters within the reserves and which are also currently subject to assessment under the <i>Regional Forest Agreement (Land Classification) Act, 1998</i></p>	<p>A: Protection of Aquatic Ecosystems(** See note on page 28) (i) Protection of pristine or nearly pristine ecosystems</p> <p>B: Recreational Water Quality & Aesthetics (i) Primary contact water quality(**See note on page 28) (ii) Secondary contact water quality (iii) Aesthetic water quality</p> <p>E: Industry Water Supply – Hydro electricity power generation (upstream of hydro impoundments)</p> <p>That is, as a minimum, water quality management strategies should 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, paddling or fishing in aesthetically pleasing waters. For surface waters up stream of hydro impoundments, water should be suitable for hydro-electric power generation (following impoundment).</p>
<p>King River down stream of the Queen river; Queen River downstream of East and West Queen River branches; Peasoup Creek; Linda Creek</p>	<p>A: Protection of Aquatic Ecosystems (ii) Protection of modified (not pristine) ecosystems (b) from which edible fish are not harvested</p> <p>B: Recreational Water Quality & Aesthetics (ii) Secondary contact water quality (King River downstream of Teepookana Bridge only) (iii) Aesthetic water quality</p> <p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a modified ecosystem from which edible fish may not be harvested; that will allow people to safely engage in recreation activities such as jet boating (on the King River downstream of Teepookana Bridge) and to maintain or enhance those aesthetic qualities that exist.</p>

PEVs for waterways within the West Coast municipal area excluding the Gordon and Pieman River Catchments	
<p>Comstock Creek Lyall Comstock Creek Dundas River Silver Lead Creek Nike Creek Zeehan Rivulet (downstream of Silver Lead Creek)</p>	<p>A: Protection of Aquatic Ecosystems (ii) Protection of modified (not pristine) ecosystems (b) from which edible fish are not harvested</p> <p>B: Recreational Water Quality & Aesthetics (i) Primary Contact water quality (Dundas River at Murchison Highway Bridge) (ii) Secondary contact water quality (iii) Aesthetic water quality</p> <p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a modified ecosystem from which edible fish may not be harvested; which will allow people to safely engage in recreation activities such as swimming (Dundas River at Highway Bridge), paddling or boating in aesthetically pleasing waters.</p>
<p>Little Henty River (downstream of Zeehan Rivulet)</p>	<p>A: Protection of Aquatic Ecosystems (ii) Protection of modified (not pristine) ecosystems (a) from which edible fish are harvested</p> <p>B: Recreational Water Quality & Aesthetics (i) Primary contact water quality (at bridges and mouth of river) (ii) Secondary contact water quality (iii) Aesthetic water quality</p> <p>That is, as a minimum, water quality management strategies should 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 in designated places, paddling and boating in aesthetically pleasing waters.</p>

<p>Town Water Supply</p> <p>Linda (at water supply weir) Gormanston(at water supply weir) Zeehan (Parting Creek catchment) Queenstown (Upstream of Conglomerate Creek dam; upstream of reservoir Creek dam and Roaring Meg Creek) Strahan (Manuka River at water supply dam)</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of 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 (where permitted)</p> <p>(ii) Secondary contact water quality</p> <p>(iii) Aesthetic water quality</p> <p>C: Raw Water for Drinking Water Supply</p> <p>(ii) Subject to coarse screening plus disinfection</p> <p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a healthy, but modified aquatic ecosystem from which edible fish may be harvested; which will allow people to safely engage in primary contact recreation activities such as swimming (where permitted), secondary contact recreation activities such as paddling or fishing in aesthetically pleasing waters and which is suitable as a raw water supply for drinking water supply (subject to coarse screening plus disinfection).</p>
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<p>Macquarie Harbour Zone 1 Within boundary of the Macquarie Harbour Historic Site (Tasmanian Wilderness World Heritage Area) this being between Coal Head and Steadman Point and includes the Farm Cove Game Reserve</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems (a) from which edible fish and crustacea but not shellfish are harvested;</p> <p>having regard for the management objectives for national parks outlined in Schedule 4 of the <i>National Parks and Wildlife Act, 1970</i> and for the management objectives of the World Heritage Area Management Plan</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (ii) Secondary contact water quality (iii) Aesthetic water quality</p> <p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish and crustacea but not shellfish may be harvested; which allows people to safely engage in activities such as swimming; and allows boating or fishing in aesthetically pleasing waters.</p>
<p>Zone 2 – Bounded by Backagain Point and Yellow Bluff, Macquarie Harbour Historic Site (Tasmanian Wilderness World Heritage Area) and the boundary between Yellow Bluff and Sophia Point</p>	<p>A: Protection of Aquatic Ecosystems</p> <p>(ii) Protection of modified (not pristine) ecosystems (a) from which edible fish and crustacea but not shellfish are harvested;</p> <p>B: Recreational Water Quality & Aesthetics</p> <p>(i) Primary contact water quality (ii) Secondary contact water quality (iii) Aesthetic water quality</p> <p>E: Industrial Water Supply – Aquaculture (for those areas covered by the Macquarie Harbour Marine Farming Development Plan)</p> <p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish and crustacea but not shellfish may be harvested; which allows people to safely engage in activities such as swimming; allows boating or fishing in aesthetically pleasing waters and is suitable for finfish farming.</p>

<p>Macquarie Harbour (continued) Zone 3 – north of the boundary between Yellow Bluff and Lignite Creek</p>	<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 and crustacea but not shellfish are harvested; <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (ii) Secondary contact water quality (iii) Aesthetic water quality <p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish and crustacea but not shellfish may be harvested; which allows people to safely engage in activities such as swimming; and allows boating or fishing in aesthetically pleasing waters.</p>
<p>Zone 4 Lettes Bay (between Dead Horse Point and King Point and</p>	<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 but not shellfish or crustacea are harvested; <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (ii) Secondary contact water quality (iii) Aesthetic water quality
<p>Risby Cove (between Strahan Point and Regatta Point)</p>	<p>That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish but not shellfish or crustacea may be harvested; which allows people to safely engage in activities such as boating or fishing in aesthetically pleasing waters.</p>
<p>Zone 5 – Bounded by Spur Point and Yellow Bluff and Macquarie Heads (Nigger Head to Braddon Point)</p>	<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, crustacea and shellfish are harvested; <p>B: Recreational Water Quality & Aesthetics</p> <ul style="list-style-type: none"> (i) Primary contact water quality (ii) Secondary contact water quality (iii) Aesthetic water quality <p>E: Industrial Water Supply – Aquaculture (for those areas covered by the Macquarie Harbour Marine Farming Development Plan)</p> <p>That is, as a minimum, water quality management strategies should 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; which allows people to safely engage in activities such as swimming; allows boating or fishing in aesthetically pleasing waters and is suitable for finfish farming.</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.

****Historic mining activities or other historic land uses may have resulted in long term water quality impacts to some streams or rivers within these reserve classes and to their associated ecosystems. This may mean that the water quality in these rivers or streams may not currently support pristine or nearly pristine ecosystems or primary contact recreational activities. This should be taken into consideration at the time that management decisions are being made for individual rivers or streams. Water quality data is not currently available for most surface waters in these areas.**

5 WATER QUANTITY VALUES FOR CATCHMENTS WITHIN THE WEST COAST MUNICIPAL AREA

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 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.

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;

Your advice will provide input into a broader process aimed at gathering water management values from stakeholders, community groups and government agencies. This information will be utilised when water management planning for your catchment is undertaken.

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 that are to be protected and / or enhanced in the current state of aquatic and adjacent land ecosystems. Community 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. Community 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.

6 COMMUNITY WATER VALUES FOR CATCHMENTS WITHIN THE WEST COAST MUNICIPAL AREA

Table 2: Community Water Values – Henty, King and Little Henty Catchments	
Water Value Categories	Community Water Values
Ecosystem values	<ul style="list-style-type: none"> • maintain native fish, eels, platypus, bird life and other animals dependent on waterways • maintain native riparian vegetation • maintain natural geomorphological conditions • protection from introduced species, reduce feral animals • Henty River Marshes • protect whitebait run on Henty and Little Henty Rivers • protect Huon Pine stands • protect trout free areas (South West Conservation Area) • maintain populations of large freshwater crayfish • protect orange bellied parrot • maintain platypus and large crayfish population on Lynch Creek
Consumptive or non-consumptive values: Industry intakes, drinking water supply intakes and agricultural use	<ul style="list-style-type: none"> • Zeehan water supply – Parting Creek (Water supplies have been detailed in discussion paper. Trial and Granville Harbour water supplies will not be included as a PEV because they are not formal supplies). • Mine water intakes have been marked on maps in Discussion Paper. They occur at various locations in the region. • Henty River Catchment- Fingerlings growing (Zeehan side), Yolande HEC (Lake Margaret), irrigation and stock watering • Little Henty Catchment - mineral exploration throughout • King River Catchment – power generation • Lake Burbury – power generation, firefighting • Private power generation on Lynch Creek, Queenstown • Stock watering at Granville Harbour and near mouth of the Henty River. • Gardening water supply • Fire fighting water supply <p>A question was raised about how PEVs will influence new industries wanting to operate in an area. They should not prejudice the set PEVs but the issues raised should be addressed during the process for setting Water Quality Objectives.</p>
Recreational values	<ul style="list-style-type: none"> • Henty River Catchment – camping at mouth, swimming at bridges, fishing, boating, canoeing, fossicking and panning. • Little Henty River Catchment – fishing (primarily at mouth and bridges) and rafting, swimming at bridges, • Canoeing and fishing in Parting Creek Dam • Swimming at park on highway (Dundas River) • Trail Bike and Horse Riding (around Nike Creek near Zeehan) • Conglomerate Creek – swimming half way to falls • Princess Creek – swimming at botanic gardens • King River Catchment – jet boating, canoeing • Lake Burbury – fishing, boating, swimming and water skiing • Generally walk on designated walking tracks, forestry tracks and historic tracks (have access to creeks and rivers). • Mt Dundas scout camp – camping and hiking • Walking to waterfalls and camping throughout catchments

Table 2: Community Water Values – Henty, King and Little Henty Catchments	
Water Value Categories	Community Water Values
Aesthetic values	<ul style="list-style-type: none"> • King River Catchment – Abt Railway (Creeks, rivers, riparian vegetation) • Conglomerate Creek Falls • General – Riparian vegetation, Water flows, Photography, Clarity of water (minimal turbidity) • Values of Bird River Track • Dundas Rivulet • Princess Creek (near Queenstown) • Tyndall Range (waterfalls etc) • Iron Blow • Horsetail Fall • Lake Burbury • Rainforest vegetation (ferns, lichens, trees etc). • Waterfalls
Other Values and comments	Want real protection of small creeks and rivers on the west coast, not just on paper.

Water Value Categories	Community Water Values
Ecosystem values	<ul style="list-style-type: none"> • protect and enhance riparian vegetation, • protect stingrays & dolphins, • protect Grayling, • maintain fish health, • sea grass beds (know they exist in zone one), • sea eagles & wedge-tailed eagles, • maintain and protect benthic invertebrates, • maintain biodiversity and links in food-chain, • protect penguins (primarily exist in zone 2) and seals (known in Birch Inlet) • maintain waterways free of introduced species • protect bird sanctuary at Birch Inlet and Kellys Inlet • protect ocean bird rookeries
Consumptive or non-consumptive values: Industry intakes, drinking water supply intakes and agricultural uses	<ul style="list-style-type: none"> • Zone 2 – fish farms, commercial fishing (flounder), some fish processing on barges (delivery of fresh fish to wharves). • Zone 3 and/or 4 – fish factory, fish processing (need to find more information regarding the requirements for water and locations) • One written submission indicated the importance of reducing emissions of toxicants from the King River and quantifying the toxicological impacts on fish in Macquarie Harbour.
Recreational values	<ul style="list-style-type: none"> • Zone 4 - Sailing, fishing and swimming, photography, sea planes, also swimming in Lettes Bay, cruise boats, windsurfing, jet boats, hovercraft, kayaking, jet boats • Zone 2 – swimming, fishing, boating, sailing, photography, camping • Zone 3 – canoes, sea kayaking, fishing, windsurfing, jet boats, hovercraft, photography, camping • Zone 1 – fishing, duck shooting, cruising, sailing, kayaking, birdwatching, photography, camping • Heads of Macquarie Harbour – recreational shell fish harvesting (need to change zoning to take into consideration this activity) <p>Proposed zones in Macquarie Harbour will need to be amended to reflect these values.</p>
Aesthetic values	<ul style="list-style-type: none"> • cruise boats, photography, tourism, walks on foreshore • riparian vegetation • minimal sediment plumes • cultural aesthetics associated with structures in the water (jetties, Sarah Island Pillinger, Kellys Basin, Birch Inlet, Bird track to Pillinger) • shacks overlook the water, scenic value of harbour itself
Other Values and comments	

