



THIRTY-EIGHTH PARLIAMENT

REPORT 11

**STANDING COMMITTEE ON PUBLIC
ADMINISTRATION**

**RECREATION ACTIVITIES WITHIN PUBLIC
DRINKING WATER SOURCE AREAS**

Presented by Hon Max Trenorden MLC (Chairman)

September 2010

STANDING COMMITTEE ON PUBLIC ADMINISTRATION

Date first appointed:

17 August 2005

Terms of Reference:

The following is an extract from Schedule 1 of the Legislative Council Standing Orders:

“7. Public Administration Committee

7.1 A *Public Administration Committee* is established.

7.2 The Committee consists of 5 members.

7.3 The functions of the Committee are to inquire into and report on -

- (a) the structure, efficiency, and effectiveness of the system of public administration;
- (b) the extent to which the principles of procedural fairness are embodied in any practice or procedure applied in decision making;
- (c) the existence, adequacy, or availability, of merit and judicial review of administrative acts or decisions;
- (d) any Bill or other matter relating to the foregoing functions referred by the House; and
- (e) to consult regularly with the Parliamentary Commissioner for Administrative Investigations, the Public Sector Standards Commissioner, the Information Commissioner, and any person holding an office of a like character.

7.4 The Committee is not to make inquiry with respect to -

- (a) the constitution, functions or operations of the Executive Council;
- (b) the Governor’s establishment;
- (c) the constitution and administration of Parliament;
- (d) the judiciary;
- (e) a decision made by a person acting judicially;
- (f) a decision made by a person to exercise, or not exercise, a power of arrest or detention; or
- (g) the merits of a particular case or grievance that is not received as a petition.”

Members as at the time of this inquiry:

Hon Max Trenorden MLC (Chairman)

Hon Jim Chown MLC

Hon Jon Ford MLC (Deputy Chairman)

Hon Ed Dermer MLC

Hon Ken Baston MLC

Staff as at the time of this inquiry:

Anne Turner, Advisory Officer (Legal)

Carolyna Malouf, Committee Clerk from 5th February 2010 to 6 August 2010

Peter Axford, (Research Officer)

Renae Jewell, Committee Clerk from 9 August 2010

Cassandra Stephenson,
Committee Clerk to 17 February 2010

Address:

Parliament House, Perth WA 6000, Telephone (08) 9222 7222

lcco@parliament.wa.gov.au

Website: <http://www.parliament.wa.gov.au>

ISBN 978-1-921634-47-5

Government Response

This Report is subject to Standing Order 337:

After tabling, the Clerk shall send a copy of a report recommending action by, or seeking a response from, the Government to the responsible Minister. The Leader of the Government or the Minister (if a Member of the Council) shall report the Government's response within 4 months.

The four-month period commences on the date of tabling.

CONTENTS

GOVERNMENT RESPONSE.....	I
EXECUTIVE SUMMARY, FINDINGS AND RECOMMENDATIONS	I
EXECUTIVE SUMMARY.....	I
FINDINGS AND RECOMMENDATIONS.....	IV
CHAPTER 1 INTRODUCTION.....	1
REFERENCE	1
PROCEDURE.....	2
THE MOTION ON THE INQUIRY.....	3
IMPETUS FOR THE INQUIRY	3
Logue Brook dam.....	3
CHAPTER 2 BACKGROUND	7
DIMINISHING SURFACE WATER AND THE DRYING CLIMATE	7
DEFINING A PUBLIC DRINKING WATER SOURCE AREA	9
VISUAL REPRESENTATION OF A SOURCE AREA	10
Diagram 1.....	10
Drinking water source areas the subject of this Inquiry.....	11
Table 1 - Perth Hills and south-west source areas	12
Table 2 - Irrigation, industry or recreation lakes and dams	20
WATER BARRIERS AND TREATMENT PROCESSES.....	24
Diagram 2.....	25
CHANGING CATCHMENT CHARACTERISTICS	26
CHAPTER 3 SOCIAL, ECONOMIC AND ENVIRONMENTAL VALUES OF RECREATIONAL ACCESS	29
THE SOCIAL VALUE OF RECREATIONAL ACCESS	29
Bushwalkers and others.....	29
Fishers	30
THE ECONOMIC VALUE OF RECREATIONAL ACCESS.....	31
Government departments.....	31
Fishers	32
Local governments	33
Other recreational groups and individuals.....	33
THE ENVIRONMENTAL VALUE OF RECREATIONAL ACCESS.....	35
CHAPTER 4 RISKS ASSOCIATED WITH RECREATIONAL ACTIVITY IN SOURCE AREAS	39
THE BENEFITS AND COSTS OF RECREATIONAL ACCESS ON PUBLIC HEALTH.....	39
Diagram 3.....	45
THE BENEFITS AND COSTS OF RECREATIONAL ACCESS ON WATER QUALITY	46
Human impacts	46

Chemical contaminant impacts.....	48
Disinfection by-products impacts	49
Shoreline fishing impacts	50
Ecological impacts.....	51
THE BENEFITS AND COSTS OF RECREATIONAL ACCESS ON INDIGENEOUS CULTURE.....	59
THE BENEFITS AND COSTS OF RECREATIONAL ACCESS ON MANAGEMENT OPTIONS	60
Legal Liability and Costs	62
CHAPTER 5 WESTERN AUSTRALIAN LEGISLATION AND POLICY	67
The <i>Metropolitan Water Supply, Sewerage, and Drainage Act 1909</i>	67
The Metropolitan Water Supply, Sewerage and Drainage By-laws 1981	68
Penalties	71
Lack of an infringement notice system	74
The <i>Country Areas Water Supply Act 1947</i>	76
Operation of the CAWS By-Laws	77
Penalties	77
The Conservation and Land Management Regulations 2002.....	78
The <i>Health Act 1911</i>	79
PRINCIPAL POLICIES.....	80
Western Australian Planning Commission’s Statement of Planning Policy No 2.7 – Public Drinking Water Source Policy	80
Western Australian Planning Commission’s State Planning Policy 2.9 Water Resources	81
Department of Environment and Conservation Policy Statement No. 18 recreation, tourism and visitor services.....	81
Department of Water Statewide Policy 13 - Policy and Guidelines for Recreation within Public Drinking Water Source Areas on Crown Land.....	82
Hypothetical scenario	89
CHAPTER 6 ACCESS IN OTHER JURISDICTIONS	91
RECREATIONAL ACCESS IN OTHER AUSTRALIAN JURISDICTIONS AND OVERSEAS	91
The Australian Capital Territory	91
South Australia	92
Queensland	93
The Northern Territory	95
Victoria	95
New South Wales	96
Tasmania.....	97
Overseas	97
The United Kingdom	98
United States of America	98
Canada.....	98
Conclusion	99

CHAPTER 7 COMMUNITY VIEWS ON THE VALUE OF WATER AND RECREATION IN SOURCE AREAS	101
Recreational groups and individuals	102
The Logue Brook Community Survey	103
Water Quality Research Australia, Project 1023-09 Milestone 5: Survey Report, Public Perception of Source Protection and its Relationship to Recreation and Water Treatment, April 2010	105
CHAPTER 8 COST OF ALTERNATIVE WATER MANAGEMENT	107
COSTS AND TREATMENTS FOR WATER CATCHMENTS CONTAINING RECREATION	107
Diagram 4.....	109
Table 3 - Summary information on the treatment and costs for existing drinking water supply and estimated costs with recreation	111
CHAPTER 9 ALTERNATIVE RECREATION SITES	113
SIZE OF THE RECREATIONAL COMMUNITY	113
WHAT IS CURRENTLY AVAILABLE TO THE RECREATIONAL COMMUNITY?	113
CHAPTER 10 OTHER MATTERS.....	117
KUNUNURRA	117
CHAPTER 11 CONCLUSIONS	123
APPENDIX 1 LIST OF SUBMISSIONS RECEIVED.....	125
APPENDIX 2 LIST OF STAKEHOLDERS TO WHOM THE COMMITTEE WROTE (OTHER THAN LOCAL GOVERNMENTS)	137
APPENDIX 3 LIST OF WITNESSES	141

EXECUTIVE SUMMARY, FINDINGS AND RECOMMENDATIONS

EXECUTIVE SUMMARY

- 1.1 The Standing Committee on Public Administration does not support the use of public drinking water source areas for both recreation and drinking water supply. Two previous parliamentary inquiries have endorsed the need for a preventive approach to source protection in Western Australia and this Report builds on that work. Source protection is the paramount consideration in water planning and overrides any recreational consideration. Western Australia's century old preventive approach to source protection has strong foundations in significant public health events, prescriptive legislation, globally best practice Australian Drinking Water Guidelines and the Department of Water's Statewide Policy 13.
- 1.2 Two community surveys as well as 193 submissions the Committee received for this Inquiry overwhelmingly reveal that the general public have a fundamental concern for the primacy of drinking water and its source protection.
- 1.3 Relevant considerations in the Committee's conclusion that dual use of public drinking water source areas is untenable, included:
 - diminishing surface yields in the catchments as a result of a drying climate;
 - the need to protect expensively produced surplus desalinated water stored in various catchment reservoirs;
 - that human pathogens remain the most significant threat to water quality;
 - that human presence in the catchments has cumulative, adverse ecological impacts potentially affecting water quality; and
 - that the recreational benefits of activities in natural environments can be achieved in locations other than public drinking water source areas.
- 1.4 From Mundaring in the Perth hills to Boyup Brook in the south-west, the Committee identified 29 catchment areas and water reserves that can supply drinking water noting that only 18 are currently being used. The Department of Water and the Water Corporation are now reviewing Bancell Brook Catchment Area; Bickley Brook Catchment Area; Boddington Dam Catchment Area; Brunswick Dam Catchment Area; Dirk Brook Water Reserve; Gooralong Brook Water Reserve; Harvey Dam Catchment Area; Mullalyup Water Reserve; Murray River Water Reserve; and

Wellington Dam Catchment Area for de-proclamation as public drinking water source areas. The vast majority of these catchment areas and water reserves already allow many forms of recreation in the outer catchment and at a minimum, walk trails. If de-proclamation were to occur, additional recreational opportunity would become available. However, the remaining eight catchment areas and water reserves would require an even more stringent application of government policy and enforcement of legislation to protect raw water quality. 12 irrigation or recreation lakes and dams are not public drinking water source areas and are currently available for recreational activities.

- 1.5 Recreational activity has positive social and health benefits for individuals as well as economic value to local governments but it is the very presence of humans in an ecosystem that poses the most risk to water quality and therefore risk to ‘whole of community’, human health. Source protection remains a first line defence given the very clear evidence that microbial pathogens persist for long periods in soil and water; and cause human illness via drinking water.
- 1.6 The Committee witnessed the worst effects of human behaviour in the catchments from photographs of pig entrails next to the water’s edge of a reservoir to visual inspection of gouged shoreline from trail bike tracks at Mundaring reservoir. The Committee learned that a dead kangaroo in a water body or catchment is less likely to carry infective organisms than a person swimming illegally in a dam; that chemical contaminants do not replicate themselves in the same way that organisms will; and that the role of disinfection by-products from fully treated water has been the subject of extensive but inconclusive epidemiological and toxicological research, necessitating a precautionary approach.
- 1.7 The Committee deferred to Water Services Association of Australia’s literature review of the *Effects of recreational activities on source water protection areas*, to understand the impacts of human presence on flora and fauna, biodiversity, water quality and soil. The Committee was particularly concerned at the immediate and long term impact of wildfires caused by human presence in forests, especially in circumstances of a subsequent weather event with sudden, accelerated high run-off on pathogen behaviour. This was described by one witness as an ‘aquatic freeway’ straight into the water body.
- 1.8 Cumulative recreational activity has ecological impacts in catchments which pose an unacceptable risk to raw water quality. Given that there is a degree of uncertainty with respect to some of these impacts, the Committee found that a precautionary approach within a risk management framework is preferred for the recreational activity that is currently allowed in catchments.

- 1.9 The Committee discovered that the penalties for breaching the By-laws protecting our public drinking water source areas encourage potential offenders. Substantial increases of up to \$5,000 have been recommended through amendments to the principal legislation as well as an infringement notice system with modified and daily offence penalty provisions to deter access.
- 1.10 Contrary to opinion expressed in the majority of submissions, Statewide Policy 13 does not lock people out of public drinking water source areas, rather it restricts incompatible activities and provides for passive, land-based recreation as well as a small number of events subject to rigorous assessment and conditional approval. Previous application of Statewide Policy 13 has raised an expectation that approvals based on past custom and practice will be granted. In order to protect public drinking water source areas, any future conditional approval applications should be limited.
- 1.11 Allowing any further relaxation of Statewide Policy 13 in the outer catchments will create health risks for water providers to manage on behalf of future generations of Western Australians. The current system of conditional approvals has unfortunately created a culture of ‘rights’ to access public drinking water source areas for certain group events. It is then difficult to restrict the access those groups have had in a particular location.
- 1.12 Comparing interstate and overseas jurisdictions revealed a diversity of drinking water source protection practices which can be explained by historical, multiple land use and significant public health events.
- 1.13 The recreational fishing community pleaded for access to catchments’ water storages, arguing that with modern technology, these should be opened and the water fully treated before entering the reticulated system. However, the Committee found the cost of alternative water quality treatment to be prohibitive. For example, if hypothetically, Harding dam in the Pilbara was converted to dual use, the estimated cost would be \$49.75 million for additional processes, \$333 million for an environmental storage barrier and \$3 million in additional annual operating costs. The cost of water treatment so as to enable recreation in the catchments is contrary to the Australian Drinking Water Guidelines. These guidelines include a multiple barrier approach to protecting drinking water sources, which is more cost effective and efficient than full treatment. There are far higher priority calls on the public purse.
- 1.14 The Committee noted many alternative sites available for recreational use and that if some public drinking water source areas are de-proclaimed, they would provide further opportunity.

FINDINGS AND RECOMMENDATIONS

1 Findings and Recommendations are grouped as they appear in the text at the page number indicated:

Page 9

Finding 1: The Committee finds that an ever increasing proportion of Western Australia’s potable water is produced by desalination and groundwater recovery, which entails significant capital and operational cost. In addition to the public health imperative, this cost furthers the importance of protecting existing surface water dams and their catchments.

Page 31

Finding 2: The Committee finds that the recreational community places a high social value on recreation in natural bush settings, rivers, water bodies and catchments.

Page 35

Finding 3: The Committee finds that recreational activity provides economic benefit to the State and particularly to local government districts.

Page 37

Finding 4: The Committee finds that the objectives of providing safe water and achieving the health and social benefits of interaction with natural environments are not compatible in the same geographical area. Public drinking water source areas are best committed to the single purpose of providing safe water.

Page 46

Finding 5: The Committee finds that recreation in natural environments provides an important benefit and addresses many modern day health problems. However, protection of drinking water sources remains the paramount consideration.

Page 57

Finding 6: The Committee finds that that humans recreating in source areas pose an unacceptable risk to drinking water quality.

Page 58

Recommendation 1: The Committee recommends no increase in the amount of current recreational activity in the outer catchments of public drinking water source areas.

Page 59

Recommendation 2: The Committee recommends that the public drinking water source areas identified by the interagency collaborative partnership described in paragraph 4.37 as appropriate for de-proclamation as public drinking water source areas, be used for irrigation and recreation.

The Committee further recommends that recreational activity be managed by a working group for each such area comprising representatives as appropriate from the Department of Water, Department of Environment and Conservation, Department of Sport and Recreation, Department of Health, the Water Corporation, Tourism WA and the relevant local government authority.

Page 59

Recommendation 3: The Committee recommends the continuation of the collaborative approach between the Department of Water, Department of Environment and Conservation, Department of Sport and Recreation, Department of Health and the Water Corporation towards identifying appropriate dams and their catchments compatible for irrigation and recreational purposes. The Committee anticipates that this would increase recreational opportunities for the people of Western Australia.

Page 65

Finding 7: The Committee finds that limiting recreational access in public drinking water source areas to their current level is appropriate risk management.

Page 75

Finding 8: The Committee finds that the penalties for breaching the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981 are not an effective deterrent and fail to adequately protect public drinking water source areas.

Page 75

Finding 9: The Committee finds that the absence of an infringement notice system in the *Metropolitan Water Supply, Sewerage, and Drainage Act 1909* is an impediment to effective enforcement of the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981.

Page 75

Recommendation 4: The Committee recommends that the penalties in by-law 31.4 of the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981 be increased to a level comparable to the \$5,000 penalty found in the *Local Government Act 1995*. This recommendation reflects the seriousness of the offences contained in by-law 31.4.

Page 76

Recommendation 5: The Committee recommends an amendment to the *Metropolitan Water Supply, Sewerage, and Drainage Act 1909* to provide for an infringement notice system and modified penalties of \$500 to apply to the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981.

Page 77

Finding 10: The Committee finds that the penalties in the Country Areas Water Supply By-laws 1957 are not an effective deterrent and fail to adequately protect public drinking water source areas.

Page 77

Finding 11: The Committee finds that the absence of an infringement notice system in the *Country Areas Water Supply Act 1947* is an impediment to effective enforcement of the Country Areas Water Supply By-laws 1957.

Page 78

Recommendation 6: The Committee recommends that the penalties in the Country Areas Water Supply By-laws 1957 be increased to a level comparable to the \$5,000 penalty found in the *Local Government Act 1995*. This recommendation reflects the seriousness of the offences contained in the By-laws.

Page 78

Recommendation 7: The Committee recommends an amendment to the *Country Areas Water Supply Act 1947* to provide for an infringement notice system and modified penalties of \$500 to apply to the Country Areas Water Supply By-laws 1957.

Page 89

Recommendation 8: The Committee recommends that the 1994 Agreement between the Federation of Western Australian Bushwalkers Inc and the Water Corporation as described in paragraph 5.55 be cancelled.

Page 89

Recommendation 9: The Committee recommends that all future reviews of Statewide Policy 13 should be based on the imperative of source protection and guided by the precautionary principle.

Page 100

Finding 12: The Committee finds that a comparative analysis of recreational access in other Australian and overseas drinking water sources is unhelpful in determining an appropriate level of access for Western Australia. Diverse drinking water source protection practices are explained by historical multiple land use and significant public health events.

Page 112

Finding 13: The Committee finds that it is possible to treat public drinking water to reduce potential health risks arising from access to the source areas to that water for recreational use. The Committee further finds that such treatments entail significant cost and cannot guarantee a safe drinking water supply.

Page 120

Finding 14: The Committee finds an absence of a lead agency that should be responsible for decision making in the Priority 1 area of the Kununurra Water Reserve.

Page 120

Recommendation 10: The Committee recommends that a lead agency be nominated to be responsible for decision making in the Priority 1 area of the Kununurra Water Reserve.

Page 121

Recommendation 11: The Committee recommends that the Government give consideration to relocating the Kununurra bore field to another site to enable the development of the existing Priority 1 area of the Kununurra Water Reserve as a tourist precinct.

CHAPTER 1

INTRODUCTION

REFERENCE

- 1.1 On 15 September 2009, the Legislative Council referred an inquiry to the Standing Committee on Public Administration (**Committee**) with the following Terms of Reference:

That the Standing Committee on Public Administration investigate —

(1) The social, economic and environmental values and costs of recreation access, where possible, to Perth Hills and South West drinking water catchments including the costs and benefits to public health, water quality, recreation, indigenous culture and management options.

(2) State, interstate and international legislation, policy and practice for recreation within public drinking water source areas including information relating to population health benefits and impacts.

(3) The range of community views on the value of water and recreation in public drinking water source areas.

(4) The costs and benefits of alternative water quality management strategies and treatment for water catchments containing recreation.

(5) Possible recreation sites/opportunities available outside the Perth Hills and South West drinking water catchments.

The Committee is to report to the House not later than 1 July 2010.¹

- 1.2 On 20 May 2010, the Committee sought and was granted an extension of the reporting date to 23 September 2010.
- 1.3 To assist the reader, the Committee advises that Chapters 1 and 2 of this Report contain introductory and background information. Chapter 3 addresses that part of the first term of reference which is to investigate the social, economic and environmental values and costs of recreational access to public drinking water

¹ On a motion by the Hon Norman Moore MLC, Leader of the House, Western Australia, Legislative Council, *Parliamentary Debates (Hansard)*, 15 September 2009, pp6867a-6869a.

- source areas (**source areas**). Chapter 4 addresses another part of the first term of reference, that is, the costs and benefits of recreational access to public health, water quality, recreation, indigenous culture and management options.
- 1.4 Chapter 5 addresses part of the second term of reference which is to scrutinise Western Australian legislation, policy and practice. Chapter 6 addresses another part of the second term of reference which is to investigate inter-jurisdictional and international legislation, policy and practice for recreation within source areas.
- 1.5 Chapter 7 addresses the third term of reference which is to investigate the range of community views on the value of water and recreation in source areas. Chapter 8 addresses the fourth term of reference which is to investigate the costs and benefits of alternative water quality management strategies and treatment for water catchments made available for recreation.
- 1.6 Chapter 9 addresses the fifth term of reference which is to investigate possible recreation sites and opportunities available outside the Perth Hills and south-west drinking water catchments. Chapter 10 provides observations from the Committee's visit to the Kununurra Water Reserve and Chapter 11 draws a number of conclusions.

PROCEDURE

- 1.7 The Committee placed an advertisement in *The West Australian* newspaper on 26 September 2009 and received 193 written submissions from those persons and organisations listed in **Appendix 1**.
- 1.8 The *Terms of Reference* for the Inquiry focussed on public drinking water source areas in the hills and south-west region of the State which the Committee defined as occurring from Mundaring to Boyup Brook. However, the Committee contacted rural media outlets and sent letters sent to all 144 local governments, given that public drinking water source areas are proclaimed throughout the entire State; although the majority are located in the hills and south-west. Stakeholders contacted other than local governments are listed at **Appendix 2**.
- 1.9 The Committee conducted 13 hearings. Those witnesses who appeared and gave evidence are listed at **Appendix 3**.
- 1.10 The Committee travelled to Kununurra, Karratha, the south-west of Western Australia and south east Queensland inspecting various catchments and dams. No international travel was undertaken.
- 1.11 The Committee extends its appreciation to the Water Corporation, the Department of Water, the Department for Sport and Recreation; and the Department of

Environment and Conservation for the particular assistance of their officers during the Inquiry.

THE MOTION ON THE INQUIRY

- 1.12 The debate on the motion establishing the Inquiry indicated that the government is seeking a recommendation from the Committee as to whether dual use of public drinking water source areas is tenable.² The Leader of the House referred to the “*particular interest*”³ the Minister for Water; and the Minister for Sport and Recreation have in resolving the “*conflict that exists between drinking water sources or catchments and their use for recreational purposes.*”⁴ However, the Committee found from written submissions that the Ministers for Tourism, Environment, Health, Indigenous Affairs and others have a significant level of interest in the outcome of this Inquiry, reflecting their own perspectives.
- 1.13 Submissions from recreational groups, particularly the fishing and bushwalking lobby, and other individuals revealed a passionate interest in accessing dams, rivers and catchments. In hearings, scientists and health experts provided technical expertise about the risk of allowing human activity inside the 149 proclaimed source areas.⁵
- 1.14 Drinking water source protection plans have been prepared for the majority of the groundwater and surface water areas⁶ source areas. The remaining plans are still to be completed for the “*lower risk water supplies*”.⁷

IMPETUS FOR THE INQUIRY

Logue Brook dam

- 1.15 This Inquiry has its genesis in the 2007 policy decision by the then government to close recreation on Logue Brook dam and proclaim it as “*constituting a catchment area to be known as the Logue Brook Dam Catchment Area*” on 2 May 2008.⁸ The

² Hon Norman Moore MLC, Leader of the House, Western Australia, Legislative Council, *Parliamentary Debates (Hansard)*, 15 September 2009, pp6867a-6869a.

³ Ibid.

⁴ Ibid.

⁵ Proclaimed in the *Government Gazette* as at October 2009 and per Department of Water, Additional Information related to the Inquiry into Activities within Public Drinking Water Source Areas, 10 November 2009, Attachment 4.

⁶ Mr Nigel Mantle, Manager, Water Source Protection Branch, Department of Water, *Transcript of Evidence*, 21 October 2009, p8.

⁷ Mr John Ruprecht, Director, Water Resource Management, Department of Water, *Transcript of Evidence*, 21 October 2009, p10.

⁸ *Government Gazette* No. 68, 2 May 2008, p1699.

objective of this decision was to use Logue Brook dam water to supply the Integrated Water Supply Scheme. This became a matter of considerable public debate in 2007 and in the context of the 2008 state election campaign.

- 1.16 Logue Brook dam was constructed in 1963 as an irrigation/recreation dam for the South West Irrigation Scheme. For 44 years recreation was enjoyed and the local community developed a longstanding historical nexus to the dam which provided both social and recreational value to residents as well as economic value to the Shire of Harvey. That historical nexus was a relevant consideration in the decision to abolish the Logue Brook Dam Catchment Area six months after proclamation and reopen it to “*irrigation/recreation*”.⁹
- 1.17 At the same time, heightened community concern over the decision to close Logue Brook dam galvanised the recreating public to agitate for access to what the Shire of Denmark said could be perceived as other “*wasted recreational resources*”.¹⁰
- 1.18 The Water Corporation said that although Logue Brook brought recreation in source areas into focus, it is not a new phenomenon. A “*small percentage of the community has always sought to have wider recreation in our drinking water catchments, ... this is not something that has suddenly emerged. It has been something that has been ... at various levels in various discussions for the past 35 years ... and probably much beyond.*”¹¹
- 1.19 The Committee noted that this is the most recent of a series of examinations by parliamentary committees into elements of Western Australia’s water supply. Previous examinations include:
- Legislative Assembly, Select Committee report on Metropolitan Development and Groundwater Supplies (1994);
 - Legislative Council, Standing Committee on Ecologically Sustainable Development Report in relation to the Quality of Perth’s Water Supply (2000);
 - Legislative Council, Standing Committee on Public Administration and Finance, Interim Report into Water Services in Western Australia (2004);

⁹ Government Gazette No. 195, 21 November 2008, p4919.

¹⁰ Submission No 9 from the Shire of Denmark, 2 November 2009, p1.

¹¹ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p4.

- Legislative Council, Standing Committee on Public Administration, Report into the Water Resources Legislation Amendment Bill 2006 (2007);
- Legislative Council, Standing Committee on Public Administration, Interim Report in relation to the Inquiry into the Governance of Western Australia's Water Resources (2007); and
- Legislative Council, Standing Committee on Public Administration, Annual Reports 2007 and 2008.

1.20 The above examinations demonstrate that the Committee, by its longstanding experience and expertise with water legislation, policy and practice, is well positioned to undertake and settle the matters raised in this particular Inquiry.

CHAPTER 2

BACKGROUND

DIMINISHING SURFACE WATER AND THE DRYING CLIMATE

2.1 Another impetus for this Inquiry is how the Western Australian Government should assist the Water Corporation into the future as it deals with diminishing surface water sources given that:

- “there are no inalienated catchments left...[and]...no comparable catchments to the ones we currently have”;¹² and
- 40% of the water supply to Perth currently comes from catchments.¹³

Arguably, this necessitates the application of a “maximum level of protection to more water and land area than what is currently receiving that level of protection”.¹⁴

2.2 The Department of Water agreed that as a result of Western Australia’s drying climate over the past 25 to 30 years, “surface-water catchment expansion will be very limited, if any”.¹⁵

2.3 A recently published CSIRO study titled: *Water Yields and demands in south-west Western Australia*, found a future mean annual surface water yield in the project region to be “on average, 24% lower by 2030, with a possible range of 4 to 49% lower”.¹⁶ This study examined a region covering 62,500 square kilometres and 89% of the State’s population. The study projected a “marked decrease in river flows and water yields in the south west by 2030”¹⁷ as a result of the region becoming

¹² Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p9.

¹³ Mr Richard Theobald, Manager, Water Unit, Department of Health, *Transcript of Evidence*, 14 October 2009, p5.

¹⁴ Hon Ed Dermer MLC, Member, Standing Committee on Public Administration, *Transcript of Evidence*, 21 October 2009, p8.

¹⁵ Mr John Ruprecht, Director, Water Resource Management, Department of Water, *Transcript of Evidence*, 21 October 2009, p4.

¹⁶ CSIRO, *Water Yields and demands in south-west Western Australia*, Summary of a Report to the Australian Government from the CSIRO South-West Western Australia Sustainable Yields Project, December 2009, p7.

¹⁷ *Ibid.* The project resulted from a March 2008 decision by the Council of Australian Governments for a comprehensive scientific assessment of water yields in all major water systems across the country.

“*hotter and drier by 2030.*¹⁸ To deal with this scenario, the Water Corporation said it would not rule out taking water from the Wellington¹⁹ or Brunswick²⁰ catchments but does not see them as highly prospective. The Water Corporation said:

*there are also some small groundwater schemes in the Jandakot area and to the north of Perth that probably will develop and be part of our water supply, but we do not anticipate that any new significant surface water schemes are likely to be developed in the next 50 years.*²¹

2.4 Reduced surface yield projections explain the focus on possible solutions of re-injection of aquifers and desalination. Examples include:

- water being pumped from the first, Perth Seawater Desalination Plant²² and stored in Canning and Victoria dams;²³
- water proposed to be pumped from the second Southern Seawater Desalination Plant (Binningup) when it comes online at the end of 2011 and is stored in North Dandalup dam;²⁴ and
- groundwater being pumped and stored in dams.

The expense entailed in these solutions add to the importance of protecting the dams in which water is stored and their catchments.

2.5 Desalinated water carries significant capital cost and recurrent expenditure compared with taking from surface water. The Water Corporation said:

the amount of water that we get from Mundaring would be in the order of 30 gigalitres a year through the water treatment plant. A new desalination plant that we are building at Binningup will give

¹⁸ CSIRO, Water Yields and demands in south-west Western Australia, Summary of a Report to the Australian Government from the CSIRO South-West Western Australia Sustainable Yields Project, December 2009, p5.

¹⁹ The Wellington Dam Catchment area was proclaimed in 1957 as a source area but is not currently used as a drinking water source. It is used for irrigation and recreation is permitted on that water body.

²⁰ The Brunswick Catchment Area was proclaimed in November 2000. There is significant recreation activity there, for example, marroning, fishing, camping, picnicking and motorsports.

²¹ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p8.

²² Located at Kwinana, the plant is 40 kilometres south of Perth. It started supplying water to the Integrated Water Supply Scheme (IWSS) in November 2006.

²³ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p11.

²⁴ *Ibid.* Also Field Trip to the south-west, 16 April 2010.

50 gigalitres a year—about 50 per cent larger. The desalination plant at Binningup, with associated pipe work is currently estimated to cost \$955 million, compared to a capital cost of \$250 million for a surface water treatment plant. The operating cost for the desalination plant ... would be in the order of \$25 million to \$30 million. The operating cost for a surface water treatment plant would be \$2 million or \$3 million.²⁵

...

Not having to re-treat that water other than by chlorination and possibly a little bit of fluoridation ... makes the water supply more affordable.²⁶

Thus as more desalination plants come online, protecting those dams banking the surplus water and their abutting catchments, becomes of paramount economic importance to the State.

2.6 The Committee makes the following finding.

Finding 1: The Committee finds that an ever increasing proportion of Western Australia's potable water is produced by desalination and groundwater recovery, which entails significant capital and operational cost. In addition to the public health imperative, this cost furthers the importance of protecting existing surface water dams and their catchments.

DEFINING A PUBLIC DRINKING WATER SOURCE AREA

2.7 Public drinking water source areas (PDWSAs) are:

- Underground Water Pollution Control Areas constituted and declared under section 57A of the *Metropolitan Water Supply, Sewerage and Drainage Act 1909*; and
- Water Reserves and Catchment Areas constituted with defined boundaries under either section 13 of the *Metropolitan Water Supply, Sewerage and Drainage Act 1909*; or section 9 of the *Country Areas Water Supply Act 1947*.

²⁵ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p8.

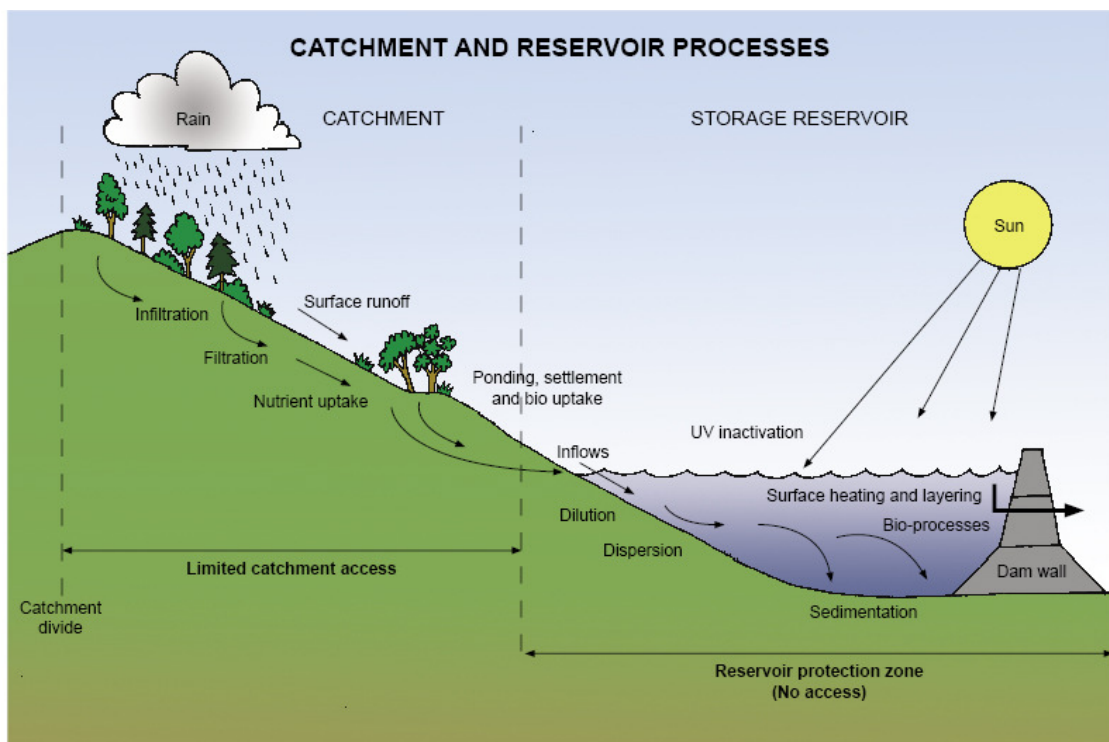
²⁶ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 5 May 2010, p4.

- 2.8 However, submissions received and witnesses at hearings did not use the acronym 'PDWSA', preferring more colloquial phrases such as 'drinking water catchments', 'catchment dams and reservoirs' or 'water reserves'. For the purposes of the Report, the Committee refers to public drinking water source areas as 'source areas'.

VISUAL REPRESENTATION OF A SOURCE AREA

- 2.9 Diagram 1 below provided by the Water Corporation, illustrates the nexus between a water body such as a weir/reservoir or dam and its abutting catchment in Western Australia.²⁷
- 2.10 The Diagram shows a protection zone surrounding a reservoir prohibiting public access and an area adjacent to the reservoir protection zone, called the 'outer catchment' which the public may access for limited, conditional recreational activity. The types of activity and conditions for use are governed by Statewide Policy 13 which is discussed at paragraphs 5.46 to 5.65 of this Report.

Diagram 1



²⁷ Submission No 112 from Water Corporation, 13 November 2009, p10.

Drinking water source areas the subject of this Inquiry

- 2.11 Table 1 lists 29 catchment areas and water reserves which are either proclaimed as a source area or not proclaimed but used as a source of drinking water. Table 2 lists 12 catchments, dams and lakes available for irrigation, industry or recreation.
- 2.12 Within the metropolitan source areas, catchments make up an area of 8,289 square kilometres. From the Perth hills to Collie the area is 35,000 square kilometres.²⁸ Seven full time Water Corporation rangers conduct surveillance with officers from the Department of Environment and Conservation, Department of Fisheries and local police providing support. Some rangers have cross authorisation powers.²⁹

²⁸ Water Corporation, Pre-Submission Information Sheet tabled at a hearing on 21 October 2009, p13. Not all south-west catchments are included in this Report. For example, the Lefroy Brook Catchment Area (declared and gazetted in 1959 as a catchment area under the *Country Areas Water Supply Act 1947*). Also Pemberton town water supply is sourced from Lefroy Brook Weir (a pipehead dam on Lefroy Brook), which is recharged from Big Brook Dam, a storage reservoir upstream. Big Brook Dam which was constructed in 1986 to provide water storage for the Pemberton Trout Hatchery Water Supply. During summer water is released from Big Brook Dam into Lefroy Brook to maintain water level requirements in Lefroy Brook Weir and to meet the water requirements of the Pemberton trout hatchery. *Lefroy Brook Catchment Area Drinking Water Source Protection Assessment Pemberton Town Water Supply*, Water Corporation, 2004, p1.

²⁹ Tabled document at a hearing with the Water Corporation, 5 May 2010, p5.

Table 1 - Perth Hills and south-west source areas

2.13 The source areas below are either formally proclaimed as a source of drinking water supply or not proclaimed but still used as a source.³⁰ The following two Tables are an amalgam of information provided by the Department of Water and the Water Corporation.

Source Areas	Type of Recreation
<p>1. Bancell Brook Catchment Area, proclaimed 1953. Pipehead dam constructed 1952.³¹ The reservoir is not currently used to supply drinking water. The Department of Water state there is potential to de-proclaim this catchment³² and <i>“if investigations show it is not required in the future, the source will be investigated for increased recreation opportunities.”</i>³³</p>	<p>1 hour 40 minutes drive from Perth. The catchment is State forest managed by DEC. Some activity is permitted. The Munda Biddi cycle trail passes through and there are other walk trails. Wildflower appreciation</p>
<p>2. Bickley Brook Catchment Area, proclaimed 1912. Dam constructed 1921. River Inflow is Bickley Brook. It operates as a pump back for the Victoria reservoir in wetter months. The Department of Water state this source area has been identified as a drinking water source that may be able to be de-proclaimed in the future.³⁴ The Water Corporation said Bickley dam is not considered a viable future water source because of the reduction in yield caused by climate change. Negotiations are underway with the Department of Water in the de-proclamation of the source.³⁵</p>	<p>27 minutes drive from Perth. Bickley Outdoor Recreation Camp available for holiday programs and extended stays. Bridle paths and the Kattamordo Heritage Trail. Free access to Bickley recreation areas and trails, picnicking, barbequing areas and children’s playground.</p>

³⁰ Boyup Brook Dam Catchment Area and Kirup Dam Catchment Area were never proclaimed.

³¹ A pipehead dam is a small dam which allows some of the water flowing in a stream to be diverted into a pipe for water supply use. It does not provide any significant storage capacity, relying on ‘run of the river’ flows.

³² Attachment to a letter from the Department of Water, 14 May 2010, p3.

³³ Department of Water, Updated copy of Attachment 4 (Drinking water, irrigation and recreational catchments from Perth Hills to South West, 10 August 2010.

³⁴ Department of Water, Attachment 2 to a letter from the Department of Water, 10 August 2010.

³⁵ Tabled document at a hearing with the Water Corporation, 5 May 2010, p1.

<p>3. Boddington Dam Catchment Area, proclaimed 1978 under the <i>Country Areas Water Supply Act 1947</i>. Not currently utilised for drinking water supply. The Department of Water state the potential to de-proclaim the catchment should be further investigated³⁶ and “<i>if investigations show it is not required in the future, the source will be investigated for increased recreation opportunities.</i>”³⁷</p>	<p>1 hour 51 minutes drive from Perth. Access to the dam is not provided. Dam wall needs repair before it can be used for recreation or water supply. Nearby is the Hotham River, Ranford Pool and Lions Weir.</p>
<p>4. Boyup Brook Dam Catchment Area. Dam constructed 1943. River Inflow is Boyup Brook. The Department of Water state that although this source is not proclaimed,³⁸ it is used as a source of drinking water. Proclamation is proposed.³⁹</p>	<p>3 hours 30 minutes drive from Perth. Access to the dam is not permitted. Some walk trails, wildflowers and wildlife appreciation. Nearby are Ironstone Gully Falls and a picnic area.</p>
<p>5. Brunswick Catchment Area (Beela Dam) proclaimed in 1957 under the <i>Country Areas Water Supply Act 1947</i> to protect the water source for the Beela dam. This source area is not currently used for drinking water supply. The Department of Water state the potential to de-proclaim the catchment should be further investigated⁴⁰ and “<i>if investigations show it is not required in the future, the source will be investigated for increased recreation opportunities.</i>”⁴¹</p>	<p>2 hours drive from Perth. The Beela dam reservoir is generally not accessible to the public. The majority of the catchment is State forest managed by the Department of Environment and Conservation (DEC). Some organised recreation activities (such as motorsport events, 4WD clubs and orienteering events) that occur in the State forest areas of the catchment. Motorsport events run by Rally Australia, Confederation of Australian Motorsport and Motorcycling Australia are held in the catchment. Trout fishing occurs in the Brunswick River,</p>

³⁶ Attachment to a letter from the Department of Water, 14 May 2010, p3.

³⁷ Department of Water, Updated copy of Attachment 4 (Drinking water, irrigation and recreational catchments from Perth Hills to South West), 10 August 2010.

³⁸ No catchment area for Boyup Brook Dam has been proclaimed under the *Country Areas Water Supply Act 1947* for the purpose of protecting the source area from potential contamination. Boyup Brook Dam catchment area is mostly covered by the Boyup Brook Water Supply Catchment, which was resumed in 1951 under the *Public Works Act 1901*. Water Corporation “*Boyup Brook Dam Catchment Area Drinking Water Source Protection Assessment, Boyup Brook Town Water Supply*”, 2004 <http://www.water.wa.gov.au/PublicationStore/first/59261.pdf> (viewed on 27 April 2010), p2.

³⁹ Attachment to a letter from the Department of Water, 14 May 2010, p4.

⁴⁰ Ibid, p3.

⁴¹ Department of Water, Updated copy of Attachment 4 (Drinking water, irrigation and recreational catchments from Perth Hills to South West), 10 August 2010.

	upstream of the dam. The Department of Fisheries periodically stocks the Brunswick River with trout. Recreational hunting for feral pigs occurs in the catchment. ⁴²
6. Canning River Catchment Area, proclaimed 1915. Dam constructed 1940. River inflow is Canning River. Known as a 'peaking catchment', that is, it is needed for the summer peak demand times. ⁴³	52 minutes drive from Perth. The Bibbulum Track and Munda Biddi cycle trail pass through. Other walks and a viewing platform. Dam wall is open to the public. Wildflower appreciation
7. Churchman Brook Dam Catchment Area, proclaimed 1923. Dam constructed 1929. River Inflow is Churchman Brook	43 minutes drive from Perth. Walk trails and wildflower appreciation. Gated access to the dam wall. Picnicking, barbequing facilities and grassed areas below dam wall.
8. Conjurunup Creek Pipehead Dam Catchment Area proclaimed 1982	1 hour drive from Perth. The Munda Biddi cycle trail passes through
9. Dirk Brook Water Reserve (Karnet Prison Farm) proclaimed 1982. This source area is not currently used for drinking water supply. ⁴⁴ The Department of Water state the potential to de-proclaim this source area should be further investigated ⁴⁵ and " <i>if investigations show it is not required in the future, the source will be considered for increased recreation opportunities.</i> " ⁴⁶	1 hour drive from Perth. The reserve is mainly State forest managed by DEC. The Munda Biddi cycle trail passes through. Serpentine Falls National Park, turf farms, piggeries and horticulture.
10. Dwellingup Dam Catchment Area, proclaimed 1971. Dam constructed 1973. River Inflow is Dwellingup Brook. The Department of Water state " <i>this source is currently being used for drinking water supply. However, Water</i>	1 hour 18 minutes drive from Perth. The town of Dwellingup is in the catchment area. The Bibbulum Track and Munda Biddi cycle trail pass through. Other walk trails. Access to Dwellingup Reservoir is prohibited. Hotham Valley tourist railway.

⁴² Department of Water, Water Resource Protection Series, Report No 39, Brunswick Catchment Area Water Source Protection Plan, 2001, p7.

⁴³ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p10.

⁴⁴ Attachment to a letter from the Department of Water, 14 May 2010, p2.

⁴⁵ Ibid, p3.

⁴⁶ Department of Water, Updated copy of Attachment 4 (Drinking water, irrigation and recreational catchments from Perth Hills to South West), 10 August 2010.

<p><i>Corporation are seeking to supply Dwellingup from South Dandalup Dam. If this occurs the potential to deproclaim the catchment should be investigated.”⁴⁷</i></p>	
<p>11. Gooralong Brook Water Reserve proclaimed 2005. The Department of Water states the source is not currently used for drinking water supply. The potential to de-proclaim the catchment should be further investigated⁴⁸ and “<i>if investigations show it is not required in the future, the source will be considered for increased recreation opportunities.</i>”⁴⁹</p>	<p>53 minutes drive from Perth. Kitty’s Gorge walk trail, Serpentine Falls National Park. The Munda Biddi cycle trail passes through. Walk trails and Langford Park Picnic area.</p>
<p>12. Greenbushes Catchment Area proclaimed 1974. Dumpling Gully dam 1 constructed in 1962 and Dumpling Gully dam 2 in 1987. New Zealand Gully dam which is also known as Dumpling Gully dam 3 is upstream of the Dumpling Gully dams and is available for emergency use.⁵⁰</p>	<p>2 hours 44 minutes drive from Perth. Off road vehicle use, bushwalking at two popular bushwalking tracks including the New Zealand Gully Trail and the Greenbushes Loop heritage trail which connects with the Bibbulmun Track outside the catchment. Horse riding, fishing, marroning and swimming are prohibited.</p>
<p>13. Harris Dam Catchment Area, proclaimed 1990. Dam constructed 1990. River Inflow is Harris River.</p>	<p>2 hours 12 minutes drive from Perth. The Bibbulmun Track passes through with overnight camping huts. Cycle trails and an artificial swimming pool is below the dam wall.</p>
<p>14. Harvey Dam Catchment Area. The Harvey Weir was originally constructed 1916 and upgraded 2002. River Inflow is Harvey River. The Department of Water state this source “<i>is not currently used for drinking water supply and has been identified as a drinking water source that may be able to be de-proclaimed in the future. If this occurs the dam could be</i></p>	<p>1 hour 41 minutes drive from Perth. Swimming, fishing, non fuel powered craft in designated areas, canoeing, marroning, children’s playground, amphitheatre available for concerts and cultural events. Picnicking and barbequing at the base of the dam wall. Several walk trails including a board walk.</p>

⁴⁷ Department of Water, Updated copy of Attachment 4 (Drinking water, irrigation and recreational catchments from Perth Hills to South West), 10 August 2010.

⁴⁸ Attachment 2 to a letter from the Department of Water, 10 August 2010.

⁴⁹ Department of Water, Updated copy of Attachment 4 (Drinking water, irrigation and recreational catchments from Perth Hills to South West), 10 August 2010.

⁵⁰ Water Corporation, Greenbushes Catchment Area Drinking Water Source Protection Assessment, 2004, p1.

<i>considered for new and/or enhanced recreation.”⁵¹</i>	
15. Kirup Dam Catchment Area. Dam constructed 1966. River Inflow is Capel River. The Department of Water state this source is not currently proclaimed. However, it is used as a source of drinking water and proclamation is proposed. ⁵²	2 hours 30 minutes drive from Perth. Public access to the dam not permitted. Some walk trails and wildflower appreciation.
16. Lower Helena Catchment Area proclaimed 1972 as the ‘Lower Helena Pipehead Dam Catchment Area’ under the <i>Country Areas Water Supply Act 1947</i> . However, the Department of Water state the catchment is “ <i>proposed to be gazetted under the Metropolitan Water Supply, Sewage and Drainage Act 1909 as the Middle Helena Catchment Area</i> ”. ⁵³	35 minutes drive from Perth. The Middle Helena source has the Bibbulmun Track, bridle trails, Schipp Road and Rocky Pool walking trails. The Munda Biddi cycle trail passes through. Organised orienteering. Wildflower appreciation.
17. Mullalyup Water Reserve proclaimed 1983. This source area is not currently used for drinking water supply. Rather, it is an emergency source, which has not been used for some time. ⁵⁴ The Department of Water state “ <i>if investigations show it is not required in the future, the source will be considered for increased recreation opportunities.</i> ” ⁵⁵	2 hours 30 minutes drive from Perth. Bird watching, bushwalking and wilderness. Access to the Bibbulmun Track.
18. Mundaring Weir Catchment Area originally proclaimed in 1972 under the <i>Country Areas Water Supply Act 1947</i> . The western portion of the catchment area was then additionally proclaimed under the <i>Metropolitan Water Supply,</i>	1 hour drive from Perth. Education Centre, camping at approved sites, weir and walk trails such as the Kep Track and Mundaring precinct, long walk trail. Munda Biddi cycling trail. Off road vehicle trails including Power line and Wandoo 4WD, trail bike

⁵¹ Attachment 2 to a letter from the Department of Water, 10 August 2010.

⁵² Ibid.

⁵³ Department of Water, Updated copy of Attachment 4 (Drinking water, irrigation and recreational catchments from Perth Hills to south-west), 10 August 2010.

⁵⁴ Attachment 2 to a letter from the Department of Water, 10 August 2010.

⁵⁵ Department of Water, Updated copy of Attachment 4 (Drinking water, irrigation and recreational catchments from Perth Hills to South West), 10 August 2010.

<p><i>Sewage and Drainage Act 1909</i> in 2007.⁵⁶ The 2007 proclamation allowed a two km reservoir protection zone to be established. Weir constructed 1903. River inflow is Helena River.</p>	<p>tracks, picnicking, barbequing facilities below dam wall. Camping along the Bibbulmun Track.</p>
<p>19. Mungalup Dam Catchment Area, proclaimed 1957. Dam constructed 1935 to supply public drinking water to the southern part of Collie as well as Mungalup.⁵⁷</p>	<p>2 hours 34 minutes drive from Perth. Walk trails. Public access is not authorised but pedestrian access is allowed along the Bibbulmun Track which passes within metres of the dam. Very limited public access to the catchment area because the Department of Environment and Conservation manage the area as a State forest timber reserve. Only bushwalking, cycling and picnicking are authorised activities.⁵⁸</p>
<p>20. Murray River Water Reserve proclaimed 1982 (includes Lane Poole Reserve, declared 1984). The Murray River runs through the reserve. This source area is not currently used for drinking water supply.⁵⁹ The Department of Water state <i>“if investigations show it is not required in the future, the source will be considered for increased recreation opportunities.”</i>⁶⁰</p>	<p>1 hour 22 minutes drive from Perth. Swimming, canoeing, rafting, camping. The Bibbulmun Track and Munda Bididi cycle trail pass through. Nanaga 4WD heritage circuit, bridle trails, camping areas and caravan sites. Dogs permitted on leads.</p>
<p>21. North Dandalup Pipehead Dam Catchment Area proclaimed 1982. Original pipehead dam operated from 1971. New dam constructed 1994. River Inflow is North Dandalup River</p>	<p>1 hour 7 minutes drive from Perth. Sailing model boats, wading and beach games allowed at base of pipehead dam. Walk trails. Munda Bididi trail. Picnicking, barbequing facilities and toilets.</p>
<p>22. Padbury Reservoir Catchment Area, proclaimed in 1987 (Balingup dam). Dam constructed 1963. River Inflow is Balingup Brook. This source area is not</p>	<p>3 hours 40 minutes drive from Perth. The Bibbulmun Track passes through. Access to the dam is restricted</p>

⁵⁶ Department of Water Email to the Committee, 28 June 2010.

⁵⁷ Department of Water, Mungalup Dam Catchment Area, Drinking Water Source Protection, Plan, Collie South and Mungalup town water supply, Water Resource Protection Series, June 2009.

⁵⁸ Ibid, p16.

⁵⁹ Attachment 2 to a letter from the Department of Water, 10 August 2010.

⁶⁰ Department of Water, Updated copy of Attachment 4 (Drinking water, irrigation and recreational catchments from Perth Hills to south-west), 10 August 2010.

<p>currently used for drinking water supply. The Department of Water state the potential to de-proclaim the catchment should be further investigated.⁶¹</p>	
<p>23. Samson Brook Dam Catchment Area, proclaimed 1952 under the <i>Country Areas Water Supply Act 1947</i> and re-proclaimed under the <i>Metropolitan Water Supply, Sewage and Drainage Act 1909</i> in 2008. Dam constructed 1941 and is used for irrigation but the pipehead dam is for drinking water supply. River Inflow is Samson Brook.</p>	<p>1 hour 50 minutes drive from Perth. Walk trails and Munda Bididi cycle trail. Public access is not promoted. Nearby opportunities include Drakesbrook Weir, Logue Brook dam, Waroona dam and Lane Poole Reserve.</p>
<p>24. Serpentine Dam Catchment Area and the Serpentine Pipehead Dam Catchment Area were both proclaimed in 1982. Pipehead dam constructed 1957 and dam 1961. River Inflow is Serpentine River. It is known as a peaking catchment, that is, it is needed for the summer peak demand times.⁶²</p>	<p>1 hour drive from Perth. Recreational lake at the pipehead dam for model boats, wading. Walk trails, camping. Munda Bididi cycle trail and the Bibbulum Track, picnicking, barbequing and children's playground below the dam wall, Balmoral (Prisoner of War camp) recreation site.</p>
<p>25. South Dandalup Dam Catchment Area and the South Dandalup Pipehead Dam Catchment Area were proclaimed in 2000. Dams constructed 1971. River inflow is the South Dandalup River and Boomer Brook.</p>	<p>1 hour 9 minutes drive from Perth. The Bibbulum Track, Munda Bididi Trail, other walk trails. Picnicking, barbequing, walking and cycling trails. Wildlife and wildflower appreciation. Nearby opportunities include Lane Poole Reserve and Oakley dam. Activities are permitted in the pipehead dam catchment area. The picnic/barbeque facilities downstream of the South Dandalup dam wall are within the outer catchment of the pipehead dam, and the Munda Bididi cycle trail also passes through the outer catchment of the pipehead dam.⁶³</p>
<p>26. Stirling Dam Catchment Area proclaimed 2001. Dam constructed 1948. River inflows are Stirling and Harvey Rivers.</p>	<p>2 hours drive from Perth. Camping at Hoffman's Mill, picnicking, barbequing areas at base of the dam wall, Bibbulum Track,</p>

⁶¹ Attachment to a letter from the Department of Water, 14 May 2010, p4.

⁶² Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p10.

⁶³ Department of Water Email to the Committee, 28 June 2010.

	Munda Bididi Trail and other walk trails.
27. Victoria Reservoir Catchment Area, proclaimed 1923. It is known as a 'peaking catchment', that is, it is needed for the summer peak demand times. ⁶⁴ River Inflow is Munday Brook.	33 minutes drive from Perth. Walk trails including the Kattamorda heritage trail, cycle trails including Munda Bididi cycle trail, Pickering Brook golf course affiliated with local sports club. Shooting range.
28. Wellington Dam Catchment Area, (includes Potters Gorge) proclaimed 1957. Dam first constructed 1933. River inflows are Wellington and Collie Rivers. Not currently utilised for drinking water supply ⁶⁵ but irrigation and recreation. ⁶⁶ The Department of Water state " <i>The future use of this catchment area is subject to Government's decision on the future use of this source.</i> " ⁶⁷	2 hours 12 minutes drive from Perth. Abseiling, walk trails including the Bibbulum Track, water skiing, canoeing, white water rafting, camping, Munda Bididi cycling trail. Fishing and marroning.
29. Wungong Brook Catchment Area proclaimed 1925. The Pipehead dam was constructed 1925 and the larger dam in 1979. River inflow is Wungong River. It is known as a 'peaking catchment', that is, it is needed for the summer peak demand times. ⁶⁸	1 hour 22 minutes drive from Perth. Model boat sailing and wading in the recreation lake below dam wall. Walk trails including Munda Bididi cycle trail. Darling 2000 Motor Rally event, picnicking, barbequing and walking trails. Camping facilities available at designated sites along trails.

⁶⁴ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p10.

⁶⁵ Wellington dam was used till 1990 when it became too saline. It was made available for non motorised sports in 1990. Submission No 2 from the Shire of Dardanup, 26 October 2009, pp1-2.

⁶⁶ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, at p9 said "*Depending on how climate change affects the water yield there, we do not totally rule out [using it as a drinking water source] but probably our ninety-fifth percentile expectation is that the Collie River will be needed for agriculture and industry in the south west. As the drying climate continues to reduce the amount of water, we will continue to need food to feed people. We—crystal-ball gazing—think in 10 or 20 years time it is most likely that that will not be a prospective water supply source for drinking water. I think other uses will probably be more valuable to the community in a broad sense, which means that the recreational opportunities on the Wellington would continue, and not be under threat.*"

⁶⁷ Attachment 2 to a letter from the Department of Water, 10 August 2010. No absolute decision has been made on the future uses of Wellington dam. As noted in the Upper Collie water allocation plan (August 2009) the Department "*encourages new and expanding industries to access Wellington Reservoir for fit-for-purpose uses; and the highest value use of the water resource will be achieved by allocating water from Wellington Reservoir to irrigation, regional industries and, potentially, public water supply*". Department of Water Email to the Committee, 28 June 2010.

⁶⁸ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p10.

2.14 Table 1 reveals that of the 29 source areas:

- 18 are currently used for drinking water supply. The vast majority allow many forms of recreation in the outer catchment, that is, beyond the two kilometre, prescribed by law, reservoir protection zone. At a minimum, designated walk trails are provided.
- 11 are no longer used as a source of drinking water supply.⁶⁹ If de-proclamation were to occur, noting that two sources were never proclaimed,⁷⁰ there would be potential for recreational opportunity.
- Five dams have either restricted or prohibited access.⁷¹

Table 2 - Irrigation, industry or recreation lakes and dams

Lakes and dams	Type of Recreation
1. Black Diamond Lake, Collie. It is located within the Wellington Dam Catchment Area.	2 hours 20 minutes from Perth. Water based recreation. The Department of Water state <i>“recreation at Black Diamond Lake is currently not actively managed. The Shire of Collie and Department of Mines and Petroleum are investigating management options for this site.”</i> ⁷²
2. Drakesbrook Weir (Lake Moyanup). Dam constructed 1931. River Inflow is Drakes Brook. The Department of Water state this dam could be considered for new and/or enhanced recreation. ⁷³	1 hour 23 minutes drive from Perth. Fishing, swimming, power boating, marroning, canoeing, picnicking, barbecuing, wildlife and wildflower appreciation. Currently closed to the public for upgrading. The dam is stocked with rainbow trout.

⁶⁹ These are Bancell Brook Catchment Area, Boddington Dam Catchment Area, Brunswick Catchment Area (Beela Dam), Dirk Brook Water Reserve, Gooralong Brook Water Reserve, Harvey Dam Catchment Area, Kirup Dam Catchment Area, Mullalyup Water Reserve, Murray River Water Reserve, Padbury Reservoir Catchment Area and Wellington Dam Catchment Area.

⁷⁰ Boyup Brook Dam Catchment Area and Kirup Dam Catchment Area.

⁷¹ These are: (1) the Boddington Dam Catchment Area, which does not provide access to its dam. (2) Boyup Brook Dam Catchment Area which does not permit access to its dam. (3) The Beela Dam reservoir in the Brunswick Catchment Area is generally not accessible to the public because it is on fenced Water Corporation owned land and surrounded by freehold land. (4) Public access to the dam in the Kirup Dam Catchment Area is not permitted. (5) Access to Balingup dam is restricted in the Padbury Reservoir Catchment Area.

⁷² Attachment 2 to a letter from the Department of Water, 10 August 2010.

⁷³ Ibid.

<p>3. Glen Mervyn dam constructed 1969. River Inflow is Lyall's Mill Stream. It supplies the Preston Valley Irrigation System. The Department of Water state this dam could be considered for new or enhanced recreation.⁷⁴</p>	<p>2 hours 37 minutes drive from Perth. Water skiing, swimming, marroning, fishing, walk and cycling trails. The Solahart Donnybrook Marathon Relay event. Access to dam wall is permitted as the Bibbulmun Track crosses the dam wall. Power boating (boat ramp available), canoeing and rafting. Camping areas and caravan sites.</p>
<p>4. Lake Kepwari. This lake is located within the Wellington Dam Catchment Area. It was a former open-cut coal mine pit till 1996 but is being developed into a man-made lake. The site is not currently open to the public due to the revitalisation project to enhance recreation opportunities. The lake is expected to open in the summer of 2010/11. It is two kilometres long, one kilometre wide and 70 metres deep. Since 2003, rehabilitation work on the site has been undertaken to develop it as a community aquatic recreation facility.</p>	<p>2 hours 34 minutes drive from Perth. Walk trails, water skiing, swimming, canoeing, rafting, fishing, walk trails, power boating, picnicking and barbequing area. Wildflower and wildlife appreciation.</p>
<p>5. Lake Leschenaultia. Dam wall constructed 1897.</p>	<p>50 minutes drive from Perth. Swimming, canoeing, camping but no caravans, motorbike trail, walk trails including a circumference walk, motorbike trails, cycling trails, picnicking and barbequing. Café and tearooms.</p>
<p>6. Lennard Drive and Honeymoon Pool, part of the Wellington National Park.</p>	<p>2 hours 17 minutes drive from Perth. Swimming, canoeing, white water rafting, bushwalking, fishing, marroning and camping at Honeymoon Pool. Also, marroning, walking and cycling trails, scenic driving (Lennard Drive) and several picnicking and barbequing facilities at Big Rock, Little Rock and Long Pool.</p>
<p>7. Lesmurdie Falls National Park established 1957. The Lesmurdie Brook (a tributary of the Canning River) flows through the park.</p>	<p>35 minutes drive from Perth. Walk trails, cycle trails, wading and swimming, scenic water fall. Picnicking, barbequing facilities below dam wall. Lewis Rd, Whistlepipe</p>

74

Attachment 2 to a letter from the Department of Water, 10 August 2010.

	Gully and Palm Terrace walking tracks, various cycling trails, boardwalk, viewing bridge and lookout points. Current recreational improvements are taking place at Mundy Regional Park, facilitated by DEC.
8. Logue Brook Dam (Lake Brockman) Catchment Area. Dam constructed 1963. River Inflow is Logue Brook. The Department of Water said this dam could be considered for new or enhanced recreation. ⁷⁵	1 hour 42 minutes drive from Perth. Irrigation dam. Water skiing, boating, power boating, swimming, canoeing, fishing, marroning and camping. The Munda Biddi cycle trail passes through. Picnicking and barbequing. Various walk trails including the Bibbulmun Track.
9. Minninup Pool on the Collie River. The pool has significance for indigenous people.	2 hours 27 minutes drive from Perth. Fishing, marroning, swimming, canoeing, rafting and walk trails. The Bibbulmun Track is nearby. Wildflower and wildlife appreciation. Picnicking facilities. Dogs permitted.
10. Oakley dam. It was constructed in the late 1930s to supply water for steam locomotives.	1 hour 30 minutes drive from Perth. Swimming, trout fishing. Munda Biddi cycle trail, marroning, picnicking, barbequing, multiple walk trails and viewing platforms. Dogs are permitted. The dam is stocked with trout by the Department of Fisheries.
11. Stockton Lake. This lake is located within the Wellington Dam Catchment Area. It is a disused coal mining pit which closed in 1957.	2 hours 30 minutes drive from Perth. Fishing, swimming (but acidic water), canoeing, water skiing, wildflowers, camping, power boating, picnicking, barbequing around the lake. Vehicle access to dam for boat launching and multiple walk trails.
12. Waroona dam (Lake Navarino). It was constructed in 1966 and originally built for drinking water supply. River Inflow is Drakes Brook. The Department of Water said this dam could be considered for new or enhanced recreation. ⁷⁶	1 hour 32 minutes drive from Perth. Walk and cycle trails, swimming, fishing, camping, canoeing, power boating and water skiing but not permitted within 200 metres of the dam wall. Boat ramp, marroning; caravan sites.

75

Attachment 2 to a letter from the Department of Water, 10 August 2010.

- 2.15 Tables 1 and 2 reveal a vast amount of varied recreational opportunity in the 41 source areas as well as irrigation dams and lakes that are between a 30 minute and four hours drive from Perth. These recreational opportunities are additional to opportunities outside those source areas and irrigation dams, for example along the coastal strip and ocean.
- 2.16 Towards the conclusion of this Inquiry, the Department of Water advised that a collaborative partnership with the Departments of Water, Environment and Conservation, Sport and Recreation, Health, and the Water Corporation has been formed to develop an agreement on recreation planning in public dams and catchments. Together with the Water Corporation, the Department of Water said it is committed to reviewing ten identified source areas to:

*determine if they are still required for drinking water supply. Any [source area] that is not required for future drinking water supply would be de-proclaimed and could be available for new or enhanced land and water based recreation.*⁷⁷

- 2.17 The ten identified source areas are:

- Bancell Brook Catchment Area;
- Bickley Brook Catchment Area;
- Boddington Dam Catchment Area;
- Brunswick Dam Catchment Area;
- Dirk Brook Water Reserve;
- Gooralong Brook Water Reserve;
- Harvey Dam Catchment Area;
- Mullalyup Water Reserve;
- Murray River Water Reserve; and
- Wellington Dam Catchment Area.⁷⁸

⁷⁶ Attachment 2 to a letter from the Department of Water, 10 August 2010.

⁷⁷ Letter from Mr Greg Davis, Acting Director Water Resource Management, Department of Water, 10 August 2010, p1.

⁷⁸ Ibid, p2.

WATER BARRIERS AND TREATMENT PROCESSES

- 2.18 Diagram 2 below, provided by the Water Corporation reveals the processes by which water is extracted from a source area and delivered to consumers at tap. The diagram shows the multiple barrier approach used in a “*typical Water Corporation drinking water supply*”,⁷⁹ managed from catchment to tap. It reveals that the Water Corporation currently carries out only coarse screening followed by disinfection using chlorine to treat water from a source area before it is tanked and distributed.⁸⁰ This is because other barriers such as the priority⁸¹ status given to the catchment by the Department of Water, that is, P1, 2 or 3 and the two kilometre reservoir protection zone, protect the water from the need for more chemically invasive treatment before distribution.
- 2.19 The size of the reservoir protection zone exclusion area within metropolitan drinking water reservoirs is 559 square kilometres. From the Perth hills to Collie this is approximately 1.5% of the land area.⁸² The Water Corporation deems the reservoir protection zone exclusion area “*reasonable in terms of preserving the integrity of the natural vegetation and the natural ecosystem.*”⁸³

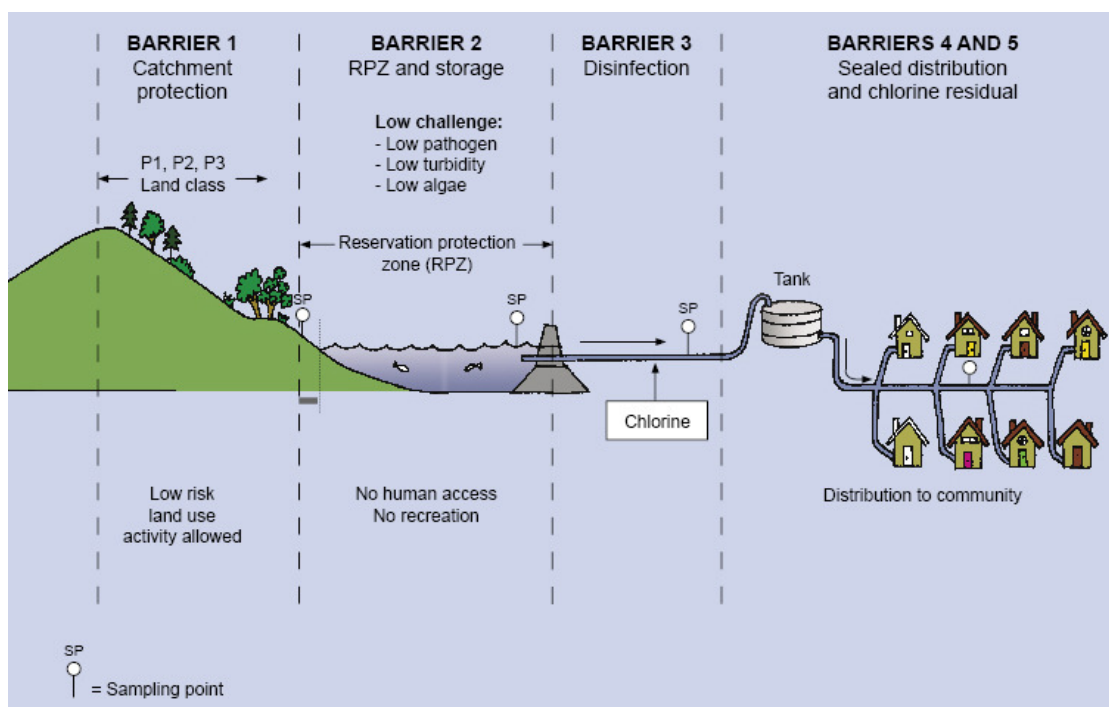
⁷⁹ Submission No 112 from Water Corporation, 13 November 2009, p13.

⁸⁰ Chloramination on the Mundaring pipeline - Tabled document showing *E. Coli* levels at Logue Brook and Canning dams, during a hearing with Mr Richard Theobald, Manager, Water Unit, Department of Health, *Transcript of Evidence*, 14 October 2009, p4.

⁸¹ Priority 1 (P1) areas are declared over land where the provision of the highest quality public drinking water is the prime beneficial land use. Priority 2 (P2) areas are declared over land where low intensity development (such as rural) already exists. Priority 3 (P3) source protection areas are defined to manage the risk of pollution to the water source. P3 areas are declared over land where water supply sources need to co-exist with other land uses such as residential, commercial and light industrial developments.

⁸² Water Corporation, Pre-Submission Information Sheet tabled at a hearing on 21 October 2009, p13.

⁸³ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p9.

Diagram 2

- 2.20 The multiple barriers referred to in Diagram 2 above have a high probability of preventing consumers being exposed to contaminants such as bacterial and viral pathogens; disinfection by-products, chemicals and hydrocarbons. All of these are detrimental to health. Multiple barriers from catchment to tap significantly reduce the risk that contaminants will affect consumers because if one barrier was to fail, the operation of the other barriers will continue to provide protection. The Australian Drinking Water Guidelines encourage a multiple barrier approach to source protection as they enhance water security by dealing with contaminants at the point of each barrier.⁸⁴

84

Professor Steve Hrudey, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009 at p7 said the guidelines are “frankly head and shoulders above the guidance everywhere else because they have tried to distil common themes and principles out of all this complexity”. Professor Hrudey is an internationally recognised expert and authority in public health matters.

CHANGING CATCHMENT CHARACTERISTICS

2.21 In considering dual use of source areas the Health Department warned that:

Different water bodies often require different styles of treatment facility. We do include ultraviolet radiation if we know there is cryptosporidium or those types of protozoan contaminants on top of the chlorine. All of those things are an additional cost and an additional barrier. To know which one to put into the suite, we need to know what we have going upstream. We need to be confident of that. No-one has come to us and said that. All they are saying at the moment is that they have an exclusion and from history, the current treatment regime works. If they want to change the catchment characteristics, they will have to change those treatment barriers.⁸⁵

2.22 If catchment characteristics were to change, then dependence on a technological intervention means only one barrier stands between the water source and the consumer. The catchments are pivotal to potable water source security, as was recognised in the *Sydney Water Inquiry Final Report*. This report into the Sydney water crisis in 1998 noted that “*the state of the catchment poses continuing serious risks for the safety of Sydney’s drinking water*”.⁸⁶ Catchments are the primary barriers to the entry of pathogens, particularly *Cryptosporidium parvum* and *Giardia lamblia*.⁸⁷

2.23 In February 2010, the *O’Keefe Review of the Sydney Water Crisis* noted that from a public health viewpoint, the principal difference between *Cryptosporidium* and *Giardia* is that *Cryptosporidium* oocysts⁸⁸ are highly resistant to chlorine, the most commonly used disinfectant. The chlorine levels and exposure times required to inactivate *Cryptosporidium* are at least ten times greater than that for *Giardia* and certainly beyond the concentrations and exposure times that can be achieved in domestic water distribution systems. This renders the usual disinfection barrier in treated water ineffective against *Cryptosporidium* at the concentrations typically used. It thus places a much heavier onus on catchment management and water filtration to reduce the chance of *Cryptosporidium* entering the drinking water supply.⁸⁹

⁸⁵ Mr James Dodds, Director, Environmental Health Directorate, Public Health Division, Department of Health, *Transcript of Evidence*, 14 October 2009, p5.

⁸⁶ Sydney Water Inquiry, Final Report, 1998, unnumbered page.

⁸⁷ Sydney Water Inquiry Ten Year Review, *Final Report of the Review Panel*, 17 February 2010, p10.

⁸⁸ An oocyte is a cyst containing a zygote formed by a parasitic protozoan.

⁸⁹ Sydney Water Inquiry Ten Year Review, *Final Report of the Review Panel*, 17 February 2010, p4.

- 2.24 Any one barrier can fail, be it an environmental situation, human error or mechanical failure “*and probably will at some point in time*”.⁹⁰ Given that technological solutions do fail, water treatment alone cannot guarantee the quality of a water supply. Melbourne Water told the Committee that:

*Unfortunately treatment plants do occasionally fail and often the consequences ... can be catastrophic. Failures ... are not restricted to poorly run plants in developing countries; some of the most dramatic and unfortunate failures have been in the United States and the United Kingdom. Having a low risk water source ensures that the consequences of occasional treatment failures are less severe.*⁹¹

- 2.25 Professor Steve Hrudehy, Environmental and Analytical Toxicologist, University of Alberta, Canada, reinforced this view of treatment failure when he told the Committee that:

*If you are going to put reliance on treatment you had better be prepared to bankroll a major undertaking to make sure that the treatment is always functioning because you cannot get a 100% assurance because it is subject to the vagaries of human behaviour and things go wrong. Most ... outbreaks ... [in the reported literature] ... involved treatment.*⁹²

⁹⁰ R. Ford, *Catchment for Drinking Water Protection*, Water Source Protection Feature, February 2010, p128.

⁹¹ Letter from Mr Peter Scott, Program Director Research and Technology, Melbourne Water, 22 October 2009, p3 as an Attachment to the Submission from the Water Corporation, Submission No 112, 13 November 2009. See also the Australian Drinking Water Guidelines National Health and Medical Research Council website.

⁹² Professor Steve Hrudehy, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009, p6.

CHAPTER 3

SOCIAL, ECONOMIC AND ENVIRONMENTAL VALUES OF RECREATIONAL ACCESS

THE SOCIAL VALUE OF RECREATIONAL ACCESS

3.1 The social value of access to source areas was evident from the numerous submissions the Committee received from fishers, bushwalkers, orienteers, rogainers, nature observers, canoeists, long distance riders, motorcyclists and trail bike riders. One rural local government recounted a history of families enjoying fresh air and the traditional experience of camping during the school holidays in natural, forested environments.⁹³

Bushwalkers and others

3.2 The Bibbulmun Track Foundation said their trails allow the community to access the wilderness to relieve the stresses of modern life with some, like the Cape to Cape trail, having wheelchair and disabled access.⁹⁴ The Foundation referred to the importance of the bush for the growing “*reconnection of Aboriginal people to the land*”;⁹⁵ that “*Aboriginal leaders have been mapping the Great Dreaming Trails that meander all over WA*”.⁹⁶ Other bushwalkers wrote of the stimulating challenge of walking and keeping “*socially connected*”.⁹⁷

3.3 Bushwalkers of WA (Inc) described their programme as providing opportunities for participants to “*enjoy the natural attributes of the bush in a sociable, well organised and safe manner*”.⁹⁸ Outdoors WA described participation in the outdoors as “*quintessentially Australian*”⁹⁹ and that recreating in natural environments as individuals, families and groups is a “*social imperative*”.¹⁰⁰ Their student based outdoor education groups involve young people learning to interact with the

⁹³ Submission No 2 from the Shire of Dardanup, 26 October 2009, pp1-2.

⁹⁴ Submission No 3 from the Bibbulmun Track Foundation, 26 October 2009, p1.

⁹⁵ Ibid, p2.

⁹⁶ Ibid, p2.

⁹⁷ Submission No 52 from Haydee Adel, Private Citizen, 9 November 2009, p1. Also Submission No 79 from the Perth Bushwalkers Club Inc, 12 November 2009, p1. Also Submission No 81 from the Federation of Western Australian Bushwalkers Inc, 12 November 2009, p1.

⁹⁸ Submission No 75 from Bushwalkers of WA (Inc), 12 November 2009, p1.

⁹⁹ Submission No 38 from Outdoors WA, 6 November 2009, p1.

¹⁰⁰ Ibid.

environment and this interaction addresses what is described by Mr Richard Louv, author and journalist, as ‘onset outdoor deficit disorder’ or ‘nature deficit disorder’.¹⁰¹ Outdoors WA said that outdoor deficit disorder is “*a term for a modern day trend describing the generations of people who have not engaged the outdoors and missed vital aspects of their development.*”¹⁰²

3.4 In a submission, C.R. Oakeley, private citizen, described the social benefits of bushwalking. It:

- *promotes a healthy lifestyle for all ages, promoting exercise, enjoyment of fresh air, and healthy avenues to make achievements in life;*
- *encourages knowledge and respect for the environment and nature, and love for the country we live in;*
- *provides a challenge for young people in an ever more cosseted society;*
- *encourages correct practices and self sufficiency in the bush and remote areas, which breeds confidence and esteem for everyday living; and*
- *provides a healthy and socially safe environment for people to meet.*¹⁰³

Fishers

3.5 Both the West Australian Trout & Freshwater Angling Association Inc (**WATFAA**) and the Recreational Fishing Advisory Committee Western Australia emphasised that trout and marron fishing is a “*highly valued activity that holds a unique cultural value to generations of Westerns Australians.*”¹⁰⁴ Mr Anthony Brand, member of WATFAA, described how “*many elderly and retired friends in their 70s look forward to the peace, calm and safety of inland water fishing - especially fly fishing*”;¹⁰⁵ that “*it is one of the few safe and reasonably economical pastimes that the growing number of aged persons in this community can enjoy.*”¹⁰⁶

3.6 The Committee makes the following finding:

¹⁰¹ Nature deficit disorder was coined by Mr Richard Louv, Canadian author and journalist.

¹⁰² Submission No 38 from Outdoors WA, 6 November 2009, p1. Mr Barry Powell, Private Citizen and Teacher in Submission No 76, 12 November 2009, p1 said he liked “*the idea of that magnificent resource (Western Australian forest) accessible to children accompanied by adults who can impart its value.*”

¹⁰³ Submission No 77 from C.R. Oakeley, 12 November 2009, p1.

¹⁰⁴ Submission No 14 from the West Australian Trout & Freshwater Angling Association Inc, 3 November 2009, p1 and Submission No 15 from the Recreational Fishing Advisory Committee Western Australia, 3 November 2009, p2.

¹⁰⁵ Submission No 48 from Mr Anthony Brand, 9 November 2009, p1.

¹⁰⁶ Ibid.

Finding 2: The Committee finds that the recreational community places a high social value on recreation in natural bush settings, rivers, water bodies and catchments.

THE ECONOMIC VALUE OF RECREATIONAL ACCESS

Government departments

- 3.7 The economic value of allowing recreation in source areas was best explained by the Department of Environment and Conservation (**DEC**) in a collaborative submission with Tourism Western Australia.
- 3.8 According to DEC, in 2008, Perth's population reached 1,518,700 and is projected to reach 4,200,000 by 2051.¹⁰⁷ DEC argued that as population grows, demand for recreation based tourism will intensify, especially for “*nature based experiences*”¹⁰⁸ in inland water catchments, water impoundments and streams in the south-west of the State. The level of demand for facilities now outstrips the available resources, let alone by 2051.
- 3.9 Tourism WA said:
- over a three year average to June 2007, the Shire of Murray received 160,000 overnight visitors spending \$14 million. It was estimated that 38,000 of these overnight visitors participated in recreational activity. Comparable figures were obtained for the Shires of Harvey and Waroona;¹⁰⁹
 - Western Australia's southern forests' natural attractions have been valued at \$61.9 million;
 - direct visitor expenditure of \$4.3 million at Wellington dam and its surrounds; and
 - the local impact of Logue Brook dam was estimated at \$630,000 in 2006.¹¹⁰

¹⁰⁷ Submission No 198 from the Department of Environment and Conservation, 7 January 2010, p4.

¹⁰⁸ Submission No 182 from Tourism Western Australia, 7 December 2009, p1.

¹⁰⁹ Ibid, p2.

¹¹⁰ Submission No 182 from Tourism Western Australia, 7 December 2009, p2, quoting ACIL Tasman, *The value of recreation at Logue Brook Dam*, June 2006, p18.

- 3.10 Tourism WA said that the impact of exclusion on recreational activity is important as it extends beyond the direct impact on users to secondary impacts that include the loss of expenditure by those visitors in small towns close to the site. As an example, the value assigned to shifting Logue Brook dam's amenities and infrastructure to Harvey dam was assigned a value of \$10 million.¹¹¹

Fishers

- 3.11 The economic value of access to catchments and dams was evident from the numerous submissions the Committee received from fishing groups and individuals.¹¹² The WA Fish Foundation referred to studies of recreational freshwater fishing in the USA showing that a vibrant freshwater fishery may generate many millions of dollars per year in economic activity. These include expenditure on holiday accommodation, travel, equipment and tour guides. By way of example, three individual submissions referred to a fishing trip to Pemberton where four people spent more than \$1,500 on a weekend for three redfin perch.¹¹³ Another fisher said he spends "*about \$200 in the area that [he has] to travel to*"¹¹⁴ for fishing.
- 3.12 Mr Neil Daw, private citizen, described a recent trip to the United Kingdom where he spent "*somewhere in the vicinity of \$2,000 on fishing equipment [and how] many UK fisherman visit Spain and other destinations as a group on fishing holidays.*"¹¹⁵ Mr Dean Carnaby private citizen, referred to vibrant sportsfishing businesses in Queensland and the financial benefits accruing in nearby towns providing accommodation and other recreation.¹¹⁶
- 3.13 Mr Hal Harvey, proprietor of the Bluewater Tackle-Surf-Dive Marine stores and Chairman of the Tackle World Group for Australia referred to the "*accompanying facilitation businesses*"¹¹⁷ resulting from catchment access. Mr Harvey said a playground alongside Harvey Weir is not the "*crying need for a community. Let people use the weir dozens of times each year and support all the associated businesses and economies*".¹¹⁸

¹¹¹ Submission No 182 from Tourism Western Australia, 7 December 2009, p3.

¹¹² For example, the WA Fish Foundation and WAFFTA members.

¹¹³ Submission No 58 from Mr Matthew Lilly, 10 November 2009, p2. Submission No 97 from Mr Cameron Finnie, 11 November 2009, p2. Submission No 127 from Mr Scott Coghlan, 17 November 2009, p2.

¹¹⁴ Submission No 188 from Mr Robert Goodlich, 7 December 2009, p2.

¹¹⁵ Submission No 108 from Mr Neil Daw, 13 November 2009, p1.

¹¹⁶ Submission No 128 from Mr Dean Carnaby, 17 November 2009, p1.

¹¹⁷ Submission No 161 from Mr Hal Harvey, 24 November 2009, p2.

¹¹⁸ Ibid.

Local governments

- 3.14 The Committee noted that local governments are worried about losing economic benefits from their communities if current allowed activities in source areas under Statewide Policy 13 are to change. For example, the Shire of Dardanup said that any move to ban swimming, canoeing and fishing from Wellington dam “*would have ...economic impacts on the region; ... and a detrimental impact on the kiosk, surrounding businesses in Collie, Burekup, Dardanup and Bunbury*”.¹¹⁹
- 3.15 The Shire of Murray explained that the entire townsite of Dwellingup is in a source area. The Shire claims it would be devastating and catastrophic to the town and its developing tourism industry if there were restrictions placed on the area.¹²⁰ 300,000 visitors per year enjoy eco-tourist spots and Lane Poole Reserve. The Shire believes that its district, being both a source area and a recreational area, has been a “*very healthy marriage*.”¹²¹
- 3.16 The Shire of Manjimup said the water supply for the township is Big Brook dam¹²² on which DEC managed recreation occurs “*sustaining the economy of both Pemberton and Manjimup by attracting many tourists to the region*”.¹²³
- 3.17 The Shire of Mundaring said its district, containing the Helena River, Mundaring Weir and Lake CY O’Connor, is one of Western Australia’s most significant and iconic public water sources with many recreational activities traversing its district. The Shire claims its “*emerging industry sector may present itself as one of the few opportunities that Mundaring has to create sustainable local jobs*”.¹²⁴

Other recreational groups and individuals

- 3.18 Mr Mike Wood, Chairman of the Bibbulmun Track Foundation referred to an injection of \$40 million into the Western Australian economy by 180,000 users of the Track and 380,000 user days per annum.¹²⁵

¹¹⁹ Submission No 2 from the Shire of Dardanup, 26 October 2009, p1.

¹²⁰ Submission No 61 from the Shire of Murray, 10 November 2009, p2.

¹²¹ Ibid, p3.

¹²² However, the Committee understands from the *Lefroy Brook Catchment Area Drinking Water Source Protection Assessment Pemberton Town Water Supply*, Water Corporation, 2004, p1, that Pemberton town water supply is sourced from Lefroy Brook Weir (a pipehead dam on Lefroy Brook), which is recharged from Big Brook Dam, a storage reservoir four and a half kilometres upstream.

¹²³ Submission No 137 from the Shire of Manjimup, 17 November 2009, p1.

¹²⁴ Submission No 191 from the Shire of Mundaring, p1.

¹²⁵ Submission No 3 from the Bibbulmun Track Foundation, 26 October 2009, p1.

- 3.19 Mr Waldemar Mackowiak, former Secretary of WATFAA said, “*many small country towns and Shires rely on the tourism dollar to survive when their previously regional high employment provider has gone out of business or their local industry such as tree felling has been curtailed. Allowing access to selected water bodies in economically distressed areas would prove a boon to local economies.*”¹²⁶
- 3.20 RallyWA estimates the total economic impact of approved gravel rallying events like Safari Rally in the Mundaring region and the Darling 200 in the Jarrahdale area as well as the Quit Targa West tarmac rally event “*would be well over \$2 million per annum*”.¹²⁷
- 3.21 Mr Michael Morcombe, private citizen, referred to the “*huge economic benefit that can flow from promotion of the natural environment and its creatures whilst bird watching (birding)*”¹²⁸ for example as has occurred in the USA.
- 3.22 Numerous submissions from the Western Walking Club Inc referred to towns adjacent to catchment areas benefiting economically from activities associated with bushwalkers.¹²⁹
- 3.23 The Recreational Trailbike Riders’ Association WA estimates from the *Back on Track State Trail Bike Strategy* that the off road motorcycle industry generates over \$120 million per annum to the State’s economy.¹³⁰ However the Committee noted that the *Back on Track State Trail Bike Strategy* stated that there was no readily available estimate of the size and value of the trail bike industry but the scale of it (value of employment, sales of new and used bikes, parts and fuel) is approximately \$135 million plus an unknown contribution to local communities.¹³¹
- 3.24 The Committee has no doubt that recreation generally has a strong economic value to the State and makes the following finding:

¹²⁶ Submission No 6 from Mr Waldemar Mackowiak, former Secretary, WATFAA, 27 October 2009, p1.

¹²⁷ Submission No 57 from RallyWA, 10 November 2009, p1.

¹²⁸ Submission No 111 from Mr Michael Morcombe and an Attachment from the American Birding Association, *The Economics of Birding, the Growth of Birding and the Economic Value of Birders*, 13 November 2009.

¹²⁹ For example, Item 4 in Submission No 169 from Ms Veronica Brusaschi, 1 December 2009, p1 and other template submissions from the Western Walking Club Inc.

¹³⁰ Submission No 177 from the Recreational Trailbike Riders’ Association WA, 4 December 2009, p7. The *Back on Track State Trail Bike Strategy*, Full Report, June 2008, at p16 states that “*the overall value of the off road motorcycle industry in Western Australia is around \$150 million per annum.*”

¹³¹ Trail Bike Management Australia and MotorCycling WA, *Back on Track State Trail Bike Strategy*, Full Report, June 2008, pp82-83.

Finding 3: The Committee finds that recreational activity provides economic benefit to the State and particularly to local government districts.

THE ENVIRONMENTAL VALUE OF RECREATIONAL ACCESS

3.25 This term of reference was somewhat confusing for those who made submissions and little specific comment was offered. It refers to the value to humans of interacting in a natural environment together with its plants, animals and micro-organisms as an “*ecological system*”.¹³² The Department of Sport and Recreation’s submission included a raft of benefits that accrue from just being within an ecological system. These are:

- enjoying nature and escaping civilisation;
- escape from routine and responsibility;
- creativity, self improvement and relaxation;
- social contact and meeting new people;
- altruism;
- stimulus seeking;
- self actualising (self improvement); and
- challenge, achievement and competition.

3.26 The Recreational Trailbike Riders’ Association WA added:

- freedom, getting away from it all, adventure, exploring;
- stress relief, relaxation;
- exercise and fitness;
- enjoying the outdoors, environment, scenery; and
- focus of a hobby or interest.¹³³

¹³² Water Services Association of Australia, Occasional Paper No. 22 - *Effects of recreational activities on source water protection areas*, Literature Review, April 2009, p4.

¹³³ Submission No 177 from the Recreational Trailbike Riders’ Association WA, 4 December 2009, p7.

- 3.27 The Western Walking Club Inc noted the environmental awareness gained from its members “*shared knowledge of flora and fauna along the walk routes*”¹³⁴ within a source area ecosystem. For example, one member described the “*joy of discovering the great variety of forest and plant life in the Darling Ranges plus many previously unknown ... land forms and places of great beauty*”.¹³⁵ The Swan Canoe Club said paddlers as a group “*depend on waterways and treat the environment with the respect it deserves*”.¹³⁶
- 3.28 Many in the recreational community see themselves as custodians of the bush, ethically interacting with the ecosystem, cleaning up after other people¹³⁷ rather than polluting¹³⁸ and monitoring activities like illegal dumping and wildfires, thereby contributing to the ecosystem’s environmental value. The Recreational Trail Bike Riders’ Association WA argued that “*by creating more legal opportunities to ride in catchments, you then create more opportunities to engender environmental awareness and responsibility amongst riders*”.¹³⁹
- 3.29 The value recreational groups place in visiting a source area ecosystem is linked to its exclusivity: that is, those areas are unique, new and untouched. That very exclusivity will be risked by opening the catchments. Arguably, it is in the interests of these groups to have controlled access maintained.
- 3.30 The experiences and benefits listed at paragraphs 3.25 and 3.26 characterised the vast majority of submissions received from recreational groups. The Department of Sport and Recreation’s submission referred to how unfortunate it is that:

*positive relationships between natural environments and human health are ignored while the negative effects of human interaction with ecosystems receive more attention.*¹⁴⁰

- 3.31 The Committee concurs with that view. Human interaction with source area ecosystems must be carefully controlled as it is the presence of humans in the ecosystem that pose the most risk to water quality and human health. Recreational

¹³⁴ No 121 from Ms Ann Sutton, Member, Western Walking Club Inc and others, 13 November 2009, p1.

¹³⁵ Submission No 193 from Ms Sue Folks, 9 December 2009, p2.

¹³⁶ Submission No 176 from the Swan Canoe Club, 4 December 2009, quoting Mr Cameron Patrick, Club Member, p8.

¹³⁷ Submission No 56 from Mr Shane Milligan, 9 November 2009, p1 said “*Unfortunately some fishers feel the need to leave their rubbish; hopefully the rest of us will keep cleaning it up*”. Also Submission No 176 from the Swan Canoe Club, 4 December 2009, quoting Mr Phil Harris, Club Member, p8, who said “*We usually camp in three regular camping spots, and each time we carry out a large bag of trash left by hoon campers.*”

¹³⁸ Submission No 176 from the Swan Canoe Club, 4 December 2009, pp2 and 8.

¹³⁹ Submission No 177 from the Recreational Trailbike Riders’ Association WA, 4 December 2009, p14.

¹⁴⁰ Submission No 181 from the Department of Sport and Recreation, December 2009, p4.

groups put the view that managed access to source areas would not compromise water quality and would provide beneficial recreation to those involved. The Committee is of the view that the recreational benefits of activities in natural environments can be achieved in locations other than source areas. Unfortunately the assertion that the recreational community, “*leave nothing but footprints*”¹⁴¹ in an ecosystem is incorrect.

3.32 The Committee made the following finding.

Finding 4: The Committee finds that the objectives of providing safe water and achieving the health and social benefits of interaction with natural environments are not compatible in the same geographical area. Public drinking water source areas are best committed to the single purpose of providing safe water.

¹⁴¹ Submission No 39 from Mr J.E. Turner and other template submissions from the WA Trout and Freshwater Angling Association, 6 November 2009, p1.

CHAPTER 4

RISKS ASSOCIATED WITH RECREATIONAL ACTIVITY IN SOURCE AREAS

THE BENEFITS AND COSTS OF RECREATIONAL ACCESS ON PUBLIC HEALTH

- 4.1 Anecdotal evidence cited in Chapter 3 of this Report regarding the health benefits of outdoor recreation including in source areas, confirms that from a population health perspective, outdoor recreation is beneficial. Such recreation enhances mental and physical health, addressing conditions such as attention disorders and obesity. The emerging partnership between the Department of Health and the Department of Sport and Recreation is founded on the contribution of recreational activity to improved health.¹⁴²
- 4.2 Recreational groups have been forthright in their demand for what Mr Leon Price, Department of Environment and Conservation officer, described as “*fresh experience*”.¹⁴³ For example, the Western Australian Endurance Riders Association said “*ride organisers are constantly looking to make changes to courses to find suitable new areas in which to conduct our rides*”.¹⁴⁴ The Western Australian Local Government Association cited studies from the United Kingdom which demonstrate that the more diverse the natural environment where people undertake their physical activity, the greater the benefits to their psychological health.¹⁴⁵ Arguably, providing adequate opportunities for walking through diverse natural environments close to where people live is, from a public health perspective, an important consideration in land use planning.
- 4.3 However, no matter how fundamental and attractive recreation is from a population health perspective, this must be tempered by the very clear evidence that microbial

¹⁴² For example, see the study by Carter, M.E, Southern Darling Regional Recreation Strategy “Health, well-being and nature based outdoor recreation”. Dr Carter said that “*from a physical health perspective, access to good quality natural environments encouraged physical activity, with green spaces being the most preferred places to be active.*”

¹⁴³ Department of Environment and Conservation officer, Mr Leon Price used this phrase during a field trip to the south-west on 16 April 2010.

¹⁴⁴ Submission No 200 from the Western Australian Endurance Riders Association, 4 December 2009, p1.

¹⁴⁵ R. Fuller, K. Irvine, P. Devine-Wright, P. Warren & K. Gaston, (2007), ‘Psychological benefits of green-space increase with biodiversity’, *Biology Letters* 3, 390-394 in Submission No 199 from the Western Australian Local Government Association, December 2009.

pathogens cause human illness via drinking water.¹⁴⁶ The Department of Health said:

*There is a desire to increase recreation and physical activity as an intense form of recreation. We need to acknowledge that communities want those, but we would not ever compromise the public health because of the water. If those things shift, there will be a shift in the intensity of the risk management to reflect that, and an informed decision should be made about whether we want to spend money to reflect that intensity.*¹⁴⁷

4.4 Globally the World Health Organisation estimates 1.7 million deaths per year, that is, 3.1% of all deaths and almost 90% of diarrhoeal diseases are caused by microbial pathogens.¹⁴⁸ First world countries are not immune as is evidenced in Steve E. Hrudehy and Elizabeth J. Hrudehy's book "*Safe Drinking Water, Lessons from Recent Outbreaks in Affluent Nations*".¹⁴⁹ In Australia for example, the book refers to the following outbreaks:

- Moama, NSW in late 1989 and early 1990 where sanitary sewage leaked into underground storage tanks for untreated river water. There were eight confirmed cases of gastroenteritis and 300 people were estimated to have been affected.
- An island resort in north Queensland contamination by *Campylobacter* in 1997.
- A construction site in central Queensland was contaminated with *Salmonella saintpaul* in 1999.
- Sydney in 1998 when over 3 million boil water notices were issued when monitoring indicated high levels of *Cryptosporidium* and *Giardia* in treated water. No illness resulted.
- Sunbury, Victoria in 1988 where one creek source was faecally contaminated and the outbreak was preceded by heavy rain. 6,600 people were estimated to have been affected.

¹⁴⁶ Professor Steve Hrudehy, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009, p1.

¹⁴⁷ Mr James Dodds, Director, Environmental Health Directorate, Public Health Division, Department of Health, *Transcript of Evidence*, 14 October 2009, pp1-2.

¹⁴⁸ Professor Steve Hrudehy, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009 at pp1-2.

- 4.5 Professor Steve Hrudehy, Environmental and Analytical Toxicologist, University of Alberta Canada, explained that the scientific community “do not have any doubt that about the capacity of faecal material to cause human illness and if you allow that into a drinking water source and it is disbursed and diluted, some people will get sick.”¹⁵⁰ The capacity of humans and their pets to ‘shed’ or:

*produce microbial pathogens is ... striking. Infected individuals can share between 100,000 to 10 million protozoan pathogens per gram of faeces or between 100,000 to one trillion enteric viruses per gram of faeces. An individual bather sheds an estimated 0.14 grams of faecal material simply from water contact, not to mention the possibility of improper faecal waste disposal.*¹⁵¹ [Committee emphasis]

- 4.6 Mr Richard Theobald, Manager, Water Unit, Department of Health, provided two charts comparing *Escherichia coli* (*E. coli*) levels at Logue Brook dam, where full body water contact is allowed, with Canning dam where it is prohibited. Peak levels were recorded at Logue Brook dam especially during the school holiday periods and “indicate that there is a direct human impact as a result of being in close contact.”¹⁵² However, the Committee noted *E. coli* levels were high at other, colder times of the year with the Department of Health attributing this to retention time and the fact that runoff is greater in winter.¹⁵³
- 4.7 Mr James Dodds, Director, Environmental Health Directorate, Public Health Division, Department of Health, said the number of bathers who swim at the beach also has an impact on *E. coli* levels. Mr Dodds said:

*We have been able to show that at Hillarys. There is a massive difference in the contamination load in the water when a whole bunch of kids are swimming when RecSwim is on as opposed to the middle of the winter when just the seagulls are there.*¹⁵⁴

¹⁴⁹ Steve E. Hrudehy and Elizabeth J. Hrudehy, “*Safe Drinking Water, Lessons from Recent Outbreaks in Affluent Nations*, 2004, IWA Publishing, London.

¹⁵⁰ Professor Steve Hrudehy, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009, p5.

¹⁵¹ Ibid, p3.

¹⁵² Mr Richard Theobald, Manager, Water Unit, Department of Health, *Transcript of Evidence*, 14 October 2009, p4.

¹⁵³ Ibid, p5.

¹⁵⁴ Mr James Dodds, Director, Environmental Health Directorate, Public Health Division, Department of Health, *Transcript of Evidence*, 14 October 2009, p4.

4.8 *E. coli* bacteria can survive months in water bodies. Salmonella may be viable for two to three months, *Giardia* may still infect after one month in the natural environment and *Cryptosporidium* may survive weeks or months in freshwater.¹⁵⁵ In 2010, the O’Keefe Review of the Sydney water crisis quoted *Cryptosporidium* oocysts and *Giardia* cysts as surviving for at least two months in source waters, although there is some evidence that a range of environmental conditions can reduce the survival time.¹⁵⁶ Viruses and protozoa can also survive for long periods in water. Unlike chemical contamination, low numbers of pathogens can quickly multiply to large numbers in the right conditions.¹⁵⁷ Recent outbreaks in Australia include:

- May 2010, *Cryptosporidium* was detected in the Behana Creek water supply, south of Cairns. Residents in the Gordonvale area and Goldsborough Valley were impacted, that is, approximately 1,500 to 2,000 homes.¹⁵⁸
- March 2010, *E. coli* was detected at Nerang on the Gold Coast during routine testing, putting 2,500 homes at risk.¹⁵⁹
- February 2010, the Bega Valley Shire Council on the New South Wales far south coast issued a boil water alert for people on the Bemboka, Bega, Kalaru and Tathra water supply systems. This was a precautionary measure after heavy rain caused the sewerage system to overflow and the council discharged partially treated sewage into the Bermagui and Bega Rivers.
- February 2010, Tasmania’s Health Department issued a boil water alert after heavy rain for two Northern Midlands towns. The water authority had to provide fresh water supplies to Campbell Town and Ross.¹⁶⁰
- February 2010, routine monitoring of the water supply to Bowen in Queensland found unusually high levels of *E. coli* and there were concerns other harmful bacteria may be present. Residents were told to

¹⁵⁵ Department of Water, Harris Dam Catchment Area Drinking Water Source Protection Plan, Report No 80, June 2007, p9.

¹⁵⁶ Sydney Water Inquiry Ten Year Review, *Final Report of the Review Panel*, 17 February 2010, p4.

¹⁵⁷ Department of Water and Department of Health Brochure, *Risks from Pathogenic micro-organisms in public drinking water source areas*, tabled at a hearing on 21 October 2010. p4.

¹⁵⁸ <http://www.abc.net.au/news/stories/2010/05/17/2900898.htm>, (viewed on 17 May 2010).

¹⁵⁹ <http://safewateralerts.com/news-and-alerts/339-bowenecolioutbreak> (viewed on 21 May 2010).

¹⁶⁰ A water tank was set up on the Campbell Town football oval and a second tank filled at the Ross fire station. http://www.optuszoo.com.au/regional_news/99637/northtas/boil-water-alert-continues.html (viewed on 21 May 2010).

boil their tap water after bacteria was found in the local supply. The outbreak was attributed to high rainfall in the preceding fortnight.¹⁶¹

- January 2010, a temporary boil water alert was issued for the township of Ross, Tasmania after routine tests detected low levels of *E. coli* in water supplied to the town.¹⁶²
- December 2009, a boil water alert was instigated by the Tasmanian Health Department after *E. coli* was found in the water supplies of Launceston and Hobart.¹⁶³

4.9 In 2000, a water-borne outbreak of *E. coli* and *Campylobacter jejuni* at Walkerton, Ontario killed seven people and was estimated to have affected 2,300 with gastroenteritis.¹⁶⁴

4.10 The Department of Water said:

*Science does show us that ... that pathogens are the greatest risk to drinking water ... that pathogens survive in water and can grow rapidly under the right conditions (unlike chemical contaminants); that pathogens are difficult to detect and monitor for; that contaminants flow quickly through feeder streams and into reservoirs (particularly during storm events); and that vegetated buffers can be very effective in filtering contaminants.*¹⁶⁵

4.11 A 2004 research study by ECOS Consulting questioned whether shoreline fishing should be allowed at Tarago Reservoir, Victoria. Potential risk exposure pathways were quantitatively assessed for microbial risk based on the protozoan pathogen *Cryptosporidium* and the viral pathogen Rotavirus.¹⁶⁶ The study stated that allowing fishing at Tarago Reservoir has the potential to increase human health risk above World Health Organisation guideline values during peak events and therefore was not recommended.

¹⁶¹ <http://www.abc.net.au/news/stories/2010/02/25/2829719.htm>, (viewed on 21 May 2010).

¹⁶² <http://safewateralerts.com/news-and-alerts/321-boilwateralert-ross>, (viewed on 21 May 2010).

¹⁶³ ABC news, *Boil Water Alerts issued after E. Coli outbreak*, 7 December 2009.

¹⁶⁴ Steve E. Hrudey and Elizabeth J. Hrudey, *Safe Drinking Water, Lessons from Recent Outbreaks in Affluent Nations*, 2004, IWA Publishing, London, p95.

¹⁶⁵ Letter from the Department of Water, 14 May 2010 including answers to questions at a hearing on 5 May 2010, p8.

¹⁶⁶ ECOS Environmental Consulting, *Assessment of Potential Recreational Use (Shoreline Fishing) of Tarago Reservoir*, Report prepared in conjunction with Water Futures for the Department of Human Services Victoria, March 2004.

- 4.12 Referring to research by Climburg and others on patterns of human faecal waste disposal in the wild, ECOS Consulting said similar contamination would occur from shore based faecal defecation from which pathogens would be readily mobilised into the water during a rain event.¹⁶⁷ The study referred to how there is “*always uncertainty*”¹⁶⁸ about how fishers and their pets behave, especially on hot days when it is likely they would enter the water.¹⁶⁹ Even if fishers were fully compliant, Australian studies show that the reliability of on-site sewage management facilities have high failure rates of between 40% and 80%, and more probable as loadings increase.¹⁷⁰
- 4.13 Diagram 3 below provided by the Water Corporation shows how body contact recreation can potentially cause community illness.¹⁷¹

¹⁶⁷ Climburg A, Monz, C and Kehoe, S, (2000) “Wildland Recreation and Human Waste: A Review of Problems, Practices and Concerns”, *Environmental Management* 25(6) 587-598.

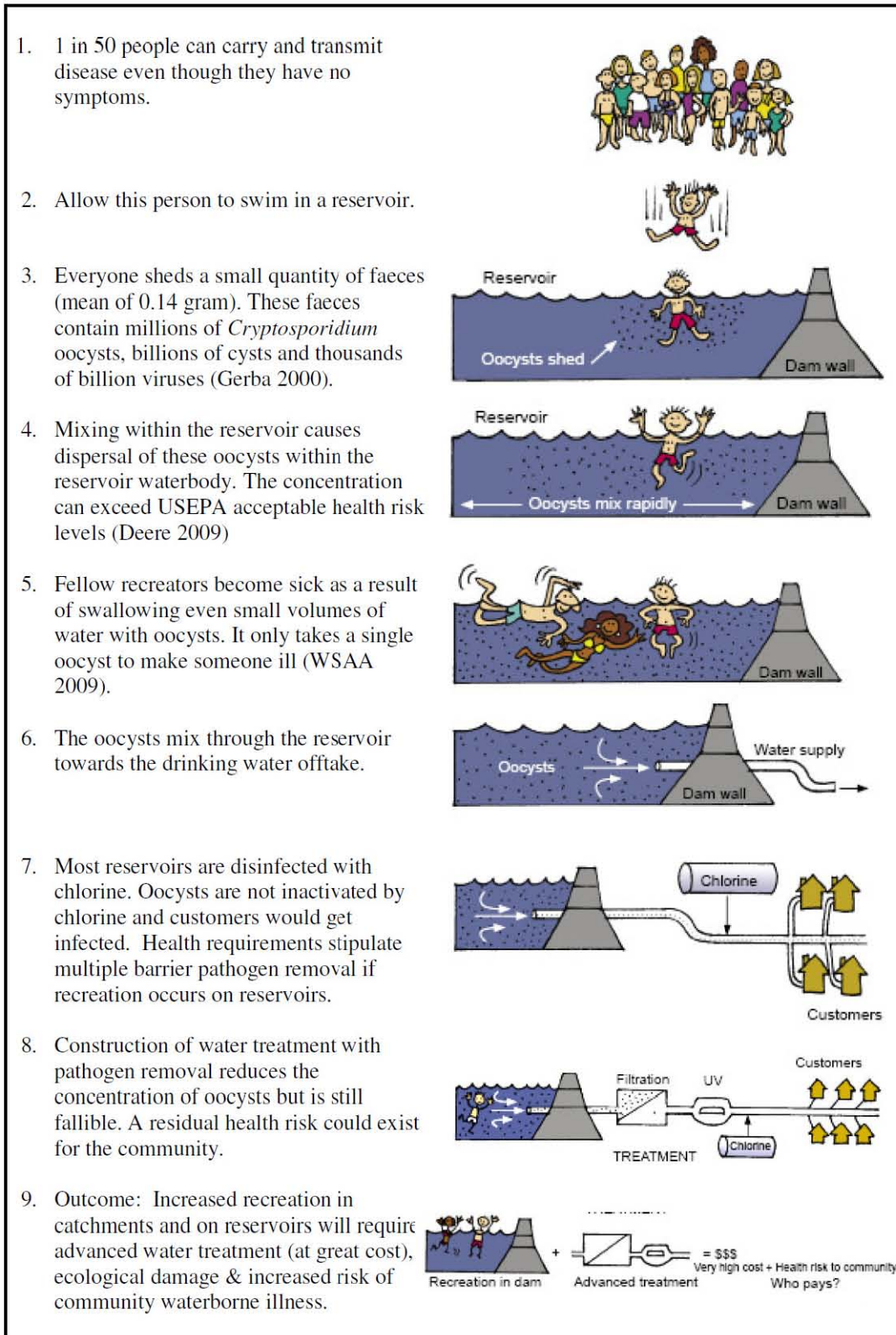
¹⁶⁸ ECOS Environmental Consulting, *Assessment of Potential Recreational Use (Shoreline Fishing) of Tarago Reservoir*, Report prepared in conjunction with Water Futures for the Department of Human Services Victoria, March 2004, p33.

¹⁶⁹ Ibid, p35.

¹⁷⁰ Ibid, p35.

¹⁷¹ Submission No 112 from the Water Corporation, 13 November 2009, p10.

Diagram 3



4.14 Professor Hrudehy said:

I would sum up by saying that the only universally effective way of reducing drinking water disease risk to a negligible level is to systematically reduce or eliminate those controllable circumstances that can otherwise allow microbial pathogens access into or passage through a drinking water system. Allowing human recreational use of drinking water catchments and storages to a greater extent than currently allowed would be a major step in the opposite direction to the well-grounded, world-recognised guidance of the National Health and Medical Research Council's Australian Drinking Water Guidelines.¹⁷²

4.15 Given this scenario, Guiding Principle 1 of the Australian Drinking Water Guidelines (*Protection of water sources and treatment are of paramount importance and must never be compromised*)¹⁷³ means source protection is always a first line defence.

Finding 5: The Committee finds that recreation in natural environments provides an important benefit and addresses many modern day health problems. However, protection of drinking water sources remains the paramount consideration.

THE BENEFITS AND COSTS OF RECREATIONAL ACCESS ON WATER QUALITY

Human impacts

4.16 During field trips the Committee witnessed first hand the impacts of recreation at a number of water source perimeters. Additionally, the Committee was provided with photographs of:

- pig entrails and head left next to the water's edge at Harris dam;
- people illegally swimming in Victoria dam and Wungong reservoir;
- illegal habitation in the middle Helena catchment;

¹⁷² Professor Steve Hrudehy, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009, p4.

¹⁷³ *Ibid*, p2.

- trail bike tracks and gouged ground on the edge of the Mundaring reservoir;¹⁷⁴
- a vehicle intentionally bogged in Mundaring reservoir where people practice pulling vehicles out;
- a goat carcass dumped in Victoria dam as marron bait;
- toilet paper and faeces next to a reservoir; and
- marijuana cultivation at Ten Mile Brook dam catchment.

4.17 Of these, the Committee heard evidence that people entering the reservoir posed the most threat to water quality, a point denied by some in the recreation lobby. For example, in a submission Mr John Clark, private citizen, said:

*Mining, forestry, log trucks, burning, feral animals, all contaminate the water catchment areas and the water, this has happened for many years, nobody jumps up and own about this contamination.*¹⁷⁵

In wanting swimming and fishing, one bushwalker said “nothing prevents fish, reptiles, amphibians, birds and mammals dying & decomposing (fish rarely manage this on land) in the reservoirs hence I suspect the impact would be negligible”.¹⁷⁶ However, science holds that a dead kangaroo in or at a water body or in a catchment is less likely to carry human infective organisms than for example, a domestic dog accompanying a fisher to a water body. This is because the dog has been living with humans or livestock raised by humans. Professor Hrudehy said:

The ... general evidence seems to be that the dominant pathogen risk is human waste, followed by livestock and pets—largely because they have contact with humans. In order for a pathogen to be infective of us there has to be some interchange and interaction.

The more remote you get from humans, the less likely the pathogen that is emitted by, for example, possums—although I guess possums are not that remote from humans. Pick yourself some remote wildlife - that is less likely to carry human infective pathogens than is a dead dog that has been living with humans or livestock that has been raised by humans. The evidence for human infective pathogens - at least

¹⁷⁴ Also photographs provided by Mr David Osborne, Walks GPS, Submission No 163, 25 November 2009, p14 showing uncontrolled trail bike riding within Wandoo National Park within the northern water (Mundaring) catchment.

¹⁷⁵ Submission No 78 from Mr John B. Clark, 12 November 2009, p4.

¹⁷⁶ Submission No 100 from Mr Alan Boynton, 11 November 2009, p1.

*enteric pathogens - from wildlife is that they are few and far between.
So it is not zero risk, but it is a much lower risk.*

- 4.18 The Committee noted that the ‘distance’ Professor Hrudehy is speaking about is a level of contact, not a geographic distance.¹⁷⁷ This was confirmed with Dr Dan Deere, Director, Water Futures, who said that in the Australian context, the evidence is the same:

*There are many articles that talk about the genotypes and serotypes of pathogens found in the guts and faecal scats from different animal hosts. The body of that literature shows that the order of prevalence of human infectious genotypes and serotypes is, from highest to lowest: humans, calves and lambs, adult domestic animals, wild mammals, marsupials, birds, reptiles, amphibians. There is no practically significant risk from viral and protozoan pathogens from wild native Australian animals. The only risk is that from some bacterial pathogens.*¹⁷⁸

- 4.19 The Department of Water reinforced that the “science does show us that ... people and domesticated animal pathogens are more concerning than native animal pathogens.”¹⁷⁹

Chemical contaminant impacts

- 4.20 Hydrocarbons are not as dangerous as pathogens on human health and chemical contaminants do not replicate themselves in the same way that organic organisms will in water. Professor Hrudehy said:

There are orders of magnitude of difference in risk. It is because you do not need very much of a pathogen to make people sick but you need a lot more chemicals to make that happen via drinking water. People are not going to consume a glass of water that tastes like crankcase oil. It has to be a relatively low concentration for people to ingest it, whereas you cannot necessarily detect sewage

¹⁷⁷ Professor Steve Hrudehy gave the following example: “When the drinking water experts first started discovering that in filtration plants in North America we were getting outbreaks of *Giardia*, which came to have the name beaver fever, they tracked the source of the outbreak to beavers and they discovered that the beavers had been swimming in sewage infested waters. There is a connection here”. Professor Steve Hrudehy, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009, p8.

¹⁷⁸ Email correspondence from Dr Daniel Deere, 30 March 2010.

¹⁷⁹ Letter from the Department of Water, 14 May 2010 including answers to questions at a hearing on 5 May 2010, p8.

*contamination of drinking water because it can be so tiny and still be dangerous.*¹⁸⁰

- 4.21 The Department of Water said pathogens react very differently to chemicals. Pathogens grow, but chemicals dilute “*and so you can start off with a very small number of pathogens and end up with a very large number under the right conditions that can be transferred into your source.*”¹⁸¹

Disinfection by-products impacts

- 4.22 The Committee heard evidence in Queensland regarding the science of disinfection by-products, which is a particular problem in jurisdictions with fully treated systems. Vigilance is required to monitor water quality given that these by-products are a major group of water contaminants. Their role in causing adverse health outcomes has been subject to extensive epidemiological and toxicological research and review.
- 4.23 Determination of safe levels in drinking water has been debated since their discovery in 1974 with a wide range of acceptable levels set across the industrialised world. The Cooperative Research Centre for Water Quality and Treatment explained their danger:

When chlorine is added to raw water supplies it can react with dissolved substances in the water, such as natural organic matter, to produce unwanted chemicals, called “disinfection by-products”. The natural organic matter comes from decaying plants and animals in the water catchment that break down into smaller components, which dissolve in the water.

The by-products formed are generally organic compounds, with the most common being a group of chemicals called trihalomethanes (THM). Around 250 disinfection by-products have been found in drinking water, with some scientists predicting that there may be hundreds more yet to be discovered.

To keep the level of disinfection by-products low in drinking water, suppliers treat the water to remove as much natural organic matter as possible before it undergoes disinfection. Removing this organic matter also decreases the total amount of chlorine needed for

¹⁸⁰ Professor Steve Hrudey, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009, p9.

¹⁸¹ Mr Nigel Mantle, Manager, Water Source Protection Branch, Department of Water, *Transcript of Evidence*, May 2010 p8.

disinfection, because organic matter reacts with chlorine and so its presence reduces the amount of disinfectant.

Several scientific studies have shown that there is a possible link between disinfection by-products and an increased risk from a variety of cancers, but this has not been confirmed. Recent studies have suggested possible links with bladder cancer in men and effects on pregnancy,¹⁸² but again this has not been clearly established.¹⁸³

- 4.24 For Perth's water supply, the disinfectant by-products used to treat trihalomethanes are inextricably linked to catchment management practices. Dissolved organic material in raw water provides a haven for micro-bacterial contamination. Bacteria also attaches to particulate matter. Therefore, the management of catchments to prevent organic material entering the water source is critical.¹⁸⁴

Shoreline fishing impacts

- 4.25 A 2004 research study at Tarago Reservoir which was constructed in 1967 but closed to recreational access in 1978 due to water quality issues, found that already elevated nutrient loads are likely to increase if shore based recreation including fishing is allowed.¹⁸⁵ The study found that about 15% of the sediment delivered to the reservoir was derived from shoreline erosion.¹⁸⁶ The reservoir was found to be very sensitive to further increases in nutrient loads, introduction of carp (not then recorded at the reservoir) and loss of near shore macrophyte beds which carp destroy.¹⁸⁷ The reservoir would be likely to experience an increased frequency and duration of blue-green algal blooms. Relevantly, the study said that "placing

¹⁸² Chisholm K, Cook A, Bower C and Weinstein P, *Risk of Birth Defects in Australian Communities with High Brominated Disinfection By-product Levels*, School of Population Health, The University of Western Australia, Perth, Australia, National Institute of Environmental Health Sciences, *Environmental Health Perspectives*, 116 9: 1267-1273, 2008-2009.

¹⁸³ The Cooperative Research Centre for Water Quality and Treatment, *Drinking Water Facts, Keeping Water Safe: Chlorination and Disinfection By-Products*, <http://www.wqra.com.au/crc>, (viewed on 11 May 2010).

¹⁸⁴ Western Australia, Legislative Council, Ecologically Sustainable Development Committee, Report 9, *The Quality of Perth's Water Supply*, 23 November 2000, p56.

¹⁸⁵ ECOS Environmental Consulting, *Assessment of Potential Recreational Use (Shoreline Fishing) of Tarago Reservoir*, Report prepared in conjunction with Water Futures for the Department of Human Services Victoria, March 2004.

¹⁸⁶ Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009, p24.

¹⁸⁷ These are large aquatic plants that grow in or near water. They provide cover for fish and substrate for aquatic invertebrates, produce oxygen and act as food for some fish and wildlife. A decline in a macrophyte population may indicate water quality problems. Such problems may be the result of excessive turbidity, herbicides, or salinisation.

*suitably tight limits on fishing access to minimise impacts would require unrealistic levels of supervision and enforcement.*¹⁸⁸

- 4.26 The study found there was “*no current international standard practice that can be identified in relation to access offered by water authorities with authorities being evenly split between those who do and don’t allow fishing access at storages.*”¹⁸⁹ A triple bottom line quantitative analysis suggested that the costs exceeded the benefits and therefore recreational fishing at the reservoir would result in an economic loss.¹⁹⁰

Ecological impacts

- 4.27 Water Services Association of Australia’s literature review of the *Effects of recreational activities on source water protection areas*,¹⁹¹ noted that:

*while the most significant risk from recreational activities is often identified as the direct or indirect contamination of water supplies with the micro-organisms contained in human excreta, there is a growing body of literature describing the way in which recreational activities pose significant risks to ecological values.*¹⁹²

- 4.28 The catchment is the first component in a drinking water supply system and land use in surface water catchments is the primary influence on source water quality. For this reason, limitation or exclusion of human activities in water catchments has traditionally been the first potential barrier which can be applied to protect the quality of drinking water eventually delivered to the consumer. Protection of surface water catchments by complete exclusion of public access provides valuable habitats for native plants and animals, thus preserving natural ecosystems and protecting biodiversity.¹⁹³
- 4.29 Cumulative and varied recreational activity in the catchments disturbs these ecological values which in turn impacts on raw water quality. “*All wilderness recreation disturbs the natural environment although specific impacts associated*

¹⁸⁸ ECOS Environmental Consulting, *Assessment of Potential Recreational Use (Shoreline Fishing) of Tarago Reservoir*, Report prepared in conjunction with Water Futures for the Department of Human Services Victoria, March 2004, p3.

¹⁸⁹ Ibid, p42. This was ascertained from a survey of 33 water authorities around the world.

¹⁹⁰ Ibid, p4.

¹⁹¹ Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009.

¹⁹² Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009, p4.

¹⁹³ Health Stream Article - Issue 54 - June 2009, Recreational Access To Catchments, <http://www.wqra.com.au/hsarch/HS54a.htm>, (viewed on 24 May 2010).

*with each activity differ to some extent, they all potentially affect soil, vegetation, wild life and water.*¹⁹⁴

4.30 The impacts noted below do not occur in isolation. A single activity can cause multiple impacts, for example, hiking in the bush causes soil compaction, weed invasion, accidental damage to flora, disturbance of nesting fauna in the adjoining bush corridor, removal of log habitat for a camping bushwalker's fire, accidental escape of fire and littering.

4.31 The Committee noted the following specific ecological impacts.

- Turbidity. Increased turbidity in the reservoirs from greater dust and run-off along tracks and roads.¹⁹⁵
- Flora and fauna. The spread of die-back through the forests.¹⁹⁶ A number of submissions referred to dieback, for example, Dr Martin Krogh referred to the *“role of tourism in spreading dieback disease in Australian vegetation.”*¹⁹⁷ How *“recreational access is recognised as being one of, if not the crucial factor in the artificial spread of the disease in the south west of Western Australia.”*¹⁹⁸ The Urban Bushland Council WA Inc said *“bush at the top of Bluff Knoll has been killed off with people walking in with dieback on their shoes. The plant diversity up there is pretty well destroyed by dieback. That is all foot led”*.¹⁹⁹
- Noxious weeds. Weed seed entering through footwear, clothing, bags, vehicles and especially from horse back riding via horse dung.²⁰⁰ The Urban Bushland Council WA Inc said weeds are *“an issue in bits of bushland all around Perth anywhere where there are tracks going in. There was an issue with the Mirrabooka Bush Forever site recently. For bushland in suburbia, it is still in remarkably good condition, but along the tracks you tend to gradually get disturbance of the soil and weeds*

¹⁹⁴ Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009, p8.

¹⁹⁵ For example, Submission No 71 from Mr Barry Sanders, 10 November 2009, p3.

¹⁹⁶ For example, Submission No 71 from Mr Barry Sanders, 10 November 2009, p3 and Submission No 178 from the Urban Bushland Council WA Inc, 4 December 2009, p2.

¹⁹⁷ Attachment from Dr Martin Krogh to the Water Corporation Submission No 112, 13 November 2009, unnumbered page. Also citing (Gillen and Napier 1994) in Krogh M, Davison A, Miller R, O'Connor N, Ferguson C, McCloughlin V and Deere D. (2008). *Water Services Association of Australia, Occasional Paper No. 22, Effects of recreational activities on source water protection areas, Literature Review*, April 2009.

¹⁹⁸ Ibid.

¹⁹⁹ Mrs Mary Gray, President, Urban Bushland Council WA Inc, *Transcript of Evidence*, 24 March 2010, p4.

²⁰⁰ Submission No 178 from the Urban Bushland Council WA Inc, 4 December 2009, p1.

blowing in or coming in on vehicle tyres. It happens everywhere, less so perhaps in the hills than on the coastal plain; however, it still happens.

...

*In this part of the world weed invasion, particularly annual grassy weeds, is a bigger issue than in other vegetation types in other parts of Australia, particularly on the coastal plain. Delt grass is a prime example. It comes in and then dries off in the summer so there are increased fibres.*²⁰¹

- Erosion. Bushland degradation caused by disturbance and erosion from roads, tracks and paths.²⁰² The Australian Water Association (AWA) said “*hiking and biking can result in accelerated erosion of soil within the catchment and that can introduce nutrients, pathogens and sediment to the source water supply. Sediments in particular can also reduce the effectiveness of downstream chlorination.*”²⁰³ AWA concede that “*the complex interrelationships that characterise catchment processes make it difficult to provide a quantitative estimate of the extent of the impact, given an anticipated or measured quality of recreational access.*” Nevertheless, there is an impact.

A comparison of erosion impacts of hikers, horses, off-road vehicles, bicycles and motor cycles showed that sediment yields from horse trails were greater than for any other type of use.²⁰⁴

A NSW study into the impacts of four wheel driving found heavy use of main tracks, proliferation and extension of 4WD tracks, new informal tracks, heavy use of campsites and fireplaces, accumulation of rubbish at campsites and along the river, illegal activities like shooting, felling of vegetation, dogs, gullyng of tracks through repeated use, track rutting, severe ground compaction, clearing of native vegetation, major disturbance of vegetated areas due to uncontrolled vehicular access and camping, increased runoff and erosion of hill slopes and riverbanks,

²⁰¹ Mrs Mary Gray, President, Urban Bushland Council WA Inc, *Transcript of Evidence*, 24 March 2010, p3.

²⁰² Submission No 178 from the Urban Bushland Council WA Inc, 4 December 2009, p1.

²⁰³ Submission No 107 from the Australian Water Association, 13 November 2009, p3.

²⁰⁴ Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009, p22.

displacement of native fauna, death of animals through collision and more.²⁰⁵

- Wildfires. Fire and arson, especially on the Gnagara Mound P1 intake areas and pine plantations where illegal dumping occurs.²⁰⁶ Research indicates that “*humans cause the majority of all fires in Australia, either deliberately or through negligence with recreators as one possible source of ignition particularly as the majority of fires occur on the weekend and especially Sundays.*”²⁰⁷

The effect of fire is that catchment sediment yields rise. Exposed ground surfaces reduce shade and increase soil nutrients – ideal conditions for noxious weeds to germinate.²⁰⁸ For example, Victoria’s ‘Black Saturday’ fires of February 2009 damaged river and stream frontages along 900 kilometres of Melbourne Water’s waterways and the threat from severely burned catchments is predicted to remain for a number of years. Reservoirs there will be taken offline if a “*big rain event occurs*”.²⁰⁹

The Water Corporation gave the example of the 2005 Mundaring catchment fire where burnt and de-vegetated material increased winter run-off as well as the turbidity of the runoff.²¹⁰ Although the water quality in the Mundaring reservoir has been deteriorating for years (and this is the primary reason for putting water treatment there to deal with the contamination from predominantly the lower Helena catchment), the Water Corporation recognises that Mundaring is also vulnerable to fire “*particularly in a drier climate where the risk of fire goes up*”.²¹¹ As the Department of Water explained, fire creates considerable ash debris that

²⁰⁵ Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009, p23.

²⁰⁶ Submission No 178 from the Urban Bushland Council WA Inc, 4 December 2009, p2.

²⁰⁷ Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009, p10.

²⁰⁸ Ibid, p16.

²⁰⁹ Conway T and Miller K, Black Saturday in Melbourne’s Catchments, Water Source Protection: Incident Management, February 2010, p146. Water supply infrastructure was also damaged.

²¹⁰ Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009, p13.

²¹¹ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p10.

washes down the feeder streams. In the Mundaring fire, two metres deep debris at a V-notch weir had to be cleared out several times.²¹²

- Biodiversity. Loss of biodiversity. For example, it has been suggested that tourism is responsible for the disappearance of the tree orchid from roadsides in northern Australia.²¹³
- Disturbance of birds. Impacts on nesting birds during the breeding season.²¹⁴
- Walking along a shoreline. Studies of the trampling of soil by humans and animals have established that vegetation and soils are impacted and degraded leading to increased erosion risk.²¹⁵
- Wading or swimming by dogs or humans. Studies of bank and bed damage by fishers have found significant impacts on vegetation, soils and aquatic fauna. This will also disturb macrophyte beds.²¹⁶
- Strangling and entrapment of animals by humans littering modern plastics.²¹⁷
- Boating. Wave action from power boating causes damage to banks and shorelines increasing the potential for erosion.²¹⁸
- The effect of even a small weather event with sudden high run-off on pathogen behavior in inland freshwater catchments.²¹⁹ The Urban

²¹² Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p7. Mr Nigel Mantle, Manager, Water Source Protection Branch, Department of Water, *Transcript of Evidence*, 21 October 2009, p8.

²¹³ For example, Submission No 71 from Mr Barry Sanders, 10 November 2009, p3. Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009, p25.

²¹⁴ Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009, pp32-33.

²¹⁵ ECOS Environmental Consulting, *Assessment of Potential Recreational Use (Shoreline Fishing) of Tarago Reservoir*, Report prepared in conjunction with Water Futures for the Department of Human Services, p57.

²¹⁶ Ibid, p58.

²¹⁷ Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009, p54.

²¹⁸ Ibid, p32.

²¹⁹ That is, a rapid marked water level rise typically greater than a 20cm rise in less than four hours. In the Australian Capital Territory's Burra Creek sub catchment, the load of *E.coli* exported to Googong Reservoir, Australian Capital Territory, proved to be equivalent to that transported during circa 300 years of dry weather flow. Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009, p29.

Bushland Council WA Inc, said such “events ... deliver the contamination that may be sitting in a catchment on an aquatic freeway straight into the water body. It goes like a rocket.”²²⁰ This claim is supported by a 2007 study by the Cooperative Research Centre for Water Quality and Treatment which found “fully protected catchments had by far the highest water quality even during rain events.”²²¹

Microbial load estimation showed in one extreme case - the Australian Capital Territory’s Burra Creek sub-catchment - that as much as 300 years worth of dry weather pathogen contaminant loads could be exported during one day in a single small event.²²² This study is significant given Western Australia’s drying climate and the likelihood of extreme weather events when pathogens are readily mobilised and that some pathogens can survive long periods of dry conditions.²²³

- 4.32 Guiding Principle Number 3 of *The Australian Drinking Water Guidelines* states that “any sudden or extreme change in water quality flow or environmental conditions (eg extreme rainfall or flooding) should arouse suspicion that drinking water might become contaminated.”
- 4.33 Guiding Principle 2 of the Australian Drinking Water Guidelines states “The drinking water system must have, and continuously maintain, robust multiple barriers appropriate to the level of potential contamination facing the raw water supply.” Professor Hrudehy said:

*The multiple barrier approach is universally recognised as the foundation for ensuring safe drinking water. No single barrier is effective against all conceivable sources of contamination, is effective 100 per cent of the time or constantly functions at maximum efficiency. Therefore prevention of contamination provides greater surety than removal of contaminants by treatment, so the most effective barrier is protection of source waters to the maximum degree practical.*²²⁴

²²⁰ Mrs Mary Gray, President, Urban Bushland Council WA Inc, *Transcript of Evidence*, 24 March 2010, p1.

²²¹ Equivalent to over 99.9% pathogen reduction compared to unprotected catchments.

²²² Cooperative Research Centre for Water Quality and Treatment, ‘Source water Quality Assessment and the Management of Pathogens, Research Report 29, p4.

²²³ R. Ford, *Catchment for Drinking Water Protection*, Water Source Protection Feature, February 2010, p130.

²²⁴ Professor Steve Hrudehy, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009, p3.

4.34 The presence of humans alone or with their accompanying pets, motorbikes, horses, camping gear, water skis, trail bikes and fishing tackle has adverse environmental impacts. Many of these impacts are well documented.²²⁵ Arguably, where there is uncertainty a precautionary approach should be adopted. For example, there are no specific research studies on the impact of hydrocarbons from one hundred boats compared with one or two boats on water and landscape. The Department of Water said “*the science on one motor boat versus a thousand—what is the level and can you treat it, and what is the residual risk? — certainly has some uncertainty. It is about a judgment on what risk you are prepared to accept, given the information you have, which is not all based on clear scientific evidence.*”²²⁶ In this example, a precautionary approach is supported at law. (See the discussion regarding *Western Water v Rozen & Anor*²²⁷ at paragraphs 4.47 to 4.47)

4.35 The Committee makes the following finding:

Finding 6: The Committee finds that that humans recreating in source areas pose an unacceptable risk to drinking water quality.

4.36 The Committee noted that the Department of Sport and Recreation has no ambition to allow recreational activities on water catchments that are currently being used for drinking water. The Department has, in the Committee’s view, taken a very reasonable position and is concerned not to lose the right to use water bodies that are now used for purposes other than drinking water.²²⁸ Dr David Deeley said:

The position that we have been talking about is that there should not be any recreational activities on drinking water reservoirs and the immediate catchments. We agree with the Department of Water and the Water Corporation’s position on that, unless there is treatment.

We are not advocating that we stick treatment plants everywhere; we are suggesting that there be no roll-back for the dams that are currently non-potable—the irrigation dams such as Waroona and Harvey—and that we draw a line in the sand today. We are happy to accept the exclusion that has occurred historically on all the current

²²⁵ Water Services Association of Australia, Occasional Paper No. 22, *Effects of recreational activities on source water protection areas, Literature Review*, April 2009, pp25- 33.

²²⁶ Mr John Ruprecht, Director, Water Resource Management, Department of Water, *Transcript of Evidence*, 21 October 2009, p6.

²²⁷ [2008] VSC 382.

²²⁸ Dr David Deeley, Managing Director, Acacia Springs (Australia) Pty Ltd, with the Department of Sport and Recreation, *Transcript of Hearing*, 2009, p5.

drinking water dams, but for the ones which are used for irrigation and on which recreational activities, that is it. If you want to make that a potable water source, you must put a treatment plant on it. We are not going to roll back and kick out the community once we have set up this expectation.

Our position, effectively, is to not recreate in the existing dams but to keep recreating in the ones that are open. We should do it better because it is not being done particularly well at the moment. When you look at some of the power boating issues down there, as the water levels shrink, powerboats are getting closer and closer. Either a death or a serious accident is just waiting to happen. The toilets there have fallen into disrepair and are vandalised. The recreation that is occurring down there is not particularly well managed. We believe that sport and rec can do a professional job of managing what is there while at the same time agreeing with the Water Corp and the DOW's policy of exclusion in those pristine drinking water catchments. That is effectively our position.²²⁹

- 4.37 Towards the close of this Inquiry, the Committee was advised that an interagency collaborative partnership has been formed between the Departments of Water, Environment and Conservation, Sport and Recreation, Health and the Water Corporation to investigate de-proclaiming ten identified source areas and opening them to managed recreation²³⁰ (see paragraph 2.17). The Committee welcomes this collaborative partnership and the intent of participants to “develop a formal agreement between all agencies for recreation planning in public dams and catchments throughout Western Australia by 31 December 2010.”²³¹
- 4.38 The Committee does not recommend any increase in the recreational activity currently allowed in source areas.

Recommendation 1: The Committee recommends no increase in the amount of current recreational activity in the outer catchments of public drinking water source areas.

²²⁹ Dr David Deeley, Managing Director, Acacia Springs (Australia) Pty Ltd, with the Department of Sport and Recreation, *Transcript of Hearing*, 2009, pp3-4.

²³⁰ Letter from Mr Greg Davis, Acting Director Water Resource Management, Department of Water, 10 August 2010, p1.

²³¹ Letter of intent, dated 9 August 2010, from Mr Greg Davis, A/Director Water Resource Management, Department of Water. Letter of intent, dated 6 August 2010, from Mr Ron Alexander, Director General, Department of Sport and Recreation and Letter of intent, dated 9 August 2010, from Ms Sue Murphy, Chief Executive Officer, Water Corporation. Letter from the Water Corporation, 11 August 2010.

Recommendation 2: The Committee recommends that the public drinking water source areas identified by the interagency collaborative partnership described in paragraph 4.37 as appropriate for de-proclamation as public drinking water source areas, be used for irrigation and recreation.

The Committee further recommends that recreational activity be managed by a working group for each such area comprising representatives as appropriate from the Department of Water, Department of Environment and Conservation, Department of Sport and Recreation, Department of Health, the Water Corporation, Tourism WA and the relevant local government authority.

Recommendation 3: The Committee recommends the continuation of the collaborative approach between the Department of Water, Department of Environment and Conservation, Department of Sport and Recreation, Department of Health and the Water Corporation towards identifying appropriate dams and their catchments compatible for irrigation and recreational purposes. The Committee anticipates that this would increase recreational opportunities for the people of Western Australia.

THE BENEFITS AND COSTS OF RECREATIONAL ACCESS ON INDIGENEOUS CULTURE

- 4.39 The Department of Indigenous Affairs said water has spiritual and ceremonial significance for indigenous people. Many have a “*sacred belief in the sanctity of water*”²³² and places of importance are located next to or associated with water source areas. These places receive protection under the *Aboriginal Heritage Act 1972*.
- 4.40 The Water Corporation said it has a specialised ‘Indigenous Resources Section’ within the organisation which is a centre of expertise and has a high level of experience in engagement with Indigenous groups across Western Australia.
- 4.41 Statewide Policy 13 states that the Department of Water’s position on recreational access to specific source areas will be set out in the water source protection plans for those areas and that a determination will be made “*recognising the impact on Aboriginal and culturally significant areas.*”²³³

²³² Submission No 110 from Hon Dr Kim Hames MLA, Deputy Premier and Minister for Indigenous Affairs, 13 November 2009, p1.

²³³ Department of Water, Statewide Policy No 13, Policy and Guidelines for Recreation within Public Drinking Water Source Areas on Crown Land, July 2003, p3.

- 4.42 The Committee was advised by Hon Dr Kim Hames MLA, Deputy Premier and Minister for Indigenous Affairs, that Nyungar people believe they should have unimpeded access to places of importance such as waterways and this presents a challenge to those engaged in source area management.²³⁴ The Water Corporation recognises that minimising activity and access to catchments “*inherently meets the desires of indigenous culture in protecting various sites and access to that area.*”²³⁵ The Committee concurs with the Water Corporation’s statement that “*Policy 13, through minimising access, supports the protection of indigenous areas*”.²³⁶

THE BENEFITS AND COSTS OF RECREATIONAL ACCESS ON MANAGEMENT OPTIONS

- 4.43 Many submissions from recreational lobby groups and individuals argued that the approach of the Water Corporation and the Department of Water to source protection is ‘risk avoidance’ rather than ‘risk management’. It is the Committee’s view that this is inaccurate. Risk management is a process used to avoid, reduce or control risks whereas risk avoidance is making a decision not to become involved in, or to withdraw from a risk situation. The Water Corporation’s adherence to the Australian Drinking Water Guidelines, the Department of Water’s administration of Statewide Policy 13 and the Department of Health’s work in water purity provide evidence of a ‘risk management’ approach.

- 4.44 The Department of Water observed that:

The term 'risk management' is often misinterpreted to mean "risks can/should be allowed if they can be managed". This is an oversimplification of the risk management tool which requires 'avoidance of risks' to also be considered as an option. Given that the potential outcome of 'getting it wrong' in [source areas] includes human illness, hospitalisation and even death; risk avoidance/prevention mitigation strategies are important to consider.

*It is also noted that some stakeholders confuse the terms risk and probability. This is a fatal error because a low probability may still result in a high risk.*²³⁷

²³⁴ Attachment to Submission No 110 from Hon Dr Kim Hames MLA, Deputy Premier and Minister for Indigenous Affairs, 13 November 2009, titled *South West Regional Water Plan: Workshops held with the Nyungar community*, April 2008, p20.

²³⁵ Dr Andrew Bath, Manager, Water Quality Operations, Water Corporation, *Transcript of Evidence*, 5 May 2010, p2.

²³⁶ Tabled document at a hearing with the Water Corporation, 5 May 2010, p1.

²³⁷ Letter from the Department of Water, 14 May 2010, including answers to questions at a hearing on 5 May 2010, p4.

- 4.45 Mr James Dodds, Director, Environmental Health Directorate, Public Health Division, Department of Health said:

*A body of evidence shows that when there is some form of recreational activity in catchments, there can be an increased microbiological load, but we do take a risk-management approach to it. We know that some people believe we are saying that there should be total exclusion. However, we have always taken a risk-management approach, and our approach has always been to make sure that the contamination does not occur as the first step. If a source is contaminated or is not pristine, we have always identified the risks.*²³⁸

The Precautionary Principle

- 4.46 According to Professor Steve Hrudehy:

*Risk management is about taking a carefully considered course of action. As the obligation is to ensure safe water and protect public health, the balancing process must be tipped in favour of taking a precautionary approach.*²³⁹ *That precautionary approach was certainly recognised in the Walkerton inquiry that I was engaged in and that is the guidance and direction that most places in the world are going when they have that option.*²⁴⁰

- 4.47 The most recent judicial pronouncement on the precautionary principle is a Victorian Supreme Court decision in *Western Water v Rozen & Anor*.²⁴¹ This decision is important because it held cumulative risk to be a relevant consideration in water utility management. Evidence indicates that the Water Corporation, the Department of Water and the Department of Health are certain about the risks to source areas from increased recreational access. However, this certainty is not shared by the Department of Environment and Conservation, the Department of Sport and Recreation, Tourism WA or the recreational community. Given these polarised views, the Committee finds the precautionary principle to be a useful tool in water source risk management.

²³⁸ Mr James Dodds, Director, Environmental Health Directorate, Public Health Division, Department of Health, *Transcript of Evidence*, 14 October 2009, pp1-2.

²³⁹ The precautionary principle was criticised by the West Australian Family Bushwalking Club Inc, Submission No 80, 12 November 2009.

²⁴⁰ Professor Steve Hrudehy, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009, p3.

²⁴¹ [2008] VSC 382.

Legal Liability and Costs

- 4.48 The Cooperative Research Centre for Water Quality and Treatment warned that decision making bodies must consider other aspects of recreational impact such as legal liability.²⁴² The Committee noted that under section 5 of the *Water Corporation Act 1995* the Water Corporation is not an agent of the Crown and under section 6, its officers are not part of the public sector. Responsibility is imposed under statute, specifically in Schedule 2 of the *Water Corporation Act 1995* which states that the duty of directors is to “*exercise reasonable care and diligence.*”²⁴³

The board and the senior officers of the Water Corporation do not have the protection that many other government departments have. So, in many areas, including occupational health and safety and drinking water quality, the board and the senior officers of the corporation take their responsibilities very, very seriously.

*Part of that is to be able to exercise a due diligence defence, one that we have diligently discharged our duty of care. One of the reasons we place so much emphasis on the Australian drinking water guidelines and their foundations in terms of world health guidelines and practices is to reinforce that these are examples of best practice, and are examples of what are regarded as appropriate management regimes for a water utility. As... people who work in the water industry, we have a passion to make sure that our customers receive the safest possible water. We drink the water; our families drink the water. We do not want to take chances, but at the same time we operate within a legal framework that was consciously set up by Parliament to ensure that, in very much that, in very much a legal situation, we are constantly reminded of our personal, criminal and financial liabilities.*²⁴⁴

- 4.49 The ECOS Environmental Consulting Report on *Assessment of Potential Recreational Use (Shoreline Fishing) of Tarago Reservoir*, said that in addition to any statutory duties, utilities have a common law duty of care to persons utilising the water or service that they supply. For negligence to be established, a utility or person would have to show conduct that breached the standard of care owed to the

²⁴² The Cooperative Research Centre for Water Quality and Treatment, *Research Report 24*, Recreational access to drinking water catchments and storages in Australia, 2006, p7.

²⁴³ Item 3 of Schedule 2 states: “A director must at all times exercise the degree of care and diligence in the performance of his or her functions, whether within or outside the State, that a reasonable person in that position would reasonably be expected to exercise in the corporation’s circumstances. Penalty: \$5 000.”

²⁴⁴ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p12.

person harmed and would require various elements to be proved. The duty of care here involves a reasonable decision made by a utility or agency responsible for recreational access to water supply storages given the known facts.²⁴⁵ Arguably, the Water Corporation owes a duty of care to its customers when making a decision about increasing recreational access beyond that currently permitted.

4.50 The legal liabilities that directly accrue to a water utility from allowing and supporting a range of recreational uses, particularly those activities linked to primary contact or high risk activities was well demonstrated when the Committee visited Queensland. Seqwater, the water provider for south-east Queensland told the Committee during a site visit to its major dams, (Wivenhoe and Somerset) that the recreational community do not carry any risk, they are “*not married to the environment*”²⁴⁶ whereas Seqwater has been required to:

- Manage over crowding from motorised boat access on the Somerset dam. For example, in a 12 month period there was a 200% increase in people at Somerset dam with the consequent need for full time staff just to manage recreation.²⁴⁷ Somerset dam has 100 times higher levels of *E. coli* parts per million (aptly described as ‘bum soup’²⁴⁸) than the geographically lower, Wivenhoe dam as a result of that activity.
- Frequently remove aquatic weeds such as cabomba and hyacinth from water bodies. Cabomba is fast-growing, up to one inch per day, very expensive to remove and a hazard for recreational water users. It must be removed so that people do not drown.
- Spend money on signage promoting safety for example, the ‘Be Dam Safe’ campaign.
- Treat blue green algae blooms at Wivenhoe dam with activated carbon.²⁴⁹ This algae is caused by the stirring up of nutrients and sediments which are then redistributed through the water body.²⁵⁰

²⁴⁵ ECOS Environmental Consulting, *Assessment of Potential Recreational Use (Shoreline Fishing) of Tarago Reservoir*, Report prepared in conjunction with Water Futures for the Department of Human Services Victoria, March 2004, pp45-46.

²⁴⁶ Informal discussions between the Committee and Seqwater staff, 12 March 2010.

²⁴⁷ Hon Jon Ford MLC at a hearing with representatives from Recfishwest and West Australian Fish Foundation, *Transcript of Evidence*, 24 March 2010, p4.

²⁴⁸ Professor Peter Schneider, Executive Manager Land and Water Quality Seqwater, 9 March 2010.

²⁴⁹ R. Ford said “*as a secondary benefit, protection of source waters will generally also reduce the capital and operating costs associated with treatment*”. See R. Ford, *Catchment for Drinking Water Protection*, Water Source Protection Feature, February 2010, p130.

- Repair erosion impacts of wake boarding on dam shorelines and powerboats.
- Deal with injuries sustained by canoeists knocked over by wake boarders.
- Manage endangered species such as the native lung fish and the white throated turtle.
- Construct a temporary helipad at Easter time to lift injured water skiers to hospital.²⁵¹
- Maintain boat ramps that historically, were part of the dam infrastructure.
- Manage the recreational risk of one million people subsidising 50,000.
- Pay for maintenance of the extensive camping grounds facilities and lawn mowing.

4.51 According to Seqwater, the operational costs associated with the above responsibilities are disproportionate to the income received and the public are not willing to engage in cost recovery. It costs \$4 million a year to run the recreational responsibility of Somerset and Wivenhoe dams - not the actual water, with a mere \$200 000 back in entrance fees. This funding for services is at a net loss to the public purse.

4.52 Seqwater believes that ideally such functions should not be part of a water provider's role and in lacking enforcement powers, building relationships with key agencies such as the police and local governments has become imperative. As in South Australia (see paragraphs 6.6 to 6.9), the only other tool Seqwater has in its armoury is education which, according to rangers the Committee met, does have some local effect on modifying recreational behaviour.

4.53 Anecdotally, when the Committee visited Seqwater, it was clear that source protection and closed or restricted access is preferred to the full treatment, open recreational access on drinking water sources that Seqwater inherited. This accords with Professor Steve Hrudehy's observation that:

²⁵⁰ Dr Andrew Bath, Manager, Water Quality Operations, Water Corporation, *Transcript of Evidence*, 5 May 2010, p3.

²⁵¹ Dr David Deeley, Managing Director, Acacia Springs (Australia) Pty Ltd, said the Department of Sport and Recreation is interested in managing irrigation dam recreation.

*If you were to survey water utilities around the world and say that they had the opportunity to turn back the water clock 100 years and to set up systems like you have here versus dealing with what they have to deal with right now, and you ask them would they take that option, I think that you would get a universal answer saying that yes, they would go for what you have got here.*²⁵²

- 4.54 Seqwater's management challenge may be contrasted with Cairns Regional Council which manages 15 drinking water intakes within either the Wet Tropics World Heritage Area or national parks. Copperlode dam supplies drinking water to Cairns, where some access is allowed but no water contact. There is no plan to increase access.²⁵³ In the Committee's view, Cairns Regional Council has the advantage of inexpensive water treatment and is absent recreational risk as a result of closed catchments.
- 4.55 Contamination costs must also be factored by water utilities whether or not actual contamination occurs. The 1998 Sydney water incident cost over \$37 million in direct costs and contingency costs were estimated at over \$100 million yet caused no illness or death.²⁵⁴
- 4.56 The Committee makes the following finding:

Finding 7: The Committee finds that limiting recreational access in public drinking water source areas to their current level is appropriate risk management.

²⁵² Professor Steve Hruzey, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009, p7.

²⁵³ Letter from Mr Bruce Gardiner, General Manager, Waste and Water, Cairns Regional Council, 27 October 2009, p1 as an Attachment to the Submission from the Water Corporation, Submission No 112, 13 November 2009.

²⁵⁴ Steve E. Hruzey and Elizabeth J. Hruzey, "*Safe Drinking Water, Lessons from Recent Outbreaks in Affluent Nations*, 2004, IWA Publishing, London, p352.

CHAPTER 5

WESTERN AUSTRALIAN LEGISLATION AND POLICY

- 5.1 By-laws made under the *Country Areas Water Supply Act 1947* and the *Metropolitan Water Supply, Sewerage, and Drainage Act 1909* govern source areas. The Water Corporation said:

Both by-laws provide a reasonable level of catchment protection. The agency responsible for those bylaws is now the Department of Water, but there is a formal delegation role from the Department of Water to the Water Corporation to enforce those bylaws within the water supply areas that the water supply operates.

*The Water Corporation has a team of about a dozen catchment rangers in the metropolitan area, and others in the south west, who patrol those catchments, do catchment management activities and enforce the bylaws. That is an ongoing operation in trying to deal with the worst effects of recreation in catchments.*²⁵⁵

The Metropolitan Water Supply, Sewerage, and Drainage Act 1909

- 5.2 The Committee noted that the *Metropolitan Water Supply, Sewerage, and Drainage Act 1909 (MWSSD Act)* and its by-laws are highly prescriptive and clear with respect to water protection. This is not surprising given the historical context within which that particular item of legislation was enacted. Mr Keith Cadee described how:

In the 1890s Perth was a fairly unpleasant place. There were typhoid epidemics; there was a great deal of loss of life and suffering. Perth's water supply was established by the City of Perth Water Company, a private water company that built the Victoria reservoir on Munday Brook. That reservoir very quickly became grossly contaminated due to development, particularly timber-cutting operations in what is now the Victoria catchment.

The government of the day purchased the City of Perth Water Company and put it into public hands and also set about a number of catchment protection measures, including purchasing significant amounts of land in the catchment and introducing various catchment

²⁵⁵ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p10.

*management practices. By the early part of last century, the worst of the contamination issues had been dealt with and a high standard of catchment protection was very much the foundation of our water supply for most of the past 100 years.*²⁵⁶

The Metropolitan Water Supply, Sewerage and Drainage By-laws 1981

5.3 Under section 57E of the MWSSD Act, the Governor may, on the recommendation of the Minister, by proclamation constitute and declare any part or parts of the ‘Area’ to be a Public Water Supply Area. Again under s146, the Minister may make by-laws:

- for the prevention of the pollution of water within or under any water reserve or catchment area;
- preventing or minimising the pollution of watercourses and sources of supply; and
- for the regulation or prohibition of bathing in watercourses and reservoirs.

5.4 The Water Corporation see the MWSSD Act as “*outdated and ineffective in serving the intent of the Act specifically, and source protection objectives at a broader level*”.²⁵⁷ However, the Committee noted that despite this criticism, the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981 (**MWSSD By-laws**) supporting the MWSSD Act are drafted in a ‘black letter’ style; that is, they are prescriptive and clear. The By-laws regulate the entry and behaviour of persons on Water Corporation property;²⁵⁸ with the purpose of preventing the contamination of water stored for distribution by prohibiting various activities including:

- swimming, bathing, washing in any reservoir, pond, or tank containing water stored for distribution to consumers;²⁵⁹
- boating, canoeing, fishing, or shooting;²⁶⁰ and
- the trespassing of dogs, birds or other animals under human control.²⁶¹

²⁵⁶ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p3.

²⁵⁷ Water Corporation, Source Protection Annual Report for delegated catchments, 2008/9, p7.

²⁵⁸ By-law 2.1.1(b).

²⁵⁹ By-law 3.2.3.

²⁶⁰ By-law 3.2.3.

²⁶¹ By-law 3.2.5.

5.5 The Committee noted other strict controls and strong protection on Water Corporation land: for example, no camping or littering.²⁶² Others include preventing trespass,²⁶³ and obedience to signs and verbal instructions.²⁶⁴

5.6 Part 4.0 specifically protects catchment areas and water reserves. By-law 4.1.1 states that the By-laws contained in this Part are intended to:

(a) prevent any deterioration of the quality of water collected from ... catchment areas and water reserves by way of increased bacteriological or chemical contamination, increased turbidity, or increased level of nutrients necessary to the growth of undesirable aquatic flora;

(b) control and manage existing and future development within the catchments and water reserves that could adversely affect water quality;

(c) regulate the behaviour of persons entering the catchment areas.

5.7 Respectively, By-law 4.3 protects water quality and 4.7 protects water from turbidity. By-law 4.2.1 applies to water reserves and catchment areas within which surface or sub-surface water may be collected into an open storage reservoir before distribution to consumers. These By-laws are the most contentious as they establish the reservoir protection zone:

4.2.2.2 Prohibited zone means that part of a catchment area which lies —

(a) upstream of a dam; and

(b) within 2 kilometres of the top water level of any reservoir in which water is or can be stored.

5.8 The Committee heard from a Water Corporation Ranger that the two kilometre zone has a ‘*line of sight*’ context. That is, if a person is two kilometres away from the water body, the water cannot be seen and therefore the person is not attracted to the water body.²⁶⁵ The Department of Water admitted that the zone is not scientifically based because the:

²⁶² By-law 2.3.7.

²⁶³ By-law 2.3.3.

²⁶⁴ By-law 2.3.10.

²⁶⁵ Mr Peter Chalmers, Water Corporation Ranger, Field Trip at Mundaring Weir, 15 April 2010.

*science is not currently available to determine, (through quantitative risk assessment) whether a 1 km, 2 km, 3 km or other size RPZ is correct. This is because ... there is only limited quantitative data on the impact of any particular type or level of recreational activity on drinking water quality. It is unlikely that the costs involved in quantifying these relationships will be justifiable by any agency or organisation.*²⁶⁶

- 5.9 Fire management officers suggested two kilometres to be a reasonable distance for fire management control around sensitive sites.²⁶⁷ The Department of Water advised that it recognises that at times (such as in small catchments or where key physical boundaries can be substituted) the two kilometre boundary is not a practical size. To address this matter the Department will ask for the boundary in any new legislation to be set at two kilometres or other distance approved by the Minister for Water during the publicly consulted drinking water source protection plan process.²⁶⁸
- 5.10 The Committee asked Professor Steve Hrudey, Environmental and Analytical Toxicologist, University of Alberta, Canada how far the zone should be drawn and if there is a “*difference between a motor vehicle going past, such as in a car rally, a person riding a horse or a person walking past the water, or somebody having a barbecue ... beside the water?*”²⁶⁹ Professor Hrudey said:

I think the sixth principal in the drinking water guidelines says that risk management is about making decisions in the face of uncertainty. Nobody coming before you, no matter how much expertise they claim to have, can claim that they have the right answer—draw this line and it is okay. What you are talking about is a continuum of risk.

The more direct that you allow the possibility of human activity into a drinking water source, the greater the risk. That is what we know. Trying to put a number on it, to say two kilometres is good, three kilometres would be better, 100 metres is acceptable—anybody who

²⁶⁶ Letter from the Department of Water, 14 May 2010 including answers to questions at a hearing on 5 May 2010, p8 quoting the Cooperative Research Centre for Water Quality and Treatment 2006, p4.

²⁶⁷ Letter from the Department of Water, 14 May 2010 including answers to questions at a hearing on 5 May 2010, p8.

²⁶⁸ Ibid.

²⁶⁹ Hon Max Trenorden MLC, Chairman, Public Administration Committee, *Transcript of Evidence*, 26 November 2009, p5.

*tells you that they can give you a precise answer on that is misleading you.*²⁷⁰

Penalties

5.11 A critical issue with the By-laws is the penalty regime. By-law 31.4 states:

31.4.1 A person committing a breach of any of the provisions of these by-laws, to which no specific penalty is attached shall be liable on summary conviction to a penalty not exceeding \$200.00 and in addition may be ordered to pay any expense incurred by the Corporation ... or [Department of Water] in consequence of such breach.

31.4.2 In the case of a continuing breach the offender shall be liable in addition to the fine and payment of expenses to a daily penalty not exceeding \$50.00 for each day the breach continues after notice ... has been given ... to the offender.

5.12 Evidence from DEC officers²⁷¹ and Water Corporation rangers²⁷² during field trips to the hills and south-west of the State in April 2010 indicated that many people who are caught breaching the By-laws simply view the penalty as part of the cost of the day's entertainment.²⁷³ Arguably, the penalty fails to provide an effective disincentive to breach the legislation. Mr Rod Annear, Acting Assistant Director, Visitor Services, Department of Environment and Conservation said:

Mountain bikes and bushwalkers and some of these people who want to go into places where we do not want them to go are very difficult to stop. We can stop some of them but I do not think that we will stop all

²⁷⁰ Professor Steve Hrudehy, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009, pp5-6. The Committee noted the USA Climburg et al (2000) study on disposal of human excreta as quoted by the Federation of Western Australian Bushwalkers Inc at 60 metres from water as sufficient but Climburg also warned that the findings cannot necessarily be extrapolated to all ecosystems.

²⁷¹ Mr Leon Price, Parks and Visitor Services Coordinator, Department of Environment and Conservation, whilst at the Logue Brook Dam Field Trip, 16 April 2010.

²⁷² For example, Mr Peter Chalmers, Senior Catchment Ranger, Water Corporation whilst at the Mundaring Weir Field Trip, 15 April 2010.

²⁷³ Mr Nigel Mantle, Manager, Water Source Protection Branch, Department of Water, *Transcript of Evidence*, 21 October 2009, p10 said "*The maximum penalty at the moment under the metropolitan by-laws is \$200. You have to take that through a magistrate to get that prosecuted. The magistrate will usually give a lesser amount than \$200. The feedback I have had from the rangers is that sometimes they see that as a waste of time. Also, people who have undertaken illegal activities will say, "Well, that's my fee for my activity," and they will carry on doing what they are doing. Over the years there have been desires to increase those penalties, particularly for things like setting fires where it is illegal. There are designated places to have fires in picnic areas and so on. There is certainly a desire to ramp up some of the penalties.*"

*the use. It certainly does not go anywhere near stopping the use that is going on in there at the moment.*²⁷⁴

- 5.13 Mr John Ruprecht, Director Water Resource Management, Department of Water disagrees with this bleak view of the recreational community.

*I note the suggestion from some public hearings that as much 'illegal' activity occurs in [source areas] as 'legal' activity. This is not the experience of my officers. Repeatedly, patrols and survey data show us that most recreators do the right thing, and that the catchments are at their capacity at specific peak holiday times. The view is that at these peak times illegal activity also increases, but it is not supported with data that illegal access in [source areas] ranks equally with legal access numbers. Our observation is that legal access for recreation far outweighs illegal access.*²⁷⁵

- 5.14 Mr Ruprecht further said:

*Protection zones (that limit or prohibit public access) are a common and effective approach in drinking water programs in Australia (and worldwide).*²⁷⁶ *The recent (2007) application of a protection zone for the Mundaring [source area] has seen recreation access drop by approximately 90%, reducing risks to water quality.*

- 5.15 The Committee is of the view that more stringent penalties are needed. For example, the *Local Government Act 1995* imposes a maximum penalty of \$5,000 with a modified penalty system where the penalty continues to accumulate on a daily basis until the offender desists. Such a regime would deter behaviour and send a clear message to the recreational community and the judiciary that drinking water source protection is a serious concern to the wider Western Australian community and Government. Unfortunately this message appears lost on some recreational groups, for example, Mr Richard Gill, Executive Director, Motorcycling Western Australia said:

*Most people know that the reality of getting caught in a water catchment is unlikely, if not remote.*²⁷⁷

²⁷⁴ Mr Rod Annear, Acting Assistant Director, Visitor Services, Department of Environment and Conservation, *Transcript of Evidence*, 21 April 2010, pp5-6.

²⁷⁵ Covering letter from the Department of Water, 14 May 2010 including answers to questions at a hearing on 5 May 2010, p2.

²⁷⁶ Ibid, p10.

²⁷⁷ Mr Richard Gill, Executive Director, Motorcycling Western Australia, *Transcript of Evidence*, 31 March 2010, p6.

- 5.16 The Water Corporation advised of an “*upwards trend in illegal activity in metropolitan surface water catchments in close proximity to urban areas... Prosecutions initiated against by-laws have increased 325% from 05/06 to 08/09 (from 78 prosecutions to 254 prosecutions).*”²⁷⁸ The Department of Water advised that during 2008/9, Water Corporation rangers “*gave out 188 warnings and undertook 263 prosecutions under water legislation and 29 under other legislation*”.²⁷⁹ An example of a prosecution under other legislation is the offence of marroning out of season under the *Fish Resources Management Act 1994*.
- 5.17 The Committee observed that penalties designed to protect source areas are generally inadequate and are applied inconsistently across the agencies charged with the protection of the source areas. An example of this was in the Mundaring catchment where a Water Corporation ranger indicated that he found *Fish Resources Management Act 1994* penalties were more effective to deter source area incursions than the small fines available through his own agency.
- 5.18 The Water Corporation said there are several issues that relate to illegal access to drinking water catchments:
- Fines for unlawful access are small amounts of money and thus pose no deterrent to illegal activity. Revised penalties should consider impounding or confiscation of vehicles and more punitive fines.
 - Fines associated with the MWSSD Act range from \$50 to \$200, and the *Country Areas Water Supply Act 1947 (CAWS Act)* from \$40 to \$100. In comparison, fines in terms of the *Fish Resources Management Act 1994* can be up to \$10,000 for marroning out of season.
 - The MWSSD Act and associated by-laws need revision and updating. The same applies for the country area water supplies that fall under the CAWS Act. Ideally, a single Act is required for both metropolitan and country areas to provide consistent management and enforcement across all areas of Western Australia.
 - Metropolitan catchments cover a considerable area (8,000 km²) that is under surveillance by seven full time Water Corporation rangers. Enforcement officers from the Department of Environment and Conservation, Department of Fisheries and local police also support the rangers.

²⁷⁸ Water Corporation, Source Protection Annual Report for Delegated Catchments 2008/9, p7.

²⁷⁹ Department of Water, Additional Information related to the Inquiry into Activities within Public Drinking Water Source Areas, 10 November 2009, Attachment 4.

- In 2008/09, Water Corporation rangers recorded over 16,000 surveillance hours, prosecuted 283 individuals and gave 264 verbal warnings across the metro, south-west and great southern regions.²⁸⁰
- With the increasing popularity of off-road vehicles there is a need for dedicated areas where the community can take their vehicles. Unfortunately, the catchments are close to the city and present an ideal secluded destination.
- There is a section of the community that will always try and operate outside the law. In the Mundaring Catchment at Barton's Mill which the Committee visited, there are a group of off-road riders and drivers who repeatedly remove boom gates and signs. At weekends, catchment enforcement officers do not go on site alone because of security risks.²⁸¹

Lack of an infringement notice system

5.19 A Water Corporation ranger at Mundaring Weir gave anecdotal evidence that when a notice of an offence is given, the matter is remitted to the Magistrates Courts for protracted and complicated processing. Despite the \$200 penalty, the Magistrate frequently imposes a \$100 penalty, a practice the Committee confirmed from statistical information provided by the Department of the Attorney General.²⁸² Of 533 fines imposed under all provisions of the two principal sets of by-laws in 2007, 2008 and 2009:

- 378 were for \$100;
- 29 were for \$150; and
- 51 imposed the maximum \$200 fine.

5.20 In relation to water contact offences, in the same three year period there were 34 convictions for breach of By-law 4.3.2 of the MWSSD By-laws, that is, that the person "*Had bodily contact with water in a catchment area*" or "*swam in water within a catchment area*":

- 24 were for \$100; and
- one was for \$200.

²⁸⁰ At a hearing on 5 May 2010, the Water Corporation gave different statistics. These were 264 warnings and 283 prosecutions but covered the metropolitan, south west and great southern regions.

²⁸¹ Tabled document at a hearing with the Water Corporation, 5 May 2010, p4.

- 5.21 In the same three year period, of two convictions for breach of by-law 31 of the Country Areas Water Supply By-Laws 1957, that is, “*Bathing in a water course within catchment area prohibited*”, the two were for \$100.
- 5.22 This practice of imposing a lesser penalty is not surprising given that the penalty is a maximum under section 9 of the *Sentencing Act 1995*. Legal costs associated with prosecuting an offence are prohibitive: one example given was \$880 in costs for a \$100 penalty.²⁸³ This may explain why there were only 61 prosecutions in 2008/9 in the Mundaring Weir catchment.²⁸⁴
- 5.23 The Committee noted that the absence of an infringement notice system in the MWSSD Act is a feature of older legislation and that an infringement notice system similar to that in the *Local Government Act 1995* would provide a template for a more modern approach to enforcement.

Finding 8: The Committee finds that the penalties for breaching the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981 are not an effective deterrent and fail to adequately protect public drinking water source areas.

Finding 9: The Committee finds that the absence of an infringement notice system in the Metropolitan Water Supply, Sewerage, and Drainage Act 1909 is an impediment to effective enforcement of the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981.

- 5.24 The Committee makes following recommendations:

Recommendation 4: The Committee recommends that the penalties in by-law 31.4 of the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981 be increased to a level comparable to the \$5,000 penalty found in the *Local Government Act 1995*. This recommendation reflects the seriousness of the offences contained in by-law 31.4.

²⁸² Letter from Mr Ray Warnes, Executive Director, Court and Tribunal Services, Department of the Attorney General, 17 May 2010.

²⁸³ Mr Peter Chalmers, Ranger, Field Trip to Mundaring, 15 April 2010.

²⁸⁴ Attachment 4 titled “*Drinking water, irrigation and recreational catchments from Perth Hills to South West*”, with Submission No 180 from Department of Water, 4 December 2009, relating to the Mundaring Weir Catchment, unpublished report, November 2009.

Recommendation 5: The Committee recommends an amendment to the *Metropolitan Water Supply, Sewerage, and Drainage Act 1909* to provide for an infringement notice system and modified penalties of \$500 to apply to the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981.

The Country Areas Water Supply Act 1947

5.25 Similar to the MWSSD Act, the CAWS Act enables the Governor to constitute any defined portion of the State to be “*a country water area*,”²⁸⁵ as well as constituting catchment areas and water reserves.²⁸⁶ Under section 105(1)(ii), the Minister may make by-laws for the prevention of the pollution of water within any water reserve or catchment area. Amongst other things, the Country Areas Water Supply By-Laws 1957 (**CAWS By-laws**) protect water supplies and Water Corporation property by:

- excluding pigs within 500 metres of a reservoir;²⁸⁷
- excluding persons on any fenced land;²⁸⁸
- restricting camping and fire lighting;²⁸⁹ and
- restrictions on hunting, shooting and fishing in the catchment area.²⁹⁰

5.26 The By-laws expressly prohibit:

- bathing;²⁹¹
- washing clothes in a watercourse or reservoir within a catchment area or washing dogs or other animals or throwing any rubbish or dead animal;²⁹²
- fouling or contamination of water;

²⁸⁵ Section 8(1)(a). Section 5 defines a ‘country water area’ as meaning “*any part of the State for which part a scheme for a reticulated supply of water is prepared.*”

²⁸⁶ Section 9.

²⁸⁷ By-law 19A.

²⁸⁸ By-law 37.

²⁸⁹ By-law 39.

²⁹⁰ By-law 35.

²⁹¹ By-law 31.

²⁹² By-law 30.

- the removal, plucking, or damaging of any wild flower, shrub, bush, tree, or other plant, growing on any land or reserve within 800 metres of any reservoir or bore,²⁹³
- dogs;
- the leaving of loose paper or other refuse; and
- the posting of advertisements and notices.

Operation of the CAWS By-Laws

5.27 The Department of Water is the agency responsible for the By-laws but there is a formal delegation role from the Department of Water to the Water Corporation to enforce those laws within the water supply areas that the Water Corporation operates. Water Corporation catchment rangers in the metropolitan area and south west patrol those catchments, undertake catchment management activities and enforce the By-laws.

Penalties

5.28 The penalty under By-law 105(1) is not to exceed \$200 and a further penalty not exceeding \$50 is to apply for each day during which the offence continues after notice of the contravention or breach is given. The penalties under the CAWS Act do not act as a deterrent and like the penalties under the MWSSD By-laws, should be strengthened. This will reduce the complacency by which offenders view the penalties under each enactment and evince an intention by the Parliament to deal seriously with breaches of the legislation. Prescribing an infringement notice system would assist the rangers.

5.29 The Committee makes the following findings:

Finding 10: The Committee finds that the penalties in the Country Areas Water Supply By-laws 1957 are not an effective deterrent and fail to adequately protect public drinking water source areas.

Finding 11: The Committee finds that the absence of an infringement notice system in the Country Areas Water Supply Act 1947 is an impediment to effective enforcement of the Country Areas Water Supply By-laws 1957.

²⁹³

By-law 40.

Recommendation 6: The Committee recommends that the penalties in the Country Areas Water Supply By-laws 1957 be increased to a level comparable to the \$5,000 penalty found in the *Local Government Act 1995*. This recommendation reflects the seriousness of the offences contained in the By-laws.

Recommendation 7: The Committee recommends an amendment to the *Country Areas Water Supply Act 1947* to provide for an infringement notice system and modified penalties of \$500 to apply to the Country Areas Water Supply By-laws 1957.

The Conservation and Land Management Regulations 2002

- 5.30 The Conservation and Land Management Regulations 2002 made under section 126(2) of the primary enactment provides for a system of penalties not exceeding \$2,000. Two divisions, *Division 3 - Pollution and litter* and *Division 4 - Disturbance of the landscape* are relevant.
- 5.31 Regulation 23 prohibits the pollution of water supply in reservoirs, tanks, pipes and “any public water catchment area on CALM land, or in any area on CALM land where the matter is likely to pass to a public water catchment area.”²⁹⁴ There is a \$500 penalty if a person swims, bathes or washes in any reservoir or tank containing water stored for human consumption or use on CALM land.²⁹⁵ There is a similar prohibition against littering but with a higher \$1,000 penalty attached.²⁹⁶
- 5.32 In terms of disturbing the landscape and thereby potentially impacting on water, Division 4 provides that a person must not take or interfere with water on CALM land.²⁹⁷ The penalty is \$2,000. Additionally, both sand boarding and abseiling are prohibited. Each carries a penalty of \$500.²⁹⁸ There is a \$2,000 penalty for illegal dumping and the unlawful lighting of campfires.
- 5.33 The Committee noted similar types of offences relevant to human impacts on drinking water sources in each of the Conservation and Land Management Regulations 2002; the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981; and the Country Areas Water Supply By-Laws 1957. Clearly the penalties

²⁹⁴ Regulation 23(1)(b).

²⁹⁵ Regulation 23(2).

²⁹⁶ Regulation 24.

²⁹⁷ Regulation 30.

²⁹⁸ Regulations 32 and 33 respectively.

under the Conservation and Land Management Regulations 2002 are more rigorous with respect to protection of water and landscape. The infringement notice system under regulation 112 is a useful tool for DEC rangers.

The Health Act 1911

- 5.34 Section 17(2) of the MSSWD Act provides that “*all the provisions of the Health Act 1911... apply to every water reserve and catchment area...*”.
- 5.35 It is important to appreciate the context of the *Health Act 1911*. It was enacted 11 years following catastrophic typhoid fever outbreaks between 1895 and 1900. Community memory of the 4047 reported cases and 425 deaths persisted.²⁹⁹ At the time the catchment area for the reservoir was used for cattle and sheep grazing and also housed timber mill settlements. This context explains why, for example, provisions such as section 87 appear in the *Health Act 1911*. That section required local governments to drain, clean, cover or fill up “*ponds, pools, open ditches, sewers, drains, and places containing or used for the collection of any drainage, filth, water, matter, or thing of an offensive nature, or likely to be prejudicial to health*”. This was the era of the public health imperative.
- 5.36 Division 7 titled ‘Pollution of water’ contains section 129 which provides that “*Any person who defiles or pollutes any water supply, or the catchment area thereof; or ... permits or suffers any water supply or the catchment area thereof to become defiled or polluted, commits an offence.*” Water supply in section 129 includes any river, stream, watercourse, creek, swamp, water-hole, well, tank, lake, or reservoir containing water intended or available for human consumption. So serious was contamination by domesticated animals, local governments were able to (and still may) post notices prohibiting pigs, dogs, ducks and geese from trespassing on a water supply or its catchment area. Those animals could be seized, then either destroyed or sold.
- 5.37 The *Health Act 1911* is clear evidence of the Parliament’s response to a water contamination crisis and how best to deal with infectious diseases in a post-typhoid world. The Health Department reinforced this when it said:

The Department... takes the protection of water supplies and the protection of the public in regard to drinking water very seriously. Our current legislation is the Health Act 1911. It does not give us a lot of freedom in that area but it is focused on the old sanitation principles of public health, which are obviously about making sure that there is adequate clean water and adequate waste disposal.

²⁹⁹

Extracted from a photograph of a memorial at the gazebo overlooking the Victoria reservoir during a field trip on 15 April 2010.

*Although drinking water is not strongly prominent in the legislation, it is a key interest. ... We also use a number of other systems. We have been looking at the area of drinking water for 75 years through our purity of water committee, which is an advisory committee to the Minister for Health. We monitor the water across the state in various supplies. We do not monitor the water in private supplies, such as a bed and breakfast in Margaret River, but we monitor water supplies, including mining camp supplies. We monitor those and ask people to provide a response if we believe that there is a risk to public health. A subcommittee forms part of that process, and it looks at the catchments. We monitor chemical contamination and microbial contamination in the catchments.*³⁰⁰

PRINCIPAL POLICIES

5.38 The Committee noted the following policies as relevant to its Inquiry:

- Western Australian Planning Commission's Statement of Planning Policy No 2.7 – Public Drinking Water Source Policy;
- Western Australian Planning Commission's State Planning Policy 2.9 Water Resources;
- Department of Environment and Conservation Policy Statement No. 18 Recreation, Tourism and Visitor Services; and
- Department of Water, Statewide Policy 13 - Policy and Guidelines for Recreation within Public Drinking Water Source Areas on Crown Land.

Western Australian Planning Commission's Statement of Planning Policy No 2.7 – Public Drinking Water Source Policy

5.39 This Policy covers both surface and groundwater resources. It adopts and implements recommendations by the Department of Water regarding land use activities in source areas. The Policy does not mention specific activities that are to be restricted, instead it refers to guidance documents from the Department of Water which provide lists of allowed activities. Of the Policy, Hon John Day MLA, Minister for Planning, said:

Only P1 and P2 zones are listed as water catchments reservation, rural water protection zones or special control areas. P3 zones are

³⁰⁰ Mr James Dodds, Director, Environmental Health Directorate, Public Health Division, Department of Health, *Transcript of Evidence*, 14 October 2009, p1.

*not subject to specific provisions in planning schemes. For example, under the Metropolitan Region Scheme, catchments in the Perth Hills are listed as water catchments reserves. No development is allowed ...without the approval of the Western Australian Planning Commission on advice from the Department of Water.*³⁰¹

- 5.40 The Department of Planning (**DPI**) see the information the Department of Water supplies to Western Australian Planning Commission as an important component of any assessment as to compatible land use. DPI stated that if the dual use of source areas was contemplated, the Western Australian Planning Commission would be guided by advice from the Department of Water.³⁰²

Western Australian Planning Commission's State Planning Policy 2.9 Water Resources

- 5.41 This Policy states that water resources have a range of values, including ecological values, such as flora, vegetation and fauna, and human use values such as drinking water, recreation, agriculture and industry. Human use values may require a high level of protection, for example public drinking water supplies. Importantly, planning strategies, policies and statutory proposals and applications need to be adequately informed about these values, and together with consideration of other relevant planning, social and economic values ensure responsible and balanced decision making.³⁰³

Department of Environment and Conservation Policy Statement No. 18 recreation, tourism and visitor services

- 5.42 The Department of Environment and Conservation becomes a partner in drinking water source protection when an “*area is designated as a water catchment but it might also be a state forest or national park ... we work with those other agencies to get outcomes.*”³⁰⁴ Policy 18 is a prescriptive document of a variety of recreation and the conditions that attach, for example section 2.1.12 deals with backpack camping areas and where they are provided:

these should be located in protected, stable landscapes with well-drained, non-erodible soils. Where possible, designated campsites should be situated within reasonable proximity (200-300 metres) of

³⁰¹ Letter from Hon John Day MLA, Minister for Planning, 27 November 2009, p1.

³⁰² Ibid.

³⁰³ The *Government Gazette*, 19 December 2006, p5720.

³⁰⁴ Mr James Sharp, Deputy Director General, Parks and Conservation, Department of Environment and Conservation, *Transcript of Evidence*, 21 April 2010, p3.

*potable water, but with careful consideration being given to minimising potential downstream impacts on any water body.*³⁰⁵

- 5.43 Policy 18 is also a prescriptive document of the processes by which a group can apply to access an area for a special event. Under regulation 50 of the *Conservation and Land Management Regulations 2002*, events such as cross country running, orienteering, rogaining, cross country navigation exercises or equestrian events on CALM land may be authorised.
- 5.44 Policy 18 states competitive rallies and other motor sports may be approved in State forests, timber reserves and other reserves subject to the procedures and conditions outlined in section 5.4.3 being met.³⁰⁶ Where approval is sought to conduct a major event within a source area, section 1.12.2 states:

*Approval of activities is generally the responsibility of Regional and District Managers. In the case of major events Managers may need to consult with the Corporate Executive and with the Conservation Commission of Western Australia and the Marine Parks and Reserves Authority as appropriate before granting approval. Where approval is sought to conduct an activity within a Public Drinking Water Source Area, applications will be referred to the Department of Water and Water Corporation for their review.*³⁰⁷

- 5.45 This approval system was the subject of discontent amongst some recreational groups but the Committee is of the view that the rigor of Policy 18 protects source areas.

Department of Water Statewide Policy 13 - Policy and Guidelines for Recreation within Public Drinking Water Source Areas on Crown Land

- 5.46 This Policy has its genesis in 2001 when the government released *State Water Quality Management Strategy No.1* as its response to the *National Water Quality Management Strategy*. Both strategies recognised five environmental values of water resources, where the values of ‘raw water for drinking water supply’ and ‘recreation and aesthetics’ were identified as two of the five environmental values. With the increasing pressures for recreation around water bodies in Western Australia, Statewide Policy 13 was prepared to help protect the quality of water in source areas from the negative impacts of recreation. The policy considered existing legislation and water resource policy, and contains two tables listing the compatibility of land and water based recreational activities. Statewide Policy 13

³⁰⁵ Policy Statement No.18, p34.

³⁰⁶ Clause 5.3.2 of Policy Statement No. 18.

³⁰⁷ Policy Statement No.18, p19.

was publicly consulted and published in 2003 and is subject to a five year review period.

5.47 The Department of Water said Statewide Policy 13 is an effective tool for recreation management in source areas, but not popular within the recreational community. It does not prevent all recreation from occurring within source areas, as it provides for passive, land-based recreation within the outer catchments. Much of Statewide Policy 13 is also consistent with Department of Environment and Conservation's Policy Statement No. 18 - *Recreation, tourism and visitor services*.

5.48 Statewide Policy 13 was the subject of vitriolic complaint amongst the various recreational groups who claim it:

- locks people out;
- declares some things as incompatible such as off road driving;
- overzealous and unnecessary;
- excessively constrains activities such as trail bike riding;
- over protectionist;³⁰⁸ and
- strangles some sports like orienteering.

5.49 Other views were that:

- the public deserve to derive some benefit from the dams;³⁰⁹
- dams are not the personal kingdoms of the Water Corporation; and
- as a community asset, the community has rights to use and deserves to derive some benefit.³¹⁰ For example, Mr John Baas, bushwalker said *“While probably relatively small in overall numbers of participants, bushwalking and overnight camping have been a very long standing and consistent use of the metropolitan forests. In this, one would think that this user group has accumulated rights through custom and practice.”*³¹¹

5.50 The Department of Water responded to this criticism in the following manner:

³⁰⁸ Submission No 176 from the Swan Canoe Club, 4 December 2009, p3.

³⁰⁹ Submission No 137 from the Shire of Manjimup, 17 November 2009.

³¹⁰ Submission No 176 from the Swan Canoe Club, 4 December 2009, p4.

³¹¹ Submission No 72 from Mr John Baas, 11 November 2009 enclosing a letter to the former Minister for Water Resources dated 17 August 2007 and response dated 20 September 2007.

- The submissions and complaints about the policy reflect the view of recreation stakeholders who have been shown to be risk tolerant in relation to recreation in source areas.
- The policy reflects a wider community view following public consultation and is consistent with a different position on risk, which is to be risk averse/sensitive. These findings have been confirmed by a recent survey conducted for Water Quality Research Australia in 2010.
- The policy was prepared to determine what the public wanted (recreators and the wider community); respond to increasing recreation access pressure; and to establish a consistent and equitable framework within which recreation access applications could be considered.
- The Perth Hills and South West dams pre-date Statewide Policy 13. However, some dam expansion or maintenance works have occurred since 2003 when the policy was published. The consequences of Statewide Policy 13 have been reduced: access for recreation in source areas (reflecting the outcome of the consultation process); and implementation of existing legislation and best practice water quality protection/management of source areas.³¹²

5.51 The Water Corporation said that its monitoring data at metropolitan reservoirs shows existing land use activities under Statewide Policy 13 (such as scenic drives, picnicking and designated camping, nature trails, wood collection and wild flower picking) “*have no recognisable impact on the quality of the drinking water sources*”. By contrast, in country irrigation reservoirs, where Statewide Policy 13 is not applied, some water bodies have poorer water quality.³¹³ This demonstrates that the extent of the permitted compatibility land uses is working in the metropolitan reservoir catchments.

5.52 The Committee scrutinised Statewide Policy 13 noting the following strengths:

- It has a clearly stated objective which is to “*protect drinking water sources from contamination through inappropriate recreational activities*”.³¹⁴

³¹² Extracted from a letter from the Department of Water, 14 May 2010 including answers to questions at a hearing on 5 May 2010 and Dr Andrew Bath, Manager, Water Quality Operations, Water Corporation, *Transcript Of Evidence*, 5 May 2010, p6.

³¹³ Tabled document at a hearing with the Water Corporation, 5 May 2010, p4.

³¹⁴ Department of Water, Statewide Policy No 13, Policy and Guidelines for Recreation within Public Drinking Water Source Areas on Crown Land, July 2003, p1.

- It guides those agencies responsible for approving activities and those groups or individuals who wish to organise an event in a source area, that is, the policy provides a process by which the relevant agency can make a decision.³¹⁵
- It has a strong “scope and justification” clause which reinforces that the “*most significant risk to water quality from recreational activity is direct or indirect contamination with micro-organisms contained in human and animal excreta*”.³¹⁶
- It refers to the Australian Drinking Water Guidelines and the multiple barrier approach to source protection.
- It notes that many source areas are accessible to the public; that full water treatment is expensive; that the Parliament has on two occasions endorsed the source protection, preventative approach.³¹⁷
- That acceptable recreational activities within source areas will be determined on the basis of the assigned Priority classification.³¹⁸
- It provides for water source protection plans to determine ongoing water quality and catchment environmental monitoring associated with recreation.³¹⁹
- It provides for a system of permits for some activities.³²⁰
- That signage is to promote public awareness of the need to protect water quality.³²¹
- It provides for conditional access in the outer catchments. That is, it clarifies that the Department of Water may permit certain recreational activities in circumstances where (a) assessment indicates that water quality will not be compromised; (b) the quality of the water is assured by other existing protection measures; (c) historical and traditional uses

³¹⁵ Department of Water, Statewide Policy No 13, Policy and Guidelines for Recreation within Public Drinking Water Source Areas on Crown Land, July 2003, p1.

³¹⁶ Ibid, p2.

³¹⁷ Ibid, p2.

³¹⁸ Ibid, p5.

³¹⁹ Ibid, p6.

³²⁰ Ibid, p6.

³²¹ Ibid, p6.

have existed such as the Bibbulum Track; and (d) conditional approval has been recommended in a water source protection plan.³²²

5.53 It is the recourse to conditional approval that has caused problems for the Water Corporation and the Department of Water in dealing with recreational groups that have enjoyed historical access. Its inclusion in Statewide Policy 13 has raised a hope and expectation that approvals into the future will be granted in source areas based on past custom and practice. The Committee finds such expectation understandable. For example:

- Motorcycling Western Australia (Inc) said “*Enduro and organised trail events have been held since before records were kept by our association in forests surrounding Perth and the south west. Since Policy 13, that has been withdrawn.*”³²³
- In 1994 the Federation of Western Australian Bushwalkers Inc entered into an agreement with the then Water Authority for access inside the reservoir protection zone. This was tolerated even though the zone has been law since 1981.

5.54 The Department of Water advised of two specific notations in relation to historical approvals within the tables in Statewide Policy 13. These apply to:

- Rallying and racing. New events are considered to be incompatible within source areas, whilst established, approved motorsport events are considered to be conditional. This conditional approval is noted to apply to “*Events/competitions that have historically been approved in [source areas], and cannot readily be relocated (ideally these activities would occur outside RPZs and P1 areas)*”.
- Non-motorised boating and fishing. These activities are generally considered to be incompatible within both the reservoir protection zone (RPZ) and outer catchment (P1 areas); however, the following notation is included for these activities within the outer catchment: “*May be allowed if activity has been approved historically and the risk to the resource is accepted following community consultation. (Generally, additional barriers to contamination and/or costly treatment would be*

³²² Department of Water, Statewide Policy No 13, Policy and Guidelines for Recreation within Public Drinking Water Source Areas on Crown Land, July 2003, p5.

³²³ Submission No 173 from Motorcycling Western Australia (Inc), 2 December 2009, pp4-5.

required.) It is unlikely that recreational activities will be allowed in undeveloped catchments.”³²⁴

5.55 The Federation of Western Australian Bushwalkers Inc (**Federation**) advised of a 1994 agreement with the Minister and the Water Corporation to off-track bushwalking. However, two recent drinking water source protection plans have removed this approval.³²⁵ The Federation raised a concern that this agreement is under threat. The agreement allowed the then four (now nine) member clubs pedestrian access to catchments areas for bushwalking and camping in groups of 50 participants. It also allowed “*occasional*” access within the existing two kilometre prohibited zone.³²⁶ Clause 9 stipulates faecal waste is “*to be buried at least 250 mm deep no closer than 200 metres to the high water mark and 100 metres to any feeder streams*”. Clause 8(c) allows camping in the catchment “*on the understanding*” that it will only take place more than “*500 metres from the full supply level and not be visible from the dam wall*”. Clause 3 of the General Conditions states that the agreement “*does not infer exclusive rights to any areas by the Federation*” and other clause 3 provides that the Water Corporation can cancel the agreement.

5.56 The Committee noted the context of that agreement, that is, it was made at a time when water source managers relied much more heavily on treatment to make drinking water safe. That reliance as been shown to be flawed since:

- The fallout from Sydney water-quality incident when “*the implications of getting it wrong became very clear. In the case of Sydney ... no-one actually died; it was just a great deal of inconvenience with six months of bore water advisories, but it did bring into focus, ..., the idea that you just cannot manage drinking water quality by putting it in a treatment plant and taking samples at the end, at the consumer’s tap.*”³²⁷
- The Australian Drinking Water Guidelines were updated in 2004.

5.57 The Department of Water said:

Considering the approval process was always conditional and noting the increased understanding about pathogens and catchment protection, it is understandable that the original approval was

³²⁴ Letter from the Department of Water, 14 May 2010, including answers to questions at a hearing on 5 May 2010, p2.

³²⁵ Mundaring Weir Catchment Area 2007 and Serpentine Dam Catchment Area 2007.

³²⁶ Clause 1, Photocopy of an Agreement between the Federation of Western Australian Bushwalkers Inc and the Water Authority of Western Australia (1 January 1994 to 31 December 1994) in Submission No 81 from the Federation of Western Australian Bushwalkers Inc, 12 November 2009, p13.

³²⁷ Mr Richard Walker, Manager, Drinking Water Quality, Water Corporation, *Transcript of Evidence*, 21 October 2009, p5.

*withdrawn over time. Given the evidence, it would have been irresponsible to have continued to allow this access, and more difficult to defend it with greater recreation access being sought by other recreators.*³²⁸

- 5.58 The Committee noted that a combination of by-laws 4.3.6 and 4.2.2.2 of the Metropolitan Water Supply, Sewerage and Drainage By-laws 1981 expressly prohibit entry within the two kilometre reservoir protection zone. However, the 1994 Agreement created a natural expectation that the Federation could “*go, as we were before, within 100 metres or 200 metres of the high water level*”.³²⁹ This is the type of unfortunate legacy issue that the Committee observed in Queensland, that once a group has been conditionally allowed into a catchment to recreate near a water body, it develops a culture of rights that makes it extremely difficult to oust that group, especially when that group sees their impact as low risk or benign. This is evidenced in the submission by the Western Australian Local Government Association which wants “*historical access to catchments for water and land based recreation maintained where it currently occurs [and the] necessary water treatment ...undertaken should these sites be used for potable supplies in the future*”.³³⁰
- 5.59 The Federation said “*We are prepared to go along with the Water Corporation on a reasonable distance. It would be nice to put your toe in the water*”³³¹ shows that it is not up to the Federation ‘to go along with the distance’. The law prescribes the distance.
- 5.60 The Committee concurs with the Department of Water that:
- allowing people inside a reservoir protection zone for one activity sets a precedent for other activities that would also claim to be low risk and cumulatively the risks would be high; and
 - excluding people from a small proportion of each source area by no means encourages a sedentary lifestyle. People can traverse the vast array of national parks, reserves and state forests.³³²

³²⁸ Letter from the Department of Water, 14 May 2010 including answers to questions at a hearing on 5 May 2010, p10.

³²⁹ Mr Melvyn Lintern, Committee Member, Federation of Western Australian Bushwalkers Inc, *Transcript of Evidence*, 24 March 2010, p4.

³³⁰ Submission No 199 from the Western Australian Local Government Association, 4 December 2009, p1.

³³¹ Mr Melvyn Lintern, Committee Member, Federation of Western Australian Bushwalkers Inc, *Transcript of Evidence*, 24 March 2010, p3.

³³² Photocopy of a letter sent to Mr David Osborne, Walk GPS, from the Department of Water dated 3 February 2006, p3 as part of Submission No 163 from Mr David Osborne, Walk GPS, 25 November 2009.

5.61 The Committee makes the following recommendations:

Recommendation 8: The Committee recommends that the 1994 Agreement between the Federation of Western Australian Bushwalkers Inc and the Water Corporation as described in paragraph 5.55 be cancelled.

Recommendation 9: The Committee recommends that all future reviews of Statewide Policy 13 should be based on the imperative of source protection and guided by the precautionary principle.

5.62 The Committee scrutinised Statewide Policy 13 noting that it fails to state the penalties under both sets of by-laws. In omitting the penalties the policy lacks the character of law. The Committee suggests that in reviewing the Policy, this be addressed to reinforce the recreational community's understanding that the policy is, reflective of the law.

Statewide Policy 13 in operation

5.63 The following practice applies when a recreational group wants to stage an event in a source area. Initially, the process is:

- all events require an assessment of the potential impacts of that event on water quality; and
- DEC and Water Corporation have developed a number of standard conditions that apply to events being held in source areas.

Hypothetical scenario

5.64 The Department of Water described the process of approval in the following hypothetical scenario of a group seeking approval to hold a special car rally event on existing roads and tracks across several Perth Hills drinking water source areas. The event has been held previously but there have been changes to the rally routes proposed. The event is to be held over two days in August, with approximately 100 participants and several thousand spectators expected. Steps taken for approval include:

- Organisers plan their preferred dates, routes and stages.
- Organisers contact other relevant agencies for comment (and support or approval).
- Organisers send a letter and maps outlining the proposed routes and rally stages to the Water Corporation and/or the Department of Water requesting permission to hold the rally in a source area. Often discussions have already been held on the proposal before this occurs.
- The Department of Water and/or the Water Corporation conduct a water quality risk assessment of the proposed routes and stages (desktop study involving officers with first-hand knowledge of the area). Contact and discussion with DEC as the other major approver and advisor is also made if this has not already occurred. Risks identified in this example include:
 - The event is proposed to occur in winter (time of the highest rainfall in the Perth region) and Stage A of the proposed rally route comes within 50-100 m of the reservoir water body. This means that any contaminants can be washed into the water body quickly. Stage B of the route is further from the reservoir.
 - Accidents can happen in race environments that lead to fuel and/or chemical spills. Should an accident occur along Stage A, it may be difficult to prevent contamination of the water source given its proximity to the reservoir.
 - A large number of competitors and officials would be entering the reservoir protection zone. This means that there would be an increased water quality contamination risk.
 - The Department of Water writes to the organisers agreeing to support Stage B of the route with conditions. These conditions reflect management recommendations made in drinking water source protection plans and are similar to conditions applied to car rally approvals in other source areas. However, support is not given for Stage A due to the proximity to the reservoir.
 - Organisers request a meeting with the DoW and/or the Water Corporation, which is agreed. The DoW will discuss Stage A and ideally identify possible alternative routes to replace it.

5.65 The above process of approval appears at first glance to be convoluted. However, the Committee is of the view that the process demonstrates the rigour by which those responsible make their decision.³³³ The Committee is of the view that this approval system continue.

³³³ In this case, the decision is made by the Water Corporation but delivered by the Department of Environment and Conservation. Mr Ronald Brimage, Director Strategic Policy, Planning and Research, Department of Sport and Recreation, *Transcript of Evidence*, 14 October 2009, p14.

CHAPTER 6

ACCESS IN OTHER JURISDICTIONS

RECREATIONAL ACCESS IN OTHER AUSTRALIAN JURISDICTIONS AND OVERSEAS

- 6.1 The Committee noted diverse views regarding the level of access to drinking water source areas in other jurisdictions and overseas from submissions and witnesses at hearings. There is considerable variation amongst the Australian States and Territories as well as within overseas jurisdictions. These variations have been used by the fisher and bushwalking groups to argue for a less restrictive approach in Western Australia.
- 6.2 The Committee wrote to all jurisdictions inviting comment on the level of recreational access to their equivalent source areas.

The Australian Capital Territory

- 6.3 The Australian Capital Territory has two main catchments supplying raw water to the Canberra region - the Googong and Cotter catchments. Cotter has limited access for recreation for fishing, bushwalking, cycling and driving on formed roads. Some activities are allowed with permits such as horse riding and camping (24 persons at any one time). Boating and swimming are not allowed.
- 6.4 The Queanbeyan River catchment which feeds Googong dam, is an occupied and degraded rural catchment. Recreational activities on Googong dam are controlled to avoid excessive turbidity and contamination problems.³³⁴ Non powered boating is allowed; bushwalking fishing and cycling is allowed on formed roads. Swimming is prohibited. The reserve is locked at night and no camping is allowed.³³⁵
- 6.5 This dam is frequently cited by the fishing lobby as how a public drinking water source can co-exist with fishing activity. However, this is incorrect. Googong is a secondary source of water for Canberra and is drawn to meet peaks in demand in summer or during dry periods. When drawn, extensive treatment is necessary to ensure a safe water supply. Water from Googong costs ten times more to produce

³³⁴ <http://www.actewagl.com.au/water/treatment/default.aspx>, (viewed on 4 May 2010).

³³⁵ Letter from Ms Katy Gallagher MLA, Minister for Health, The Australian Capital Territory, 1 December 2009, pp1-2.

than water from the other dams, as treatment includes coagulation³³⁶ by liquid alum and a polymer coagulant aid flocculation, clarification and filtration, disinfection by chlorination and pH adjustment and stabilization with lime.³³⁷

South Australia

- 6.6 The Minister for Health said that the primary source of water is the Murray River, reservoirs in the Mount Lofty ranges and some rural reservoirs. Recreational access is not seen as a competing interest as there are requirements for both. Restrictions are only applied at reservoirs and short sections of inlet streams. Shore based fishing is allowed at South Para, which does not directly supply water to a treatment plants. South Australia is not in favour of opening their reservoirs to recreation but want to maintain the current balance.³³⁸
- 6.7 The South Australian Water Corporation gave a different viewpoint to the Minister for Health. Similar to Queensland, the Corporation does not own or manage the catchments as most are private agricultural, industrial or residential land. The Corporation's hands are tied, it has only "*non Bidding input into local council development plans*".³³⁹ It is unable to drive or substantially influence existing land use and management. The Corporation invests money in "*education and incentives as it has no alternative and no direct responsibility for managing the catchments*".³⁴⁰
- 6.8 Like Queensland, the Corporation has a high level of investment in end treatment processes and barriers because of their open catchments. The Corporation said:

There is a saying that states: "If you filter water through enough money you will get good water quality", however, it is still considered

³³⁶ To cause particles that are slow to settle or are non-settling to settle out more readily, a soluble chemical or mixture of chemicals is added to the water. Such a chemical is called a coagulant and the process is called coagulation. The coagulant reacts with the particles in the water, forming larger particles called flocs, which settle rapidly. Flocs can also be effectively removed by passing the water through a filter. The process is controlled so that the coagulant chemicals are removed along with the contaminants. Coagulation/flocculation processes generally use aluminium sulphate (alum) or ferric chloride as the coagulant. A combination of coagulation/flocculation/sedimentation and filtration is the most widely applied water treatment technology around the world, used routinely for water treatment since the early part of the 20th century. Coagulation/flocculation processes are very effective at removing fine suspended particles that attract and hold bacteria and viruses to their surface. Research has shown that these processes alone are capable of removing up to 99.9% of the bacteria and 99% of the viruses from water supplies.

Website http://www.wqra.com.au/crc_archive/consumers/Consumersp9.htm (viewed on 22 June 2010).

³³⁷ Department of Health, Water Unit, *Drinking Water Catchment Protection*, October 2009, pp3-4.

³³⁸ Letter from Hon John Hill MP, Minister for Health, South Australia, 18 December 2009, pp1-2.

³³⁹ Letter from Mr John Howard, Head of Water, Quality and Environment, SA Water Corporation included in the Water Corporation Submission No 112, 13 November 2009.

³⁴⁰ Ibid.

*amongst water quality experts in SA Water that money spent on catchment management is more effective than money spent on treatment. If a problem can be prevented then it is better than trying to cure it once it has occurred.*³⁴¹

- 6.9 The Corporation owns and manages buffer zones which restrict public access to dam walls. Some approved activities are allowed such as scientific research, surveys, trapping and monitoring, educational, cultural such as indigenous events at sacred sites, seed collection and revegetation, emergency training events and the use of two national and regional trails.

Queensland

- 6.10 The Water Corporation said:

*There are no water supply catchments in Queensland that are dedicated to drinking water purposes. As a result, most of the rivers and water bodies in Queensland are heavily degraded and polluted. In order to deal with the consequences of that pollution, all the water supply in Queensland is treated to a very high level—extensively treated at great cost. In that context, the local government people in Queensland have chosen to allow some levels of recreation on their water bodies, but only in the context that the water is already very heavily contaminated and polluted and requires extensive treatment before public supply. Queensland is the extreme, and is by no means the model that the rest of Australia or indeed the rest of the world would want to follow.*³⁴²

- 6.11 The Committee visited south east Queensland at the suggestion of Mr Ron Alexander, Director General, Department of Sport and Recreation, meeting with representatives from its Department for Communities (the equivalent of Western Australia's Department of Sport and Recreation) and Seqwater, the main water provider. Mr Alexander touted Queensland as the best example of how recreation in drinking water sources can co-exist with the production of high quality drinking water.
- 6.12 The Committee learned that Seqwater owns only 2% of land and that relatively few water storages have been developed solely for drinking water supply. Dams were constructed "*principally to supply agriculture and mining requirements with*

³⁴¹ Letter from Mr John Howard, Head of Water, Quality and Environment, SA Water Corporation included in the Water Corporation Submission No 112, 13 November 2009.

³⁴² Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p7.

drinking water supply a minor component of overall water use".³⁴³ Governing legislation requires the water service providers to develop drinking water quality management plans but the provider does not generally have the power to manage those catchments' risks at source as they are neither owned nor controlled by the provider. The risks are "*managed at the treatment plants or through voluntary processes negotiated with catchment owners or managers.*"³⁴⁴

- 6.13 Seqwater has significant legacy issues and this historical context explains its drinking water source practice. Originally catchments were working farmlands and in a number of cases "*existing neighbours to our storages are the original landowners from which the farmlands were resumed*" to create Wivenhoe, Hinze, North Pine and Baroon dams".³⁴⁵ These dams were constructed over a ten year period - 1970 to 1980 and represent 90% of the regional catchment based water supply. The original landholders retained existing access rights as a condition of resumption and at the time recreational demand (and hence pressure) was low. Thirty years on and in dealing with open recreational access, not only is this contrary to the Australian Drinking Water Guidelines, there is little or no acknowledgement of the true costs in managing recreational access in water supply storages and catchments. Seqwater said:

Recent work ... has identified that raw water quality has significant influence on the price of water treatment. Existing science literature confirms that recreational impacts have capacity to degrade catchments, reduce water storage quality and increase monitoring and treatment requirements.

*This effect has been observed at between the Lake Wivenhoe and Lake Somerset systems where water quality exceedences are more prevalent in Lake Somerset which is exposed to greater recreational use pressure than Lake Wivenhoe.*³⁴⁶

- 6.14 An example of the exceedences referred to above was discussed at paragraph 4.50 regarding high levels of *E.coli* at Somerset dam where motorised boats are allowed compared with the adjacent Wivenhoe dam where ski boats are not allowed.

³⁴³ Letter from Ms Tess Bishop, Health Specialist Advisor, on behalf of the Queensland Minister for Health, Hon Paul Lucas MP, 14 January 2010, p1.

³⁴⁴ Ibid, p2.

³⁴⁵ Letter from Mr Peter Borrows, Chief Executive Officer, Seqwater for Life, 29 October 2009, pp1-3 as an Attachment to the Submission from the Water Corporation, Submission No 112, 13 November 2009.

³⁴⁶ Ibid, p3.

The Northern Territory

- 6.15 The Power and Water Corporation said its primary drinking water supply is the Darwin River Dam Catchment which provides 90% of the Darwin region. The Darwin River Catchment has been closed since operations began in 1972 and relies on the ecosystem services to provide high quality raw water. Public access is prohibited at all times. As a result of a closed catchment, Darwin River dam is recognised as having high biodiversity conservation value protected through management plans.³⁴⁷
- 6.16 Manton dam which supplied drinking water to Darwin between 1942 and 1973 is now a recreational dam for swimming boating, skiing and adjacent land based activities. However, the Power and Water Corporation has plans to return it to service as part of a staged source augmentation to meet demand growth in the Darwin region. The Corporation admits that “*water treatment if required is likely to add significant costs to the provision of water from this catchment.*”³⁴⁸

Victoria

- 6.17 Melbourne is one of five cities in the world with closed catchments, it has a long history of restricting access to its water supply catchments and reservoirs. In Melbourne’s early years and in order to avoid outbreaks of cholera or other infectious diseases that periodically devastated European cities, it was decided in 1857 that a supply of pure water would be piped to each residence, with the public rather than the private sector providing the service. Unfortunately, like Western Australia, typhoid was found in the supply after it emerged that one of the creeks running into the Yan Yean reservoir carried human waste.
- 6.18 Similar to Western Australia, much of Melbourne’s water supply requires only disinfection and is sourced from areas covered in native vegetation which have no development. Historically, its long detention time reservoir system allowed it to operate a public surface with no treatment, not even chlorination until 1976.³⁴⁹ Access to its 160,000 hectares of uninhabited, forested catchments north-east of Melbourne, is either completely prohibited or restricted. Melbourne Water employs a full time security team to monitor wildfires and people can be fined. Recently many of the catchments were converted to national parks.

³⁴⁷ Letter from Mr Paul Heaton, General Manager, PowerWater, Northern Territory, 3 November 2009, pp1-2 as an Attachment to the Submission from the Water Corporation, Submission No 112, 13 November 2009.

³⁴⁸ Ibid, p2.

³⁴⁹ Steve E. Hrudey and Elizabeth J. Hrudey, “*Safe Drinking Water, Lessons from Recent Outbreaks in Affluent Nations*, 2004, IWA Publishing, London, p188.

- 6.19 Of nine reservoirs in service, one has limited non-contact recreational access - sailing and restricted shoreline fishing. Melbourne Water commented that a multi use catchment feeds the reservoir and thus the water is fully treated. Reservoirs with catchment access have a 200 metre wide exclusion zone. All other reservoirs are closed.
- 6.20 Only 20% of Victoria's water requires full treatment. Water from Sugarloaf Reservoir receives full treatment, as it is fed by water from the Yarra River, Maroondah Aqueduct, and the Sugarloaf Pipeline. The water is fully treated as it leaves the reservoir at the Winneke Water Treatment Plant. Water from Yan Yean Reservoir is also fully treated as it has noticeable colour, high iron concentration and turbidity due to the nature of the soils and vegetation in the area and the shallowness of the reservoir. The Yan Yean Water Treatment Plant was completed in 1994 to overcome these water quality problems.
- 6.21 Melbourne Water stopped using untreated water from the Tarago Reservoir in 1994 when it became unsuitable for drinking. However the reservoir was reconnected to Melbourne's water supply network with the commissioning of the Tarago Treatment Plant in July 2009. Water from Tarago Reservoir receives full treatment.³⁵⁰
- 6.22 Melbourne water catchments come under National Parks legislation, which has a 'personal infringements notice' system (on the spot fine) for minor infringements of \$234.00 which rises annually. More serious cases go to court. Melbourne Water's own land is covered by a by-law system and intrusions generally go to court.³⁵¹

New South Wales

- 6.23 The Sydney Catchment Authority prevents access to their 'Special Areas 1'. Some fishing and boating is permitted on emergency sources and all sources have downstream filtration treatment. Following the Sydney water crisis in 1998, a three kilometre exclusion zone was implemented around Warragamba dam.
- 6.24 The Hunter Catchments Authority told the Committee that a catchment was opened to allow controlled sailing for the disabled in the 1980s and that policy is under review. Water science is now suggesting restricting access but the Catchment Authority is having difficulty with the sailors because of the historical usage and the difficulty of changing something that has been in place for a lengthy period of time.

³⁵⁰ http://www.melbournewater.com.au/content/water_storages/water_treatment/water_treatment.asp, (viewed on 5 May 2010).

³⁵¹ E mail correspondence from Mr Russell Gray, Work Coordinator, Melbourne Water, 12 May 2010.

It is particularly difficult to politically change access when it involves the disability lobby.³⁵²

Tasmania

- 6.25 Water-based recreational activities are popular in Tasmania during summer and most recreational water areas are pristine. However, while Tasmania has extensive coastline and many inland water bodies, most recreational areas are not easily accessible for recreational purposes. This results in people attending accessible coastal beaches, freshwater rivers and lakes, especially those close to urban areas with good road access.
- 6.26 Local Tasmanian Councils, the Department of Primary Industries, Parks, Water and Environment and the Department of Health and Human Services all have responsibilities for the management of recreational water and the protection of human health where the public use such waters. However, it is recognised that it is not practical for all possible recreational waters in a jurisdiction to be regularly monitored. Therefore where a particular area, such as a beach, lake or river is used regularly by a large number of people for primary contact purposes, it is monitored in accordance with the relevant National Health and Medical Research Council Recreational Water Quality Guidelines.³⁵³ For example, blue green algae was detected at Lake Trevallyn. Warning signs were erected at various locations by West Tamar Council. These signs were in place from April to May 2009 advising the public that full body contact was not recommended.

Overseas

- 6.27 Research reveals a divergence of approach to recreation in reservoirs and catchments. For example, Canada does not have the controlled access Western Australia enjoys.³⁵⁴ Vancouver and Victoria dams have tight controls but Vancouver with its vast amount of fresh water more so than Victoria. Areas in the United States, such as Seattle, Boston and New York city are putting more energy into protecting their reservoirs and controlling access, not less.³⁵⁵
- 6.28 The Committee has extracted a useful summary prepared by the Department of Health of what occurs in some overseas countries.³⁵⁶

³⁵² Mr R. Blackburn, telephone response on behalf of the Hunter Catchment Authority, 14 December 2009.

³⁵³ Department of Health and Human Services Tasmania, Director of Public Health, Recreational Water Report, 2008 - 2009, p15.

³⁵⁴ Professor Steve Hrudey, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009, p6.

³⁵⁵ Ibid.

³⁵⁶ Department of Health, Water Unit, *Drinking Water Catchment Protection*, October 2009, pp4-5.

The United Kingdom

- 6.29 Twenty-seven water supply authorities provide drinking water. Where groundwater is available as a primary source, it is generally of good quality and requires very little additional treatment other than chlorination. However, surface waters (dams and reservoirs) require comprehensive treatment to remove chemical and microbiological contaminants resulting from agricultural and human activities as most catchments have been compromised. As the water supplies in many catchments are subject to contamination events, water supply authorities rely on sophisticated treatment technologies to provide safe drinking water. However, the drinking water provided to the public does not always achieve 100% compliance even with basic microbiological criteria.³⁵⁷

United States of America

- 6.30 There are approximately 170,000 public water supplies, of which about 80,000 (47%) come from surface water reserves. Control of recreational activities on surface catchments has historically been dependent upon local regulators and water providers. Between 1986 and 1992, the United States Centres for Disease Control and Prevention reported 102 disease outbreaks affecting 34,155 people in 35 States, attributed directly or indirectly to bacteria, viruses or parasites from drinking water.
- 6.31 In 1993 one of the largest water-borne disease outbreaks in history occurred in Milwaukee, Wisconsin, which draws its drinking water from Lake Michigan. *Cryptosporidium* in the supply affected over 400,000 people and caused approximately 100 deaths. This led in 1999 to the introduction of an Interim Enhanced Surface Water Treatment Rule. The effect of this Rule has been to force large water providers to reassess dam usage and catchment integrity. As a consequence, individual States and Territories are currently reviewing and developing legislation to limit recreational activities on surface catchments and storages.

Canada

- 6.32 In 2000, a water-borne outbreak of *E. coli* at Walkerton, Ontario, affected over 2,000 people and killed seven. The bacteria came from a contaminated groundwater source in this case, but the Royal Commission set up to inquire into the outbreak recommended a radical shake up of the water industry making “*extensive use of the*

³⁵⁷ Department of Health, Water Unit, *Drinking Water Catchment Protection*, October 2009, pp4-5 refers to material extracted from a UK Drinking Water Inspectorate report that in 1999, 32 (2.21%) of the 1,447 treatment works in England and Wales had contraventions of the standard in respect of faecal coliforms and 165 (11.40%) in respect of coliforms. In 2001 a total of 169 samples taken from 133 treatment works (9.60% of all works) were found to contain total coliforms, compared with 247 samples from 182 treatment works (13.11%) in 2000. In 2001, faecal coliforms were detected in 30 samples taken from 28 treatment works (2.02% of all works), compared to 43 samples from 41 treatment works (2.95%) in 2000.

early drafts of the Australian Drinking Water Guidelines".³⁵⁸ It stressed in particular the need for a multiple barrier approach to drinking water quality, including the restriction of human activities (such as recreation) on or near drinking water reserves and storages.

Conclusion

- 6.33 The Committee noted a continuum of source protection practice across all Australian and overseas jurisdictions, from Victoria's closed access to Queensland's open access. Of all the Australian jurisdictions, Queensland's water source protection practices are the least effective. However, it is clear that Queensland is required to factor significant historical, multiple land uses (such as agriculture, cleared land and industry) in their catchments as part of its provider service. The Committee concurs with the Water Corporation that there is a:

*misrepresentation by some people that Western Australia is unique in terms of restricting access to our drinking water catchments. In fact ... the reality is that in Western Australia we take very much a middle-ground approach.*³⁵⁹

- 6.34 The Committee's visit to south-east Queensland revealed that Western Australia is fortunate not to have the legacy challenges facing Seqwater. However, Statewide Policy 13 through its conditional approval system, has to some degree created a legacy challenge. Legacy themes proliferate many recreational groups, for example, Mr Richard Gill, Executive Director, Motorcycling Western Australia said:

*I have been organising events in the forest in the south west for 30 years. I do not know how many, but it would be hundreds or perhaps a thousand events that I have organised over that time. Many of them are in the Harvey Weir [never a source area], and the Stirling Dam catchment [proclaimed as a source area in 2001], which is now a metropolitan water supply. ...It is not only us, but also horse riders, rogainers and anybody else who has access to the forest quite comfortably without any negative outcomes on water quality. We have been doing that since the 1970s. There are thousands of kilometres of trail in the hills around Stirling and Harvey Dams.*³⁶⁰

³⁵⁸ Professor Steve Hrudey, Environmental and Analytical Toxicology, University of Alberta, Canada, *Transcript of Evidence*, 26 November 2009, p2.

³⁵⁹ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p6.

³⁶⁰ Mr Richard Gill, Executive Director, Motorcycling Western Australia, *Transcript of Evidence*, 31 March 2010, p2.

6.35 The Committee makes the following finding:

Finding 12: The Committee finds that a comparative analysis of recreational access in other Australian and overseas drinking water sources is unhelpful in determining an appropriate level of access for Western Australia. Diverse drinking water source protection practices are explained by historical multiple land use and significant public health events.

CHAPTER 7

COMMUNITY VIEWS ON THE VALUE OF WATER AND RECREATION IN SOURCE AREAS

7.1 One method of assessing community views is to conduct surveys. The Committee did not conduct its own survey of community views on the value of water and recreation in source areas. However, of the 193 submissions the Committee received, the vast majority demanded additional recreational opportunity in the catchments as well as safe drinking water. This presented a conundrum because, prima facie, these positions cannot be reconciled. The recreational community argued that both recreation and potable water are reconcilable through full water treatment, risk management or both. It is clear that recreation benefits those minority groups who agitate for access versus the whole of community who expect potable water. The fisher community advocate full treatment citing Queensland and the Australian Capital Territory as best practice.

7.2 Of the Department of Water community surveys some:

... were undertaken to find out what people thought of the values and so on and so forth, associated with recreation and drinking water. Overwhelmingly, the general public was saying the first principle should be primacy for drinking water over recreation, by a majority of about 70 to 80 per cent, through that process. The feedback that we have had from the general public is either not very much at all or, when we went out to survey, people were very concerned that the first principle be primacy for drinking water.

We have had presentations from bushwalking associations over the years. We have had discussions with CALM over the years. CALM has its own policy 18, and there are a lot of parallels with our policy and theirs, because they have got concerns about pig hunting, firewood collection, four-wheel driving and those sorts of things, so there are a lot of parallels there. They have also got the proviso that they would like to enhance recreation as part of their brief.

Generally, we have not had a lot of complaints. We have had the process of Logue Brook, where there were a lot of issues from recreators when that was mooted to be closed to recreation. But, with regards to our general consultation over our source protection

*planning over the past years, we have not had a lot of feedback or concern.*³⁶¹

7.3 The Water Corporation confirmed the same support for source protection.

*we have seen community attitudes in public surveys do indicate that there is overwhelming community support to maintain the current levels of protection. But there are always interest groups who would seek quite rightly to pursue their interests, and they see that a change of government and perhaps the overturning of the decision of Logue Brook has been perhaps the sentiment that there may be a change of attitude within government that they may benefit from.*³⁶²

Recreational groups and individuals

7.4 As discussed in Chapters 2 and 3, community submissions revealed an increased demand for access to source areas for health and well being. Four submissions from individuals had the view that recreational groups should not be in source areas. These views included the following comments:

- *In deriving a social benefit for themselves, they are small, unthinking and selfish. A limited number of people would benefit ... while the whole community would suffer costs to their social, economic and environmental well being.*³⁶³
- *We need to maintain the highest standards even if it upsets a minority; that water is a scare resource and why have this issue from a few people who wish recreation.*³⁶⁴
- *Water is our most precious resource which needs full protection. Recreation activities should only be in dams or water sources used for irrigation.*³⁶⁵
- *Having potable water from the dams both in the Perth Hills and the south west is very important. In many other countries you often can't drink the water from the tap, but here we can with confidence.*³⁶⁶

³⁶¹ Mr Nigel Mantle, Manager, Water Source Protection Branch, Department of Water, *Transcript of Evidence*, 21 October 2009, pp6-7.

³⁶² Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p4.

³⁶³ For example, Submission No 71 from Mr Barry Sanders, 10 November 2009, p3.

³⁶⁴ Submission No 158 from Mr Simon Bell, 24 November 2009, p1.

³⁶⁵ Submission No 159 from Mr Tony Fioraso, 24 November 2009, p1.

- *Policy 13 should be enhanced.*³⁶⁷
- *Fishing is prohibited in metro dams and anglers have been trying to gain fishing access for many years”. It is a “lost cause public health is paramount. In any event, the drinking water dams represent sterile fish habitat.*³⁶⁸

7.5 The Forests Products Commission expressed apprehension at increased catchment access citing numerous examples of how catchment integrity is compromised by:

- fire, especially wildfires; and dumping of rubbish;
- uncontrolled interaction between motorbike riders and harvesting and hauling equipment;
- vandalism estimated at \$1,000 per week;
- machinery being shot at in addition to attempted arson;
- dirt bikes and highly modified 4WDs in winter selectively targeting challenging sites such as steep terrain, firebreaks and low lying areas subject to inundation (they then become eroded and inaccessible to fire fighting equipment); and
- damaged gates and signage costing annually \$30,000 at the Brunswick Plantation.³⁶⁹

The Logue Brook Community Survey

7.6 The Committee was provided with the survey results of the Logue Brook dam proposal.³⁷⁰ Of this survey the Department of Sport and Recreation said:

The Logue Brook Dam workshop that was convened by the Department of Water brought together a range of stakeholders. Whilst it has been besmirched by many in the water bureaucracy now, that process brought together a range of stakeholders, including locals, who were given a range of pre-reading which consisted of a

³⁶⁶ Submission No 190 from Ms Peta Townsing, 3 December 2009, p1.

³⁶⁷ Submission No 175 from Hon Alison Xamon MLC, Spokesperson, Greens (WA), 4 December 2009, p4.

³⁶⁸ Submission No 60 from Dr Noel Morrissy, 10 November 2009, enclosing an article titled *Insight into Fishing, Finding a solution for WA’s frustrated freshwater fishers*, Western Fisheries, Spring 1997, p47.

³⁶⁹ Submission No 192 from the Forest Products Commission, 14 December 2009, pp2-3.

³⁷⁰ Attachment to Submission No 180 from the Department of Water, 4 December 2009.

*considerable amount of information and which was workshopped over a full day. By the end of that day, the view of the population strengthened in terms of making a transition towards improved access to water catchments for recreational purposes. They were the most informed people in the State at the time.*³⁷¹

7.7 The first process of the survey involved a random sample of 7,000 surveys sent to residents in Perth, Bunbury and the region between. These recipients were randomly chosen from the Western Australian Electoral Roll and 1017 useable surveys were returned. Statistically the first process revealed the following.

- 83% felt that drinking water should be protected by preventing possible contamination rather than relying on treating water that was used for other purposes as well.
- 70% felt that safety and protection of drinking water sources should take priority over all other issues and possible uses of dams and the water. It was found that this was *the* critical factor in predicting reactions to the Logue Brook proposal and to management practices generally.
- 67% preferred to keep the current policy of separating drinking water and recreation.
- 69% would at least quite strongly support the proposal to change the status of the dam.³⁷²

7.8 The second process was a 'Dialogue' meeting held in Harvey on 22 July 2006. It included a second survey conducted as a 'deliberative survey' where participants were asked to complete the same survey at the beginning and end of the Dialogue Forum. The comparative views were as follows.

- 64% felt that we should rely on treatment technologies to make drinking water safe, allowing development and recreation in drinking water dams and their catchments.
- 22% felt that safety and protection of drinking water sources should take priority over all other issues and possible uses of dams and the water.

³⁷¹ Mr Ronald Brimage, Director Strategic Policy, Planning and Research, Department of Sport and Recreation, *Transcript of Evidence*, 14 October 2009, p14.

³⁷² David Bruce, South West of Western Australia, Water Catchment Management Issues, Drinking Water Policy and Logue Brook Dam, Harvey Dialogue Forum, Deliberative Survey Results, October 2006, p1 <http://www.water.wa.gov.au/PublicationStore/first/82294.pdf> (viewed on 12 May 2010).

- 75% preferred the current policy of separating drinking water and recreation to be reviewed.
- 13% would at least quite strongly support the proposal to change the status of the dam.³⁷³

7.9 These statistics showed that while there was strong support from community survey respondents for both the Logue Brook dam proposal and the current policy of separating drinking water and recreation from the community survey respondents, there was little support from those people who participated in the Dialogue Forum. This may be attributed to the perspectives of the 200 participants, one third of which responded to advertisements about the Dialogue and had a particular nexus to the water body under threat.

7.10 The Bruce Report said that “*directly comparing the views of the two groups is not appropriate due to the different sampling and participation processes. However, it is clear that the views of participants at the Dialogue Forum were not typical of the general population. Those who chose to attend the deliberation Forum clearly favoured the retention of Logue Brook for recreation purposes, and those views did not change throughout the course of the day*”.³⁷⁴ Relevantly, what was common to both groups was the importance of water and dams.

7.11 The Committee is of the view that this survey shows more evidence of community support for drinking water source protection in the general community than in a local community which expects to be specifically affected by a change to a particular water source used historically for recreation.

Water Quality Research Australia, Project 1023-09 Milestone 5: Survey Report, Public Perception of Source Protection and its Relationship to Recreation and Water Treatment, April 2010

7.12 The Water Quality Research Australia contracted a community survey to *Syme and Nancarrow Water* to investigate public perceptions of source protection and its relationship to recreation and water treatment.³⁷⁵ This is the most recent state-wide survey of community feeling and perceptions about recreation in public drinking water supply areas.

³⁷³ David Bruce, South West of Western Australia, Water Catchment Management Issues, Drinking Water Policy and Logue Brook Dam, Harvey Dialogue Forum, Deliberative Survey Results, October 2006, p1 <http://www.water.wa.gov.au/PublicationStore/first/82294.pdf> viewed on 12 May 2010.

³⁷⁴ Ibid.

³⁷⁵ *Syme and Nancarrow Water* (2010) Survey Report: Public Perceptions of source protection and its relationship to recreation and water treatment, April 2010.

- 7.13 Respondents were provided with a brief description of the current policy of restricted recreational access to drinking water catchments, which included basic reasons why and the implications for treatment and additional cost if greater recreational access was allowed. When asked to rate agreement or disagreement with the current policy, 86% of the community and 57% of the professionals agreed with it, while 71% of the recreational community disagreed. A wide variety of reasons for agreement and disagreement with the policy were provided unprompted.
- 7.14 The major reasons provided by the community were “*must protect the drinking water*” and “*stop contamination of drinking water*”. The main reasons provided by the professionals for agreement were “*stop contamination of drinking water*” and “*prevention is better than the cure*”. The main reasons for professionals’ disagreement with the policy were “*some activities could be allowed*” and “*it is not policed*”. The main reasons for the recreational community’s disagreement were “*I don’t believe recreation pollutes and recreation is allowed in other parts of Australia/the world.*”
- 7.15 A fifth of the community sample nominated increased cost as a reason for agreement with the policy. This is contrary to frequent assumptions that the community will base its decisions primarily on monetary issues.³⁷⁶ However, it is the Committee’s view that government, not the community must make fiscally responsible decisions.
- 7.16 The Committee noted that 45% of the community and 39% of the professionals considered passive activities in the outer catchment, that is, beyond the two kilometre reservoir protection zone, to be either acceptable or most acceptable. Seventy-nine percent of the recreational community supported this policy option.³⁷⁷ The authors of this study said “there is no escaping the unequivocal agreement of the community (86%) with the current policy of drinking water catchment protection”.³⁷⁸ However, the study also: “*clearly establishes the need for drinking water catchment management to be considered in the context of meeting the future increase in demand for outdoor recreation in natural settings in the southwest of WA.*”³⁷⁹
- 7.17 It is the Committee’s view that regardless of the increase in demand for outdoor recreation in natural settings, the increase in cumulative risk of ever increasing and disparate recreational groups means Statewide Policy 13 should continue to be a significant tool in the risk management of source areas.

³⁷⁶ Syme and Nancarrow Water (2010) Survey Report: Public Perception of source protection and its relationship to recreation and water treatment, April 2010, p4.

³⁷⁷ Ibid, p5.

³⁷⁸ Ibid, p49.

³⁷⁹ Ibid, p49.

CHAPTER 8

COST OF ALTERNATIVE WATER MANAGEMENT

COSTS AND TREATMENTS FOR WATER CATCHMENTS CONTAINING RECREATION

- 8.1 The Water Corporation explained that by using “*well-protected natural catchments in the Darling Range, it has been able to produce high-quality, safe drinking water for over a century without major public health incidents*”.³⁸⁰ This has been achieved with:

*... minimal levels of treatment, which obviously leads to low cost and affordability as well as low levels of energy, chemicals and other consumables, which leads to a very sustainable water supply system. It also means that the relatively low cost of our surface water systems has enabled us to have a balanced water supply that includes things such as desalination, which is not cheap. But by having relatively low-cost sources, we can offset the high-cost sources such as desalination and still maintain overall an affordable water supply that is safe and reliable.*³⁸¹

- 8.2 The Committee found that the recreational fishing community has the view that water should be ‘engineered out’, that is, fully treated in any event so the public can fully recreate. Mr Ian Stagles, Chair, West Australian Fish Foundation said:

*It seems such a sad waste of a resource to see a hole in the ground with water in. It also seems fairly outdated to suggest that world-best practice to stop people conducting harmless recreation in a water supply dam is world’s best practice, given the levels of water purification that are available as options these days; if we can treat sewage and make it drinkable, I am sure we can treat water out of a potable dam that somebody has got fish in and can catch fish and enjoy themselves and relax.*³⁸²

³⁸⁰ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, pp3-4.

³⁸¹ Ibid.

³⁸² Mr Ian Stagles, Chair, West Australian Fish Foundation, *Transcript of Evidence*, 24 March 2010, p9.

- 8.3 Other fishing group submissions expressed the view that if you fully treat the water then you can enjoy all sorts of recreational activity³⁸³ and cited source areas as community assets to which community rights attach.
- 8.4 The Committee found there to be a lot of guesswork in arriving at what it would cost to fully treat water for open recreational access. For example, the Department of Sport and Recreation estimated about:

*\$10 million to put the infrastructure in and then it would cost a couple of hundred thousand dollars a year to service the infrastructure. When a big park or a place like Champion Lakes is opened up to a new rowing club, for example, there is a big cost of doing that. It costs about \$1 million a year to run that.*³⁸⁴

- 8.5 Mr Barry Sanders, private citizen, said:

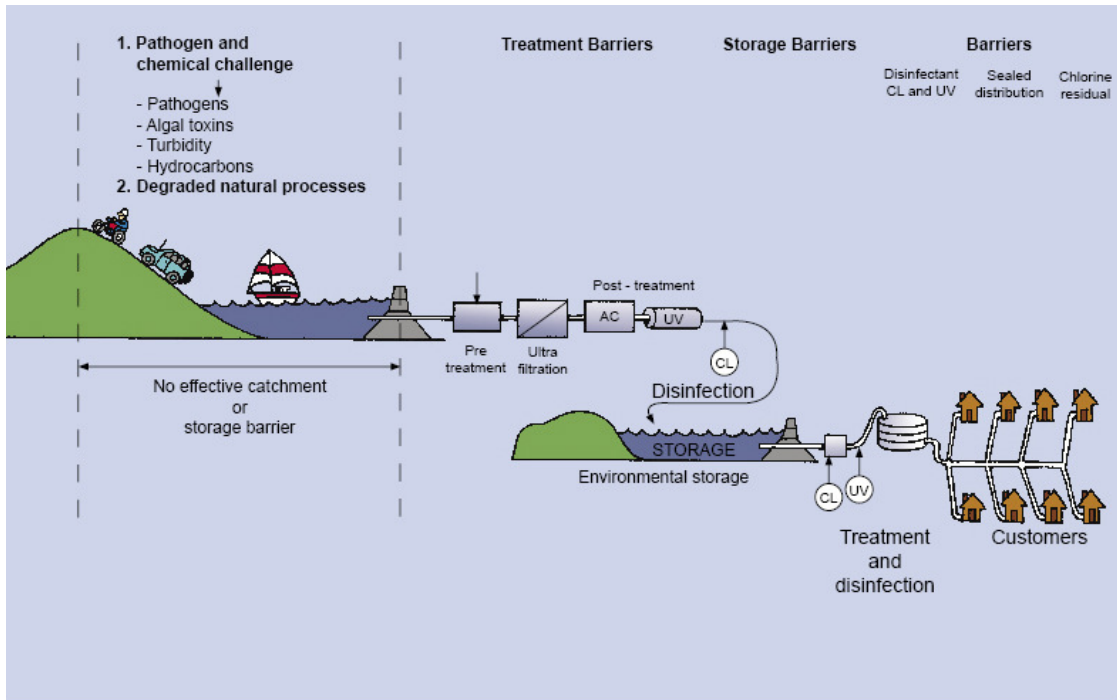
*... the capital cost of conventional treatment could be about \$250 million per dam site and if access to both catchment and dam was allowed, membrane treatment could be required by health authorities at a capital cost of up to \$400 million per site. It can be seen that \$2-3 billion of capital could be required for the Perth dams alone plus the large increase in operation costs.*³⁸⁵

- 8.6 Costing a water treatment plant if access was allowed in a source area was a difficult task and the Committee was unable to undertake an independent analysis. Diagram 4 below provided by the Water Corporation shows a possible configuration of what would be required, that is, water treatment, environmental storage barrier and post-treatment.

³⁸³ Such as Submission No 6 from Mr Waldemar Mackowiak, former Secretary, WATFAA, 27 October 2009.

³⁸⁴ Mr Ron Alexander, Director General, Department of Sport and Recreation, *Transcript of Evidence*, 14 October 2009, p3.

³⁸⁵ Submission No 71 from Mr Barry Sanders, 10 November 2009, p7.

Diagram 4

- 8.7 By way of example, the Water Corporation advised that plans are advanced to install a treatment plant at Mundaring to deal with the impacts of water contamination from primarily the lower Helena catchment, not to increase recreational access.³⁸⁶ Degradation there, including blue-green algae and algal toxins³⁸⁷ is attributable to activities in the main Mundaring catchment, mainly human and small agricultural holdings. The Water Corporation estimates that if it:

... were to allow recreation on other reservoirs and treatment plants of a similar scale—which they would be, we would be looking at something in the order of \$200 million, \$250 million to \$300 million per scheme, plus some loss of usable water and the need to invest heavily in piping to make use of that changed circumstance.

- 8.8 The Department of Health advised that treatment plants “*will be more and more intense and certainly more expensive to run because reverse osmosis and ultraviolet light are very energy intensive.*”³⁸⁸

³⁸⁶ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, pp7-8.

³⁸⁷ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 5 May 2010, p3.

³⁸⁸ Mr James Dodds, Director, Environmental Health Directorate, Public Health Division, Department of Health, *Transcript of Evidence*, 14 October 2009, p5.

- 8.9 The Committee visited Harding dam in the Pilbara, a source area dam closed to recreation and not subject to community pressure for access. It supplies the West Pilbara Water Supply System. The Committee was told that the dam cost \$30 million to construct in 1984 and the treatment plant \$40 million in 2004. Following the visit, the Committee requested the Water Corporation consider a hypothetical, dual use of the dam and provide costings for the:
- type of additional water treatment processes that would be required so as to enable recreation to occur on the drinking water source;
 - installation of those particular water treatment processes; and
 - operational costs of those further water treatments.
- 8.10 The Water Corporation said that current treatment at Harding dam was acid dosing, dosing with a coagulant, flocculation, ultra filtration, caustic dosing, chlorination and fluoridation. Current operational cost is \$2.69 million per year. If recreation was allowed, dissolved air flotation, biological activated carbon and ultra violet disinfection would be required. The capital cost of these would be \$49.75 million and an extra operating cost of \$3 million per year.³⁸⁹ Another necessary “*natural treatment step before supply to customers*” is an environmental storage barrier which is capital intensive requiring pipeline, pump stations, tanks and aquifer recharge pipework. This was costed at \$333 million.³⁹⁰
- 8.11 Following this hypothetical scenario, the Committee asked the Water Corporation to undertake the same costing exercise with respect to Logue Brook dam; and the metropolitan reservoirs at North Dandalup, Conjurunup, Lower South Dandalup and South Dandalup dams. The information is in Table 3 below and shows that the cost of fully treating source areas for dual use would require enormous infrastructure and annual operational funding.

³⁸⁹ Letter from the Water Corporation, 4 December 2009, pp1-2.

³⁹⁰ Letter from the Water Corporation, 22 February 2010, p2.

Table 3 - Summary information on the treatment and costs for existing drinking water supply and estimated costs with recreation

Reservoir (supply volume)	Existing water treatment facilities	Existing Operational costs for water treatment	Estimated total capital cost to install extended water treatment processes for drinking water and recreational use	Operational costs of those further water treatment processes
Harding Dam (10 GL/year)	Acid dosing Coagulant dosing Flocculation Ultra filtration pH Dosing Chlorine disinfection	\$2.7 million/year	\$333 million	\$9.5 million/year
Logue Brook Dam (5 GL/year)	None (non-drinking water source)		\$151 million (transfer to Stirling Dam) \$188 million (transfer to Samson Dam)	\$5.1 million/year \$5.5 million/year
North Dandalup Dam	Chlorine disinfection	\$0.34 million	\$335 million	\$21.1 million/year
Conjurunup Dam	pumpback			
Lower South Dandalup Dam	pumpback			
South Dandalup Dam (total 57 GL/year)				

8.12 Not factored into this costing Table is that:

- The capital costs are based on a planning 'desk-study'. The Water Corporation said "*experience shows that specific site considerations may increase final project costs by up to 50%*"³⁹¹ compared to those quoted in Table 3.

³⁹¹

Letter from Ms Sue Murphy, Chief Executive Officer, Water Corporation, 22 February 2010, p2.

- The estimates do not factor in the costs associated with the Water Corporation evolving into a recreational risk manager as has occurred in Queensland.
- As with many water treatment processes, *“there would also be a loss of yield from sources with recreation of the order of 10%. Considerable pumping would also be required resulting in additional energy use and greenhouse emissions.”*³⁹²

8.13 It is clear that increased access will result in significant capital and operational expenditure for the Water Corporation. This will flow through to the government when it receives less of a dividend and ultimately the community. The Water Corporation becoming a recreational risk manager rather than a water provider must also be factored. This is because *“a utility that permits recreational activities in an area of responsibility would have some responsibility to ensure that the area was safe.”*³⁹³ The Committee has been unable to quantify the capital and operational costs of the Water Corporation becoming a recreational risk manager.

8.14 The Committee finds that increased cost is a certainty but the question remains - is the cost disproportionate to the benefit? In the Committee’s view, preserving surface water sources is vital in keeping the cost of water affordable. Arguably there are greater calls on the public purse than the capital and operational cost required to fully treat existing surface water sources that would be compromised by increased recreational access to source areas.

8.15 The Committee makes the following finding:

Finding 13: The Committee finds that it is possible to treat public drinking water to reduce potential health risks arising from access to the source areas to that water for recreational use. The Committee further finds that such treatments entail significant cost and cannot guarantee a safe drinking water supply.

³⁹² Water Corporation, Pre-Submission Information Sheet tabled at a hearing on 21 October 2009, p9.

³⁹³ The Cooperative Research Centre for Water Quality and Treatment, Research Report No 24, p19.

CHAPTER 9

ALTERNATIVE RECREATION SITES

SIZE OF THE RECREATIONAL COMMUNITY

- 9.1 Sizing the recreational community in source areas is important because the number of people in a catchment has an impact on loading, but loading is very difficult to assess. The Water Corporation said:

*The loading from things like soil compaction, rubbish dispersal, erosion shows that the number of people you put through a particular hiking trail, motorbiking, mountain biking, does obviously increase the loading on that catchment. ... It will have an effect on those natural processes. Even worse, sometimes they can actually degrade the whole system, so you can end up with increased run-off with high turbidity and high nutrients. Unfortunately, with the natural systems, there is that cut-off point between what is just not enough to cause an impact and what suddenly does cause an impact, and it is a very, very narrow threshold.*³⁹⁴

- 9.2 Water Corporation and Department of Environment and Conservation warnings provide some evidence of size in addition to the membership lists of the various recreational groups. Some guidance is provided by the number of trail bikes sold which gives an estimate of people riding but not at any one point in time. The same could be said for bicycle sales; motor cycle sales and issued fishing licences. However, none of these will precisely quantify how many people are out in the catchments.

WHAT IS CURRENTLY AVAILABLE TO THE RECREATIONAL COMMUNITY?

- 9.3 A persistent refrain from the recreational community is that there is “*little elsewhere to go*”³⁹⁵ but the Committee found that this is not the case. The Water Corporation said:

There are extensive recreational opportunities available within the Darling Range, particularly the seven irrigation dams that the Water Corporation currently operate. They are available for recreation to the south east of Perth. The Avon River, Swan River and Canning

³⁹⁴ Dr Andrew Bath, Manager, Water Quality Operations, Water Corporation, *Transcript Of Evidence*, 21 October 2009, pp9-10.

³⁹⁵ Submission No 79 from the Perth Bushwalkers Club Inc, 12 November 2009, p2.

*River estuaries all exist for recreation and not for public water supply. The Murray River, Peel-Harvey, Leschenault Inlet, Wellington reservoir on the Collie River, are all extensive recreational activities.*³⁹⁶

9.4 The Water Corporation identified the following recreational alternatives:

- the Avon, Murray, Swan, Collie, and Peel-Harvey Rivers;
- the Swan, Leschenault, Harvey and Peel Inlet Estuaries;
- Cockburn Sound, a near shore and coastal area;
- the Wellington, Glen Mervyn, Harvey, Logue Brook, Drakes Brook and Waroona Irrigation reservoirs; and
- de-proclaimed drinking water sources which revert to recreational use such as Bickley dam.³⁹⁷

9.5 The Department of Water said:

*Our view is that there are recreational opportunities with existing dams that have perhaps not been fully developed, so if you are looking at the pressures on recreation, there are further opportunities with Logue Brook and Harvey Dam, in particular, that we think are clear opportunities for further recreational development.*³⁹⁸

...

*Recreational opportunities in the hills and south-west area have been mapped and published, and provided free of charge to tourism centres. They are in high demand. There are well developed picnic areas downstream of many dams have been established. (ie outside the RPZ).*³⁹⁹

...

³⁹⁶ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p4.

³⁹⁷ Tabled document at a hearing with the Water Corporation, 5 May 2010, p1.

³⁹⁸ Mr John Ruprecht, Director, Water Resource Management, Department of Water, *Transcript of Evidence*, 21 October 2009, p4.

³⁹⁹ Letter from the Department of Water, 10 November 2009, Attachment 1, p4.

*Greater access to the land downstream of [source areas] (as occurs already for parts of the Munda Biddi Cycle Trail) should be considered for recreation activities, including new tracks and trails.*⁴⁰⁰

...

*It is expected that in the mid to mid to long term, both DOW and DEC may need to sacrifice some sites or catchments in order to meet public demand for increased recreational opportunities. This has already been considered as an option by the Water Corporation and the Department of Water in relation to the Bickley and Harvey dam catchments.*⁴⁰¹

- 9.6 Dr Noel Morrisy suggested “private fishing lakes or dams may meet anglers’ demands for better sport ... especially dams with fertilised cow pastures around them which provide fast growing stocks of trout and very worthwhile angling.”⁴⁰²
- 9.7 Mr Barry Sanders, private citizen, referred to:

*... almost unlimited forest areas outside Perth water catchments that are available to the public. These include the Avon Valley, Walyunga, John Forest, Kalamunda, Lesmurdie Falls and Lane Poole National Parks; boating activities on Waroona , Logue Brook and Harvey and it is likely that many of the people requesting water catchment access actually live closer top the huge estuary system made up of Mandurah, Harvey and Leschenault estuaries. Only a further 20 minutes west lies hundreds of kilometres of superb ocean beaches stretching from Perth to Busselton. Recently an artificial water sports area has been built in the Kelmscott area (Champion Lakes) and another could be constructed if necessary using recycled effluent as the water source. This has happened overseas and is about to happen in Sydney’s’ Nepean river.*⁴⁰³

⁴⁰⁰ Letter from the Department of Water, 14 May 2010, p4.

⁴⁰¹ Mr Nigel Mantle, Manager, Water Source Protection Branch, Department of Water, *Transcript of Evidence*, 5 May 2010, pp2-3.

⁴⁰² Submission No 60 from Dr Noel Morrisy, 10 November 2009, enclosing an article titled *Insight into Fishing, Finding a solution for WA’s frustrated freshwater fishers*, Western Fisheries, Spring 1997, p48. Dr Morrisy said at pp47-48, “the growth of fish such as trout in these dams is low. With large annual drawdown of water, these dams have very bare eroded margins. This together with the fact the Water Corporation is dedicated to maintaining low salinity, unpolluted (no nutrients) drinking water to Perth means the dams represent sterile fish habitat.”

⁴⁰³ Submission No 71 from Mr Barry Sanders, 10 November 2009, p8.

9.8 Towards the close of this Inquiry the Department of Water said:

*It is noted that all stakeholders have acknowledged that recreation access expectations will grow with an expanding population. ... Logue Brook, Glen Mervyn, Harvey, Drakesbrook, Waroona and Bickley dams (and their catchments) could be considered for new and/or enhanced recreation. Wellington dam and its catchment (subject to a Government decision) could also be available for greater recreation access.*⁴⁰⁴

...

*It is expected that the DoW and DEC may need to 'release' some areas in order to meet public demand for increased recreational opportunities while maintaining the current high level protection of water quality (and public health) in [source areas]. This has already been considered as an option by the Water Corporation and DoW in relation to the Bickley and Harvey dam catchments.*⁴⁰⁵

9.9 The Committee reinforces that if source areas are released through de-proclamation as is contemplated by a collaborative partnership comprising the Departments of Water, Environment and Conservation, Sport and Recreation, Health; and the Water Corporation with respect to ten identified source areas (see paragraph 2.17), then this will meet some of the demand for further outdoor recreational purposes.

⁴⁰⁴ Letter from the Department of Water, 14 May 2010, p2.

⁴⁰⁵ Ibid, pp1-2.

CHAPTER 10

OTHER MATTERS

KUNUNURRA

- 10.1 As parts of its investigation into drinking water sources in other parts of Western Australia, the Committee visited Kununurra and considered the dual use of the water in Lake Kununurra for irrigation, recreation and drinking water supply; as well as the release of land within the water reserve for tourism development.
- 10.2 The Kununurra water reserve was proclaimed in 1970 under the *Country Areas Water Supply Act (1947)* to protect water quality in the aquifer. In 2003, the gazetted reserve boundaries were modified and reduced. An interim drinking water source protection plan which is still in force, supported the reduction.⁴⁰⁶
- 10.3 The Committee noted that the drinking water for the town is supplied from three naturally filtered bores and that the only treatment required is chlorination. The borefield lies within a Priority 1 protection (P1) boundary which is close to the township.
- 10.4 In 2006, eight exploration drilling holes and four groundwater exploration bores were constructed in the P1 area during the Kununurra Water Resource Exploration Drilling Program. Results confirmed that water from Lake Kununurra was drawn through gravel beds to the borefield that supplied the town's drinking water, across the whole of the reserve.⁴⁰⁷ The Department of Water stated that based on those results it:

*cannot release any of the currently gazetted land. The current site is the most cost efficient, suitable drinking water supply available for Kununurra. Until another appropriate alternative source of water has been identified, investigated, protected and is operational, the boundary around Kununurra's current Priority 1 reserve will remain.*⁴⁰⁸

- 10.5 The Plan states:

To use Lake Kununurra as a drinking water source would require a highly sophisticated and expensive treatment plant combined with the

⁴⁰⁶ Letter from Hon John Day MLA, Minister for Planning, 23 February 2010, p2.

⁴⁰⁷ Department of Water, Kununurra Water Resource Exploration Drilling Program Results, August 2006

⁴⁰⁸ <http://www.water.wa.gov.au/Waterways+health/Drinking+water/Kununurra+drinking+water/default.aspx>. (viewed on 26 May 2010).

prohibition of all recreational activities on the lake would be necessary. It is extremely unlikely that the community would accept prohibition of all recreational activities on the Lake, but without these conditions the source would deliver a less reliably-safe drinking water to the community.

10.6 The Plan identifies the following potential contamination threats both within and abutting the P1 boundary. Within it and tolerated are the following non conforming land uses:

- a decommissioned landfill;
- tourist operators along the lake foreshore;
- boat launching facilities along the foreshore;
- the privately owned Kona Lakeside Tourist Park. This is the only park situated on the banks of Lake Kununurra and is located in a key recharge area. The park is connected to the reticulated sewerage scheme. The owners lease the foreshore reserve surrounding their property from (jointly) the Department of Water and the Shire of Wyndham-East Kimberley. Lease conditions on that land are intended to ensure that incompatible activities do not occur;
- the Victoria Highway (with escaping hydrocarbons from cars and trucks). It transects the boundary but is down gradient of the well field;
- a stormwater drain; and
- the M1 irrigation channel.

10.7 Abutting the reserve are:

- a waste water treatment plant, the ponds of which discharge treated effluent into the irrigation channel down gradient of the well field. Contaminants are therefore not drawn up by the existing production bores;
- fuel storage at the old pump house;
- boat cruise and float plane operators where the refuelling is located over water; and
- a golf course.

- 10.8 Concerns were raised by the Committee that the surface water on Lake Kununurra is not tested for quality, even though the town's bore field is recharged from the lake. The Department of Water informed the Committee that there are several test bores around the main bores, but the Committee contended that the results of water quality from the lake, would enable the Department of Water to undertake preventative measures to ensure the safety of the town's water supply earlier than the current safety bores.
- 10.9 The Committee heard anecdotal evidence that other tourism operators want to conduct incompatible activities within the P1 boundary and on the surrounding lake. Evidence included that:
- it took 12 years to make a decision on the establishment of a restaurant on the river front, due to disagreement between state and local departments;
 - the Water Corporation objected to a pontoon being erected near the P1 area to assist in the operation of a tourist water plane;
 - house boats are not allowed on Lake Kununurra, because of concerns about the proper disposal of sullage;
 - tourist cruises are currently operating illegally from the lake foreshore in the P1 boundary, and
 - decisions about tourist attractions such as a Fish Ladder are not made.
- 10.10 During its visit, the Committee became aware of a mindset within government departments in Kununurra that it is easier to refuse to allow activities to occur, rather than approve them with conditions to properly manage the activities. The water surrounding Kununurra is the town's greatest asset with revenue generated from tourism fundamental to the district's development. Arguably, more consideration should be given to intensive management of the water body and allow greater development in and around it.
- 10.11 The Committee was informed that a new housing development to the south of the town was built with dual water pipes. Water from one of these was to be drawn directly from Lake Kununurra and used for garden irrigation. However, developers were unable to obtain the necessary approval to connect the infrastructure to the lake, due to concerns about health and safety if residents (especially children) drank from the tap water. As a result, the additional laid pipework is not being used. The Committee is aware that dual water pipes are used in other areas of the State, such as Coral Bay and Denham (Shark Bay). The Committee found this to be an odd decision

as there is no logical reason why the development could not be connected to the lake for property irrigation.

10.12 The Committee is of the view that the decision prohibiting the pipes connected to the lake being used for residential irrigation should be reconsidered and that future developments in Kununurra are connected with a dual water supply.

10.13 The Committee met with representatives from the Water Corporation, the Department of Water, local tourist operators, the Yawoorroong Miriuwung Gajerrong Yirgebe Noong Dawang Aboriginal (MG) Corporation and the Shire Council, yet experienced difficulty in identifying a lead agency responsible for decision making in the P1 boundary.⁴⁰⁹

10.14 The Committee is concerned that such ambivalence is not replicated in the management of the ten source areas which have been identified for potential de-proclamation from the hills to the south-west. Given the collaborative partnership now formed with the Departments of Water, Environment and Conservation, Sport and Recreation, Health; and the Water Corporation to develop an agreement on recreation planning in source areas, the Committee is of the view that this model could be applied to other source areas in the State. A similar collaborative partnership group in Kununurra, could consider moving the town bore field to a more suitable site to enable the development of the existing P1 area as a tourist precinct.

10.15 The Committee makes the following finding:

Finding 14: The Committee finds an absence of a lead agency that should be responsible for decision making in the Priority 1 area of the Kununurra Water Reserve.

10.16 The Committee makes the following recommendation:

Recommendation 10: The Committee recommends that a lead agency be nominated to be responsible for decision making in the Priority 1 area of the Kununurra Water Reserve.

⁴⁰⁹ The Committee was told that a collaborative management group, the *Ord River Waterway Management Group* was established to jointly manage the Ord River. The group was a collaboration of various government departments, the local council and indigenous groups. However, the group was disbanded.

Recommendation 11: The Committee recommends that the Government give consideration to relocating the Kununurra bore field to another site to enable the development of the existing Priority 1 area of the Kununurra Water Reserve as a tourist precinct.

CHAPTER 11

CONCLUSIONS

- 11.1 The Committee recognises that recreation has positive social, physical and mental health benefits for individuals as well as economic value to the State. However, the Committee concluded that the use of public drinking water source areas for both recreation and drinking water is untenable. The community can recreate outside public drinking water source areas given the abundance of natural environments. As a result of a drying climate, there is a shortage of surface drinking water source environments and this will continue into the future.
- 11.2 Policy agreement between the collaborative partners will likely result in some catchments and water reserves from the Perth Hills down to the south-west of the State being de-proclaimed, thereby increasing recreational access.
- 11.3 Western Australians have enjoyed safe drinking water for over a century but the Committee observed a loss of collective memory regarding the health events such as the outbreaks of typhoid between 1895 to 1900, that prompted our preventive approach to drinking water source protection. As the Water Corporation stated: “*We have now gone three or four generations since the public water supplies were set up in Western Australia, ... we take for granted the high-quality drinking water that we currently experience.*”⁴¹⁰
- 11.4 The Committee is persuaded by the evidence that it is the very presence of humans in the environment that poses the most risk to water quality and therefore risk to ‘whole of community’ human health. Source protection is a first line defence given that microbial pathogens cause human illness via drinking water. Where scientific evidence has neither demonstrated nor is conclusive about the impacts of a particular type of recreational activity on source water, a precautionary approach to source protection is essential.
- 11.5 The Committee concluded that Statewide Policy 13 is an essential tool for protecting our source areas. Water Corporation monitoring demonstrates that the existing land use activities allowed under Statewide Policy 13 do not compromise metropolitan water quality. The Policy’s tables, which list the compatibility of land and water based recreational activities, should not be disturbed. This approach makes drinking water safe, simple to treat and less expensive.

⁴¹⁰ Mr Keith Cadee, General Manager, Water Technologies Division, Water Corporation, *Transcript of Evidence*, 21 October 2009, p3.

- 11.6 Contrary to opinion expressed in the majority of submissions, Statewide Policy 13 does not lock people out of source areas, it restricts incompatible activities and provides for passive, land-based recreation as well as a small number of events subject to rigorous assessment and conditional approval. Previous application of Statewide Policy 13 has raised an expectation that approvals based on past custom and practice will be granted. In order to protect source areas, any future conditional approval applications should be limited.
- 11.7 The Committee concluded that the penalties for breaching the By-laws protecting our source areas should be substantially increased to deter potential offenders.

A handwritten signature in blue ink, appearing to read 'Max Trenorden', is written over a horizontal line.

Hon Max Trenorden MLC
Chairman
23 September 2010

APPENDIX 1
LIST OF SUBMISSIONS RECEIVED

APPENDIX 1

LIST OF SUBMISSIONS RECEIVED

No.	Submission	Date
1.	Mr John Lang, Western Australia Family Bushwalking Club	19/10/09
2.	Mr Mark Chester, Chief Executive Officer, Shire of Dardanup	26/10/09
3.	Mr Mike Wood, Bibbulmun Track Foundation	26/10/09
4.	Cr Troy Pickard, Mayor, City of Joondalup	26/10/09
5.	Mr Steve Cleaver, Director Community Services, Shire of Waroona	26/10/09
6.	Mr Waldemar Mackowiak, Private Citizen	27/10/09
7.	Mr B Seale, Chief Executive Officer, Shire of Menzies	29/10/09
8.	Mr Ian Stagles, Chair, Western Australian Fish Foundation	30/10/09
9.	Mr Gregg Harwood, Director of Community Regulatory Services, Shire of Denmark	02/11/09
10.	Mr David Humphrey, Private Citizen (member of the WA Trout & Freshwater Angling Association)	02/11/09
11.	Ms Kay Humphrey, Private Citizen (member of the WA Trout & Freshwater Angling Association)	02/11/09
12.	Mr Brad McDonald, RBWA Design Manager	02/11/09
13.	Mr Robert Grace, Private Citizen (member of the WA Trout & Freshwater Angling Association)	02/11/09
14.	Mr Mal Pearce, President, WA Trout & Freshwater Angling Association	03/11/09
15.	Ms Kay Webber, Chairperson, Recreational Fishing Advisory Committee Western Australia	03/11/09
16.	Mr Richard Owen, Private Citizen (member of the WA Trout & Freshwater Angling Association)	03/11/09
17.	Mr Daniel Leech, Private Citizen (member of the WA Trout & Freshwater Angling Association)	03/11/09
18.	Mr Michael Leech, Private Citizen (member of the WA Trout & Freshwater Angling Association)	03/11/09

No.	Submission	Date
19.	Mr Garry Robinson, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
20.	Mr Leslie Float, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
21.	Ms Jana Mackowiak, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
22.	Mr Harry Niven, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
23.	Mr Philip Boggin, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
24.	Ms Jenny Mackowiak, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
25.	Mr D McGregor, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
26.	Mr Paul Mackowiak, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
29.	Dr Irenusz Baran, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
30.	Mr R Menzies, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
31.	Mr Mark Burr, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
33.	Mr Richard Gedero, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
35.	Mr Monty Moy, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
36.	Mr Nick Davis, Private Citizen (member of the WA Trout & Freshwater Angling Association)	05/11/09
37.	Mr David Adams, Private Citizen	06/11/09
38.	Mr Ralph Gurr, Executive Officer, Outdoors WA	06/11/09
39.	JE Turner, Private Citizen (member of the WA Trout & Freshwater Angling Association)	06/11/09
40.	Mr Christopher Hill, Private Citizen (member of the WA Trout & Freshwater Angling Association)	06/11/09

No.	Submission	Date
41.	Mr Anthony Herbert, Private Citizen (member of the WA Trout & Freshwater Angling Association)	06/11/09
43.	Mr Steven Samuels, New South Wales Council of Freshwater Anglers	09/11/09
44.	Ms Sarah Newbon, Private Citizen (member of the WA Trout & Freshwater Angling Association)	09/11/09
45.	Mr Melvyn Lintern, Private Citizen	09/11/09
46.	Mr Pierre du Toit, Private Citizen (member of the WA Trout & Freshwater Angling Association)	09/11/09
47.	Mr Chris Bird, Private Citizen (member of the WA Trout & Freshwater Angling Association)	09/11/09
48.	Mr Anthony Brand, Private Citizen (member of the WA Trout & Freshwater Angling Association)	09/11/09
49.	Mr Don Reynolds, Private Citizen (member of the WA Trout & Freshwater Angling Association)	09/11/09
51.	Mr Peter Fragomeni, Private Citizen (member of the WA Trout & Freshwater Angling Association)	09/11/09
52.	Haydee Adel, Private Citizen	09/11/09
54.	<i>Illegible signature</i> , Private Citizen (member of the WA Trout & Freshwater Angling Association)	09/11/09
55.	<i>Illegible signature</i> , Private Citizen (member of the WA Trout & Freshwater Angling Association)	09/11/09
56.	Mr Shane Milligan, Private Citizen	09/11/09
57.	Mr Ross Tapper, Chairman, WA Rally Advisory Panel of CAMS and Adam Williss, Regional Manager Central West, Confederation of Australian Motor Sport	12/11/09
58.	Mr Matthew Lilly, Private Citizen	10/11/09
59.	Mr John McConigley, Private Citizen (member of the WA Trout & Freshwater Angling Association)	10/11/09
60.	Dr Noel Morrissy, Private Citizen (member of the WA Trout & Freshwater Angling Association)	10/11/09
61.	Mr Dean Unsworth, Chief Executive Officer, Shire of Murray	10/11/09
62.	Mr Terry Goodlich, Private Citizen	10/11/09

No.	Submission	Date
63.	Dr M J Williams, Private Citizen (member of the WA Trout & Freshwater Angling Association)	10/11/09
64.	P McConigley, Private Citizen (member of the WA Trout & Freshwater Angling Association)	10/11/09
65.	Mr Michael Tebby, Private Citizen (member of the WA Trout & Freshwater Angling Association)	10/11/09
66.	MW Power, Private Citizen (member of the WA Trout & Freshwater Angling Association)	10/11/09
67.	Mr Neil Bartholomaeus, Private Citizen (member of the WA Trout & Freshwater Angling Association)	10/11/09
68.	J Estermann, Private Citizen (member of the WA Trout & Freshwater Angling Association)	10/11/09
69.	Mr Tony Smith, Private Citizen (member of the WA Trout & Freshwater Angling Association)	10/11/09
70.	<i>illegible signature</i> (member of the WA Trout & Freshwater Angling Association)	10/11/09
71.	Mr Barry Sanders, Private Citizen	10/11/09
72.	Mr John Baas, Private Citizen	11/11/09
73.	Mr Ian Thomsett, President, Western Australian Rogaining Association	11/11/09
74.	Dr David Gellatly, Private Citizen	12/11/09
75.	Ms Sarah Ellis, Secretary, Bushwalkers of WA (inc)	12/11/09
76.	Mr Barry Powell, Private Citizen	12/11/09
77.	CR Oakeley, Private Citizen	12/11/09
78.	Mr John Clark, Private Citizen	12/11/09
79.	Mr Ralph Ditton, President, Perth Bushwalkers Club Inc	12/11/09
80.	Mr Carl Erbrich, President, West Australian Family Bushwalking Club Inc	12/11/09
81.	Mr Ian McDonald, President, Federation of Western Australian Bushwalkers Inc	12/11/09
82.	Mrs EA McGill, Private Citizen	12/11/09
83.	Mr Doug Buchanan, Private Citizen (member of the WA Trout & Freshwater Angling Association)	12/11/09

No.	Submission	Date
84.	Mr David Bryant, Private Citizen (member of the WA Trout & Freshwater Angling Association)	12/11/09
85.	Dr G C Mullins, Private Citizen	12/11/09
86.	Ms Sally Fielder, President, Action Outdoors Association	12/11/09
87.	Dr Brian Mubarak, Private Citizen	12/11/09
88.	Mr Paul Cleverly Private Citizen (member of the WA Trout & Freshwater Angling Association)	12/11/09
89.	Jutta Birmingham, Private Citizen	12/11/09
90.	Ms Peggy Read, Private Citizen	12/11/09
91.	Ash Nesbit, Executive Officer, Canoeing Western Australia	12/11/09
92.	Jerzy Krysztofiak, Private Citizen (member of the WA Trout & Freshwater Angling Association)	12/11/09
93.	Mr Peter Bartler, Private Citizen (member of the WA Trout & Freshwater Angling Association)	12/11/09
94.	Lukasz Cholewa, Private Citizen (member of the WA Trout & Freshwater Angling Association)	12/11/09
95.	Kryhyna Cholewa, Private Citizen (member of the WA Trout & Freshwater Angling Association)	12/11/09
96.	Andrzej Cholewa, Private Citizen (member of the WA Trout & Freshwater Angling Association)	12/11/09
97.	Mr Cameron Finnie, Private Citizen	13/11/09
98.	Mr Martin Crompton, Private Citizen	13/11/09
99.	Mr David Rutherford, Private Citizen	13/11/09
100.	Mr Alan Boynton, Private Citizen	13/11/09
101.	Ms Shirley Watson, Private Citizen	13/11/09
102.	Ms Carol Curtis, Private Citizen	13/11/09
103.	R M Kuhn, Private Citizen (member of the WA Trout & Freshwater Angling Association)	13/11/09
104.	Mr Luke Tondut, Private Citizen	13/11/09
105.	Mr Brian Stewart, Private Citizen	13/11/09

No.	Submission	Date
106.	Mr Chad Guyatt, Private Citizen	13/11/09
107.	Mr Tom Mollenkopf, Chief Executive, Australian Water Association	13/11/09
108.	Mr Neil Daws, Private Citizen	13/11/09
109.	Mr Stephen Roberts, Private Citizen	13/11/09
110.	Dr Kim Hames MLA, Deputy Premier, Minister for Indigenous Affairs	13/11/09
111.	Mr Michael Morcombe, Private Citizen	13/11/09
112.	Ms Sue Murphy, Chief Executive Officer, Water Corporation	13/11/09
113.	Mr John Toomey, President, Orienteering Association of Western Australia (Inc)	13/11/09
114.	Mr Bretton Stitfold, Private Citizen (member of the WA Trout & Freshwater Angling Association)	13/11/09
115.	S Mitchell, Private Citizen (member of the WA Trout & Freshwater Angling Association)	13/11/09
116.	G L Jackson, Private Citizen (member of the WA Trout & Freshwater Angling Association)	13/11/09
117.	Jean Hayes, Private Citizen (member of the WA Trout & Freshwater Angling Association)	13/11/09
118.	Blaire Gersbach, Private Citizen (member of the WA Trout & Freshwater Angling Association)	13/11/09
119.	Ms Marlene Dye, Secretary, Centaurs Men's Hockey Club	13/11/09
120.	Ms Jacqueline Furby, Hon Treasurer, Western Walking Club Inc.	13/11/09
121.	Ms Ann Sutton, Private Citizen	13/11/09
122.	Mr Michael Kingham, Private Citizen	13/11/09
123.	Mr Geoff Palfreyman, Private Citizen	13/11/09
124.	Mr Craig Buckingham, Project Manager, Park Engineers Pty Ltd	17/11/09
125.	Mr Bernie Masters, Principal Consultant, BK Masters and Associates	17/11/09
126.	Mr David Fishlock, Private Citizen	17/11/09
127.	Mr Scott Coghlan, Editor, Western Angler Magazine	17/11/09
128.	Mr Dean Carnaby, Private Citizen	17/11/09

No.	Submission	Date
129.	Mr Laurie Ralston, Private Citizen, (member of the Western Walking Club Inc)	17/11/09
130.	Mr Mark Guest, Private Citizen, (member of the Perth Bushwalking Club)	17/11/09
131.	Ms Carol Curtis, Private Citizen, (member of the Western Walking Club Inc)	17/11/09
132.	Ms Bernadette Holmes, Private Citizen, (member of the Western Walking Club Inc)	17/11/09
133.	Mr G White, Private Citizen, (member of the Western Walking Club Inc)	17/11/09
134.	Mr Kim Waddell-Kingham, Private Citizen, (member of the WA Trout & Freshwater Angling Association)	17/11/09
135.	Mr Henk Hanemaaijer, Private Citizen	17/11/09
136.	Mr Stephen Goodlich, Private Citizen	17/11/09
137.	Mr Andrew Campbell, Director Statutory Services, Shire of Manjimup	17/11/09
138.	Ms Linda Daniels, Executive Director, Bibbulmun Track Foundation	17/11/09
139.	Mr Tim Hartland, Manager fo Community and Economic Development, Shire of Harvey	17/11/09
140.	Mr Frank Prokop, Executive Director, WA Recreational and Sportfishing Council (Inc)	19/11/09
141.	Frauke Chambers, Private Citizen, (member of the Western Walking Club Inc)	19/11/09
142.	Ms Helen Farrington, Private Citizen, (member of the Western Walking Club Inc)	19/11/09
143.	Mr Wolfgang Schlieben, Private Citizen, (member of the Western Walking Club Inc)	19/11/09
144.	FW & AJ Bowyer, Private Citizen, (member of the Western Walking Club Inc)	19/11/09
145.	Mr Geoff Mortlock, Private Citizen, (member of the Western Walking Club Inc)	19/11/09
146.	Ms Jessica Wolff, Private Citizen, (member of the Western Walking Club Inc)	19/11/09
147.	Mr Glyn Counsel, Private Citizen, (member of the Western Walking Club Inc)	19/11/09

No.	Submission	Date
148.	Mr Ian Firth, Private Citizen, (member of the Western Walking Club Inc)	19/11/09
149.	Mr David Smith, Private Citizen, (member of the Western Walking Club Inc)	19/11/09
150.	Mr John Kerr, Private Citizen, (member of the Western Walking Club Inc)	24/11/09
151.	Ms Barbara Jones, Private Citizen, (member of the Western Walking Club Inc)	24/11/09
152.	Mr John McLaughlin, Private Citizen, (member of the Western Walking Club Inc)	24/11/09
153.	Ms Margaret Armstrong, Private Citizen, (member of the Western Walking Club Inc)	24/11/09
154.	B McLaughlin, Private Citizen, (member of the Western Walking Club Inc)	24/11/09
155.	Ms Edith Thomas, Private Citizen, (member of the Western Walking Club Inc)	24/11/09
156.	Mr John Davies, Private Citizen, (member of the Western Walking Club Inc)	24/11/09
157.	Mrs Beth Davies, Private Citizen, (member of the Western Walking Club Inc)	24/11/09
158.	Mr Simon Bell, Private Citizen	24/11/09
159.	Mr Tony Fioraso, General Manager Property Services, Burswood Entertainment Complex	24/11/09
160.	Mr Andy Woodford, Private Citizen	24/11/09
161.	Mr Hal Harvey, Private Citizen	24/11/09
163.	Mr David Osborne, Private Citizen, (walkgps.com)	25/11/09
164.	Miss Elizabeth Forbes, Private Citizen, (member of the Western Walking Club Inc)	26/11/09
165.	Mr Barry Fitzpatrick, Private Citizen, (member of the Western Walking Club Inc)	26/11/09
166.	Mr Scott Coghlan, Private Citizen	20/11/09
167.	Mr Matthew Doohan, Private Citizen	30/11/09
168.	Ms Wendy Hampton, Private Citizen	30/11/09

No.	Submission	Date
169.	Ms Veronica Brusaschi, Private Citizen, (member of the Western Walking Club Inc)	01/12/09
170.	Ms Roslyn Griffiths, Private Citizen, (member of the Western Walking Club Inc)	01/12/09
171.	Ms Catherine Phillips, Private Citizen, (member of the Western Walking Club Inc)	01/12/09
172.	Mr David Shattock, Private Citizen, (member of the Western Walking Club Inc)	01/12/09
173.	Mr Rick Gill, Executive Director, Motorcycling Western Australia	02/12/09
174.	Hildegund Wittenberg, Private Citizen, (member of the Western Walking Club Inc)	26/11/09
175.	Hon Alison Xamon MLC, Member for the East Metropolitan Region	04/12/09
176.	Ms Rebekah Manley, President, Swan Canoe Club	04/12/09
177.	Mr Steve Pretzel, President, Recreational Trailbike Riders' Association of WA Inc	04/12/09
178.	Ms Mary Gray, President, Urban Bushland Council WA Inc	04/12/09
179.	Mr Steven McKiernan, Water Policy Officer, Conservation Council of Western Australia Inc	04/12/09
180.	Mr John Ruprecht, Director Water Resource Management, Department of Water	04/12/09
181.	Department of Sport and Recreation	04/12/09
182.	Mr Richard Muirhead, Chief Executive Officer, Tourism Western Australia	07/12/09
183.	T J Mahoney, Private Citizen, (member of the Western Walking Club Inc)	07/12/09
184.	Ms Margaret Dawbarn, Private Citizen, (member of the Western Walking Club Inc)	07/12/09
185.	Ms B P Holmes, Private Citizen, (member of the Western Walking Club Inc)	07/12/09
186.	Ms Elizabeth Sharp, Private Citizen, (member of the Western Walking Club Inc)	07/12/09
187.	Terry Mahoney, President, Western Walking Club	07/12/09
188.	Mr Robert Goodlich, Private Citizen	07/12/09

No.	Submission	Date
189.	C Knight, Private Citizen, (member of the Western Walking Club Inc)	09/12/09
190.	Ms Peta Townsing, Private Citizen	03/12/09
191.	Mr Jonathan Throssell, Chief Executive Officer, Shire of Mundaring	14/12/09
192.	Mr Gavin Butcher, Executive Manager Operations, Forest Products Commission	14/12/09
193.	Ms Sue Folks, Private Citizen, (member of the Western Walking Club Inc)	09/12/09
195.	Mr Cameron Crowe, Executive Director, Leave No Trace Australia Ltd	17/12/09
196.	Dr Peter Flett, Director General, Department of Health	18/12/09
197.	Mr Kevin Young, Managing Director, Hunter Water Corporation	22/12/09
198.	Mr Keiran McNamara, Director General, Department of Environment and Conservation	07/01/10
199.	Ms Jessica Lenney, Community Policy Officer, WALGA	04/12/09
200.	Mr Ross McCamish, President, WA Endurance Riders Association	04/12/09
201.	Mr Steve Morton, Group Executive, Manufacturing, Materials and Minerals, CSIRO	20/04/10

APPENDIX 2
LIST OF STAKEHOLDERS TO WHOM THE COMMITTEE WROTE (OTHER
THAN LOCAL GOVERNMENTS)

APPENDIX 2
LIST OF STAKEHOLDERS TO WHOM THE COMMITTEE WROTE
(OTHER THAN LOCAL GOVERNMENTS)

Name	Position	Date
Hon Dr Kim Hames MLA	Minister for Health, Western Australia	17/09/09
Hon Terry Waldron MLA	Minister for Sport and Recreation, Western Australia	17/09/09
Hon Dr Graham Jacobs MLA	Minister for Water, Western Australia	17/09/09
Dr Jim Gill	Chief Executive Officer Water Corporation	30/09/09
Mr Frank Prokop	Executive Director Recfishwest	13/10/09
Dr Naomi Roseth	Leader Cooperative Research Centre for Water Quality and Treatment	13/10/09
Dr Dennis Steffensen	Chief Executive Officer Australia Water Quality Centre	13/10/09
Hon Carmel Tebbutt MP	Minister for Health, New South Wales	16/10/09
Hon Katy Gallagher	Minister for Health, Australian Capital Territory	16/10/09
Hon Daniel Andrews	Minister for Health, Victoria	16/10/09
Hon John Hill	Minister for Health, South Australia	16/10/09
Hon Kon Vatskalis	Minister for Health, Northern Territory	16/10/09
Hon Paul Lucas	Minister for Health, Queensland	16/10/09
Hon Kevin Greene	Minister for Sport and Recreation, New South Wales	16/10/09

Name	Position	Date
Hon Andrew Barr	Minister for Sport and Recreation, Australian Capital Territory	16/10/09
Hon James Merlino	Minister for Sport, Recreation and Youth Affairs, Victoria	16/10/09
Hon Michael Wright	Minister for Recreation, Sport and Racing, South Australia	16/10/09
Hon Karl Hampton	Minister for Sport and Recreation, Northern Territory	16/10/09
Hon Phil Reeves	Minister for Sport, Queensland	16/10/09
	Centre for Water Research University of Western Australia	20/10/09
Hon Dr Elizabeth Constable MLA	Minister for Tourism, Western Australia	20/10/09
Hon Donna Faragher MLC	Minister for Environment, Western Australia	20/10/09
Hon Dr Kim Hames MLA	Minister for Indigenous Affairs, Western Australia	20/10/09
Mr Kevin Young	Managing Director The Hunter Valley Water Corporation	17/11/09
Mr Michael Bullen	Chief Executive The Sydney Catchment Authority	17/11/09
Hon John Day MLA	Minister for Planning, Western Australia	23/11/09
Professor Don Bursill	Chair National Health and Medical Research Council	24/11/09

APPENDIX 3
LIST OF WITNESSES

APPENDIX 3

LIST OF WITNESSES

Witness	Date
Ms Yvette Peterson Strategic Project Manager Department of Sport and Recreation	14/10/09
Mr Graham Brimage Director Strategic Policy, Planning and Research Department of Sport and Recreation	14/10/09
Dr David Deeley Managing Director Acacia Springs (Aust) Pty Ltd	14/10/09
Mr Ron Alexander Director General Department of Sport and Recreation	14/10/09
Mr Richard Theobald Manager, Water Unit Department of Health	14/10/09
Mr Jim Dodds Director, Environmental Health Directorate, Public Health Division Department of Health	14/10/09
Mr John Ruprecht Director, Water Resource Management Division Department of Water	21/10/09
Mr Nigel Mantle Manager, Water Source Protection branch Department of Water	21/10/09
Mr Stephen Watson Program Manager, Protection Planning Department of Water	21/10/09
Mr Keith Cadee General Manager Water Technologies Division The Water Corporation	21/10/09

Witness	Date
Mr Richard Walker Manager Drinking Water Quality The Water Corporation	21/10/09
Dr Andrew Bath Water Quality Operations Manager The Water Corporation	21/10/09
Professor Steven Hrudey Environmental and Analytical Toxicology Faculty of Medicine and Dentistry University of Alberta	26/11/09
Mr Ian Stagles Chair West Australian Fish Foundation	24/03/10
Mr Kane Moyle Foundation Board Member West Australian Fish Foundation	24/03/10
Mr Frank Prokop Executive Director Recfishwest	24/03/10
Mr Andrew Matthews Chairman Recfishwest	24/03/10
Mr Ian McDonald President Federation of Western Australian Bushwalkers Inc	24/03/10
Mr Melvyn Lintern Member Federation of Western Australian Bushwalkers Inc	24/03/10
Mrs Mary Gray President Urban Bushland Council WA Inc	24/03/10
Mr Rick Gill Executive Director Motorcycling Western Australia	31/03/10

Witness	Date
Mr Steve Pretzel President Recreational Trailbike Riders' Association of WA Inc	31/03/10
Ms Yvette Peterson Strategic Project Manager Department of Sport and Recreation	21/04/10
Mr Ron Alexander Director General Department of Sport and Recreation	21/04/10
Mr Richard Louv International Speaker hosted by the Department of Sport and Recreation	21/04/10
Mr Peter Sharp Director, Parks and Visitor Services Division Department of Environment and Conservation	21/04/10
Mr Jim Sharp Deputy Director General, Parks and Conservation Department of Environment and Conservation	21/04/10
Ms Tracy Shea A/Director, Policy & Planning, Parks and Visitor Services Division Department of Environment and Conservation	21/04/10
Mr Rod Annear Acting Assistant Director Visitor Services Department of Environment and Conservation	21/04/10
Mr Leon Price District Parks and Visitor Services Coordinator Department of Environment and Conservation	21/04/10
Mr John Ruprecht Director Water Resource Management Department of Water	05/05/10
Mr Nigel Mantle Manager Water Source Protection Department of Water	05/05/10

Witness	Date
Mr Stephen Watson Program Manager Protection Planning Department of Water	05/05/10
Mr Andrew Bath Water Quality Operations Manager Water Corporation	05/05/10
Mr Keith Cadee General Manager Water Technologies Water Corporation	05/05/10