



Discussion Paper

A Framework for Alternative Urban Water Supplies: Industrial Water

December 2006



Our Water Our Future
A Victorian Government initiative





Department of Sustainability and Environment
Department of Human Services

Published by the Victorian Government
Department of Sustainability and Environment
Melbourne, December 2006

Also published on www.epa.vic.gov.au

© State of Victoria

This publication is copyright. No part may be reproduced
by any process except in accordance with the provisions of the
Copyright Act 1968

Authorised by the Victorian Government,
8 Nicholson Street, East Melbourne
ISBN 1 74152 433 4

Printed by Documents on Call – 2B Parker Street, Footscray

Disclaimer: This publication may be of assistance to you but the
State of Victoria and its employees do not guarantee that the
publication is without flaw of any kind or is wholly appropriate for your
particular purposes and therefore disclaims all liability for any error,
loss or other consequence which may arise from you relying on any
information in this publication.



Foreword

Over recent years it has become increasingly clear that our current water use is not sustainable. Our rainfall is becoming less reliable. Victorians understand that we need to change the way we use and value water so we protect our supplies for future generations.

Victorian communities have responded quickly to our water challenges and have made many water savings through smarter, more efficient water use at home and at work.

As part of our ongoing efforts to address the wider water challenges we need to enable opportunities to recycle alternative water sources. In doing so, it is important that public health and environmental risk is well managed to maintain community confidence and support for water recycling.

Currently, the key water recycling regulatory and approval mechanisms for ensuring environmental and public health protection vary depending on the source of the water and the characteristics of the recycling scheme.

Under the Victorian Government White Paper *Our Water Our Future* Actions 5.42 and 5.43, the Environment Protection Authority (EPA) and the Department of Human Services (DHS) were required to undertake a review of the public health and environmental framework supporting alternative urban water supplies.

In February 2006, I released a discussion paper on the first phase of the review, which covered rainwater, stormwater, greywater and recycled sewage.

This Discussion Paper presents results from the second phase of the review, and includes recommendations for the proposed regulatory framework supporting the reuse of Industrial Water (IW). It forms the key document to be used in the consultation process designed to gather feedback from stakeholders and interested groups on the proposed regulatory framework recommendations.

The review of the public health and environmental framework, and the preparation of this Discussion Paper, were overseen by a steering committee comprising representatives from EPA, DHS and the Department of Sustainability and Environment (DSE). In addition, a working group provided detailed input into the risk assessment and development of management controls.

The working group comprised representatives from EPA, DHS, DSE, Melbourne Water, City West Water, Qenos Pty Ltd and Fosters Australia – Abbotsford Brewery. I thank these organisations and individuals for their input.

Your feedback on the proposed regulatory framework will play an important role in finalising a regulatory framework which effectively enables access to alternative water supplies while ensuring environmental and public health protection. I encourage all Victorians to participate in this important initiative to ensure that we work together to secure our water future.

John Thwaites
Minister for Water

There has been growing interest in Victoria in reusing industrial water for industrial uses (e.g. cooling, material washing) or non-industrial uses (e.g. irrigation, toilet flushing) to reduce the demand on drinking water supplies.

As a result, there is a need to review Victoria's existing public health and environmental framework supporting industrial water reuse.

This Discussion Paper forms part of the review and proposes recommendations for a new Regulatory Framework for the reuse of industrial water.

The Discussion Paper is divided into three parts:

PART A: About the Review

PART B: About Industrial Water

PART C: The Proposed Regulatory Framework.

Individuals and organisations are encouraged to provide feedback on Part C: the Proposed Regulatory Framework.

A glossary is contained in Section 4.1.

Table of Contents

PART A: About the Review

1	The Need for a Review	1
2	Objectives of this Discussion Paper	2
3	How to Use this Document	3
4	Useful Information	4
4.1	Industrial Water Terms and Definitions	4
4.2	Management Control Definitions	5
4.3	Regulatory Framework Definition	5
4.4	Roles and Responsibilities of Agencies	6
5	The Need for Consultation	7
5.1	Getting It Right for the Future	7
5.2	Who Might the Review Affect?	7
5.3	Should I Participate in Consultation?	7
5.4	How Feedback Will Be Considered	8
6	The Review Process	9

PART B: About Industrial Water

7	About Industrial Water	10
7.1	Industries That Produce Industrial Water	10
7.2	Industrial Water Quality	10
8	Reusing Industrial Water	11
8.1	Industrial Uses	11
8.2	Non-Industrial Uses	11
9	Understanding Hazards and Risk	12
9.1	What is a Hazard?	12
9.2	What is a Hazardous Event?	12
9.3	What is Risk?	12
9.4	What is Risk Management?	12
10	Potential Industrial Water Hazards	13

PART C: The Proposed Regulatory Framework

11	Managing Industrial Water Hazards	14
11.1	Introductory Comments	14
11.2	Diagram: Recommended Industrial Water Scheme Assessment Process	15
11.3	Explanatory Text: Recommended Industrial Water Scheme Assessment Process	16
11.4	A Point to Note	17
11.5	Questions	17
12	Summary of Existing Regulatory Framework	18
12.1	Victorian Acts of Parliament	18
12.2	Regulations	20
12.3	State Policies	21
12.4	Codes, Standards and Guidelines	22
12.5	Question	22
13	Industrial Water Recommendations	23
13.1	Recommendations	23
13.2	Questions	24
14	All-of-Framework Recommendations	25
14.1	Recommendations	25
14.2	Questions	25

1

The Need for a Review

Victoria's prosperity depends on secure water supplies for our homes, farms, environment and industry.

Population growth, climate change and the need to ensure healthy river systems are all factors that demonstrate why the State needs new and better ways to secure water for the future.

The Victorian Government's White Paper, *Our Water Our Future*, is an action plan to enable smarter water use and management across the State.

Reducing the amount of water we use (saving water) is one way to protect the State's water supplies; another way is by collecting and recycling alternative water sources such as industrial water, rainwater, stormwater, greywater and sewage.

An increasing number of Victorian industries have shown interest in reusing industrial water for industrial uses (e.g. cooling, material washing) or non-industrial uses (e.g. irrigation, toilet flushing) to reduce the amount of reticulated water used.

As a result, there is now a need to review Victoria's existing public health and environmental regulatory framework supporting industrial water reuse to:

- support an appropriate regulatory framework to establish confidence and security in alternatives to reticulated drinking water;
- ensure public health and the environment are protected and community confidence in alternative water use is maintained;
- give Victorian industries access to comprehensive information and education about safe and sustainable industrial water reuse;
- create a system which is easy for Victorian industries to use, navigate and participate in; and
- make possible greater uptake of safe and sustainable industrial water reuse.

The review of the public health and environmental framework for industrial water forms a key part of actions 5.42 and 5.43 of the White Paper, *Our Water Our Future*, which requires EPA Victoria, in partnership with the Department of Human Services, to review the public health and environmental framework supporting alternative water sources.

For each alternative water source, the review considers:

- The level of regulatory oversight that is needed;
- The most efficient approaches for assessing and approving the use of individual alternative water supplies; and
- The necessary reporting and auditing requirements so that the community retains confidence in the safety of alternative water supplies.

2

Objectives of this Discussion Paper

The objectives of this Discussion Paper are:

- To inform interested Victorians about the review of the Regulatory Framework for the reuse of industrial water.
- To assist Victorians in providing feedback on the proposed Regulatory Framework by providing information in an easy-to-read format and clear instructions for participation in consultation.
- To generate feedback on the proposed Regulatory Framework contained in Part C, in order to identify recommendations which need further consideration and areas of acceptance.



3

How to Use this Document

Although at some points there is a need to use technical language, wherever possible this Discussion Paper has been written in a style that enables all stakeholders to participate in the consultation process.

Interested stakeholders are invited to:

1. **Read** this paper, focussing on the earlier sections first as they provide useful information about the context for the review and developments to date.
2. **Seek further information if required:** The *Industrial Water Technical Report* – which informed this Discussion Paper – is available to all stakeholders seeking more detailed technical information.

The report is available:

- at www.epa.vic.gov.au; or
- by phoning: **03 9821 4895**.

3. **Respond to the questions provided in Part C: The Proposed Regulatory Framework.** The following channels are available for Victorians and others to provide feedback on this Discussion Paper.

- **Workshops:** During February 2007, workshops will be held with key stakeholders to gather feedback on the Discussion Paper. Victorians interested in participating in a workshop should contact **03 9821 4895** to register their interest and to locate the workshop nearest them.
- **Written Feedback:** Victorians can also provide written feedback without attending a workshop. It is important that written feedback clearly identifies which section and/or question is being responded to. Written feedback must be submitted by Friday 16 March, 2007 via:
 - e-mail: feedback@bcg.com.au; or
 - post:
Industrial Water Discussion Paper Feedback
13/499 St Kilda Road
Melbourne VIC 3004

Should you require further assistance, please contact **03 9821 4895**.

4

Useful Information

4.1 Industrial Water Terms and Definitions

Below are some common terms used in this Discussion Paper.

Beneficial Use

A use of the environment or any element or segment of the environment which is conducive to public benefit, welfare, safety, health or aesthetic enjoyment and which requires protection from the effects of waste discharges, emissions or deposits or of the emission of noise.

Drinking Water

Water that is intended, and of a quality that is suitable, for drinking. Within the water industry, water of this quality is also referred to as *potable water*.

Dual Pipe Water Recycling Scheme

An urban water recycling scheme where recycled water is provided to householders for certain uses via a reticulation system that is separate from the drinking water supply.

Industrial Process

An activity conducted at an industrial site directly associated with producing or handling of goods, for example, cooling, operation of boilers, pulping, washdown and cleaning. Also included for the purpose of this paper are activities at commercial premises such as carwash and laundromats. Activities that are **excluded** for the purpose of this paper are agricultural, mining, forestry, fishing and other activities where reuse would lead to a discharge to the environment.

Industrial Water

Wastewater produced from processes at industrial or commercial premises. It includes all waterborne waste from these facilities except sewage.

Industry

An industry is generally any grouping of businesses that share a common method of generating profit, and includes sectors such as commercial, manufacturing, processing, petroleum, power generation, tourism, mining and agriculture.

Inherent Risk

The probability that without intervention, an adverse outcome will occur in a person, group of people, plants, animals and/or the ecology of a specified area that is exposed to a particular dose or concentration of a hazardous agent.

Prescribed Waste

A waste that is listed in Schedule 1 and any mixture containing a waste listed in Schedule 1 of the Environment Protection (Prescribed Wastes) Regulations 1998.

Prescribed Industrial Waste

An industrial waste that arises from an industrial, commercial or trade activity or from a laboratory; or that is potentially harmful to human beings or equipment and arises from a hospital; and is listed in Part B of Schedule 1 of the Environment Protection (Prescribed Wastes) Regulations 1998.

Rainwater

Water collected directly from roof run-off.

Recycled Water

Water that has been derived from sewage, greywater or stormwater systems and treated to a standard that is appropriate for its intended use.

Reclaimed Water

Water that has been derived from sewerage systems and industry processes and treated to a standard that is appropriate for its intended use.

Regulatory Framework

The term "Regulatory Framework" is used broadly in this project to include the hierarchy of potential management controls including Acts, regulations, guidelines, education etc.

Residual Risk

The probability that following the implementation of risk management controls, an adverse outcome will occur in a person, group of people, plants, animals and/or the ecology of a specified area that is exposed to a particular dose or concentration of a hazardous agent.

Reticulated Drinking Water

Drinking water supplied to a site by a water authority through a network of pipes.

Sewage

Any waste containing human excreta or domestic wastewater. Sewage within a sewerage system may also contain a percentage of industrial waste commonly known as trade waste.

Sewerage System

The sewerage system comprises the pipes and plant needed to transport and treat sewage.

Stormwater

Urban surface water runoff most commonly captured from rain events.

Trade Waste

Any waterborne waste (other than sewage) which is suitable, according to the criteria of an Authority, for discharge into the Authority's sewerage system; or any other matter which is declared by a by-law made under the Water Act to be trade waste.

Treated Effluent

Aqueous waste flowing from agriculture and industry processes, or sewage treatment plants, that has been subjected to one or more of screening, sedimentation, biological and chemical processes to improve its quality.

Wastewater

The used water of communities, industry, or agriculture, containing dissolved and suspended matter.

4.2 Management Control Definitions

Management controls are used to control the use of alternative water sources and vary depending on the level of risk posed.

Management controls need to be viewed as part of a spectrum, where interventions are proportional to the level of risk posed, with education to control low inherent risks at one end and explicit regulation to control higher inherent risks at the other end.

Education

Information made available either proactively (e.g. a brochure sent directly to stakeholders) or passively (e.g. a brochure available for collection from Government agencies or downloading from a website).

Regulation

Requirements and restrictions for the operation and management of specific activities and/or premises which are legally enforceable and carry appropriate penalties for non-compliance. The spectrum of regulation options is broad, ranging from notification of an activity and compliance with guidelines, through to assessment and approval and licensing requirements.

4.3 Regulatory Framework Definition

The term "regulatory framework" is used broadly to include the hierarchy of potential management controls including Acts, regulations, guidelines, education etc.

4.4 Roles and Responsibilities of Agencies

The key Victorian agencies with responsibilities related to industrial water schemes are:

EPA Victoria

EPA administers the *Environment Protection Act 1970* and State environment protection policies including the *State environment protection policy (Waters of Victoria)*. The Act provides the legal framework by which environmental objectives, goals and regulations are established throughout the State for industry, commerce and the general public. EPA is responsible for developing, implementing and enforcing environmental guidelines including those for the development of safe and sustainable water recycling schemes.

Department of Human Services

The Department of Human Service (DHS) administers the *Health Act 1958* and is responsible for the enhancement and protection of health and well being of all Victorians. The Public Health Group within DHS is responsible for programs including disease control, food safety and environmental health. In this role the Public Health Group regulates drinking water safety, pest control, radiation safety, cemeteries and food safety.

Department of Sustainability and Environment

The Department of Sustainability and Environment is Victoria's lead government agency responsible for promoting and managing the sustainability of the natural and built environment. DSE is responsible for the implementation of priorities outlined in *Our Water Our Future*, including water recycling and river health initiatives. The DSE oversees the administration of the *Water Act 1989*, the *Water Industry Act 1994*, the *Catchment and Land Protection Act 1994* and the *Planning and Environment Act 1987*. It also works with CMAs, water authorities and other agencies to assist in the development and implementation of regional priority programs and regional targets, and to develop a framework for monitoring and evaluating the implementation of regional strategies.

Local Government

Local councils are responsible for protecting the public health and environment within their municipal areas and are responsible for permitting septic tank installations.

Water Authorities

Water Authorities supply water and sewerage services and may have other roles such as waterway management, drainage or floodway management functions.

Catchment Management Authorities (CMAs)

Under the *Catchment and Land Protection Act 1994* (the CaLP Act), Victoria is divided into 10 regions each with its own CMA. The CMAs apply a whole of catchment approach to ensuring the protection and restoration of land and water resources, the sustainable development of natural resource based industries and the conservation of our natural and cultural heritage. CMAs also administer permits for works on waterways under the *Water Act 1989*.

Victorian WorkCover Authority

The Victorian WorkCover Authority (VWA) is the manager of Victoria's workplace safety system. WorkSafe Victoria, the VWA's occupational health and safety arm, takes the lead role in the promotion and enforcement of health and safety in Victorian workplaces.

Broadly, the responsibilities of the organisation are to:

- help avoid workplace injuries occurring; and
- enforce Victoria's occupational health and safety laws.

The VWA's statutory obligations are spelt out in the *Occupational Health and Safety Act 2004*.

Plumbing Industry Commission

The Plumbing Industry Commission enforces standards and regulatory requirements for all regulated plumbing work including plumbing for reuse.

5

The Need for Consultation

5.1 Getting It Right for the Future

The Regulatory Framework will have a life span of many years and as a result, it is important at the outset to create a *quality* framework which:

- Is well-designed and well administered;
- Avoids overlap and duplication with existing regulation;
- Ensures participation in, and where appropriate consistency with, national initiatives;
- Provides flexibility to adapt to emerging technologies and community behaviour; and
- Provides for periodic review to ensure it continues to meet the needs of Victorians in line with contemporary behaviours and best practice.

To achieve this, it is important to hear – through consultation – the views of Victorians and others who will be affected by new regulations or changes to existing regulation, to ensure the best possible Regulatory Framework is developed.

5.2 Who Might the Review Affect?

There is a range of stakeholders who might be affected by the review of the current Regulatory Framework. They can be described as:

- Those who might seek to reuse and/or supply industrial water for their own purposes;
- Designers, installers and maintainers of industrial water systems;
- Regulators and authorities responsible for overseeing the reuse of industrial water systems; and
- Environmental peak bodies and related interest groups.

All stakeholders are invited to provide feedback through consultation.

5.3 Should I Participate in Consultation?

Key stakeholders representing all of the groups mentioned above are being actively consulted; however, anybody interested in providing feedback is welcome to do so through the channels provided.



5.4 How Feedback Will Be Considered

All feedback will be incorporated into a report which identifies Regulatory Framework challenges that need further consideration as well as areas of acceptance.

The report will inform actions 5.42 and 5.43 of the White Paper, *Our Water Our Future*, as it relates to industrial water reuse.

Action 5.42 states that:

EPA Victoria, in partnership with the Department of Human Services, will review the public health and environmental framework supporting alternative urban water supplies, including recycled water, greywater, stormwater and rainwater. For each alternative water source, the review will consider:

- the level of regulatory oversight that is needed;
- the most efficient approaches for assessing and approving the use of individual alternative water supplies; and
- the necessary reporting and auditing requirements so that the community retains confidence in the safety of alternative water supplies.

Action 5.43 states that:

EPA Victoria will work in partnership with the Department of Human Services to build from the existing *Guideline for Environmental Management: Use of Reclaimed Water* (EPA, 2003) and establish a broad suite of guidance for alternative water supplies.

The guidelines will establish water quality standards and appropriate management controls to expand the use of alternative supplies, including:

- the use of recycled water in urban third pipe networks;
- the use of recycled water to provide environmental flows for waterways;
- the use of greywater in individual households;
- the use of stormwater for urban recycling;
- the use of aquifer storage and recovery in water recycling; and
- the use of industrial waste water for industrial and urban recycling.

Additional consultation and/or communication with Victorians is anticipated during implementation of actions 5.42 and 5.43.

6

The Review Process

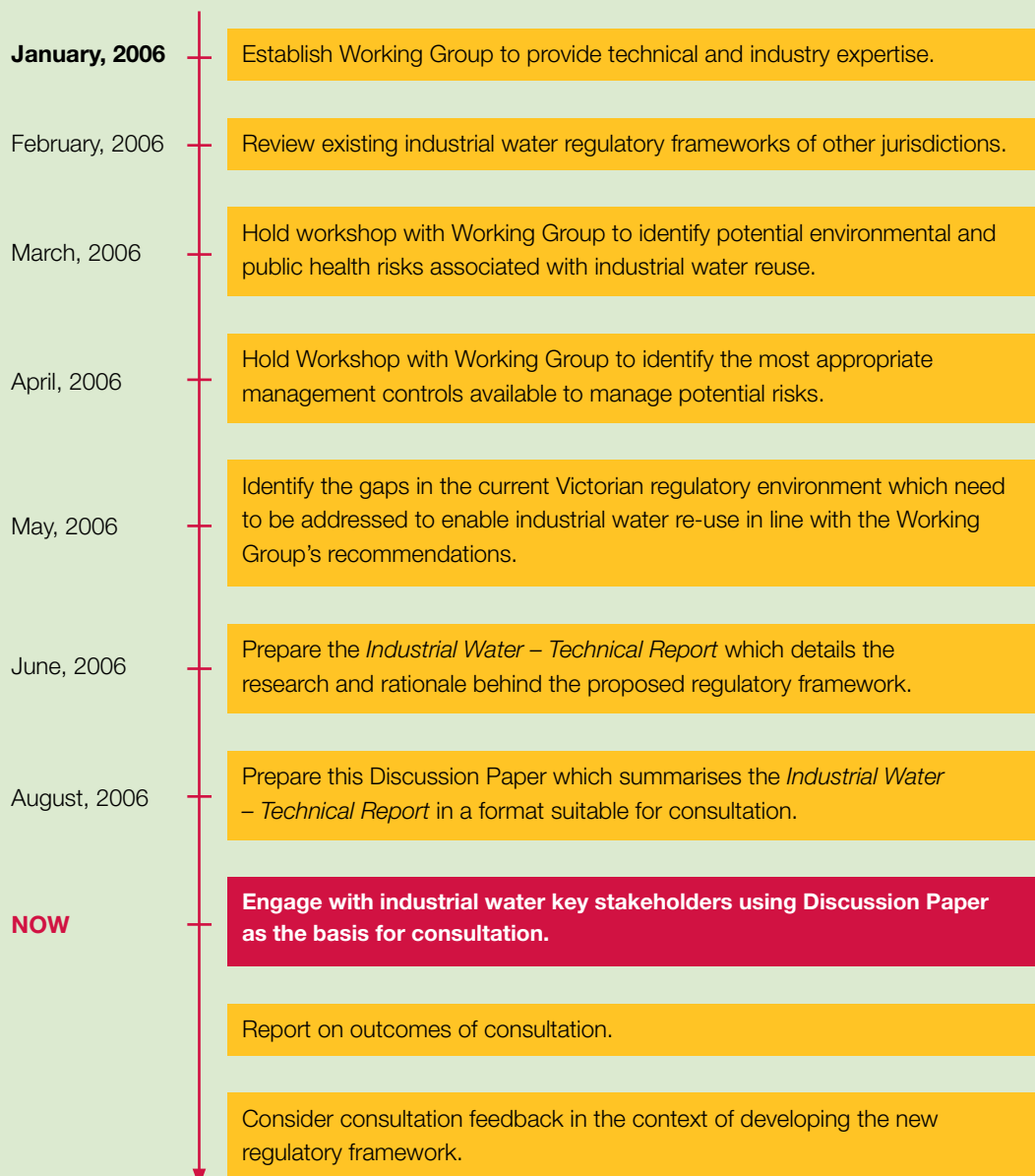
To ensure this Discussion Paper provides high quality advice and recommendations to manage the potential public health and environmental risks associated with industrial water reuse, a Working Group was created to bring together technical and industry expertise. The Working Group included representatives from the following organisations.

- Department of Sustainability and Environment
- Department of Human Services
- Environment Protection Authority

- Qenos Pty Ltd
- City West Water
- Melbourne Water
- Fosters Australia – Abbotsford Brewery (formerly Carlton United Beverages Limited).

The process of reviewing the existing regulatory framework for industrial water includes the steps outlined below.

The process of seeking feedback on this Discussion Paper is one of the steps.



7

About Industrial Water

The primary source of water for most Victorian industries is reticulated drinking water.

In some cases, reticulated drinking water is supplemented with groundwater, water from waterways, recycled industrial process water, rainwater, stormwater or treated wastewater (including greywater and treated sewage).

Once the supply water is used in an industrial process or in association with an industrial process, it becomes industrial water for the purposes of this Discussion Paper. As such, industrial water is defined as:

Water produced from processes at industrial or commercial premises. It includes all waterborne waste from these facilities except sewage.

7.1 Industries That Produce Industrial Water

Most industries will use water in some fashion, and as a result will produce industrial water as waste with potential for reuse. Some common industries that produce industrial water include the following.

- Chemical industries
- Abattoirs
- Food and beverage manufacturing
- Automotive manufacturing
- Energy production
- Oil and gas refineries
- Pulp and paper mills

7.2 Industrial Water Quality

The quality and quantity of industrial water produced can vary dramatically depending upon a range of factors:

- The industrial process that generates the water for example, raw material washing, finished goods wash water, process filtrates, centrifugations and pressings, and boiler and cooling tower blow down etc.
- The number of times the water has been reused, potentially increasing or decreasing the concentration levels of contaminants.
- The characteristics of the products and surfaces the water contacts.
- Reactions that occur during the industrial process.
- Additives such as biocides, antiscalants and pH adjusters.
- The temperature of the water.

More detail about the types of industrial water is contained in the *Industrial Water Technical Report* available at www.epa.vic.gov.au.

8

Reusing Industrial Water

There has been growing interest in Victoria in reusing industrial water for industrial uses (e.g. cooling, material washing) or non-industrial uses (e.g. irrigation, toilet flushing) to reduce the demand on drinking water supplies.

8.1 Industrial Uses

With appropriate treatment, industrial water can be reused on-site, or on a second industrial site, for many industrial processes, including the following:

- Material washing
- Process rinse water
- Crate and pallet washing
- Hardstand and vehicle washing
- Industrial fire protection
- Cooling
- Boiler or cooling tower feed water supplement

8.2 Non-Industrial Uses

With appropriate treatment and where risks can be managed to an acceptable level, industrial water can also be used on-site or off-site for non-industrial uses, such as:

- Crop irrigation (surface and subsurface)
- Landscape irrigation (surface and subsurface)
- Construction
- Dust suppression
- Fire protection
- Toilet flushing
- Heating/cooling (air-conditioning) systems
- Outdoor use (for washing cars, outdoor surfaces, outdoor recreation, and use in ornamental water features)
- Washing machine (with dedicated washing machine taps)

NB: Industrial water is not recommended for drinking, food preparation, personal washing, swimming pool/spa and laundry trough uses.



9

Understanding Hazards and Risk

Risk-management is a process used to direct efforts to mitigating risks to an acceptable level. In discussing risk management, it is important to distinguish between hazards and risks.

9.1 What is a Hazard?

A hazard is the capacity of an agent (e.g. biological, chemical, physical) to have adverse consequences to public health or the environment¹.

9.2 What is a Hazardous Event?

A hazardous event is an incident that can lead to an exposure of the hazard to humans or the environment.

9.3 What is Risk?

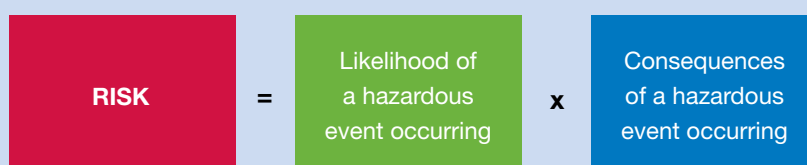
Risk is the likelihood of the hazardous event occurring and causing harm to the exposed population or environment.

9.4 What is Risk Management?

Risk management aims to reduce both the likelihood of a hazardous event occurring, and the consequences of that event.

Effective risk management involves the following.

1. Identifying potential human health and environmental hazards.
2. Identifying potential hazardous events.
3. Assessing the level of risk.
4. Reducing the risk to a level acceptable to the community.



¹ Modified from Department of Health and Ageing and enHealth Council, (2002), *Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards*.

10 Potential Industrial Water Hazards

This section outlines the common hazards present in industrial water.

Industrial water can contain a wide array of hazards due to the presence of chemical (some of which may be reactive), microbiological, physical, and radiological agents.

Without adequate protections, people or the environment can be exposed to hazards if industrial water is reused.

There are many potential hazards, including the following:

- Pathogenic organisms.
- Nutrients (nitrogen and phosphorus).
- Biodegradable organics (composed principally of proteins, carbohydrates and fats).
- Refractory organics which tend to resist conventional methods of wastewater treatment (e.g. phenols, agricultural pesticides).
- Dissolved inorganics (e.g. calcium, sodium).
- Metals (eg. arsenic, barium, cadmium, chromium, lead, mercury and silver).
- Suspended solids.
- Organic and inorganic compounds with toxicity.



11

Managing Industrial Water Hazards

11.1 Introductory Comments

In this section, a proposed framework for assessing the viability of potential industrial water reuse schemes and managing potential risks is presented for discussion.

The variability in industrial water quality, in combination with possible uses, provides a wide range of risks as discussed in Section 10. As such, each industrial water reuse project needs to be assessed on a case-by-case basis.

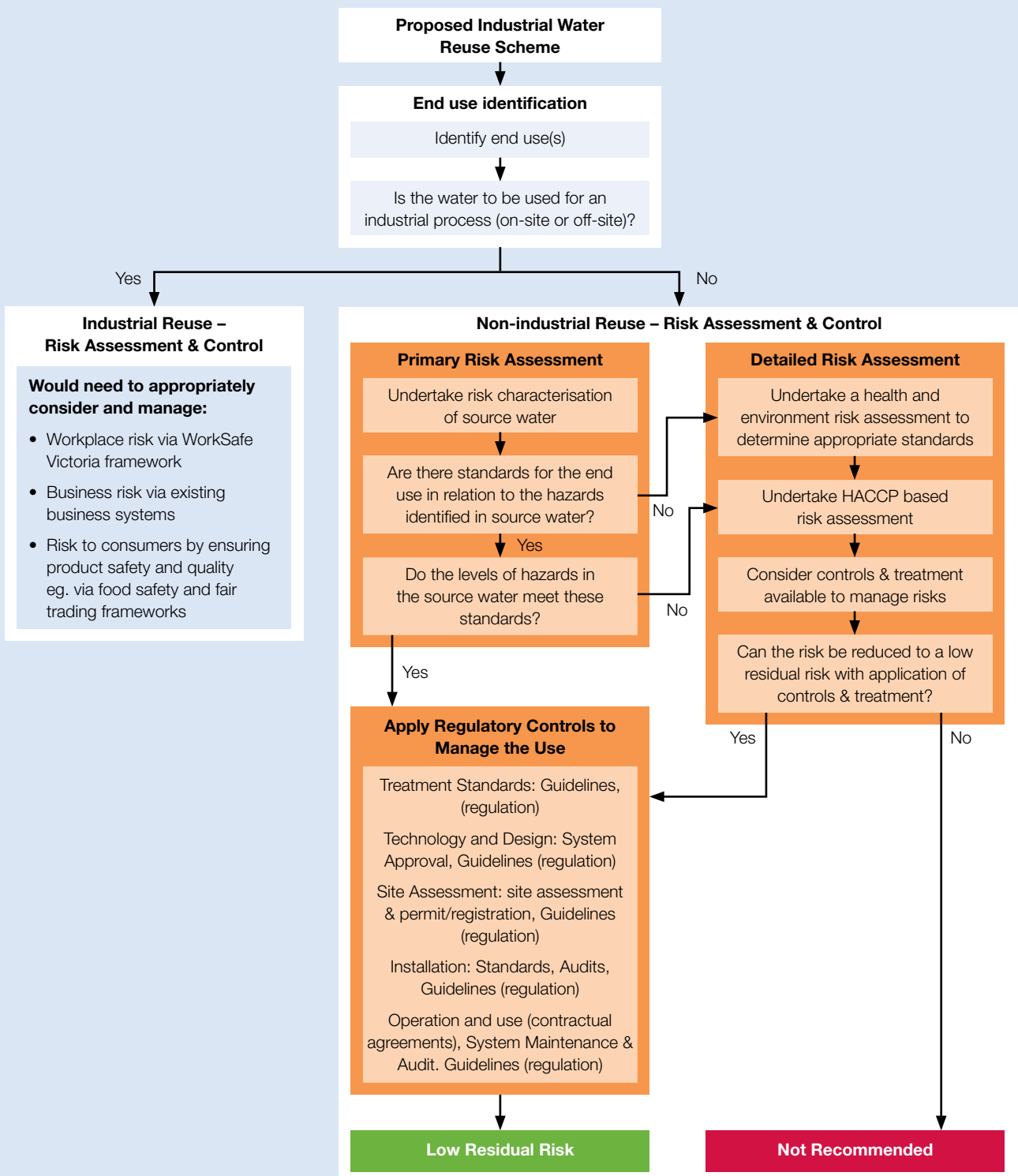
The recommended approach for assessing individual industrial water reuse schemes from a human health and environmental risk perspective and for implementing appropriate management controls is shown diagrammatically on the following page.

In summary:

- **Industrial Water for Industrial Reuse (e.g. cooling, material washing):** The proposed framework will not seek to regulate the reuse of industrial water for on-site or off-site industrial purposes (e.g. cooling, material washing). If the industrial water is transported off-site, regulatory requirements that apply to the transport of industrial waste would apply.
- **Industrial Water for Non-Industrial Reuse (e.g. irrigation, toilet flushing):** The proposed framework has two stages of Risk Assessment (Primary and Detailed) for non-industrial reuse, depending on the existence of recognized standards for hazards in the particular source water and whether the application of management controls can reduce risk to an acceptable (low) level.

11.2 Diagram: Recommended Industrial Water Scheme Assessment Process

The following diagram shows the recommended approach to manage human health and environmental risk in relation to industrial water reuse schemes.



11.3 Explanatory Text: Recommended Industrial Water Scheme Assessment Process

The recommended steps for assessing individual industrial water reuse schemes are:

11.3.1 End-use Identification Phase

End-use identification is needed to determine the nature of human health and environmental exposures.

If the end use is exclusively for an industrial process (either on the site where the industrial water is sourced or off-site at another industrial premises) the **Industrial Reuse – Risk Assessment and Control Phase** applies.

If the end use is a non-industrial use (either on the site where the industrial water is sourced or off-site) the **Non-industrial Reuse – Risk Assessment and Control Phase** applies.

11.3.2 Industrial Reuse – Risk Assessment and Control Phase

Where the end use is exclusively for an industrial process (either on the site where the industrial water was sourced or off-site at another industrial premises), the proposed framework will not seek to regulate the reuse. It is proposed that the risks involved need to be appropriately considered and managed via the controls available under the relevant frameworks as indicated:

- **Workplace Risk:** If the water is used for an industrial process, primary exposure is to employees and visitors to the workplace, and therefore, the reuse presents a workplace risk. This risk is proposed to be managed by WorkSafe Victoria's current occupational health and safety framework;
- **Business Risk:** The suitability of the water for the industrial process is a business risk and should be managed via existing business risk management systems; and
- **Risks to Consumers:** Specific regulatory frameworks control risks to consumers in relation to product safety and quality, for example, food safety is regulated by the *Food Act* 1984, and the *Fair Trading Act* 1999 provides a framework for the safety of goods that are intended to be used, or are of a kind ordinarily used for personal, household or domestic purposes.

It is important to note any inadvertent spills, leaks, etc. (including any used water) will be captured by the provisions of the *Environment Protection Act* 1970, as is the off-site transport of industrial water under the regulatory requirements for the transport of industrial waste.

11.3.3 Non-industrial Reuse – Risk Assessment and Control Phase

Non-industrial Reuse – Risk Assessment

The proposed framework for non-industrial reuse includes two stages of Risk Assessment, 'primary' and 'detailed', depending on the existence of recognized standards for hazards in the source water considered and the risks posed by the hazards identified.

The **primary risk assessment** requires a risk characterisation of the source industrial water. This involves the identification of hazards present in the source water and the risks posed by these hazards to human health and the environment when reused.

The primary risk assessment would need to establish whether applicable standards exist for the end use in relation to the industrial water hazards. These may include state, national or international standards. Where applicable end use standards exist, the proponents of the scheme would need to establish if the industrial water meets these standards.

For cases where existing standards are met, it is recommended that the reuse scheme comply with regulatory controls as specified in **Non-industrial Reuse – Control** below.

If end use standards are not present, the standards are not applicable, or the industrial water does not meet the end use standard, it is recommended that a detailed risk assessment be undertaken to determine whether risks can be reduced to a low residual level.

Where standards are not available for water use a risk assessment is needed to determine appropriate health and environmental standards. Guidance needs to be developed to provide the methodology to determine standards for industrial water reuse. However, the *National Guidelines for Water Recycling Managing Health and Environmental Risks* provides a model for such guidance.

The Hazard Analysis and Critical Control Point (HACCP) approach used in the *Guidelines for Environmental Management: Dual Pipe Water Recycling Schemes: Health and Environmental Risk Management* (EPA 2005), is recommended. HACCP is an industry-recognised preventive risk management system that identifies, evaluates and controls hazards associated with the production of safe food or water.

HACCP focuses on preventing substandard water being delivered for use, by ensuring that treatment steps, controls, monitoring and verification that are essential for achieving the required water quality objectives are in place.

Where it is determined that residual risks can be reduced to a low level, it is recommended that the scheme comply with regulatory controls described under **Non-industrial Reuse – Control below.**

Where residual risks cannot be reduced to a low level, it is recommended that the scheme does not proceed.

Non-industrial Reuse – Control

The level of regulatory rigour to manage industrial water reuse should be proportional to the risk involved. The regulatory framework recommended requires industrial water reuse scheme proponents to comply with:

- treatment standards and treatment system design;
- site assessment and permit/registration;
- installation; and
- system operation and use.

11.4 A Point to Note

It is recommended that the regulatory framework include and be supported by guidance to be incorporated in the existing EPA reclaimed water guidance series, including:

- guidance and advice on safeguards for businesses wishing to sell their industrial water to third parties.
- general guidance (but not regulatory requirements) on risk management where industrial water is used for industrial purposes.

11.5 Questions

Question 1

Does the assessment process present any potential issues or challenges?

Question 2

Do the proposed regulatory controls for industrial water present any potential issues or challenges?

Question 3

Are there any other regulatory controls which should be applied to industrial water?

12

Summary of Existing Regulatory Framework

To aid introduction of the management framework proposed in Section 11, an analysis of existing regulation and guidance was undertaken to determine where changes need to be made and where new regulation or guidance needs to be created.

A summary of the Regulatory Framework in Victoria is provided below. The Regulatory Frameworks of New South Wales, Queensland, the United Kingdom and California (in the USA) were also reviewed to determine the gaps in the existing Victorian regulatory environment and identify best-practice legislation.

The detailed Regulatory Framework review of Victoria, New South Wales, Queensland, the United Kingdom and California (in the USA), is available in the complete *Industrial Water Technical Report* upon which this Discussion Paper is based.

Individuals seeking more detailed information should refer to the *Technical Report* available at www.epa.vic.gov.au.

The existing regulatory framework for industrial water schemes in Victoria is described in the following pages.

12.1 Victorian Acts of Parliament

The main Victorian Acts of Parliament that apply to industrial water are listed below.

- *Water Act 1989*
- *Water Industry Act 1994*
- *Building Act 1993*
- *Occupational Health and Safety Act 2004*
- *Environment Protection Act 1970*

The critical aspects of these Acts of Parliament, as well as regulations and key State Environment Protection Policies that are relevant to industrial water, are described below.

12.1.1 *Water Act 1989 and Water Industry Act 1994*

The *Water Act 1989* governs Melbourne Water and water authorities outside metropolitan Melbourne.

The *Water Industry Act 1994* governs water retailers within Metropolitan Melbourne.

The *Water Industry Act 1994* requires that the two Acts “be read as one”.

Both the *Water Act* (Part 9) and the *Water Industry Act* (Division 3 of Part 3) provide for sewerage services and the regulation of “trade waste”, a term defined in the *Water Act* (but which applies in both Acts) as “any water borne waste other than sewage which is suitable...for discharge into the ...sewage system or any other matter declared by a bylaw to be trade waste.”

The *Water Act* provides for the making of bylaws by water authorities on trade waste whereas the *Water Industry Act* provides for the making of regulations in relation to trade waste.

The matters which may be dealt with pursuant to regulations or bylaws are comparable. They include:

- regulating or prohibiting the discharge of any trade waste into the sewers of a licensee/water authority;
- prescribing the terms and conditions to be included in agreements for the receipt and disposal of trade waste by a licensee/water authority, including the grounds on which a licensee/water authority may disconnect the service;
- prescribing any waste as trade waste for the purposes of this Act; and
- prescribing the information to be provided to a licensee/water authority by any person whose trade waste the licensee/water authority agrees to receive.

Water from a variety of sources can be treated by a water authority or licensee under the *Water Industry Act 1994* and supplied as Drinking Water.

In this context, the provisions of the *Safe Drinking Water Act 2004* apply. It is also possible for a “water supplier” to be another party if declared to be a “water supplier” by the Regulations. Such circumstances are beyond the scope of this review.

Industrial water which is not treated and used must be discharged or disposed of appropriately; that is, in accordance with the trade waste bylaws, any trade waste agreement and the relevant statutory provisions.

There does not appear to be any role for the involvement of a water authority/licensee in the on-site reuse of industrial water.

Additionally there does not appear to be a need for the consent of a water authority for the sale by an industrial proprietor of industrial water (whether treated, partially treated or otherwise) to a third party.

The exception is likely to occur if that water is used in a way that sees it interact with water in a waterway, groundwater or other water under the control of the relevant water authority/licensee. Similarly, if the reuse scheme requires works that interact with or affect water in a waterway, requires the drilling of a bore etc, the provisions of the *Water Act/Water Industry Act* will apply.

12.1.2 *Building Act 1993*

The *Building Act 1993* provides the head of power for the Plumbing Regulations 1998.

The Act was amended in 2004 to establish a regulatory framework to protect the public from legionnaire’s disease. The amendment required the registration of cooling tower systems, the development and implementation of risk management plans (and their audit) and made provision for compliance certificates issued for certain plumbing work. Importantly, it also provides for the regular testing of cooling tower systems against minimum standards prescribed by regulation.

In this context, any proposed reuse of industrial water in cooling towers must comply with the *Building Act 1993*.

12.1.3 *Occupational Health and Safety Act 2004*

The *Occupational and Health and Safety (OH&S) Act 2004* applies in all workplaces across Victoria. The objects of the *OH&S Act 2004* are to:

- secure the health, safety and welfare of employees and other persons at work;
- eliminate, at the source, risks to the health, safety or welfare of employees and other persons at work;
- ensure that the health and safety of members of the public is not placed at risk by the conduct of undertakings by employers and self-employed persons; and
- provide for the involvement of employees, employers, and organisations representing those persons, in the formulation and implementation of health, safety and welfare standards.

The Act requires employers to provide, as far as practicable, a working environment that is safe and without risk to health. Employers are responsible for eliminating or reducing those risks to health or safety so far as is reasonably practicable. Under the Act employers are required to be proactive, take all reasonably practicable measures to ensure health and safety at workplaces, and to exchange information and ideas about risks to health and safety and measures that can be taken to eliminate or reduce those risks.

12.1.4 *Health Act 1958*

The *Health Act 1958* is the principal Act that provides the legislative framework to protect public health. It provides for both the Department of Human Services and Local Governments to undertake activities to prevent diseases, prolong life and promote public health.

This Act does not specifically refer to industrial water reuse. However, where an industrial water scheme creates a nuisance (a condition that is dangerous to health or offensive, in that water sourced, treated or extracted is noxious or injurious to personal comfort) the Health Act requires the condition to be investigated by local government.

Where the council is satisfied of the existence of a nuisance it can issue a “Notice to Abate” the nuisance and/or take action against the person responsible for a statutory offence under the Act.

12.1.5 Environment Protection Act 1970

The *Environment Protection Act 1970 (EP Act)* provides a legislative framework for the protection of the environment in Victoria. The *EP Act* includes a range of provisions that bear on the management of industrial water. These provisions are in both the Act and the statutory policies that underpin the Act. These include state environment protection policies and waste management policies.

Under the *EP Act* discharges to the environment must be managed so that they do not adversely affect the receiving environment (for example, land, surface water or groundwater). The *EP Act* provides the basis for the licensing of sewage treatment plants (STPs). STP treatment capacity and discharge requirements have a direct relationship to trade waste controls.

Sections 39, 41 and 45 of the *EP Act* make it an offence to pollute water, air and land respectively. It is also an offence to cause an “environmental hazard” which is defined as a “state of danger to human beings or the environment, or otherwise resulting from the location, storage or handling of any substance having ... otherwise dangerous characteristics.”

12.2 Regulations

Listed below are aspects of various regulations which are relevant to industrial water.

12.2.1 Building (Legionella Risk Management) Regulations 2001

These regulations specify the matters to be included in risk management plans prepared in accordance with Part 5B of the *Building Act 1993*.

12.2.2 Building (Cooling Tower Systems Register) Regulations 2001

The Building (Cooling Tower Systems Register) Regulations 2001 prescribe information which must accompany an application to register, or to renew the registration of, a cooling tower system under the *Building Act 1993*.

12.2.3 Environment Protection (Scheduled Premises and Exemptions) Regulations 1996

The Environment Protection (Scheduled Premises and Exemptions) Regulations 1996 outline the premises and activities that are scheduled and therefore require works approval and/or licensing under the *Environment Protection Act 1970*.

The Regulations also provide for exemptions from these works approval and licensing provisions for certain, otherwise scheduled, activities and premises.

An industrial or commercial facility may, by virtue of the activity carried out by it, already satisfy the definition of “scheduled premises” and require a licence in relation to its discharge.

That licence would impose requirements on the proprietor in relation to the treatment and disposal of waste including wastewater generated on the premises.

If the discharge is to the sewer the premises would not require a licence. Similarly, where the discharge is reused in accordance with the requirements of EPA, the premises would not require a licence (as it would be exempt in accordance with regulations)

It should be noted that a licence may not cover all aspects, i.e. On-site recycling. Not all industrial premises are scheduled. As such, licensing cannot always be used as the means for facilitating industrial water reuse.

12.2.4 Environment Protection (Prescribed Waste) Regulations 1998

The Environment Protection (Prescribed Waste) Regulations 1998 establish a system of controls over the management of wastes that require careful management and close regulation because of their potential adverse affect on the environment, human health and amenity.

Prescribed waste is a waste that is listed in Schedule 1 and any mixture containing a waste listed in Schedule 1 of the Environment Protection (Prescribed Waste) Regulations 1998.

Under these regulations, prescribed industrial waste (solid and liquid) is defined as an industrial waste that arises from an industrial, commercial or trade activity or from a laboratory; or that is potentially harmful to human beings or equipment and arises from a hospital; and is listed in Part B of Schedule 1.

Therefore wastewater generated from industrial processes can be classified as a prescribed industrial waste.

Off-site Transport of Industrial Water

Prescribed waste regulations provide a regulatory mechanism to facilitate off-site reuse of industrial water.

These regulations establish detailed requirements for the transport of prescribed waste, including a tracking system and a permit system for vehicles transporting prescribed waste. The movement of industrial water that contains prescribed industrial waste off-site (other than via sewer) must comply with these requirements.

Further, the industrial waste management policy (Movement of Controlled Waste Between States and Territories) 2001, and the *National Environmental Protection Council (Victoria) Act* 1995, ensure consistency with controls in relation to the cross-border movement of controlled hazardous wastes.

Onsite Reuse of Industrial Water

The Environment Protection (Prescribed Waste) Regulations 1998 do not address the situation of on-site reuse of industrial water.

If a premises or activity is scheduled under the *Environment Protection (Scheduled Premises and Exemptions) Regulations* 1996, exemptions for reuse (from works approval and licensing) may be granted under Table B-Exemptions.

12.2.5 Plumbing Regulations 1998

For industrial facilities that generate industrial water, all plumbing must be carried out by someone with the appropriate qualifications and training. Plumbing includes, but is not limited to draining, mechanical services including cooling towers, roofing (stormwater), water supply, fire sprinkler systems and backflow prevention.

12.3 State Policies

12.3.1 State Environment Protection Policies

The *Environment Protection Act* 1970 provides for State Environment Protection Policies (SEPPs) that identify beneficial uses to be protected through the setting and attainment of environmental objectives.

The SEPP (Waters of Victoria) and its schedules provide a framework for State and local government agencies, businesses and communities to work together to protect and rehabilitate Victoria's surface water environments.

In particular, the SEPP (Waters of Victoria) imposes standards and requirements for EPA in relation to the licensing of wastewater discharges to surface waters.

12.3.2 Industrial Waste Management Policy (Prescribed Industrial Waste) 2000

The industrial waste management policy (Prescribed Industrial Waste) 2000 (IWMP) aims to:

- protect human health, amenity and the environment from hazards that may be posed by prescribed industrial waste (PIW); and
- minimise the generation of PIW, and to eliminate as soon as practical the disposal of PIW to landfill.

The IWMP is the key piece of legislation that manages industrial waste and although it mainly addresses solid waste it provides a framework or model for managing industrial water.

The IWMP:

- establishes a framework for classifying particular types of PIW and regulating their management;
- allows the EPA to establish waste reduction targets for avoidance, reuse and recycling of and/or recovery of energy from PIW;
- only allows for the discharge of liquid PIW to the sewer in accordance with a business's trade waste agreement if opportunities for reuse and recycling are not available.

The IWMP definitions of recycling and reuse of PIW appear to be limited to use as an input to the manufacturing of a product and hence do not specifically identify non-industrial uses.

12.4 Codes, Standards and Guidelines

12.4.1 Safe Handling of Industrial Waste, A Practical Guide for Workplaces 2003

The Safe Handling of Industrial Waste guide, produced by the Victorian WorkCover Authority, aims to simplify actions that employers can take to meet some of their legal requirements in providing a safe working environment. This document is applicable for the OHS management of hazardous wastes and wastewaters classified by the EPA as prescribed wastes.

12.4.2 Environmental Guidelines for Industry

The EPA has a responsibility to ensure that the environment is protected both now and for future generations. To this end, EPA has produced environmental guidelines for specific industries.

These include the following publications:

- Publication 570: Environmental guidelines for the dairy processing industry;
- Publication 607: Environmental guidelines for the fired clay building products industry;
- Publication 621: Environmental guidelines for the textile dyeing and finishing industry;
- Publication 628: Environmental guidelines for the concrete batching industry;

- Publication 480: Environmental guidelines for major construction sites;
- Publication 508: Environmental guidelines for composting and other organic recycling facilities; and
- Publication 722: Environmental guidelines for reducing greenhouse gas emissions from landfills and wastewater treatment facilities.

The Best Practice Environmental Management series comprises guidelines and codes of practice for industry sectors or activities with an emphasis on how efficient resource usage can result in increased productivity as well as reduced environmental impact.

These guidelines refer to the Industrial Waste Management Policy (Waste Minimisation) 1990 which requires premises which are subject to works approval to have waste management plans incorporating waste minimisation.

12.4.3 Guidelines for Environmental Management: Use of Reclaimed Water (Publication No. 464.2) 2003

The overall objective of the Guidelines for Environmental Management: Use of Reclaimed Water 2003 is to maximise the reuse of reclaimed water through minimising and managing risks associated with its use.

These guidelines primarily relate to the reuse of treated effluent from sewage treatment plants.

While this guideline does not provide extensive detail in relation to industrial water, it outlines potential options for the reuse of reclaimed water from industry sectors and potential quality concerns for industrial reuse.

12.5 Question

Question 4

Are there any other aspects of the Victorian regulatory environment which are important in the development of the Regulatory Framework for industrial water?

13 Industrial Water Recommendations

13.1 Recommendations

The following recommendations are proposed for discussion and designed to enable industrial water reuse.

The recommendations identify changes which need to be made to existing Victorian legislation and/or guidelines, and where new legislation and/or guidelines need to be created to facilitate the reuse of industrial water.

1. The reuse of industrial water for industrial processes (e.g. cooling, material washing) will not be regulated. Where the reuse of industrial water is exclusively for an industrial process (on-site or off-site):
 - the workplace risks must be assessed and managed in accordance with WorkSafe Victoria's current occupational health and safety framework;
 - the suitability of the water for the industrial process is a business risk and should be managed via existing business systems;
 - risks to consumers in relation to the product safety and quality are to be managed by the existing frameworks for ensuring food safety and product quality.
 - for any inadvertent spills, leaks, etc. the provisions of the *Environment Protection Act* 1970 would apply.If the industrial water is transported off-site, regulatory requirements that apply to the transport of industrial waste would apply.
2. Ensure that head of power legislation is provided to manage environmental and health risks in relation to the non-industrial reuse of industrial water (on-site or off-site), which:
 - allows for roles and responsibilities to be clearly identified and assigned;
 - ensures proposed industrial water reuse schemes undergo an appropriate assessment process, including primary assessment and where necessary, detailed risk assessment; and
 - allows for controls to be imposed based on a regulatory framework which balances the level of rigour with the level of risk.

3. During the review of the Environment Protection (Prescribed Waste) Regulations 1998, consider:
 - provision for industrial water reuse to be undertaken in accordance with guidance to be developed; and
 - the definition of industrial water.
4. Develop industrial water reuse guidance that provide guidance on managing environmental and health risks for non-industrial uses that address:
 - roles and responsibilities, including contractual arrangements;
 - the process for evaluating industrial water reuse proposals;
 - environmental and health risk assessment methodologies;
 - methodologies and processes for managing environmental and health risk;
 - management of the industrial water reuse system;
 - compliance with industrial and trade waste policies and objectives;
 - communication, awareness and training;
 - incidents and emergencies;
 - documentation and reporting; and
 - auditing, review and improvement.
5. When the regulations are reviewed, amend where necessary the industrial waste management policy (Prescribed Waste) 2000 and existing guidance to ensure consistency with the proposed changes to the Environment Protection (Prescribed Waste) Regulations 1998 referred to in Recommendation 3.
6. Review all relevant regulations to allow for on-site non-industrial reuse at all industrial premises where appropriate as determined by a risk-based approach as set out in guidance referred to in Recommendation 4.

7. Clarify where relevant in the regulations/guidance definitions such as “industrial waste”, “trade waste”, “prescribed industrial waste” and “industrial water”.
8. Large-scale adoption of industrial water reuse can have potential impacts (either negative or positive) on the functioning of sewerage systems and sewage treatment plants. Although outside the scope of this project, such impacts need to be assessed and considered when promoting industrial water reuse, and maintaining and constructing sewerage infrastructure and sewage treatment plants.

13.2 Questions

Question 5

Do the proposed recommendations for industrial water present any potential issues or challenges?

Question 6

Are there any other aspects of industrial water which you would like considered?

14

All-of-Framework Recommendations

Although this Discussion Paper focuses on industrial water, the Regulatory Frameworks for a number of other alternative water sources (rainwater, stormwater, greywater, sewage and managed aquifer recharge) are also currently being reviewed.

It is possible that an industrial organisation wishes to reuse its industrial water, as well as its on-site rainwater, stormwater, greywater or sewage. In this situation, it is important that the Regulatory Frameworks for all alternative water sources are integrated and managed effectively.

14.1 Recommendations

The following general recommendations are proposed for all water sources.

1. Ensure integration between the Regulatory Frameworks of each alternative water source where possible.
2. Ensure participation in, and where appropriate consistency with, national initiatives.
3. Ensure that the Regulatory Framework provides for the trial and adoption of new and innovative technologies.
4. Develop mechanisms to determine the impact of alternative water source uptake throughout the water cycle, including consideration of relevant management plans at the local, regional and state level.
5. Develop a mechanism to allow for data collection of alternative water source usage to assist with assessment of water cycle impacts.
6. Determine the most appropriate institutional and administrative arrangements given the adoption of the proposed Regulatory Framework.
7. Ensure that the Regulatory Framework takes account of the resourcing capacity and capability of the agencies responsible for administering the framework.
8. Develop a unified system to inform new owners and occupiers (resulting from change of ownership or tenancy) of existing alternative water systems and the maintenance requirements.
9. Develop guidance documents expressing a hierarchy for the best and lowest risk uses of alternative water sources for a range of common scenarios.
10. Establish mechanisms to provide for the assessment of long-term impacts on the environment from alternative water source usage.
11. Develop and implement a communication strategy to promote the guidance and Regulatory Framework for all alternative water sources.

14.2 Questions

Question 7

Do the proposed all-of-framework recommendations present any potential issues or challenges?

Question 8

Are there any other recommendations which should guide this review?

