

ALTERNATIVE WATER SOURCES FOR ROADWORKS

INTRODUCTION

VicRoads promotes the use of recycled and other water sources (collectively referred to as alternative water sources) in road construction projects, maintenance and other activities across the State. Alternative water sources are increasingly being viewed as a valuable resource, rather than a waste material.

This Technical Note provides a summary of the requirements that are vital when sourcing and using alternative water sources for VicRoads activities. This document also provides information on transporting and managing recycled water on site through the development of an Environmental Improvement Plan (EIP) to minimise risks associated with its use.

WATER POLICY

VicRoads has developed a new Water Usage Policy (VicRoads 2007) that outlines VicRoads approach to alternative water sources to potable water. The policy states, "VicRoads will use recycled or other alternative water in construction and maintenance activities dependant on availability and environmental and human health considerations". In rural Victoria, VicRoads will also seek alternatives to surface water that ultimately form domestic water supplies. This commitment applies irrespective of the prevailing climatic conditions. VicRoads will continue the current practice of reusing water captured in sediment ponds on construction sites.

ALTERNATIVE WATER SOURCES

Recycled water e.g. sewage treatment plants (STPs) or water from other sources e.g. quarries, groundwater, industrial wastes and washwaters can be used as an alternative to potable water in many road construction and maintenance activities.

Recycled water is the term commonly used for water sourced from STPs. There are four classes of recycled water from Class A the highest quality through to Class B, Class C and Class D the lowest quality. Class C and D are not recommended for use on VicRoads projects.

There are a range of other water sources that are used including:

Industry tradewaste and washwater. These can vary considerably in location and characteristics and generally do not currently have a classification for reuse purposes. They are generally available in large volumes across the State but each source must be assessed in relation to its suitability for use in specific road activities and its environmental and OH&S management requirements.

Quarries and farm dams. These are available across Victoria and are one primary source of water for projects.

Groundwater bores. Whilst widely available in Victoria they are mainly used for domestic and stock use or irrigation and generally are not of interest to VicRoads because of their high quality. Other bores currently not used or unsuitable for their original purpose may provide a viable water source, especially for projects in regional areas located away from potable supplies or those stressed by drought.

Other opportunistic sources. There are a number of other sources that may be identified near a project such as swimming pools, cooling towers, on-site sediment traps, or any other available water within a realistic distance.

Generally, the water quality requirements for alternative water sources used in "earthworks" will be less stringent than those requirements for water sources used in the "construction of pavements or concrete structures" due to potential reactions with some components e.g. aggregates and cement. Specialist advice should be sought prior to the use of alternative water sources in the latter two instances. In pavement surfacings, spray seals and asphalt, salts from alternative water sources can cause problems well after the project has been completed.

ROLES, RESPONSIBILITIES & RISKS

Suppliers of alternative water sources have a responsibility to ensure that the water is of a quality fit for the intended purpose. They have responsibilities that include:

- Assisting in the development of an EIP, and advising on appropriate management practices (although in practice most suppliers do not have the resources or expertise to provide this service);
- Keeping a register of all users to which they supply recycled water, including the site address, the quality, and quantity; and
- Ensure that all users have an EIP, with appropriate sign-

off before supplying the water. e.g. submission, initial assessment, formal consideration and endorsement by the EPA with or without conditions.

Users have the responsibility to ensure:

- The reuse activities are managed in accordance with EPA guidelines, including the adherence to the site specific EIP;
- The site is assessed for its suitability for using a specific type or class of recycled water use;
- Protecting surrounding land uses and the environment; and
- Recording and monitoring the volume used and location of application.

Alternative water suppliers and users should establish processes and procedures for continual and open liaison with the surrounding community, agencies and other stakeholders.

Environmental and OH&S Risks

There is a range of environmental and human health risks associated with the use of alternative water sources. The risks posed will vary depending upon the location, application techniques, use, and the class or source of the alternative water.

The risks posed will also vary depending upon the sensitivity of surrounding land uses, the location of the project, and the type of activity.

Best practice measures should be implemented to reduce potential OH&S risks for the on site workforce and the surrounding areas exposure to the alternative water source. The source of alternative water will dictate the OH&S management that needs to be undertaken.

Transporting Alternative Water Sources

The transport of recycled water (e.g. from STPs) is not subject to EPA prescribed waste regulations or waste transport certificates; however there must be procedures to ensure there are no spillages, odours or contamination of the environment and these should be outlined in the EIP, which may require sign-off from the EPA.

Transporting alternative water sources from industry e.g. trade waste, may require special conditions and/or sign-off from the EPA as it maybe prescribed waste. The management of such sources must be outlined in the EIP.

APPLICATION PROCESS FOR VICROADS

It will usually be the contractor's responsibility to undertake the negotiations with the supplier of the alternative water and sign any formal agreement required by the supplier and develop an EIP under VicRoads contracts.

Discussions should be undertaken between VicRoads, the project contractor, EPA, and other stakeholders to discuss possible risks for the project site and develop management options.

An EIP template and other information are provided in the Recycled Water Toolbox on the EIS (VicRoads internal use only) or, [<http://www.vicroads.vic.gov.au/environment>].

SITE AND ENVIRONMENTAL MANAGEMENT

A project site's suitability for using alternative water sources and environmental management issues include:

Road Construction

As many road projects do not require on-going long-term application of alternative water there should be no impact on the soil structure of the project site.

Care should be taken not to allow alternative water to move off-site either as surface flow or as a spray or mist. Application should not occur when rain is imminent.

Buffer Zones

Buffer zones between application sites and surface waters or sensitive surrounding land uses are influenced by:

- The source of alternative water used;
- The application method used;
- Site specific parameters; and
- The type and location of surface waters involved.

Drainage and Stormwater

All application methods should provide effective run-off controls including:

- Efficient application methods; and
- Water collection and recycling facilities for any excess run-off.

Signage

Whenever alternative water is used, prominent warning signs should be erected in compliance with AS 1319- Safety Signs for the Occupational Environment.

MONITORING

Before accessing any alternative source a full analysis of the water must be obtained and assessed in regard to the engineering, environmental and OH&S specifications. The outcomes of this monitoring will inform the EIP which is a requirement of a VicRoads contract when using recycled or alternative water sources.

Responsibilities for suppliers

Responsibility for the quality of alternative water sources is usually the responsibility of the supplier, who must ensure

that the water continues to meet the original specifications indicated. It is also the supplier's responsibility to cease supply and inform the relevant parties if the alternative water supply fails to meet specification.

Responsibilities for users

It is the user's responsibility to ensure that no recycled or alternative water leaves the site, either as surface flow or as a spray or mist. Monitoring for either of these can be very difficult and would normally be undertaken by visual inspections at the time of use. The EPA or catchment management authorities (CMA) may require upstream and downstream monitoring, however, unless the alternative source is being used and there is an illegal off-site discharge the monitoring will not be effective.

If using groundwater, farm dams or other unregulated source, the users should undertake regular monitoring to ensure that the water is within engineering, environmental and OH&S specification limits. These sources should also be fully assessed prior to use so an appropriate EIP can be developed, including sign-off.

All sampling and analysis should be undertaken using EPA (Publication 441) A Guide to Sampling and Analysis, Wastewaters, Soils and Wastes. A NATA registered laboratory should undertake all analysis. Further advice on monitoring the use of recycled and alternative sources can be obtained from VicRoads Environmental Services.

VICROADS EXAMPLES USING ALTERNATIVE WATER SOURCES

Road construction and maintenance activities can use large volumes of water e.g during compaction, dust suppression and landscaping. The following are some project examples of the use of alternative water sources.

Deer Park Bypass Project - Recycled Water

The Deer Park Bypass Project is a 9.3 km four lane freeway between Western Highway at Caroline Springs and Western Ring Road at Sunshine west. Construction activities currently require 300 to 600 kilolitres (kL) of water per day. Class A recycled water sourced from the Melbourne Water Western Treatment Plant (Werribee) was initially used for the project. Later, on-site bores supplied 100% of the water requirements for the project including two bores that met pavement water quality requirements.

Pakenham Bypass Site – Council Pool Water

During construction of Stage 2 of the Pakenham Bypass, 300 kL of water from decommissioning a local pool was used when offered by the local council. This water would normally have been discharged to tradewaste at great expense to the council.

Cliff St Overpass Project- Geothermal Spring

Cliff St Overpass project at Portland used water from a geothermal spring which normally discharged to an estuary. The local water authority installed a standpipe for VicRoads use which is now used by other local businesses.

REFERENCES

Recycled Water Toolbox on the EIS (VicRoads internal use only) or, [<http://www.vicroads.vic.gov.au/environment>].
VicRoads Recycled Water EIP Template.

VicRoads Water Usage Policy (Water Usage for Road Construction and Maintenance Activities), 2007.

FURTHER READING AND RESOURCES

VicRoads Environmental Guidelines: Using Recycled Water for Road Activities 2005 and EIP template.

Draft VicRoads (2007) OH&S Risk Assessment for the use of Recycled Water to perform Road Construction/Maintenance Tasks.

EPA (2003) Guidelines for Reclaimed Water

Practice Note - Summary Paper EPA (2003) Guidelines for Environmental Management: "Use of Reclaimed Water" Publication No.464.2, Environmental Services, VicRoads.

South East Water website [www.southeastwater.com.au]

Yarra Valley Water website [www.yvw.com.au]

Melbourne Water website [www.melbournewater.com.au]

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