THE RELATIONSHIP BETWEEN THE NEW QUEENSLAND WATER RECYCLING GUIDELINES AND THE DRAFT NATIONAL GUIDELINES FOR WATER RECYCLING

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INTRODUCTION

The draft National Guidelines for Water Recycling (NRMMC & EPHC 2005) were released for public consultation in October 2005. The Queensland Water Recycling Guidelines (EPA 2005) were launched in December 2005. Both documents were developed over much the same time period and have a similar scope and purpose. This has given rise to some confusion as to what the status of each document is within Queensland. The purpose of this paper is to clarify the status of each document.

1.0 BACKGROUND

The draft National Guidelines for Water Recycling ("the draft National Guidelines") have been developed by a Joint Steering Committee comprising representatives from Queensland, NSW, Victoria, Western Australia, South Australia and the Commonwealth. They are intended to provide a common framework for water recycling across Australia. When finalised, they will replace the Guidelines for Sewerage Systems: Use of Reclaimed Water (ARMCANZ, ANZECC & NHMRC 2000) that were published as part of the National Water Quality Management Strategy. The draft National Guidelines derive their status from their sponsoring organisations, the Environment Protection and Heritage Council (comprising State and Commonwealth Ministers for the environment and heritage) and the Natural Resource Management Ministerial Council (comprising State and Commonwealth Ministers for natural resources).

The process for developing new National Guidelines commenced in mid-2003. The scope for phase one of the National Guidelines included only recycled water sourced from sewage treatment plants and domestic greywater, while the scope for recycled water use included most non-potable recycled water applications. It was always intended that a second phase of guidelines development should also consider treatment and use of urban stormwater as an alternative source of water supply. However, with continuing severe drought in many parts of Australia, the Joint Steering Committee for the National Guidelines has recommended that the scope of the second phase of the guidelines be extended to include both managed aquifer recharge and use of recycled water for drinking. At the time of writing (May 2006) this extension of the scope of the guidelines had not yet been approved by both of the sponsoring Ministerial Councils.

Revision of the draft National Guidelines commenced after the public consultation process, which lasted from October 2005 to February 2006. Stakeholder feedback indicated a wide level of support for the risk-based approach taken in the Guidelines. However, a number of comments questioned the complexity of the Guidelines and requested changes to make them easier to use. This concern particularly applied to those situations where operators of smaller treatment plants or recycled water schemes may not have sufficient expertise to undertake risk analysis, or the cost of undertaking such analysis would be disproportionate to the scale of the scheme.

In response to these comments the final version of the National Guidelines will attempt to make the guidelines more user friendly via greater use of case studies, inclusion of advice on how to use the guidelines and more explanation of the concept of Disability Adjusted Life Years (DALYs): a concept that provides the foundation for the human health risk assessment approach taken in the National Guidelines. A final version of phase one of the National Guidelines is expected to be approved by EPHC and NRMMC by around August or September 2006.

When finalised, the National Guidelines will have no regulatory force. They are true guidelines, designed to inform, educate and guide regulators, the water industry, recycled water users and the general public. Each State and Territory will decide how to implement the National Guidelines approach within its own jurisdiction. This is a very similar situation to the Australian Drinking Water Guidelines (NHMRC 2004), which again are only guidelines that, at present, have no regulatory status in Queensland.

2.0 THE QUEENSLAND WATER RECYCLING GUIDELINES

Queensland has decided to adopt the framework provided by the draft National Guidelines and apply it through the Queensland Water Recycling Guidelines ("the Queensland Guidelines"). The Queensland Guidelines are therefore the key guidance document for water recycling in Queensland. The Queensland Guidelines were developed via a consultative process that took over two years. A technical review draft was released in December 2003, for review within State and local government and the water industry.

A public consultation draft was published in April 2004, following which ten public forums were held around Queensland to discuss the guidelines. Stakeholders provided extensive comments on the guidelines, which were integrated as far as possible into the final document. There is thus a significant level of stakeholder "ownership" of the Queensland Guidelines.

3.0 ALIGNMENT OF QUEENSLAND GUIDELINES WITH THE DRAFT NATIONAL GUIDELINES

There is no conflict between the draft National Guidelines and the Queensland Guidelines because the following key concepts are common to both documents:

- Promotion of use of a risk management framework to manage recycled water, based on the risk management framework within the Australian Drinking Water Guidelines. This approach uses a HACCP-style (Hazard Analysis and Critical Control Point) process to identify hazards within the system for production and use of recycled water in order to control each hazard so that the risk to human health or the environment is minimised or removed. The key components of HACCP as applied to recycled water are:
    - determination of critical control points (those stages in the production or use of recycled water where loss of control could lead to risk of harm to human health or the environment)
    - establishment of critical limits for each critical control point so that any exceedance can be immediately identified and addressed
    - monitoring, validation and verification of critical control points, recycled water and environmental quality and
    - independent auditing of system operation.

- Both documents advocate rigorous validation and verification requirements for suppliers of recycled water. This includes recommended monitoring requirements for recycled water quality and environmental end points. In plain English, validation answers the question "Will it work?", operational monitoring tells you "Is it working?" and verification confirms "Did it work?".

- Both guidelines advocate use of target log reductions of pathogens as providing the criteria for validation of treatment systems for producing high quality recycled water. Log reductions have been adopted in preference to reliance entirely on final recycled water quality as they provide a better method for validating the capacity of a treatment system to remove pathogens over a range of operating conditions and loading rates. It has long been recognised that reliance on "end of pipe" microbiological testing for recycled water is a case of "too little, too late" as the water has often already been delivered to customers or storages before any non-conformances can be identified and rectified. A more robust system for maintaining recycled water quality is established by rigorous validation testing to show the system is capable of removing the required percentage of microbiological indicators, online monitoring of surrogate indicators (such as turbidity, UV transmittance or chlorine residual) to permit automatic shutdown of supply (or other appropriate action) when a critical limit is reached for any critical control point and verification testing and reporting of final water quality to ensure continuing achievement of performance standards. For more information on log reductions, see either the Queensland Guidelines or the draft National Guidelines.

- When considering the possibility of impacts on human health, both guidelines focus on microbiological hazards much more than chemical hazards. This is because the scope of both guidelines concentrates on non-potable uses of recycled water for which the human exposure is simply too low to lead to any measurable risk from chemical contaminants at the levels typically found in recycled water that already meets microbiological standards relevant to safe uses. In other words, given that microbiological exposures from recycled water may lead to acute human health risks (i.e. infection), this necessitates either very high levels of treatment or effective exposure controls, and thus the risk of chronic exposure to chemicals in recycled water is negligible.

- Both guidelines acknowledge the key role of community engagement when planning and implementing water recycling projects. Few recycled water practitioners will now advocate the old "keep below the community's radar" approach for water recycling schemes, as recycled water has become fair game for those in the media who rely on public panics to sell newspapers or attract viewers. The only true guarantee of a supportive local community is through engagement, openness and trust.

3.1 What is different about the Queensland Guidelines?

Notwithstanding this close alignment between the draft National and Queensland Guidelines, there remain some important features of the Queensland Guidelines that distinguish them from the National Guidelines.

- The scope of the Queensland Guidelines is limited to municipal wastewater. While earlier drafts included reuse of industrial and agricultural wastewater as well as urban stormwater, during the consultation process it became clear that these other

sources for recycled water have quite different contaminant profiles from sewage and thus advice on indicators, treatment and suitable uses would be quite different. As a consequence, separate guidance would have to be provided on these other sources. In Queensland greywater use in both sewered and unsewered areas is covered by existing regulation and guidance materials provided by the Department of Local Government, Planning, Sport and Recreation.

- The Queensland Guidelines include a detailed description of current regulatory arrangements for water recycling in Queensland. This is in contrast to the draft National Guidelines which do not consider Commonwealth, State or Territory regulatory arrangements, as these vary greatly between each jurisdiction. National Guidelines cannot be expected to describe these widely varying requirements.

- The Queensland Guidelines "package up" the risk management requirements of the guidelines into what are termed Recycled Water Management Plans. This makes it relatively easy for recycled water suppliers and users to demonstrate their conformance to the recommendations of the guidelines, and it is expected that these plans will be the principal mechanism for management of recycled water in Queensland.

- The Queensland Guidelines, like most other State and Territory guidelines, retain the use of recycled water classes. In the case of Queensland, the classes range from Class A+ to D, in decreasing order of microbiological quality. The draft National Guidelines provide a more complex "fit for purpose" table (Table 3.12) that shows examples of combinations of recycled water treatment and site-based controls that would ensure the safety of recycled water use. In practice, there is very little difference between this table and similar tables in the Queensland Guidelines and other Australian recycled water guidelines. Queensland has retained recycled water classes because the consultation process for the Queensland Guidelines showed that stakeholders were comfortable with the use of recycled water classes, particularly as a communications tool for recycled water users and the general public. They were also happy with the distinction drawn between Class A and A+, which is missing from most other guidelines. This distinction provides increased flexibility in differentiating between high quality, usually tertiary filtered, disinfected recycled water (Class A) and the even higher quality water that is usually supplied via advanced recycled water treatment such as membrane filtration, advanced oxidation or activated carbon filtration (Class A+).

- The scope of the Queensland Guidelines does not explicitly include recycled water for drinking, at least in terms of recommending a particular recycled water quality for this purpose, because at the time of publication the Queensland government had not taken a definitive position either for or against potable reuse. However, in recognition of the need to provide some support to drought-stressed communities in Queensland, the Queensland Guidelines do include a section on using recycled water to supplement drinking water supplies (Section 7.6). While acknowledging that each proposed potable reuse scheme will be subject to case by case assessment by Queensland Health, this section still provides a list of basic steps that proposed potable reuse schemes would be expected to follow.

This includes a comprehensive health risk assessment, tracing of the sources of contaminants of concern in the sewerage system, strict trade waste controls, extensive monitoring requirements, design of treatment processes to remove all contaminants of concern, and a risk management system that will control all known risks. It could be expected that all of these steps would be features of the second phase of the National Guidelines when they are completed in 2007 or 2008.

- The draft National Guidelines include a great deal of background information on both human health and environmental risk. This is very valuable but due to its presence within the draft National Guidelines, the EPA was able avoid providing this detailed justification for the standards applied within the Queensland Guidelines. The Queensland Guidelines were designed to be a relatively simple, user-friendly document. Feedback received to date indicates that they have achieved this.

3.2 Which guideline do we follow in Queensland?

The Queensland Government recommends that recycled water suppliers and users refer to the Queensland Guidelines because:

- They have been aligned with draft National Guidelines so that there are no significant inconsistencies between the two documents

- They are designed for Queensland conditions, reflecting the specific regulatory framework in Queensland

- They will remain flexible and responsive to Queensland needs. This is essential in the current serious drought situation in South East Queensland as the government may be required to adjust the "rules" for water recycling to reflect this critical situation. A national guideline document will be inherently less flexible as each jurisdiction must agree to any changes, and the history of these national processes is that attaining a national consensus is often time-consuming and frustrating.

Which is not to say that the draft National Guidelines have nothing to offer recycled water suppliers and users in Queensland. While the Queensland Guidelines contain tables of recommended uses for different classes of recycled water, they also make it clear that if a risk assessment shows that human health risks can be properly managed, then an alternative class of recycled water can be used from that recommended in the guidelines. For example, Chapter 3 of the draft National Guidelines offers two alternative methods for calculating human health risks from recycled water from known data on amount and frequency of exposure. It would be an entirely appropriate use of both the Queensland and draft National Guidelines if a recycled water user were to adopt one of these methods from the draft National Guidelines for assessing risks from use of recycled water and developing a site or use specific risk management response that differed from the recommendations in the Queensland Guidelines.

3.3 What are the other States and Territories doing?

Finally, for anyone who may think that two water recycling guidelines is too many, here is a quick list of water recycling guidelines provided by other jurisdictions in Australia:

- NSW has two guidelines
  - Agricultural use guidelines (2005)
  - Dual reticulation guidelines (1993)

- Victoria now has four guidelines
  - Use of reclaimed water (2003)
  - Disinfection of reclaimed water (2003)
  - Dual pipe recycling guidelines (2005)
  - Using recycled water for road activities (2005)

- Western Australia has draft guidelines for use of recycled water (Nov 2005)

- Tasmania (2002), South Australia (1999) and ACT (1999) all have existing water recycling guidelines.

At this stage only one jurisdiction, South Australia, has indicated that it will rescind its own guideline and adopt the National Guidelines exclusively. However, they will still need to provide information to stakeholders on regulatory arrangements specific to South Australia.

4.0 REFERENCES

ARMCANZ, ANZECC & NHMRC (2000) Guidelines for Sewerage Systems: Use of Reclaimed Water, Agriculture and Resource Management Council of Australia and New Zealand, Australian and New Zealand Environment and Conservation Council and National Health and Medical Research Council, Canberra.

EPA (2005) Queensland Water Recycling Guidelines, Queensland Environmental Protection Agency, Brisbane

NHMRC (2004) Australian Drinking Water Guidelines, National Health and Medical Research Council, Canberra.

NRMMC & EPHC (2005) National Guidelines for Water Recycling: Managing Health and Environmental Risks (draft for public consultation), Natural Resource Management Ministerial Council and Environment Protection and Heritage Council, Canberra.