

Appendix H

# Review of Risk Assessment Matrix



## Memorandum

To	ACT Procurement Solutions
Attention	Doug Paul
From	Tony Wong
Date	21 June 2010
Project Name	ACT Non-Potable Water Masterplan
Project No.	10503356.01
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### Background

GHD have conducted a risk assessment to determine the risks associated with the use of non-potable water for irrigation, and to compare these risks with the extant risks associated with Canberra's lakes and ponds. Their report, a memorandum with the subject "Risk assessment of potential human contact with irrigation water" (Job no. 23/13425) concluded that Canberra's Lakes and Ponds pose residual or currently unmitigated risks that are considered to be very high for some social or human health concerns. In contrast, for non-potable water used in irrigation, the residual risk remaining after mitigation measures are implemented are very low to negligible in most cases for ecological, social and economic concerns.

### Review

AECOM has reviewed the risk assessment. We consider that overall, the risk assessment presents a realistic appraisal of the residual risks associated with non-potable water re-use for irrigation. The likelihoods, consequences and risks allocated to each category are generally appropriate. In some instances, the likelihoods and consequences have been overstated or understated, or different mitigation measures may be more appropriate or more effective than those recommended. However, we agree that mitigation measures are available to reduce the risk to that stated as residual risk.

The assessment would be more robust if the following aspects of the report were addressed.

#### ***Comprehensive assessment of all risks.***

The risk assessment could be made more comprehensive. Table 2 introduces and lists 12 risk consequences separated into three categories. However, the assessments presented in Tables 4 to 7 focus primarily on human health issues and do not necessarily present risks from each and all of these categories identified in Table 2

The review to be undertaken by AECOM will build on this work and provide a more complete assessment by further considering the ecological and management risks of non-potable water reuse.

#### ***Mitigation measures and the transparency in reduction of risks.***

Some risks were reduced by 5 categories, and this appeared to be arbitrary. – e.g. in Table 4 and Table 5, some risks were reduced from **very high to very low** in response to mitigation measures such as "irrigating at night, and putting up a sign". Further discussion could be provided to describe that "irrigating at night" = reduction of 2 risk categories, and "signage" = reduction of 2 risk categories etc... to give the assessment some transparency.

**Risk Assessment of Existing Lakes & Ponds (Table 7)**

The residual risk from the existing lakes and ponds has been overestimated. If signs were erected to advise people not to swim, the risk could be reduced from Very High to Medium. The third row of this table indicates that a sign is present advising swimmers of that swimming is prohibited. Therefore, this mitigation measure should be applied to the other issues. This will not change the conclusion of the Risk Assessment, but will reduce the magnitude of the comparison between the lakes and the irrigation practice.

**Assumptions**

No assumptions governing the quality or use of water for irrigation were stated. The assumptions of GHD's assessment appear to be:

- Stormwater includes runoff from all surfaces
- Private open space includes household gardens or commercial open space
- Treated stormwater is used to irrigate private and public open spaces
- Treated effluent is used to irrigate public open spaces only

Treated effluent is widely used for irrigation of private open spaces where dual reticulation is available, and this use could be considered.

**Additional Comments**

- The proposed mitigation measures of "irrigating at night" and "erecting signs" are appropriate for business but not household circumstances.
- Table 5 - Risk Assessment of Stormwater used for Irrigation of Public Open Space Guidelines are referred to but not specified
- A "public human health incident" impact is listed twice in the table, Rows 5 and 7. One with a consequence of "Minor", the other "Moderate".
- Some of the potential impacts are not clearly described. For example, from Table 4:

Table 4. Risk Assessment of Stormwater used for Irrigation of Private Open Space

Potential Impact	Likelihood	Consequence	Risk	Mitigation Measure	Residual Risk
The potential for algae growth within the stormwater storage ponds. These toxins can be hazardous if ingested and can cause epidermis reactions upon contact with skin	Almost Certain	Moderate	Very High	Irrigation area to be irrigated during night hours. Signs to be installed advising that irrigation water is not suitable for human contact.	Very Low

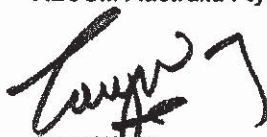
The potential impact would be better described as "exposure to toxins associated with cyanobacterial blooms" (which can be very hazardous), rather than "algal growth" (as blooms of freshwater green algae may compromise the amenity of a waterbody or clog irrigation lines but may not present any substantial health risk).

- Some obvious mitigation measures have not been considered. In the above example it would be appropriate to not use the affected water at all until the bloom has subsided, which would reduce the residual risk to very low. Monitoring the waterbodies for signs of cyanobacterial blooms should also be considered.

**Conclusion**

The risk assessment focuses primarily on human health impacts and would be more comprehensive if it also included environmental and management risks. The likelihoods, consequences and risks allocated to each category are generally appropriate. There are some instances where we disagree with the estimated likelihoods, consequences, initial risk category, and mitigation measures. The assessment would be more defensible if specific mitigation measures were clearly related to a specific reduction in risk. However, we consider that mitigation measures are available to reduce the risk to that stated by GHD as residual risk.

Yours sincerely  
AECOM Australia Pty Limited

A handwritten signature in black ink, appearing to read 'Tony Wong', with a stylized flourish at the end.

Tony Wong  
Principal  
Design + Planning

