



Stormwater in the landscape – safety and risk assessment

Andrew McMillan¹

¹*Alluvium Consulting, Surry Hills, Australia*

Overview

Stormwater harvesting schemes are required to be subject to a risk assessment to identify and manage hazards associated with the implementation of the scheme. A similar process may also be followed for stormwater treatment systems that are not intended for reuse.

A risk assessment has been carried out for a stormwater scheme in Sydney that includes a treatment system with GPT, constructed waterway, wetland, bioretention, large open storage pond, disinfection and irrigation reuse. The risk assessment identified a number of hazards that needed to be addressed during the design phase. The identification of risks in the stormwater harvesting scheme also brought to the surface comparisons with other risks found in the urban environment, and raised some inconsistencies in the guidelines that were further explored.

This study includes a comparison of a number of different guidelines for water safety around the world, as well as some further discussion on local contextual matters.

The risk assessment was found to be a valuable tool for the project but highlighted that outcomes are project specific and can differ depending on the risk tolerance of project stakeholders. It also brought about a discussion on

Objectives

The objective of the project is to investigate the hazards associated with a stormwater treatment and harvesting scheme, consider the residual risk and to what extent risks should be managed or removed.

Another objective was to investigate how stormwater risks commonly found in Australia are dealt with in other countries, including water quality and other safety risks.

Additionally, we wanted to explore the trade-offs found in natural systems between risks and other benefits such as improved biodiversity and liveability.

Method

The project uses a case-study to demonstrate the application of the risk management process to a stormwater harvesting and treatment scheme. The hazards were considered holistically and in the context of the local environment.

A literature review was also completed to investigate how risks associated with stormwater treatment and harvesting schemes are dealt with around Australia as well as in other countries.

Results

The project identified a large number of potential hazards that were considered as part of the risk assessment process.

It was also found that there are some different guidelines around water quality requirements and water body edge safety. A particular point of interest found in the investigation related to the microbiological water quality requirements for 'ornamental water bodies'. Another project specific consideration was that of safety around the open water body, particularly given the water level fluctuation that it will be subject to.

There are lessons to be taken from this risk assessment for other WSUD systems that do not necessarily include reuse for irrigation.

Conclusions

Risk assessment is a useful tool to utilise during the design of stormwater treatment and harvesting schemes. However some caution should be taken to ensure that the risk management measures are appropriate for the project.

There is opportunity for further discussion within the stormwater industry on how to manage stormwater risks, and to what level of risk can be tolerated given the other benefits that are provided.