

Application of the Hazard Analysis and Critical Control Point (HACCP) Risk Management Framework to Managed Aquifer Recharge

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ABSTRACT

The limitations of monitoring programs in facilitating the management of water quality are being increasingly recognized by both regulators and the greater community. This study describes the novel application of a Hazard Analysis and Critical Control Point (HACCP) framework for quality assurance of stormwater utilized for an Aquifer Storage Transfer and Recovery (ASTR) project. While HACCP has a long history in the food industry, it has only recently gained acceptance for potable water supplies in Australia and internationally; this application is the first in the risk management of water quality in a managed aquifer recharge project.

A preliminary HACCP plan was developed to assist in the management of the ASTR project for both human health and environmental risks. The intent in preparing this HACCP plan for ASTR is similar in concept to that for drinking water provision, where water quality and hazards are considered from source to tap in a risk-based approach but also attempts to integrate environmental risks within the same system. The preliminary HACCP plan and input from a steering committee of project stakeholders have guided the design of an evidence-based water quality monitoring program and the collection of data for direct input into decision making processes. Water quality data was collected on the efficacy of stormwater treatment processes (a settling basin and an artificial wetland) and its ability to reduce the concentrations of contaminants (chemical, physical and microbiological) as a reliable pre-treatment step for managed aquifer recharge.

From the review of the collected data, the key water quality risks to the ASTR project are discussed in addition to constraints of the system and concerns of key stakeholders. The data collected was used for refined quantitative risk assessments, and further optimization of water quality monitoring in the future.