



When do I clean my GPT? Using good monitoring to forecast the maintenance of GPTs

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Overview

Gross Pollutant Traps (GPTs) have been implemented in urban catchments in Australia for over two decades to improve the quality of stormwater runoff discharged to aquatic ecosystems. Many devices have been installed as part of land development projects to meet local authority stormwater management requirements and, after authority-specific liability periods, have subsequently been handed over to public ownership. With progressive urban development (particularly noticeable in the last two decades), authorities have absorbed management and compliance responsibilities for large numbers of devices (often scattered around their jurisdictions) including maintenance activities that carry high financial costs.

One of the most pressing challenges for authorities has been knowing when to clean and inspect GPTs to minimise costs, prevent them going into bypass, and avoid them becoming a source of pollution. Without this information, it is difficult to specify the minimum budget for GPT management and strategically plan maintenance activities. Questions often faced by GPT managers include: Which GPTs should I clean? When should they be cleaned? How much material/pollution will be removed? How much will a clean cost? In what order should I clean GPTs? Given the limited amount of money I have, which GPTs should be cleaned over others?

Objectives

As far as we know, there exists no guidance or means to reliably determine when existing GPTs should be maintained to ensure their cost-effective operation. The purpose of this study is to address this gap by:

1. developing a cost-effective, repeatable, and scientifically-based methodology for monitoring and forecasting GPT maintenance, including costs; and
2. specifying and integrating the methodology within an online operation and maintenance system to automate forecasting and improve management cost-effectiveness.

The study forms part of a larger project that seeks to monitor and model gross pollutant load generation and GPT maintenance requirements in Australian urban catchments, superseding work performed by the CRC for Catchment Hydrology and eWater almost 20 years ago.

Methods

The study will involve the following:

1. Monitoring program: the development, implementation and subsequent improvement of a long-term monitoring program for the collection of high quality data to be used for the purposes of the study.
2. Maintenance modelling: the development of statistical models to forecast GPT maintenance requirements.
3. Development of online tools: the functionality specification and integration of methodologies in an online operation and maintenance system (Assetlogue.com).

Results

The study will produce an industry report and publishable manuscript presenting its methodology, preliminary results, and future research directions. Data collected as part of the study will be used to produce device-specific models for forecasting when to inspect and clean GPTs based on runoff and other catchment attributes. As the study's monitoring may continue in perpetuity, there is also the potential for its data sets to be used to forecast maintenance for other devices, as well as strategically plan stormwater treatment in locations identified as having deficiencies and/or cost-ineffective infrastructure in place.

Conclusions

The study will be coordinated by Renew Solutions and, in the spirit of the Conference's Working Together, Building Tomorrow theme, in collaboration with:

- a prominent coastal local authority in Queensland;
- a preeminent University research institution;
- an environmental engineering consultancy; and
- a nation-wide GPT maintenance contractor.

It will contribute a methodology and tool to make the long-term monitoring and analysis of GPTs cost-efficient and achieve desired management optimisations. We feel it represents an important step towards the sustainable management of this infrastructure, addressing known and long-standing maintenance, management, and planning issues. We look forward to presenting the study and its findings at the Stormwater2018 Conference.