



Testing the SQIDEP - experiences and challenges of laboratory-based validation.

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The Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP) is under development by Stormwater Australia. It aims to standardise the testing of proprietary devices that are used to treat runoff, and it is essential in allowing the industry to efficiently and consistently validate the performance of devices. And so, provide end users confidence in performance claims.

Currently there is no national approach to the validation of devices. This has given rise to a range of test specifications by councils who are trying to ensure that the assets they are acquiring perform to a base standard. These may include field or laboratory testing (here referring to testing a device in a laboratory, not the analysis of samples by an analytical laboratory), and may specify various flow rates, various concentrations, device loading, or configurations. Some are well developed protocols, some are ad hoc. This can be a frustration to vendors, who are trying to prove devices with shifting goal posts.

Alongside of this is a general distrust of laboratory testing. This is warranted given the various targets described above, and various approaches to validation taken by different laboratories over time. In the absence of strict protocol it is possible to get different results in testing the same device. And a poorly controlled test program can provide wildly varying results. These can bias the results high or low so can draw criticism from any sector of the industry.

Despite these challenges, laboratory testing has the potential to provide efficient baseline validation. But only if standardised synthetic stormwater and test practices are used. It also offers the best opportunity for like-for-like testing. While field testing is a vital step in validation, the wide variety of hydrographic behaviour at test sites means that devices will never be subject to the same test, and removal efficiencies should not be directly compared.

In the last two years, in the process of actually testing stormwater treatment devices, we have attempted to meet the requirements of the SQIDEP and other protocols. This has shown some opportunities to provide a more efficient, better targeted protocol, and to better define the place of laboratory testing within a broader validation program.

This paper aims to share the experience and challenges of laboratory testing. And in doing so, provide an understating of what can and can't be achieved. Incorporating over 10 years of experience testing stormwater devices, we describe test benches, sampling methodologies, analytical suites, and the all-important development of a synthetic stormwater mix.

What probably has the greatest influence on results – the makeup of the synthetic stormwater – is given scant regard in most specifications. Beyond TSS/TN/TP, the balance of dissolved and particulate nutrients, the particle size distribution, and other parameters can be pivotal in the performance results. So, the sourcing and processing of ingredients is vital in allowing robust and repeatable results. We show just how much effort is required to develop a tightly repeatable synthetic stormwater, and what is a reasonable amount of variability to expect in the influent parameters.

Finally, we explore how testing could be standardised across a number of facilities and what is needed to ensure that testing is consistent across laboratories and across time. This is essential to allow several facilities to provide like-for-like testing and efficient validation of stormwater treatment devices.