STORMWATER AUSTRALIA

Stormwater Quality Improvement Device Evaluation Protocol (SQIDEP)

VERIFICATION CERTIFICATE

Applicant Information

Applicant Name	**Hydro International Limited c/o Covey and Associates**
Applicant Address	124 Duport Ave, Maroochydore QLD, 4558
Website	www.hydro-int.com
Contact Email	ksun@hydro-int.com

Verified Technology

Product Title	**Up-Flo Filter (HIUFF)**
SQIDEP Pathway	**Hybrid Pathway (Field and Laboratory Testing)**
Reviewed Documents	The following documents form the basis of this independent evaluation: • Detailed performance report for SQIDEP review – Field Monitoring Pathway Up-Flo Filter – Phase 1 (Covey Associates, November 2022) • Detailed performance report for SQIDEP review – Field Monitoring Pathway Up-Flo Filter – Phase 2 (Covey Associates, June 2023) • Detailed performance report for SQIDEP review – Hybrid Lab Testing Pathway Up-Flo Filter – Phase 3 (Covey Associates, September 2024) • Evaluation of Treatment Performance of Hydro International Up-Flo Filter (HIUFF) (Covey Associates, November 2024) • Technical Note – Responses to Stormwater Australia Evaluator Queries Regarding Hydro UFF SQIDEP Report (Terry Lucke, Covey Associates, 11 December 2024). Amended 5 March 2025

Technology Information

Applicant's Verified Performance Claims

The verified performance claim, based on the Efficiency Ratio, is shown below in Table 1.

Table 1 – Verified Performance Claim

Pollutant	Verified Performance Claim (% reduction)
TSS	94.4
TP	60.1
TN	47
GP	90*

* When used in conjunction with an upstream litter basket

Test Stormwater Runoff

Stormwater runoff was based on field conditions as per SQIDEP Field Monitoring Pathway v1.3. Laboratory testing flows were based on SQIDEP Laboratory Testing Pathway V3.2.

Test Catchment

Carpark in commercial business area (CivilMart) in Bells Creek, Sunshine Coast.

Maintenance Performed during monitoring

- The system was maintained at quarterly intervals to ensure reliable operation. This included cleaning and testing of the sampling equipment.
- Annual maintenance was also undertaken in accordance to HIUFF maintenance requirements. This included the removal of filters and media bags, pressure washing, removal of sludge and sediment from the sump and disposal offsite. New filters and media bags were then installed and the system recommissioned.

Verified method to model in MUSIC

The Upflow Filter uses a Generic Node in MUSIC to model the treatment of TSS, TN and TP in stormwater runoff. A summary of the MUSIC node pollutant concentration inputs is shown in Table 2.

Table 2 – Recommended values for MUSIC Generic Node for HIUFF

Pollutants	Inlet Concentration (mg/L)	Outlet Concentration (mg/L)	Treatment Efficiency (%)
Total Suspended Solids	500	28	94.4
Total Phosphorus	5	1.995	60.1
Total Nitrogen	20	10.6	47
Gross pollutants	1000	100	90*

* When used in conjunction with an upstream litter basket

Conditions/Notes	The limitations of the acceptance of these claims include: 1. The treatment efficiency for total nitrogen recommended for use in the generic MUSIC node is conservative and lower than that provided in Hydro International's summary of lab testing results. This may be revised pending the availability of additional data. 2. The field and lab testing data had the following range of inflow concentration values. The performance of the device is valid within these flows conditions but may not be valid outside these flow conditions. TSS: 12 – 495 mg/L TP: 0.06 – 0.26 mg/L TN: 1.4 – 2.5 m/L 3. The treatable flow rate recorded in the trial was 9.6L/s or 1.6L/s per filter module. 4. Design and installation should be performed in accordance with the Manufacturer's guidelines. Results are reliant on the design of the device being consistent with the Manufacturer's guidelines and this verification certificate. 5. Regular inspection and maintenance should be performed in accordance with Hydro International's Operation and Maintenance Manuals for the Upflow Filter. Results are reliant on the maintenance of the device being consistent with the Manufacturer's guidelines.

Independent Reviewers

Evaluator Signature	
Ricky Kwan Technical Director	
Damian McCann Director AWC	

Issue of Verification Certificate

Acceptance by SQIDEP Governance Panel	**27 March 2025**
Acceptance by Stormwater Australia Board of Directors	27 March 2025
Verification Issued	20 March 2025
Stormwater Australia Verification Certificate Number Reference	SA-2024/14-VC

Verified under SQIDEP Version 1.3

Body of Evidence Pathway