

# Formula 1

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Content placeholder

# Formula 2

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# Formula 3

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# Detailed Explanation

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The ASCE/EWRI Standard 46-22—formally titled 'Standard Practice for Monitoring the Performance of Low Impact Development (LID) Practices'—was developed through rigorous peer review and stakeholder collaboration to address the lack of consistent, scientifically defensible methods for evaluating LID effectiveness. It emphasizes a tiered monitoring approach—from basic observational checks to comprehensive instrumented studies—tailored to project scale, regulatory context, and research objectives. Core principles include defining clear performance objectives (e.g., runoff volume reduction, peak flow attenuation, pollutant load removal), selecting appropriate metrics aligned with those objectives, and applying rigorous data quality objectives (DQOs) to guide sensor selection, calibration frequency, data validation protocols, and uncertainty quantification. The standard also integrates guidance on metadata documentation, data management best practices (including temporal resolution and storage), and statistical analysis techniques for interpreting time-series data under variable climatic and antecedent conditions. Crucially, it bridges engineering practice and scientific rigor by requiring explicit linkage between monitoring design and intended use—whether for regulatory verification, adaptive management, or advancing the broader LID knowledge base through standardized, shareable datasets.

# Key Components

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| # | Component                                      |
|---|------------------------------------------------|
| 1 | Performance Objectives and Metrics             |
| 2 | Monitoring Design and Instrumentation          |
| 3 | Data Quality Assurance/Quality Control (QA/QC) |

## Applications

| # | Application                                                                       |
|---|-----------------------------------------------------------------------------------|
| 1 | Regulatory compliance verification for municipal stormwater permits (e.g., NPDES) |
| 2 | Post-construction performance evaluation of green infrastructure projects         |
| 3 | Calibration and validation of hydrologic/water quality models (e.g., SWMM, WEPP)  |

## Related Concepts

| # | Concept                               |
|---|---------------------------------------|
| 1 | Green Infrastructure                  |
| 2 | Water Balance Analysis                |
| 3 | Data Quality Objectives (DQO) Process |

## Tags

stormwater, green-infrastructure, performance-monitoring