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Appendix E

Recommended Process for Evaluating the Proposed Use of Proprietary Stormwater BMPs

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The following process is recommended for evaluating the proposed use of proprietary stormwater BMPs when the performance claim of a proprietary technology has not been fully verified by an accepted monitoring protocol and/or an efficiency rating has not been assigned by another state or approving authority.

1.1 Step 1 – Submit Information (Project Proponent)

The approving authority requires sufficient information to evaluate proposed uses of proprietary BMPs. If sufficient information is not submitted, the approving authority should request additional information as part of the review process. A project proponent shall submit the following information for projects that use proprietary BMPs:

A. A complete description of the proprietary technology or product including a discussion of the advantages of the technology when compared to conventional stormwater treatment systems and Low Impact Development (LID) practices, including:

- Size: What volume is it designed to hold and/or treat? How is the system sized to meet the performance standards in order to handle the required water quality volume, water quality flow, and design storms?
- Technical description, schematic and process flow diagram: How does it work? Description of the underlying scientific principles. What are the technical configurations of the unit? Are there any pretreatment requirements? How does it fit in combination with other treatment systems?
- Capital costs and installation process and costs: What does this size system cost? Are there any consumable materials that need to be replaced and if so, how often and how much do they cost? How will the system be installed and who will supervise the installation to ensure that it is done properly? What mistakes can happen during installation? Is any special handling, installation techniques or equipment required?
- Potential disadvantages at this site: Any physical constraints? Weight or buoyancy issues? Durability issues? Energy requirements?
- Operation and maintenance (O&M) requirements and costs: New technologies will not have long-term data on O&M requirements, so it is particularly important that an applicant provide all available information for evaluation.

B. Data on how well the product or technology works, including:

- Minimum siting and design specifications necessary to achieve the stated performance.
- Full range of operating conditions for the technology, including the minimum, maximum, and optimal conditions to meet the stated performance claims (flow rate, residence time, rainfall intensity, pollutant loading, etc.)
- Description of hydraulics and system sizing to meet the performance claims.
- Discussion of any pretreatment required to meet the performance claim.
- Flow proportional sampling from laboratory testing and full-scale field testing that is representative of the potential range of rainfall events and located at sites similar to the conditions of the installation under review.
- Estimated TSS removal rate should be presented, based on a verified performance rating for the proposed product/technology. If the proponent makes a claim for a higher TSS removal rate than the verified removal rate, the applicant must provide sufficient data to support the claim. Removal rates should show removal of various particle sizes across the full range of operating conditions including maximum, minimum and optimal conditions for reliable performance.
- Calculation of TSS removal rate of the entire stormwater management system if the proprietary device is one component of a stormwater treatment train, in order to document compliance with the 80% TSS removal standard.
- A copy of the site's operation and maintenance plan including operational details on any full-scale installations: e.g., locations, length of time in operation, maintenance logs (logs should record the dates of inspections and cleaning, actions performed, quantities of solids removed, and time required for work).
- Information on any system failures, what those failures were, and how were they corrected.
- Copies of articles from peer-reviewed, scientific or engineering journals.
- Approvals or permits involving the proposed product/technology from other authorities.
- References along with contact information from other installations.

C. Operation and Maintenance Plan:

- To ensure that the system will function as designed, stormwater management systems must have a written operation and maintenance plan in accordance with the Connecticut Stormwater Quality Manual. Routine maintenance is critical to the performance of all stormwater control technologies. Proprietary stormwater BMPs may perform well, but only if they are installed and maintained as specified by the manufacturer. For example, some wet vaults may be able to achieve a high TSS removal rate, but only if they are cleaned often enough to prevent re-entrainment of previously trapped sediment.
- The operation and maintenance plan shall:
    - Identify access points to all components of the stormwater system;
    - Specify equipment, personnel, and training needed to inspect and maintain system;

- Include a list of any safety equipment and safety training required for personnel;
- Set forth a suggested frequency of inspection and cleaning; and
- Provide a sample inspection checklist and maintenance log.

The Connecticut Stormwater Quality Manual and product manufacturers should be consulted for further guidance on operation and maintenance of proprietary stormwater BMPs.

1.2 Step 2 – Evaluate Information (Approving Authority)

The approving authority should ask the following questions to evaluate whether a proposed use of a proprietary stormwater BMP, either as a stand-alone product or in combination with other stormwater management practices and technologies, meets the requirements of this manual and guidance contained in the Connecticut Stormwater Quality Manual.

A. Why is this technology being proposed for this site? Possible reasons are the alternative technology provides a higher level of environmental protection, uses less land area, and is less expensive on a capital or operation and maintenance cost basis. The performance data and other information provided with the application should support these claims. For example, if the applicant proposes an alternative technology, because it is less expensive to maintain than a conventional stormwater control technology system, the applicant should submit information supporting that claim.

B. How convincing is the performance data? Proponents should demonstrate that their calculations show satisfactory performance in a laboratory, and preferably, adequate field-testing results. Were performance data (laboratory or field) collected by the technology developer or by independent organizations? Independent data are preferable, but may not always be available. If applicable, do the data and calculations support the claim of a higher TSS removal rate? Is the site similar to other locations where the alternative technology is already properly operating? The greater the similarity in key factors (e.g., soil conditions, climate, sediment loading rates, surficial geography, slopes), the greater the likelihood that the technology will properly work at the proposed site.

C. Are the data sets complete? If there are any gaps, why? Are you satisfied with the reasons given as to why there are gaps? For example, if maintenance data are provided for a two-year period, and there is a six-month gap in the record, a reasonable explanation for the gap should be provided. Is there enough information to persuade the approving authority that the technology will work as proposed?

D. Technologies may not work all the time or at all locations, and therefore, failures may be expected. If there have been failures, either in the laboratory or in real settings, is the applicant able to adequately explain the reasons for the failure?

Examples could be poor design, improper sizing, and higher sediment loading than anticipated, extreme hydrologic events, poor installation, or poor maintenance. If it was a design problem, has the design of the technology been modified to address the problem? For failures that were not design related, what corrections were made to prevent future failure? Were systems rechecked to see if they were functioning properly after corrections were made?

E. If only limited data is available, is it possible to assess how the technology will work over its expected life? If seasonality is an issue, the approving authority could request performance data collected over a full change of seasons that reflect a normal weather year, or at least an estimate of normal annual operations based on available data. Can the technology function well for the full range of storm events that must be controlled? If not, is there a way to address this problem?

F. Is it possible that a technology may effectively meet one standard, but hamper compliance with other standards? For example, a technology might increase the rate of TSS removal, but limit the annual recharge. The proponent should provide documentation to help the approving authority make this evaluation. Do the advantages of the technology potentially outweigh its disadvantages?

G. Check any references provided by the applicant to find out whether previous installations are properly functioning. If the information indicates that other local approving authorities have previously approved this technology for use in their municipalities, check with those commissions to verify that the system has performed properly. Were there unexpected operation and maintenance costs? If there were problems, did the vendor assist in resolving them?

1.3 Step 3 – Make a Decision (Approving Authority)

If there appears to be sufficient information, the approving authority should issue a written decision approving (with or without special conditions) or denying the use of the proposed technology, and the reason in the event of a denial.

If insufficient information exists, and the approving authority cannot adequately evaluate the proposed technology, the approving authority may either deny the project based on the lack of information and specify what information is lacking in the denial or request the proponent provide additional information.