



November 2016

**CONDITIONAL USE LEVEL DESIGNATION FOR BASIC (TSS)
& PHOSPHORUS TREATMENT**

For

**Contech Engineered Solutions Media Filtration System (MFS)
With Perlite Media Operating at 2 gpm/ft²**

Ecology's Decision:

Based on CONTECH Engineered Solutions application submissions, Ecology hereby issues the following use level designations for the Media Filtration System (MFS) with Perlite Media operating at 2 gpm/ft²:

- 1. Conditional Use Level Designation (CULD) for Basic Treatment (total suspended solids).**
 - Sized at a hydraulic loading rate of no greater than 2 gallons per minute (gpm) per square foot (ft²) of media surface, which is equivalent to 18 gpm for a 22-inch tall, 18-inch diameter cartridge, or 9 gpm for a 12-inch tall, 18-inch diameter cartridge.
 - Using perlite media
 - Internal bypassing needs to be consistent with the design guidelines in CONTECH's current product design manual.
- 2. Conditional Use Level Designation (CULD) for Phosphorus Treatment.**
 - Sized at a hydraulic loading rate of no greater than 2 gallons per minute (gpm) per square foot (ft²) of media surface, which is equivalent to 18 gpm for a 22-inch tall, 18-inch diameter cartridge, or 9 gpm for a 12-inch tall, 18-inch diameter cartridge.
 - Using perlite media
 - Internal bypassing needs to be consistent with the design guidelines in CONTECH's current product design manual.
- 3. Ecology approves MFS units with Perlite Media for Basic and Phosphorus Treatment at the hydraulic loading rate of 2 gpm/ft². Calculate the design flow rate using the following methods. Sizing for the individual facilities shall follow the WWHM sizing procedure developed by CONTECH.**

- **Western Washington:** For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.
- **Eastern Washington:** For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMM EW) or local manual.
- **Entire State:** For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.

4. These Use Level Designations expire on June 30, 2017 unless extended by Ecology, and are subject to the conditions specified below.

NOTE: The MFS unit with perlite media, operating at 1 gpm/ft², currently has GULD approval for Basic Treatment. This document pertains to the MFS units operating at 2 gpm/ft².

Ecology's Conditions of Use:

The MFS shall comply with these conditions:

1. Design, assemble, install, operate, and maintain MFS units in accordance with CONTECH Engineered Solutions applicable manuals and documents and the Ecology Decision.
2. CONTECH commits to submitting, a QAPP for review by June 30, 2015 that meets the TAPE requirements for attaining a GULD for Basic and Phosphorus Treatment (initial field monitoring has already been completed). If Ecology requires additional monitoring, Contech shall prepare a revised QAPP to describe the extended monitoring program.
3. CONTECH Engineered Solutions shall complete all required testing and submit a TER for Ecology review by September 15, 2016.
4. Install MFS systems in such a manner that the system will bypass flows exceeding the design treatment rate. Install the system to ensure captured sediments will not resuspend during operation.
5. The Owner shall provide pretreatment of TSS and oil and grease (if necessary) in accordance with the most current versions of the CONTECH's Product Design Manual or the applicable Ecology Stormwater Manual.

6. Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a “one size fits all” maintenance cycle for a particular model/size of manufactured filter treatment device.

- **Typically, CONTECH designs MFS systems for a target filter media replacement interval of 12 months. Maintenance includes removing accumulated sediment from the vault, and replacing spent cartridges with recharged cartridges.**
- **Indications of the need for maintenance included the effluent flow decreasing to below the design flow rate, as indicated by the scumline above the shoulder of the cartridge.**
- **Owners/operators must inspect MFS with Perlite for a minimum of twelve months from the start of post-construction operation to determine site-specific maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season. (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to SWMMEW, the wet season in eastern Washington is October 1 to June 30). After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.**
- **Conduct inspections by qualified personnel, follow manufacturer’s guidelines, and you must use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.**
- **When inspections are performed, the following findings typically serve as maintenance triggers:**

- **Accumulated vault sediment depths exceed an average of 2 inches, or**
- **Accumulated sediment depths on the tops of the cartridges exceed an average of 0.5 inches, or**
- **Standing water remains in the vault between rain events, or**
- **Bypass during storms smaller than the design storm.**
- **Note: If excessive floatables (trash and debris) are present, perform a minor maintenance consisting of gross solids removal, not cartridge replacement.**

• CONTECH Engineered Solutions may request Ecology to grant deadline or expiration date extensions, upon showing cause for such extensions.

7. Discharges from MFS units shall not cause or contribute to water quality standards violations in receiving waters.

Applicant: Contech Engineered Solutions

Applicant's Address: 11835 NE Glenn Widing Drive
Portland, OR, 97220

Application Documents:

- Media Filtration System (MFS™) Perlite at a Specific Flow Rate of 2 gpm/ft². Submittal to Washington State Department of Ecology (June 17, 2011). Prepared by CONTECH Engineered Solutions. Received June 30, 2011.
 - Application Summary (6 pg.)
 - Appendix A – Design drawings
 - Appendix B – Typical photos
 - Appendix C – Specification
 - Appendix D – Maintenance Procedures
 - Appendix E – Lab TSS Testing – NJCAT Lab Verification
 - Appendix F – Lab Phosphorus Testing
 - Appendix G – Field Testing QAPP and Report
 - Appendix H – NJCAT Field Verification

- Media Filtration System (MFS™) Perlite at a Specific Flow Rate of 2 gpm/ft² (2nd Edition). Submittal to Washington State Department of Ecology (October 2012). Prepared by CONTECH Engineered Solutions. Received October 26, 2012.
 - Appendix A – Drawings
 - Appendix B – System Specifications
 - Appendix C – Media Specifications
 - Appendix D – Warranty
 - Appendix E – Quality Assurance Project Plan
 - Appendix F – Technical Memoranda
 - Appendix G – Raw data (laboratory reports, chain of custody forms).
 - Appendix H – Individual Storm Reports (ISRs)
 - Appendix I – Operation and Maintenance
 - Appendix J – Third-Party Review Correspondence
 - Appendix K – NJCAT Verification & Site Report

Applicant's Use Level Request:

- General Use Level Designation (GULD) as a Basic and Phosphorus treatment device in accordance with Ecology's 2005 *Stormwater Management Manual for Western Washington* and 2008 *Technical Guidance Manual for Evaluating Emerging Stormwater Treatment Technologies*.

Applicant's Performance Claims:

- The MFS using perlite media and operating at a hydraulic loading rate of 2 gpm/ft² will meet the Basic and Phosphorus treatment performance goals in accordance to the 2008 *Technical Guidance Manual for Evaluating Emerging Stormwater treatment Technologies*.

Ecology's Recommendations:

- CONTECH Engineered Solutions provided an application for the Media Filtration System (MFS) utilizing perlite media and operating at a hydraulic loading rate of 2 gpm/ft². Ecology must review the QAPP and TER to assess performance relative to Ecology's Basic and Phosphorus Treatment goals.

Findings of Fact:

- The New Jersey Corporation for Advance Technology (NJCAT) Program approved the MFS with perlite media, operating at a hydraulic loading rate of 2 gpm/ft² for an 80% TSS removal rate.
- CONTECH conducted field testing at Lolo Pass Road at Bear Creek Bridge in Zigzag, OR. Test results from 2004-2005 monitoring resulted in the Ecology GULD determination for Basic Treatment at 1 gpm/ft². Test results from 2007-2008 monitoring resulted in the NJCAT verification of 80% TSS removal. Contech is submitting the same data collected during the 2007-2008 monitoring period to the TAPE Program in consideration for Basic and Phosphorus treatment at 2 gpm/ft².
- For 19 sampled storm events, influent TSS concentrations ranged from 60 to 575 mg/L. Discrete storm event TSS removal ranged from 58 to 97 percent. The mean TSS removal efficiency based on the aggregate load reduction method was 86 percent.
- For 19 sampled storm events, influent TP concentrations ranged from 0.109 to 0.469 mg/L. Discrete storm event TSS removal ranged from 13 to 84 percent. The mean TP removal efficiency based on the aggregate load reduction method was 59 percent.

Other MFS Perlite 2 gpm/ft² Matters to be Addressed by the Applicant:

1. Ecology may require further testing to assess MFS effects on dissolved phosphorus. Dissolved phosphorus results for 17 of the 19 storm event samples collected at Lolo Pass Road were either non-detects (laboratory detection level of 0.2 mg/L) or were not analyzed (due to holding time issues).
2. CONTECH shall provide written documentation from NJCAT pertaining to the approval discussed above.
3. CONTECH will provide clarification and any additional information requested by Ecology prior to the final acceptance of the QAPP and TER by Ecology.
4. Conduct field testing at sites that are indicative of the treatment goals.

5. Conduct testing to obtain information about maintenance requirements in order to determine a typical maintenance cycle.
6. Conduct testing to determine if oils and grease affect the treatment ability of the filter media. Determine how oil and grease may affect the ion-exchange capacity of the system if Contech wishes to make claims for metals or phosphorus removal.

Technology Description

<http://www.contech-cpi.com/Products/Stormwater-Management/Treatment/MFS.aspx>

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Revision History

| Date | Revision |
|---------------|--|
| December 2011 | Original use-level-designation document |
| August 2012 | Revised design storm description. |
| November 2012 | Revised Maintenance Inspection requirements |
| January 2013 | Update format to match Ecology standard |
| April 2014 | Revised Due dates for QAPP and TER and changed Expiration date |
| November 2016 | Revised Contech contact information |