



COLORADO
Department of Public
Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

July 21, 2016

Nicholas Lucas
Technical Sales Manager
Evoqua Water Technologies LLC
725 Wooten Road
Colorado Springs, CO 80915

Subject: Acceptance of the Evoqua Memcor® S10N membrane filtration module as an Alternative Filtration Technology to meet the *Colorado Primary Drinking Water Regulations* requirements for *Giardia lamblia* and *Cryptosporidium* Removal

Dear Mr. Lucas;

The Colorado Department of Public Health and Environment's Water Quality Control Division ("the Department") has received and reviewed the information for the Evoqua Memcor® S10N submerged ultrafiltration modules in accordance with Section 11.8(2)(b)(ii) and 11.10(5)(j) of the *Colorado Primary Drinking Water Regulations* (Regulation 11), 5 CCR 1002-11. The S10N modules meet or exceed the requirements of the *State of Colorado Design Criteria for Potable Water Systems* (DCPWS) Sections 1.11 and 4.3.8 in addition to the requirements of Regulation 11. The technology is conditionally accepted for use as an Alternative Filtration Technology and granted the removal credit in Table 4.1, Section 4.3.8.2 of the DCPWS. The technical specifications and conditions of acceptance for the Scinor Modules are outlined in Table 1 of this document as well as Section 4.3.8 of the DCPWS.

This acceptance addresses the following items:

- Evoqua Memcor® S10N

This acceptance applies only to the Memcor® Ultrafiltration Modules and does not constitute construction approval for installation at any public water system. Each individual submittal to the Department must demonstrate conformance with Section 4.3.8 of the DCPWS for each installation of the filters. **Review and approval for the design of any public water system proposing to use this technology will be handled on a case-by-case basis by the Department as required by Section 11.4 of Regulation 11.**

As part of this review, the Department has evaluated the following documents:

- Evoqua submittal for alternative technology acceptance, February 24, 2016
- NSF Testing Report for Evoqua Memcor® S10N Modules - January 2, 2013
- Memcor® cut sheets

Any addenda that will modify these modules must be submitted to the Department for review and acceptance prior to use in Colorado by a regulated public water system. This requirement includes any changes made to the S10N Modules, materials of construction, or associated interfaces with process piping. The Department will review any additional third party verification reports and issue a revised acceptance letter if appropriate.



Table 1: Evoqua Memcor® S10N Technical Specifications and Conditions of Acceptance

Filter Manufacturer	Evoqua Water Technologies, LLC
Filter Model	Memcor® S10N
Surface area per module (ft ²)	250
Maximum Flux (gfd -gallons per sq. ft. per day) @ 20 °C	80
Maximum Flux (gfd) @ 1 °C	46
Max Transmembrane Pressure lbs per square inch differential (psid)	22
Alarm Transmembrane Pressure (psid)	12.3
Maximum Backwash Pressure - lbs per square inch gauge (psig)	22
Minimum direct integrity test pressure (starting pressure) (psig)	10.9
Direct integrity testing failure criteria	Pressure drop > 1.5 psi per minute
Prefiltration	250-500 micron pre-screening is required
Additional Operations and Maintenance Criteria	
<ol style="list-style-type: none"> 1. If a filter fails an integrity test, the filter must be removed from service immediately and replaced with a functional filter or repaired prior to being returned to operation. 2. The public water system must keep records of the following operational parameters (available for Department review): <ol style="list-style-type: none"> a. Integrity test date, results (pass or fail), and initials of person performing the test b. Calculated LRV for each integrity test (as applicable) c. Clean in place (CIP) dates with clean water permeability and integrity test result. d. Filter maintenance and fiber repair results e. Filter replacement date and reason for replacement. 3. Public water systems must maintain an operation and maintenance manual for the micro/ultrafiltration system. All integrity tests and CIP procedures must follow manufacturer prescribed procedures. 	

Please be aware that any point source discharges of water from treatment facilities are potentially subject to a discharge permit under Colorado’s State Discharge Permit System. Any point source discharges to state waters without a permit are subject to civil or criminal enforcement action.

Please direct any further correspondence regarding this acceptance to:

Tyson Ingels, P.E.
 Colorado Department of Public Health and Environment
 Water Quality Control Division
 4300 Cherry Creek Drive South
 Denver, CO 80246

*Nicholas Lucas
Evoqua Water Technologies, LLC
July 19, 2016
Page 3*

If you have any questions or comments, please call Tyson Ingels at 303-692-3002.

Sincerely,

Tyson Ingels, P.E.
Lead Drinking Water Engineer
Engineering Section | Water Quality Control Division
Colorado Department of Public Health and Environment