



July 12, 2012

FOREMOST FARMS
LES ISON
E10889A PENNY LANE
BARABOO WI 53913

EXCEL ENGINEERING
JEFF QUAST
100 CAMELOT DRIVE
FOND DU LAC WI 54935

Re: Description: WATER TREATMENT DEVICE - SITE SPECIFIC/COMMERCIAL
Manufacturer: EXCEL ENGINEERING
Product Name: FOREMOST FARMS - CHILTON
Model Number(s): NITRATE - POE REVERSE OSMOSIS
Trans I.D. 2098166
Product File No: 20120251

The specifications and/or plans for this plumbing product have been reviewed and determined to be in compliance with chapters SPS 382 through 384, Wisconsin Administrative Code, and Chapters 145 and 160, Wisconsin Statutes.

The Department hereby issues an approval based on the Wisconsin Statutes and the Wisconsin Administrative Code. This approval is valid until the end of July 2017.

This approval is contingent upon compliance with the following stipulation(s):

- This product has undergone sufficient testing to document the product's ability to reduce only those contaminants and/or substances as specified in this approval letter when the product is installed and maintained in strict accordance with the manufacturer's published instructions.
- Where the Department of Natural Resources (DNR) has jurisdiction, a written approval may be required prior to installation of this product in a water supply system to reduce the concentration of a contaminant that exceeds the primary drinking water standards contained in ch. NR 809, Wis. Admin. Code, the enforcement standards contained in ch. NR 140, Wis. Admin. Code, or for a water supply system that is subject to a written advisory opinion by the DNR. For more information contact the DNR Section of Private Water Systems, P.O. Box 7921, Madison, WI 53707, telephone (608) 267-9787.
- If this approved device is modified or additional assertions of function or performance are made, then this approval shall be considered null and void, unless the change is submitted to the department for review and the approval is reaffirmed.
- The system shall be provided with an in-line total dissolved solids (TDS) monitor, or other acceptable means, to warn the user when the system is not performing its functions. Acceptable alternatives to an in-line TDS monitor include:
 1. Terminating the discharge of treated water;
 2. sounding an alarm which is connected to acceptable power source;
 3. flashing a light connected to an acceptable power source;
 4. providing the user with an obvious, readily interpretable, indication of the system's ability to perform (e.g. decreasing the flow rate of treated water by 50% or more for systems making mechanical filtration claims;
 5. providing a sampling service by the manufacturer, either directly or through an authorized dealer, a minimum of once every six months;

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6. providing a sampling kit for analysis of TDS or other appropriate contaminants; or
7. providing a TDS monitor to measure the RO permeate quality.

Whichever means of TDS reduction performance verification is selected it shall be clearly described and documented in the "Project Narrative" provided to Foremost Farms.

- In addition to the product water quality monitor specified elsewhere in this letter, this device shall be provided with one of the following means to warn the user when the system is not performing its function specifically in the context of nitrate reduction:
 - a. a nitrate/nitrite monitor on the RO permeate water stream; or
 - b. a sampling and analysis kit for nitrate/nitrite with explicit instructions of recommended frequency of analysis.

Whichever means of nitrate reduction performance verification is selected it shall be clearly described and documented in the "Project Narrative" provided to Foremost Farms.

- The finished installation must undergo a final inspection prior to the treated water being used for consumptive purposes. The Plumbing Consultant having jurisdiction in this area is Scott Altenberger. Mr. Altenberger can be reached via the following:

Phone: 608-235-0557

E-mail: scott.altenberger@wi.gov

If the treated water is used for consumptive purposes prior to passing the final inspection, then this approval may be rendered null and void and the device ordered removed. The Plumbing Consultant shall provide a written indication of the results of the final inspection to the system owner. When the final inspection has been passed, the Plumbing Consultant will notify the Wisconsin Department of Natural Resources (WDNR) Field Staff having authority over the well. The WDNR will then monitor the quality of the treated water to its satisfaction. Monitoring advice, which the WDNR is free to accept or reject, is provided elsewhere in this letter. The WDNR Field Staff having authority over this well is Greg Moeller. Mr. Moeller can be contacted via the following:

Phone: 920-662-5147

E-mail: gregory.moeller@wisconsin.gov

- The suggested monitoring interval for this installation is quarterly. As a minimum, the following tests should be performed:
 1. nitrate, raw and treated
 2. nitrite, raw and treated
 3. microbiological safety, raw

Because the current treatment scheme relies on dilution to achieve the intended function, the raw water must be analyzed so any increased nitrate/nitrite concentrations can be compensated for by increasing the dilution ratio. The RO permeate samples should be collected from a dedicated sample tap down stream of the RO system and upstream of the point of raw water blending, but prior to any storage tanks. The following design dilution ratios were described in the "Project Narrative":

Daily routine operational dilution ratio = 50 gpm RO permeate/55 gpm raw water = 0.91 rendering an approximate nitrate concentration of 6.0 mg/l at present raw water nitrate concentration.

Daily peak operational dilution ration = 50 gpm RO permeate/173 gpm raw water = 0.29 and an approximate nitrate concentration of 8.3 mg/l at present raw water nitrate concentration.

Samples of blended water should be taken immediately after the point of blending and prior to any storage tanks.

- If this approved plan is modified, or additional assertions of function or performance are made, then this approval shall be considered null and void, unless the change is submitted to the department for review and the approval is reaffirmed.

In addition, please note the following that must be provided:

- a. the influent feed water pressure to this device must be \geq the manufacturer's designed minimum at all times.
 - b. a product water quality monitor must be installed (general membrane integrity); and
 - c. nitrate test strips, or equivalent, must be provided to the business owner (specific nitrate reduction membrane performance)
 - d. the influent water to the RO system must be pretreated as required to prevent premature membrane fouling.
- Any wall hydrant that is not served by the nitrate treatment device must have one, or more, of the following:
 1. The handles of the hydrant shall be removed;
 2. The hydrant shall be capped and sealed using solder; or
 3. Signage shall be posted immediately above the hydrant indicating the water is unfit for human consumption.
 - All water distribution piping, potable and non-potable, shall be marked as required by Table 82.40-1a. In addition, any untreated water outlets, other than water closets and urinals, must continually post a WDNR approved public notice which advises Foremost patrons/employees that nitrate levels may 10 mg/l and the potential health effects of exposure.
 - No bypass piping shall be installed on this nitrate reduction device. However, a locking bypass valve may be permissible.
 - Any wall hydrants that are not served by the nitrate treatment device must have one, or more, of the following:
 - a. The handles of the hydrant shall be removed;
 - b. The hydrant shall be capped and sealed using solder; or
 - c. Signage shall be posted immediately above the hydrant indicating the water is unfit for human consumption
 - The water treatment system includes a chemical injection pump. The chemical injection pump must be a pump previously approved by this department:

http://dsps.wi.gov/php/sb-ppalopp/prodcode_result.php/WTCID/WATER_TREATMENT_CHEMICAL_INJECTION_DEVICE_-_POE

The anti-scalant must conform to NSF Standard 60 and be used at a concentration \leq the documented maximum use concentration. The purpose of the anti-scalant is to allow the drain flow rate to be reduced such that the RO membranes do not foul prematurely via deposits formed due to super saturation.

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Reverse osmosis (RO) while an effective process for reducing nitrate from water, can also be relatively inefficient in the context of water use. For this reason, we encourage Foremost Farms to capture the reject water flow and reuse it for a non-potable purpose, such as toilet flushing or irrigation. This is a suggestion and not a condition of approval.

The department is in no way endorsing this product or any advertising, and is not responsible for any situation which may result from its use.

Sincerely,

Glen W. Schlueter
Engineering Consultant
Safety and Buildings Division
Department of Safety and Professional Services
(608) 267-1401 Phone
(608) 267-9566 Fax
glen.schlueter@wi.gov Email
7:30AM - 4:30PM CT Work Hours

GWS:gws