

Water Treatment Membrane Filtration Attachment

NPDES/SDS Permit Program

Doc Type: Permit Application

The National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Permit Program regulates wastewater discharges to land and surface waters. This attachment applies to municipal and industrial water treatment facilities that utilize membrane filtration treatment (i.e. reverse osmosis, ultrafiltration, microfiltration, nanofiltration and electrodialysis).

Complete the attachment by typing or printing in black ink. Attach additional sheets as necessary. For more information, please contact the Minnesota Pollution Control Agency (MPCA) at: In Metro Area: 651-296-6300 or Outside Metro Area: 800-657-3864.

Facility Information

1. **Permittee name:** _____ **Permit number:** MN
2. Describe the membrane filtration process used by your facility:

Treated Water Use

3. Water treatment wastewater from the facility is discharged to (check all that apply):
 - ☐ Surface water – Name: _____
 - ☐ Municipal storm sewer (identify where this discharges): _____
 - ☐ Sanitary sewer (*Discharges to Sanitary do not require an NPDES/SDS Permit*)
 - ☐ Seepage basin or rapid infiltration basin

Membrane Filtration

4. What is the average production of the treatment component in gallons per day? _____ gallons/day
5. What is the maximum production capacity of the treatment component in gallons per day? _____ gallons/day
6. What is the average daily design discharge rate for the treatment component in gallons per day? _____ gallons/day
7. What is the maximum daily design discharge rate for the treatment component in gallons per day? _____ gallons/day
8. How often is there a discharge to the environment? Specify frequency, volume, and duration. (ex. 5000 gal/18 hours, once every day.)

9. What is the volume of the discharged rinsate water in gallons per day? _____ gallons/day
10. What is the volume of the discharged reject water in gallons per day? _____ gallons/day
11. Describe how system cleaning and maintenance wastewater is managed, including membrane clean-in-place, permeate flush, etc. Specify frequency, volume, and duration. (ex. 13.5 gal/3 hours, once every 2 months.)

12. Where is the cleaning wastewater discharged? (ex. sanitary sewer, surface water, etc.)

13. Spent membranes are a solid waste. Describe the disposal management of spent membranes.

Water Quality Testing

Sample results for the following parameters are required as part of the permit application submitted to the MPCA. The sample shall be a composite sample, representative of the **total discharge** to the environment, collected at a time during the 12-month period before the permit application is submitted. Also include any additional test parameters required by your existing NPDES/SDS permit. For new discharges, these test parameters are required for the raw water. Additional sampling is required for other known contaminants in the source water that are not on the list below. An example of this would be radium.

Analyte	Results	Units
Acute Whole Effluent Toxicity ¹		
Aluminum, Total		mg/L
Ammonia-Nitrogen (as N)		mg/L
Arsenic, Total (as As)		mg/L
Bicarbonates		mg/L
Boron, Total (as B)		ug/L
Bromide, Total		mg/L
Cadmium, Total		mg/L
Calcium, Total (as Ca)		mg/L
Chloride, Total		mg/L
Chromium, Hexavalent (as Cr)		mg/L
Chromium, Total		mg/L
Copper, Total		mg/L
Cyanide, Total		mg/L
Fluoride, Total		mg/L
Hardness, Calcium & Magnesium, calculated (as CaCO ₃)		mg/L
Iron, Total		mg/L
Lead, Total		mg/L
Magnesium, Total (as Mg)		mg/L
Mercury, Total		mg/L
Nitrate-Nitrite-Nitrogen (as N)		mg/L
pH, field ²		SU
Phosphorus, Total		mg/L
Potassium, Total (as K)		mg/L
Salinity, Total		mg/L
Selenium, Total		mg/L
Silver, Total		mg/L
Sodium, Total (as Na)		mg/L
Solids, Total Dissolved (TDS)		mg/L
Solids, Total Suspended (TSS)		mg/L
Specific Conductance, field ²		umh/cm
Sulfate, Total (as SO ₄)		mg/L
Temperature, field ²		Degrees F
Zinc, Total		mg/L

¹ See information below on toxicity testing. ² Analyze Immediately. (mg/L = milligrams per liter ug/L = micrograms per liter)

Acute whole effluent toxicity testing instructions: The Acute Whole Effluent Toxicity Test is a static renewal test conducted on an exponentially diluted series of effluent. The purpose is to calculate the proportion of effluent that causes 50 percent mortality/immobility of aquatic organisms at 48 or 96 hours. An LC₅₀/EC₅₀ (lethal/immobile concentration) less than or equal to 100 percent effluent constitutes a positive for toxicity. Tests shall be conducted in accordance with procedures outlined in EPA-821-R-02-012 "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms" - Fifth Edition (Acute Manual) and any revisions to the Manual. Any test that is begun with an effluent sample that exceeds a total ammonia concentration of 10 mg/l shall use the carbon dioxide-controlled atmosphere technique to control pH drift. Test organisms for each test battery shall include the fathead minnow (*Pimephales promelas*)-Method 2001.0, *Ceriodaphnia dubia*-Method 2002.0, and *Daphnia magna*-Method 2021.0. Static renewal acute serial dilution tests of the effluent shall consist of a control 12, 25, 50, 75 and 100 percent effluent. All effluent samples shall be flow proportioned, 24-hour composites. Test solutions shall be renewed daily from each fresh composite. Testing of the effluent shall begin within 36 hours of sample collection. Receiving water collected outside of the influence of discharge shall be used for dilution and controls. Any other circumstances not addressed in the previous requirements or that require deviation from that specified in the previous requirements shall first be approved by the MPCA.

Please make a copy for your records. Refer to the *Transmittal Form* for mailing instructions.