



System Maintenance and Operations & Summarized Operating Procedures

1. Daily Operations

Readings: turbidity, chlorine, flow meters

- Check the ozone to ensure output is within specified range
- Walk around the system

2. Backwashing the Filters

Frequency of Backwashing is dependent on water quality and volume:

- Roughing Pre-filter: once every 1 to 30 days
- BioSand Filter: once every 2 to 10 weeks (longer with Roughing Pre-filter)
- BioCarbon Multimedia Filter: once every 5 to 12 months

Summarized Backwashing Procedure:

Mainstream's backwashing procedure is a Clean-In-Place process as no media needs to be removed or replaced. The objective of the backwash procedure is to dislodge the Schmutzdecke and intra-media particles by bubbling air and water up through the filters.

Steps:

- Close valves to isolate the particular filter to be backwashed
- Using an air compressor bubble air up through the filter
- Allow the media to settle and drain the filter to the drain level
- Bubble air and finished water from the storage reservoir up through the filter
- Allow the media to settle and drain backwashing water to the sewer
- Place valves back to normal operating positions



Sample Operating Cost Estimation

The following costs have been estimated for a 225m³ SCOR system designed to treat challenging surface water (prairie dugout). This represents the most demanding treatment requirements, therefore, the highest range of operating costs.

Annual Input Costs

Electricity Consumption (annual cost @ \$0.0864/kwhr)	\$2,167.00
Annual Repairs & Maintenance (mechanical equipment replacement, etc.)	\$750.00
Heating Cost for Treatment Building (1,800ft ²)	\$1,200.00
Annual Allowance for Carbon Media Replacement (replacement every 4 years @ \$16,350.00)	\$4,087.00
Miscellaneous Chlorine Costs	\$500.00
Total Out-of-Pocket Costs	\$8,704.00

Labour Requirement

Daily Checks/Records	30 minutes/day
Backwashing Operations (based on typical filter run times)	Average 3 hours/week

Note:

A. 75% of electrical costs are associated with the ozone system, the specifications of which vary with the raw water parameters. Electricity is supplied as 230V, 3-phase. Electrical consumption does not include non-treatment components or supply and distribution requirements.

B. Building heating costs are based on treating 112m³ average with raw water temperature averaging 3C for 6 months and 15C for 6 months. Building specifications are insulated as per standard Mainstream building specifications.

C. Filter run times vary with water volume, water contaminant levels and operator technique. The time requirement is based on backwashing as follows: Roughing Pre-Filter every 10 days, BioSand Filter every 4 weeks and Multimedia Filter every 25 weeks.