



Waterloo
BIOFILTER



SITE NAME

Sewage Treatment System

Owner's Manual



Waterloo
BIOFILTER

SITE NAME
Owner's Manual

| | |
|----------------------------|----------------------------|
| Waterloo Model: | <u>BAxxx</u> |
| Hydraulic Capacity: | <u>xx,xxx L/day</u> |
| Serial Number: | <u>IN-xxxxxx</u> |

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Table of Contents

- Important Safety Warnings..... 5
- Introduction 6
 - Document Purpose6
- How the Waterloo Works..... 7
 - Description7
 - System Components8
 - System Component Functions.....9
- System Use and Operation..... 10
 - System Start-Up10
 - Seasonal and Prolonged Periods of Non-Use.....10
 - Operational Instructions.....10
 - Owner’s Responsibilities10
 - Do11
 - Do Not11
 - Additives12
- Alarms..... 13
- Indications of a Problem..... 13
- Service and Maintenance Contracts 14
- FAQ 15
- Limited Warranty..... 17
 - Particular Exclusions20

Important Safety Warnings

| | |
|---|--|
|  | <p>There are pipes and electrical wires buried near your Waterloo Biofilter wastewater treatment system. Please contact your installer or maintenance provider before any excavation in the area surrounding your treatment tanks or leaching bed. Failure to do so may result in damage to the system and serious electrical shock!</p> |
|  | <p>DO NOT attempt to service any component of the Waterloo Biofilter system yourself and DO NOT attempt to enter any of the tanks. You risk serious injury or death by doing so!</p> |
|  | <p>Your Waterloo Biofilter leaching bed is designed and constructed for your unique site. Please contact your installer or maintenance provider before carrying out any landscaping or re-grading in the area surrounding your treatment tanks or leaching bed.</p> |
|  | <p>Ensure that the lids on all treatment tanks are accessible to grade always. This will facilitate system inspection and maintenance. Ensure lids are fully secured.</p> |
|  | <p>Your Waterloo Biofilter system is a biological treatment system and its proper function is dependent on the characteristics of your wastewater. DO NOT pour anything down your drains/toilets/sinks that will not biodegrade or that will harm bacterial populations.</p> |

Introduction

Congratulations and Thank You for choosing a Waterloo Biofilter system! The Waterloo Biofilter is a passive wastewater treatment system that uses an engineered foam filtration medium to effectively and efficiently treat sewage wastewaters. Your Waterloo Biofilter system is designed to treat sanitary wastewater only and should only be used for this purpose.

It is important for all users of the system to follow the instructions outlined in this manual to ensure proper operation. Please have all employees review this Owner's Manual and keep it with your files for future reference.

Document Purpose

This Owner's Manual outlines how the Waterloo Biofilter works, usage guidelines, maintenance and sampling requirements. Following all guidelines will help ensure treatment performance and system longevity.

It is important to note that the owner is responsible for ensuring that the system is properly used according to its intended use and hydraulic treatment capacity. It is the owner's responsibility to respect all applicable local laws and regulations regarding the operation, quality of treated effluent, and discharge into the environment of this system.

How the Waterloo Works

Description

The Waterloo Biofilter is an attached growth biological trickling filter. Sanitary wastewater from the facility is collected in the pre-treatment tank where the sewage settles, and anaerobic bacteria begin the treatment process. Pre-treatment tank effluent is pumped to the Waterloo Biofilter treatment unit. The absorbent foam filter medium within the treatment unit creates an ideal environment for microbial growth and attachment. Beneficial bacteria colonize the interior surfaces of the filter medium where they are protected from predators, desiccation, and freezing. These microbes degrade and oxidize organic pollutants, coliform bacteria, ammonium, and other contaminants as the wastewater is retained in the filter medium by capillarity. Air passively circulates throughout the filter medium providing an aerobic treatment environment without the need for forced aeration. The Waterloo Biofilter provides both physical filtration and biological treatment of wastewater in one step – ensuring high levels of pollutants are removed before water is returned to the natural environment.



Waterloo Biofilter foam filter medium

Treated effluent is returned to the environment from the Biofilter treatment unit to the leaching bed.

System Components

Anaerobic Digester tanks direct the sewage into a long, meandering InnerTube, which provides for a beneficial pre-treatment environment where anaerobic microorganisms breakdown the sewage. As a result of the reactions within the Innertube, a light and fluffy sludge is produced, while the scum layer is kept to a minimum. The sewage makes multiple passes of the tank via the Innertube before exiting the tank at the outlet. An effluent filter may be included on the outlet to keep solids in the tank for further digestion.

Pump tanks store the pre-treated sewage and house float controlled submersible effluent pumps to evenly dose the downstream Biofilter treatment units throughout the day.

Waterloo Biofilter treatment units are free-draining, attached growth, biological trickling filters. The absorbent medium houses beneficial microbes which consume organic pollutants, coliform bacteria, ammonium, and contaminants present in septic tank effluent. Basket treatment units consists of baskets filled with Biofilter medium inside of a tank. Spray nozzles evenly distribute the sewage over top of the baskets, where the sewage is treated as it trickles through the interior of the medium. The units are charcoal vented and equipped with small air fans to promote aerobic conditions. Float controlled submersible effluent pumps recirculate the treated effluent and pump it downstream.

Waterloo Biofilter WaterNOx-LS denitrification treatment units utilize agricultural minerals to denitrify nitrified Biofilter effluent. Float controlled submersible effluent pumps pump the effluent to the leaching bed.

Waterloo Smart Panels operate the pumps and electrical components in the treatment system. The Waterloo Smart Panels provide remote monitoring, control, and data logging over a stable wireless cellular network, allowing for real time operational adjustments to optimize system performance. The Waterloo Smart Panel also immediately notifies the service provider of a pump failure or high-level alarm, providing them with vital information to limit site visits while keeping the system operating properly.

Leaching beds provide final disinfection and direct the effluent back into the subsurface environment.

System Component Functions

| System Component | Function | Service Required | Minimum Frequency | Responsible |
|---|--|--------------------|-----------------------|------------------|
| Anaerobic Digester Tank | Primary Wastewater Treatment | Inspection | Annual | Service Provider |
| | | Pump-Out | As Needed | Owner* |
| Waterloo Innertube | Digestion of Solids | Inspection | Annual | Service Provider |
| | | Pump-Out | As Needed | Owner* |
| Effluent Filter | Prevents Solids and Particulates from Leaving the Tank | Clean | As Needed | Service Provider |
| Control Panel | Controls Pump(s) High-Level Alarm Notification | Inspection | Annual | Service Provider |
| Floats | Initiates Pump Triggers High-Level Alarm | Inspection | Annual | Service Provider |
| Submersible Pump(s) | Dose Treatment Unit/Leaching Bed | Inspection | Annual | Service Provider |
| Inline Filter | Filters Debris | Emptying | Annual | Service Provider |
| Electrical Splice Box(es) | Electrical Wiring | Inspection | Annual | Service Provider |
| Dosing Manifold (spray nozzles) | Distributes Pretreated Effluent Over Treatment Medium | Clean Nozzles | Annual | Service Provider |
| Waterloo Biofilter Baskets | Houses Foam Treatment Medium | Inspection | Annual | Service Provider |
| Foam Treatment Medium | Aerobically Treats Wastewater | Inspection | Annual | Service Provider |
| Sample Port (where required) | Facilitates Sampling | Sample Acquisition | Per local regulations | Service Provider |
| WaterNOx-LS Tank w/ Aggregate Medium | Denitrifies Biofilter Effluent | Inspection | Annual | Service Provider |
| | | Medium Replacement | 5-10 Years | Service Provider |
| Leaching Bed | Disperses Treated Effluent Back into the Environment | Inspection | Annual | Service Provider |

*Service Provider can make recommendations on pump-out requirements

Refer to Appendix A for the system design.

Refer to Appendix B for the sewage treatment process description & the monitoring requirements.

System Use and Operation

System Start-Up

Once the Waterloo Biofilter is installed it should be commissioned and tested by the installer to verify that it is functioning at that time. The owner is responsible for the products that enter the treatment system. Remember to review the Do's and Do Not's section of this manual.

Seasonal and Prolonged Periods of Non-Use

The Waterloo Biofilter is a passive wastewater treatment system. If correctly installed, it does not require special procedures for seasonal or prolonged periods of non-use.

Note that if you turn the power off to your seasonal facility you should also turn off the water. There is no need to have the pre-treatment tank pumped out at the end of the season. Never add anti-freeze to the system.

Operational Instructions

Using and operating a Waterloo Biofilter system is simple. However, the owner is responsible for the products that enter the system and must adhere to the responsibilities and Do's and Do Not's outlined below.

Owner's Responsibilities

The owner is responsible for:

- Using the Waterloo Biofilter according to the instructions in this manual.
- Pumping out pre-treatment tanks when notified by the service provider.
- Providing access to all components of the system.
- Having a service contract in place and providing documentation to new owners should the facility be sold.
- Respecting all local laws and regulations.

Do

- Repair leaky toilets, showerheads and other fixtures.
- Spread laundry and other high flow events over multiple days.
- Use enzyme-based alternatives to bleach products.
- Use cleaning chemicals, soaps, shampoos, and conditioners in moderation.
- Employ cleaning practices that limit the amount of chemicals washed down the drain (use hot water or wipe off residuals with paper towels and dispose in garbage).
- Dispose of fume hood degreaser off-site.
- Divert oil and grease away from the system (use cooking oils etc. in moderation).
- Direct surface water or building water run-off away from the leaching bed.
- Educate users on general best practices.

Do Not

- Discharge harsh chemicals, paints, paint cleaners, disinfectants, pesticides, herbicides, germicides, urinal pucks or any anti-septic or anti-bacterial products into the system.
- Flush materials such as plastics, cigarette butts, disposable diapers, cosmetics, wipes, condoms, sanitary napkins, feminine hygiene products, etc. into the system.
- Discharge non-sanitary wastewater (process water, water softener/water treatment backwash, floor drains, etc.) into the system.
- Discharge water from pools, spas, sump pumps OR RV's into the system.
- Regrade the leaching bed once it is installed.
- Drive or place heavy objects on top any of the tanks, forcemains, or drains.
- Permanently cover any access lids.

Additives

- Only use additives that are approved by Waterloo Biofilter, others may harm or kill the beneficial bacteria in your system.

Please note that medical radiation or irregular immune system responses can affect the health of your system, contact us for further information.

The following items should never enter the wastewater treatment system.

- Process Water
- Floor Drains
- Water Softener Backwash
- Paint – All Kinds
- Solvents – Alcohols, Glycol, Hydrocarbon
- Grease – Commercial and Industrial
- Coffee Grinds
- Bones
- Cooking Fats and Oils
- Cigarette Butts
- Diapers
- ‘Flushable’ Wipes
- Paper Towels
- Facial Tissue
- Sanitary Pads and Tampons
- Condoms
- Disposable Gloves
- Toilet Bleach Pucks
- Antibacterial Products
- Antiseptic Products
- Detergent with Bleach
- Peppermint, Palm, and Tea Tree Oils
- Pesticides, Herbicides
- Sump Pump Discharge
- Eaves Trough Runoff
- Foundation Drainage
- Cosmetic Products
- Industrial Cleansers
- Film Developing Chemicals
- Large Volumes of Olive Oil
- Excessive Hair Gels and Conditioners
- Anti-Dandruff and Medicated Shampoo
- Dead Pets
- Carpet & Upholstery Cleaners
- Expired or Unused Medication
- Disinfectants, Germicides
- Bandages, Cotton Swabs and Balls
- Baby Wipes

Alarms

Your control panel is equipped with audible and visual alarms. When the alarm goes off you will hear a loud buzzer sound and the light on top of the control panel will turn on. It is unlikely for an alarm to go off when the facility is not in use because the system only operates when water is being used.

Why is the alarm going off?

The alarm indicates that the water level in the pump tank or Biofilter is too high.

What should you do?

You should call your maintenance provider immediately. Limit water use until the problem has been corrected.

How do I silence the alarm?

For Standard Panels - Flip the black switch labelled 'SILENCE/TEST' located on the side of the control panel.

For Smart Panels - Press the 'ESC' key on the panel face to silence to alarm.

Remember that this does NOT mean the problem has been solved and you still need to contact Waterloo Biofilter or your service provider to rectify the problem.

Indications of a Problem

The key to high treatment levels and problem-free operation is a healthy bacterial population in your pre-treatment tank. The owner is responsible for ensuring that no products that are harmful to bacteria enter into the system. Remember that everything you put into the system affects what comes out.

If any of these occur, you should call your maintenance provider immediately:

- Sewage odour around your system (Note: odour coming from the vent pipe on the roof is normal and can down-draft.)
- Standing water around the leaching bed.
- Subsiding or very wet soil around the leaching bed.
- Very slow draining of backstopped toilets or fixtures.

Service and Maintenance Contracts

Follow the laws stipulated by your local jurisdiction as owners with advanced wastewater treatment units may be required by law to maintain a current maintenance contract. Failure to maintain a contract will also void your Limited Warranty offered by Waterloo Biofilter.

When contacting your maintenance provider in case of problems or when requesting service, please mention the system specifications that appear on the system label located on the control panel.

Preventative Maintenance Saves Money

Regular maintenance ensures that the system functions properly and remains operational for a long time. Regular maintenance helps to prevent and solve problems before they become large issues that may require costly excavation or replacement.

My Maintenance Provider

Please fill out this section below with the contact details for your maintenance provider. If you do not have a maintenance provider, please contact Waterloo Biofilter Systems at 1-866-366-4329.

Company: _____

Phone: _____

Email: _____

FAQ

What is the protocol for vacations, seasonal facilities, or long periods of non-use?

You do not need to do anything to the system when you leave it unattended for a long period of time. The pumps will remain inactive so long as no wastewater is being generated at the site.

What do I do if the power goes out?

The pumps will not function, and the pump tank and pre-treatment tank will start to fill up. Limit water use until the power returns.

Can I bury the lids to my tanks?

All the lids need to be accessible from the surface to facilitate service and pumping. Keep all lids accessible always.

I notice a sewage odour around my wastewater treatment, what causes this?

A sewage odour is not normal. It is an indication of an unhealthy population of bacteria. The do's and don'ts section in this manual should be reviewed carefully with the residents. Contact Waterloo Biofilter for further troubleshooting.

Can I plant or landscape around my wastewater treatment unit?

Use care when doing any landscaping near your wastewater treatment unit. There are pipes and electrical buried beneath the ground which could be damaged or cause bodily harm while digging or using machinery. Planting shallow rooted plants around the buried tanks is acceptable, so long as the lids remain accessible for service. Do not plant in the area where your dispersal bed is located. If you are unsure of the location consult your septic permit, permitting office, designer, Waterloo Biofilter, and/or local utility authority for guidance before you dig.

How often should my system be pumped?

Oil/grease interceptors and pre-treatment tanks should be pumped when the sludge and scum occupy 1/3 of the working capacity of the tank. Your service technician will indicate if any tanks require pumping after each service visit.

I'm going to sell my facility, what should I do?

Be sure to inform Waterloo Biofilter that you are moving so that we update our records. Please inform the new owners that they will need to sign a contract to receive service visits.

Should I be putting any additives in my wastewater treatment system to improve functionality?

There is a wide variety of additives available. Most systems will have great treatment without additives. If you think you may require an additive, please contact Waterloo Biofilter first to ensure it is the best option for you.

When does the foam treatment medium need to be replaced?

Waterloo Biofilter foam treatment medium comes with a 20-year warranty (further details in the Limited Warranty section). There is no required replacement after that warranty is up; with proper usage by the residents, medium is expected to last much longer.

When does the aggregate medium need to be replaced?

The aggregate medium is expected to last 5-10 years depending on system use. Your service provider can recommend when replacement is required.

Limited Warranty

This limited warranty shall only become effective upon the receipt by Waterloo Biofilter of a signed Maintenance Contract. Failure to have a Maintenance Contract means that Waterloo Biofilter may not be required to fulfill any of the obligations contained in this Limited Warranty. A Maintenance Contract is often required by local regulatory authorities, failure to sign could result in legal consequences.

Limited Warranty Coverage

Components manufactured by Waterloo Biofilter are warranted to be free from defects in materials and workmanship for the Warranty Period described below from the date of product shipment from our dock:

Waterloo Treatment Unit Enclosures – three (3) year limited warranty

Under this Limited Warranty, Waterloo Biofilter will, at its sole discretion, repair or furnish a replacement for such defective parts at no charge to the owner. Repaired or replacement parts will be warranted for the remaining portion of the original Warranty Period from the date of original product shipment.

Filter Medium

Waterloo Biofilter warrants that the foam filter medium will not biodegrade, under normal and expected operating conditions, to a point where it can no longer absorb wastewater, for a period of twenty (20) years from the date of shipment.

Under this Limited Warranty, Waterloo Biofilter will replace at no charge to the owner the portion of foam filter medium that is determined by Waterloo Biofilter to be defective. Replacement filter medium will be warranted for the remaining portion of the original Warranty Period from the date of original product shipment.

Other Components

All other components supplied by Waterloo Biofilter carry the original manufacturer's warranty and are not covered under this Limited Warranty offered by Waterloo Biofilter. The original manufacturer's applicable Warranty Periods are outlined below. Full copies of the original manufacturer's product warranties are available upon request.

Liberty Effluent pumps – three (3) year limited warranty; extended five (5) year limited warranty if purchased

Waterloo Smart panels – one (1) year limited warranty

SJE Rhombus Float switches – five (5) year limited warranty

Pump Extended Warranty

If purchased at the time of order, the Extended Warranty increases the duration of the Warranty Period to five (5) years on pumps. All other terms and conditions contained in the Limited Warranty apply.

Shipping and Labour Costs

Under this Limited Warranty, Waterloo Biofilter will not pay labour costs for installation or removal of product for repairs or replacements covered by this Limited Warranty which are performed by a Waterloo Biofilter designated service provider or others during the Warranty Period. This Limited Warranty does not cover any travel time or other labour costs. This Limited Warranty does not cover any shipping costs to or from Waterloo Biofilter's dock, to or from the designated service provider, and to or from the installation site.

Warranty Exclusions

This Limited Warranty does **NOT** apply;

1. if any portion of the product invoice issued by Waterloo Biofilter is outstanding, even if the product owner has paid in full their purchaser, installer, or agent for said product
2. to any component not supplied by Waterloo Biofilter including, but not limited to, pre-treatment tank(s), pump tank(s), other concrete tanks(s), electrical wiring, plumbing, drainage or effluent disposal system
3. to any damage caused by improper transportation, handling, installation or maintenance of the product
4. to any damage or problem caused by Natural Disaster
5. to any damage or problem caused by the fault or act of a third party
6. to any damage or problem arising from any installation, modification, correction or addition carried out, or attempted to be carried out, on the product by a person not authorized by Waterloo Biofilter
7. to any damage or problem caused by the fault or action of the owner, or the owner's successors, including but not limited to refusing system access for maintenance, tampering with the system, altering control panel settings, or any other attempt to repair, maintain, access or inspect the Waterloo Biofilter system
8. to any damage or problem if it is demonstrated that the Waterloo Biofilter treatment unit was used outside of its designed use or rated flow capacity, or was not used and maintained in compliance with the terms and conditions outlined in the Owner's

Manual

9. to any damage or problems resulting from heavy machinery or vehicles parked on or driven over the product
10. to any damage or problem caused by excavation, demolition, landscaping, snow removal, re-grading or construction to the product installation area
11. to any damage or problem resulting from errors in design specifications provided by the purchaser or its agents
12. to cosmetic damage such as scratches, scrapes, minor dents, or fading of stains, sealants or colourings.

Particular Exclusions

Maintenance Requirements

Under local laws and regulations, owners of advanced wastewater treatment units are often required to hold a service contract for maintenance with an authorized maintenance provider. Failure by the system owner to maintain a current maintenance agreement with such a maintenance provider authorized by Waterloo Biofilter will void this Limited Warranty, and Waterloo Biofilter shall be considered completely discharged from all obligations under this Limited Warranty. Complete maintenance records must be presented to Waterloo Biofilter upon request. Failure to present maintenance records will void this Limited Warranty.

Failure by the system owner to take preventative and corrective maintenance actions recommended by the maintenance provider in a timely fashion, including but not limited to periodic pumping of pre-treatment tanks, will void this Limited Warranty.

Filter Medium Biodegradation

For the purposes of this Limited Warranty, biodegradation is defined as the decomposition of the filter medium by the action of microorganisms such as bacteria that are naturally present in sewage. Damage to the foam filter medium caused by means other than biodegradation as defined above is excluded from this Limited Warranty.

Causes of damage excluded under this Limited Warranty include but are not limited to: paints, harsh cleaners or chemicals, water softener backwash, solvents, strong acids, strong bases, insects, animals, excessive flow rates and ultraviolet light.

Transfer of Ownership

If there is a change in ownership of the property where the product is installed, this Limited Warranty may be transferred once under the terms and conditions of this Limited Warranty to the new property owner, provided that:

- Waterloo Biofilter is notified of the transfer of ownership in writing within 90 days of the closing of the property sale, and
- the new owner's complete name, mailing address and valid phone number is provided in said notification, and
- the new owner accepts the terms and conditions set out in this Limited Warranty

The effective date of warranty coverage will remain the date of shipment of the original purchase by the original property owner or their agent. If the new property owner fails to provide Waterloo Biofilter with a written notification as stated above this Limited Warranty

shall be considered null and void. This Limited Warranty cannot be transferred again.

Making a Claim

If the product is suspected to be defective, you should immediately notify your system maintenance provider to assess the situation and determine next steps.

Limitation of Liability

This Limited Warranty is the only warranty given by Waterloo Biofilter. No one is authorized to make other warranties on Waterloo Biofilter's behalf. IN NO EVENT WILL WATERLOO BIOFILTER, OR ITS DIRECTORS, OFFICERS, OR AGENTS, BE LIABLE TO THE PURCHASER OR ANY THIRD PARTY, WHETHER IN CONTRACT, IN TORT, OR ON ANY OTHER BASIS, FOR ANY INDIRECT, SPECIAL, PUNITIVE, EXEMPLARY, CONSEQUENTIAL, OR INCIDENTAL LOSS, COST, OR DAMAGE ARISING OUT OF OR IN CONNECTION WITH THE SALE, MAINTENANCE, USE, OR INABILITY TO USE THE PRODUCT, EVEN IF WATERLOO BIOFILTER, OR ITS DIRECTORS, OFFICERS, OR AGENTS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH LOSSES, COSTS OR DAMAGES, OR IF SUCH LOSSES, COSTS, OR DAMAGES ARE FORESEEABLE. IN NO EVENT WILL WATERLOO BIOFILTER, OR ITS OFFICERS, DIRECTORS, OR AGENTS BE LIABLE FOR ANY DIRECT LOSSES, COSTS, OR DAMAGES THAT EXCEED THE PURCHASE PRICE OF THE PRODUCT. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO THE PURCHASER.

Governing Law and Attornment

This Limited Warranty is governed by and will be construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein. Waterloo Biofilter and the owner hereby attorns to the jurisdiction of the courts of Wellington County in the Province of Ontario with respect to any dispute arising under this Limited Warranty.

This Limited Warranty gives you certain specific legal rights, and you may also have other rights which vary from state to state or province to province.