Operation and Maintenance Manual

April 1, 2019

Dear SoilAir™ System Owner,

Congratulations! And thank you for selecting a state of the art SoilAir Wastewater Treatment System.

The SoilAir Wastewater Treatment System manufactured by Geomatrix Systems, LLC, is a system that requires virtually no maintenance on the part of the homeowner; however, a basic understanding of how septic systems function and what is needed to keep them in good working order will help protect your investment, your health and your environment. In addition to protecting water resources, the SoilAir™ has a compact footprint and low noise level; this minimizes the visual, hearing and land use impacts to the subject property. While the SoilAir system is more tolerant of "abuse" than most, using reasonable care will ensure the longevity and trouble-free operation of your system.

This owner's manual will provide you with information on proper use and care of your SoilAir.

If you have any question please contact Geomatrix Systems, LLC at info@geomatrixsystems.com or call us at 860- 510-0730.

Sincerely,

GEOMATRIX SYSTEMS, LLC

Geomatrix Systems, LLC
114 Mill Rock Road East - Old Saybrook, CT 06475 Phone: 860-510-0730 Fax: 860-510-0735

Introduction

SoilAir is a patented technology that intermittently aerates leaching systems and the surrounding soil. This process allows for rapid rejuvenation of failed leaching systems, extends the life of new leaching systems and enhances treatment.

The SoilAir System generates supra and sub atmospheric air pressure in the OWTS. This results in oxygen flowing through the OWTS and out into the surrounding soils. Through this process, the biomat is transformed from anaerobic to aerobic. The aerobic and facultative microorganisms that flourish in a well aerated environment can then reduce the thickness of the biomat through metabolic activity.

System Components

SoilAir System components, which are housed in a HDPE weather/UV rated enclosure, include a high-pressure blower that is controlled by a 7-day programmable timer and a line voltage float switch. This enclosure is wired to the dwellings power supply and is connected to the distribution pipe that runs from the septic tank to the leach field via a 2-3 inch diameter PVC airline. A float switch and a check valve are installed on the distribution pipe and/or mounted in the septic tank to monitor septic system operation and to determine aeration frequency.

The programmable timer regulates the run time of the blower and is programmed on site during the installation.

SoilAir Systems have been utilized on new and existing leach fields, dry wells and other soil absorption systems. Projects include single-family residences, community systems, commercial facilities and even restaurants with heavy grease deposits. SoilAir Systems are operating on septic systems ranging in age from 2-50+ years old, in a wide range of climates and soil conditions.

The common denominator in these SoilAir installations is... PROBLEM SOLVED, with minimal disruption to landscaping and potentially at a significant cost savings over a new leach field.

Introducing Substances Into Wastewater

Septic tank and treatment system maintenance needs are variable and dependent on the volume of water and the type and amount of wastes which are being treated. Below is a list of common household substances that should not be introduced into your wastewater treatment system:

1. Do not introduce food waste such as coffee grounds, egg shells, grease or oil into your system.
2. Minimize or eliminate garbage grinder use.
3. Do not use septic tank additives.
4. Do not dump solvents, oil, paint, paint thinner, disinfectants, pesticides or poisons down the drain.
5. Do not flush sanitary napkins, tampons, condoms, cigarette butts, diapers, wipes, plastics, kitty litter, lint, dental floss, cotton swabs, and such products into your system.
6. Wastewater treatment systems rely on periods of no wastewater flow for aeration and treatment. Running or dripping faucets can cause systems to fail, as can excessive water use.

It is impossible to identify the entire universe of harmful substances. In general, if it is not readily biodegradable it does not belong in your wastewater treatment system.

Tools Required for Maintenance and Operation

- Typical hand tools
- Tape measure
- Check valve wrench
- Pressure gauge

Start-Up Procedure

To start up the SoilAir unit follow the steps below:

1. Programming Blower Operation

Program the SoilAir unit per the specific instructions provided with it. When rejuvenating failed systems, it is best not to run the blower 24/7, but to program the blower to run with some off time, such as for 5 hours on and 1 hour off or 1 hour on and 20 minutes off, etc. The rest interval is beneficial and allows water and oxygen to redistribute in the soil adjacent to the leach field.

In most instances, less than one hour of blower operation far exceeds the daily B.O.D. Once the leach field has been rejuvenated, or when utilizing the SoilAir System for preventative maintenance or for enhanced wastewater treatment, less frequent blower operation is typically advantageous. Examples include: 1 hour on and 5 hours off, 2 hours on every night, etc.

Programming the SoilAir System should take into consideration the associated wastewater oxygen demands and general treatment objectives. When the goal is increasing the Long Term Acceptance Rate and/or treatment of high strength wastewater, the more air the better;

however, optimizing the run time should be balanced against power consumption. When the objective is enhanced nitrogen removal, sequencing the blower operation and subsequent dosing of the anoxic carbon containing wastewater will increase the removal efficiency.

2. Setting the Delay Interval

When the float is activated by water rising in the septic or pump tank, the blower should turn off. It is desirable that the blower remains off for a period of time sufficient to allow water to fully enter the leach field. This period of time is referred to as the delay interval.

With a vertical stick float, collar stops can be moved up and down on the stick (shaft) to prevent further upward or downward movement. The collar stops should come set from the factory to turn the blower off when approximately 2-3" of water has accumulated above the invert elevation of the outlet pipe. This setting should also turn the blower back on when the tank level is just above the invert of the outlet pipe. Since the collar stops allow the float to slide on the shaft, a delay is effectively built in.

In the case of a system with a SoilAir microprocessor controller, a delay can be set to take effect after the float returns to the low position. This delay is generally set for 10-60 minutes, typically 20 minutes, and serves to ensure that all the water has drained from the piping before the blower starts up.

3. Testing for Air Short Circuits

It is critical that the air supplied by the SoilAir System flows through the biomat and soil around the leach field and does not just short circuit to atmosphere. Some SoilAir units have dedicated smoke testing ports; these devices allow the air flow pathways to be evaluated.

After the blower has run for approximately five minutes, turn it off. Light a smoke bomb and quickly put it in the smoke bomb canister, put the cap back on and tighten it. **Immediately** start the blower up again preventing smoke from entering the blower and damaging it. Smoke will come out of any significant holes/short circuits. Fix any significant leaks in piping components, if the distribution box is leaking, replace it or seal it with silicone, expandable foam, chemical grout, bentonite or a combination of these. Short circuits through soil over or adjacent to the leach field can be sealed with bentonite and/or by tamping/compacting any holes in the soil and by adding additional soil. Compacting the soil with a tamp bar can be effective. Experience will prove that excessive probing to locate leach field will result in multiple holes that require sealing. Retest as necessary with another smoke bomb.

Smoke diffusing uniformly through the soil over the leaching system is not necessarily problematic, but can be indicative of shallow cover depth over the leaching system. The more resistance the air has above the leach field the better.

Do not forget to remove the smoke bomb from canister when finished

4. Start SoilAir System

Storm Water

Grades over and around the septic system should result in storm water sheet flow away from the septic tank, pump tank (if present) and leach field. If water is allowed to pond or puddle over these components, air flow short circuits can result by the bubbling. This will negatively impact the system performance and must be immediately addressed.

Air Intake Louvers

All SoilAir models are assembled with air intake louvers. SoilAir Systems are typically significantly quieter than an air conditioner. Sound is directional, when possible locate SoilAir system enclosure and/or the air intake louvers so as to direct sound in a desirable direction, or preferably into an absorptive medium such as an evergreen bush, etc. Try to not have the louvers facing a direction where grass clippings from mowing, dust, etc. will routinely be directed towards them.

Louvers should be cleaned quarterly with a stiff bristle brush and some water. Dusty site conditions may require more frequent cleaning.

Inspections and Emergency Procedures

In general, SoilAir Systems should be inspected and maintained twice annually; however, this frequency should be increased to quarterly for commercial systems with design flows in excess of 2000gpd and more challenging sites, including when operated in dusty conditions.

NOTE: Always disconnect the power supply before working on SoilAir equipment or the leach field that it serves. *The blower can start automatically, without warning, based on inputs from the programmable timer, float switch settings and other parameters. Additionally, the leach field is under pressure; stay clear of any inspection ports and other similar pressurized ancillary devices.*

If any conditions are abnormal, inspection frequency should be sufficiently frequent to ensure that variables can be identified and proper operation is maintained.

If leachfield ponding becomes excessive the service provide should consider the need for pumping or resting the system. Service provider should disable SoilAir in order to determine the cause of the excessive ponding. Your service provider may recommend different ways in which to rest system, including vacation, pumping, or zoning.

Inspection and Service Checklist

1. Remove the Cover

Some covers simply lift off and on others a 9/16 bolt retains the cover. A lock can be utilized for security purposes.

2. Clean Air Filter

Clean the air filter as required. This frequency will vary depending on specific site conditions.
Call 888 SOILAIR for replacement elements.
If removal is necessary, loosen wing nut or hose clamp. After filter replacement tighten wing nut or hose clamp.

3. Clean Air Intake Louvers

Air intake louver should be cleared of all debris with a stiff bristle brush.

4. Check General Condition of System

Check condition of rubber couplings, pipe etc.
Cooling fan on end of the blower should be kept clear of all debris.
Listen for any abnormal noises.
Check for loose parts, fittings or air leaks.

Troubleshooting and Reporting Problems with System

History has proven that if the desired effect is not being achieved, go back to the basics and confirm the septic system design basis, hydraulic load, wastewater strength; if all of this is inline, then look at the other variables that impact the SoilAir performance directly. Certain SoilAir systems can track the volume of wastewater that the septic system is treating; certain SoilAir systems can track and data log all system operating parameters.

The number one issue is to ensure that the air is flowing through the biomat; if it does not, you are not getting the benefit of the SoilAir technology. If wastewater flows prevent air from contacting the biomat due to constant flows, or if water is ponded over the surface of the leaching system biomat, there is no way to oxidize the biomat. The SoilAir technology effectively makes the natural rest period between doses more efficient; if this rest period is nonexistent, it will provide little benefit.

The first step in troubleshooting is to make certain that the individual SoilAir System components, such as the float switch and blower, are operable. Confirm that power is present

at the SoilAir disconnect with appropriate test meters. Also confirm that the float is operable and not stuck in the up position.

The second step in troubleshooting is to confirm airflow pathways by adding indicator smoke to the air stream; the smoke should highlight any short circuiting issues that are present. Address any problems identified by the smoke testing as described above in the Installation Instructions.

If smoke is diffusing uniformly over the system, this suggests that cover depth and/or permeability is a potential problem. In this case, additional top soil cover or plastic sheeting over the system will be beneficial in increasing oxygen levels at depth. If low spots are present over the leach field, they can hold water; this will negatively affect airflow and ultimately result in airflow short circuiting.

If smoke testing does not identify any obvious problems, you should confirm that air flow is present in all sections of the leach field. This is best determined by measuring the operating pressure in each individual leach field lateral or zone. Pressures can be measured with a differential pressure gauge and a suitable probe and/or test plug. Simply opening up an inspection port does not confirm that air is flowing when it is under pressure.

SoilAir technical staff is available to assist you over the phone or in the field. Contact us at the number listed below.

In the event of any problem related to the septic system served by SoilAir; turning the SoilAir system off results in the system reverting back to the traditional septic tank and leachfield operation.

If the leaching system becomes surcharged, the leaching system and septic tank should be pumped and the SoilAir system started back up. If wastewater should back up into the facility it serves, or effluent surfaces over the leachfield, the Board of Health and RIDEM should be notified in accordance with the technology approval.

If you experience problems with your SoilAir System, please contact Geomatrix, LLC at:

Geomatrix, LLC
114 Mill Rock Road East
Old Saybrook, CT 06475
860-510-0730 – phone
860-510-0735 – fax
888-SoilAir - toll free
info@soilair.com
www.soilair.com

System Information & Maintenance
Designer & Installer Information:

Date of Installation	
Copy of Plan available?	**Yes** **No**
Designer Name	
Designer Company	
Designer Address	
Designer Telephone	
Installer Company	
Installer Address	
Installer Telephone	

Site Information

Street address	
Town/ County/ State	
Map/ Lot	
Municipal Contact Name & Telephone	
Permit Number	
Water Supply	**Public** **Private**
If private, Well Info	
Soil Type / Perc Rate	
Relevant Site Characteristics	
Proximities to bodies of water, wetlands, etc.	

SoilAir Information

SoilAir model	
SoilAir Serial#	
HyAir model	
HyAir vessel size	

System Information:

Design Flow	**_____ Gallons Per Day _____# of bedrooms**
Design Type (Circle all that apply)	**Basic Combination D-Box Multiple Beds (#_____)** **Pump Gravity Raised In-Ground** **Flow equalizers Velocity reducers**
Site Slope	**Level _____%**
System Slope	**Level _____%**
Inspection Locations	
Linear Feet	
Number of Laterals	
Sand Bed Dimensions & Number of Beds	
Other Comments:	

Diagram System Location:

Identify the location of structures such as; septic tank & access lids, treatment field, vents, wells, restrictive features, property lines, pools and foundations, etc.

System Maintenance and Service Record

Date:	PERFORMED BY:	DESCRIPTION OF SERVICE: