



aero-stream[®]

—By Karl K. Holt
President and Owner, Aero-Stream, LLC

Controlled Septic System Aeration:

**Facts, Fiction and
Downright Lies**



Aeration systems may look similar, but they operate with vastly different degrees of effectiveness.

University Studies, such as those conducted by Purdue and Baylor, prove that converting an anaerobic septic system to an aerobic system produces a cleaner effluent. Further, numerous independent, third-party laboratories have confirmed the effectiveness of the Aero-Stream design and its ability to eliminate back-ups, slow-flowing drains, odor, pooling wastewater and frequent tank pumpings.

Solving septic problems would be easy if all aeration systems were created equal. However, they're not. Aeration systems may look similar, but they operate with vastly different degrees of effectiveness. What's worse, after experiencing an inferior system, disgruntled homeowners, uninformed contractors and so-called experts go onto public website forums and talk trash about the aeration process, lumping all aeration systems together.

With so much misinformation circulating online, Aero-Stream wrote this article to set the record straight. After reading it, you'll understand the importance of controlled aeration, gain confidence from independent lab results and learn how to recognize the hazards posed by cheap imitators.

If you need to understand more about basic septic system operation, why they fail and how aerobic bacteria can bring them back to life, download our free whitepaper: ***Uncover the Truth About Your Septic System.*** There are many septic system design variations.

But while the systems may be somewhat different, they all perform the same basic function: To process raw sewage into a cleaner effluent that can be evenly distributed beneath the ground and blended with the groundwater, so as to avoid creating a health hazard.

The four basic parts of the system are the inlet pipe, the septic tank, the outlet pipe and an absorption component. The waste stream is in motion almost constantly. When a toilet is flushed in your home, approximately three gallons of water and waste flows into the inlet pipe connected to the septic tank. An equal amount of waste (three gallons) then flows out of the septic tank through the outlet pipe to the absorption component. Next, an equal amount of waste (three gallons) flows through the absorption unit into the ground.



HERE'S HOW IT WORKS

The aeration process begins with micro-bubbles coming out of the patented Aero-Stream diffuser. As they rise through the water, the finely diffused bubbles combine to form larger bubbles. As the combined bubbles gather and break the surface, they release a fair amount of stored energy. When the large bubbles pop, their energy tears apart nearby organic particles.

Controlled aeration is a patented process we developed through the application of fluid dynamic engineering principles and a proprietary array of components. We developed our process and products specifically for the septic tank environment to convert a standard single chamber septic tank into an aerobic treatment plant.

How the Aero-Stream Diffuser Works

Aerobic bacteria consume organic material 20 times more effectively than anaerobic bacteria!

Because the Aero-Stream diffuser breaks up the organic matter into smaller particles, it increases the surface-area-to-volume ratio. With a larger surface area, the good aerobic bacteria have more food to dine on—and they digest these smaller particles quite rapidly. In fact, aerobic bacteria consume organic material 20 times more effectively than anaerobic bacteria! That's why aerobic bacteria reduce wastewater strength by more than 90% in the septic tank, vs. a mere 30 to 40% for anaerobic bacteria.

To further support the aerobic process, Aero-Stream developed the **Bio-Brush™**. It floats on top of the tank liquid so that the bristles of the Bio-Brush attract larger organic solids. Once captured, the colony of aerobic bacteria living in the Bio-Brush quickly breaks down trapped solids.

Results Confirmed at “Poop Central”

As an engineering company, Aero-Stream wanted scientific, third-party validation for the principles of controlled aeration. To do this, we worked with the **Massachusetts Alternative Septic System Test Center** (MASST . . . informally known as “Poop Central” to the scientists who work there). MASST has been providing third-party independent testing of advanced onsite

treatment and other devices since 1999. The Center works with the National Sanitation Foundation (NSF) to develop standards, and they conduct tests in accordance with American National Standards Institute (ANSI) protocols.

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Results Confirmed at “Poop Central”



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ANSI uses two key measures to evaluate the effectiveness of septic tank products:

- **BOD₅**—*Biological Oxygen Demand, which measures the strength of the effluent leaving the tank. Higher measures indicate more material (undigested/unprocessed waste).*
- **TSS**—*Total suspended solids, which is the amount of debris contained in the effluent leaving the tank.*

In a single chamber septic tank, Aero-Stream demonstrated an 80% reduction in BOD₅ and a 60% reduction in TSS!

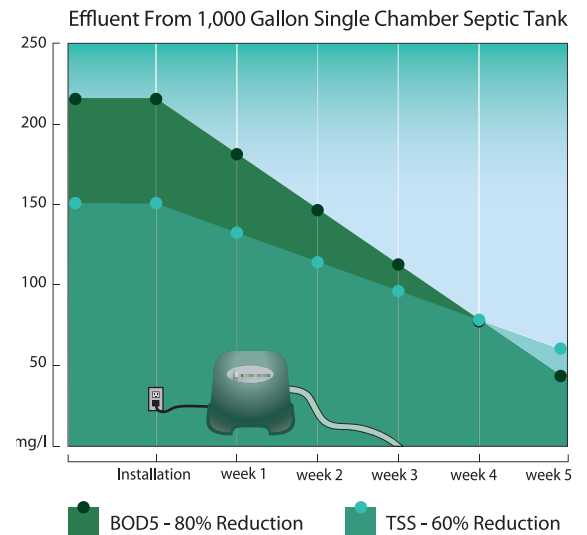
Higher BOD₅ and TSS numbers mean that the effluent places more stress on the drain field, requiring it to work harder to “clean” the discharge. Lower numbers mean that the bacteria in the septic tank are working more effectively to reduce effluent strength.

TEST #1-SINGLE CHAMBER SEPTIC TANK

An Aero-Stream septic aerator was installed in a 1,000-gallon single chamber septic tank at MASST’s Barnstable County (Cape Cod) location. Following the protocols outlined in *NSF/ANSI Standard 40 – Residential Wastewater Treatment Systems*, residential strength wastewater was diverted to the test tank at a daily flow rate of 450 gallons per day (GPD)

for seven days a week, with data collected over a five-week period. The flow simulates that from a three-bedroom home with six occupants (each occupant uses an average of 50 GPD). To add a safety margin, the test increases flow rate by 50%, yielding a daily flow rate of 450 gallons.

The table below summarizes the MASST results. **Aero-Stream’s aerator demonstrated an 80% reduction in BOD₅ and a 60% reduction in TSS!**



Customer water samples above document 8 days of Aero-Stream operation in a single chamber septic tank.

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Results Confirmed at “Poop Central”



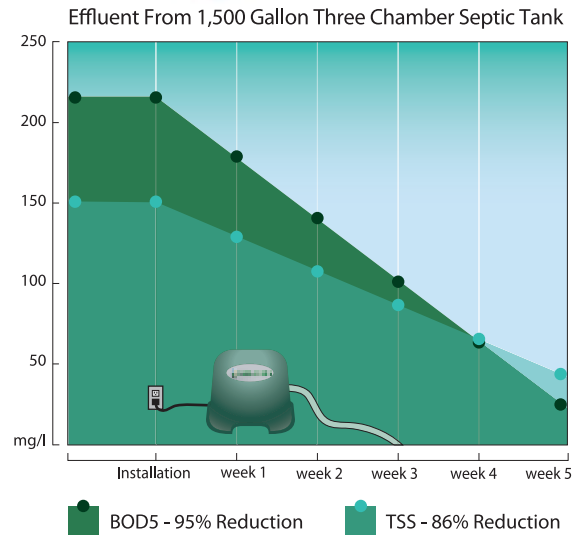
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In a three-chamber septic tank, Aero-Stream demonstrated a 95% reduction in BOD₅ and an 86% reduction in TSS!

TEST #1-THREE CHAMBER SEPTIC TANK

To further confirm results, Aero-Stream worked with MASST to conduct a second test, this time with a septic aerator installed in a 1,500-gallon, three chamber septic tank (flow rates and other parameters remained constant).

As expected for a three chamber tank, the results were even better: **The project yielded a 95% reduction in BOD₅ and an 86% reduction in TSS!**



Saving a Failed or Condemned System

As you can see, Aero-Stream significantly reduces effluent strength and the amount of solids flowing to your drain field. This may run contrary to what you may have read or heard from your pumper or contractor, but scientifically valid tests results tell the real truth: controlled aeration works! Even better, controlled aeration can save a failing or condemned tank that might cost you \$15,000 or more to fix. As always, Aero-Stream offers scientific proof of its results.

This time, it comes from a 40-year-old home in Springfield, Missouri, with three occupants. The septic tank holds 890 gallons, and the 12-month average flow rate was 174 GPD. The system exhibited signs of failure in 2002, with surface ponding and surface discharge in an area approximately 20 feet in diameter.

To “correct” the problem, the homeowners had the system pneumatically “ruptured” at a cost of \$1,500 . . . which improved the system performance for only two years. The County then issued violation notices for two years, with the next step being condemnation of the home.

Searching for a solution, the homeowners installed an Aero-Stream controlled septic aerator on December 16, 2009. By December 26, the majority of the effluent surfacing stopped. Within 60 days of installation, Aero-Stream eliminated surface ponding. **Ultimately, installing Aero-Stream reduced the BOD₅ by more than 85%, the TSS by 96% and fecal coli by 97%**

There is No Substitute



Dozens of rigorous scientific tests, thousands of successful installations and hundreds of letters from happy customers prove that Aero-Stream's controlled aeration process works!

Online Forums and False Claims

Unethical behavior may lead to negative comments in online forums where a moderator lumps all septic aerator designs together, creating an unrealistic picture of aeration in a homeowner's mind.

If you've conducted online research or talked to a septic tank pumper or contractor, chances are you've been told, *"Don't install an aerator. It'll stir up solids and clog the drain field!"*

Aero-Stream uses a single vertical diffuser that creates a narrow column of micro-bubbles. This process of ***controlled septic tank aeration does NOT stir up solids***. The diffuser is positioned a prescribed distance off the bottom of the tank using parameters developed specifically for septic tanks through extensive research and testing. Aero-Stream generates a level of aeration sufficient to support healthy colonies of aerobic bacteria throughout the tank, but not so great as to agitate solid waste that has settled below. Our process is proven, well documented, and backed by thousands of satisfied customers.

Beware of Imitators



There's a huge performance difference between Aero-Stream and cheap imitations: knock-off aerators CAN cause problems.

Beware of septic tank aerators that have not passed the rigorous testing and reviews of a independent, third-party testing facility.

You might see companies with claims of superior oxygen transfer through the use of a synergistic airlift principle . . . a design intended to eliminate the stratification layers in a pond. In a septic tank, it's a recipe for failure (see a video demonstrating these hazards).

Some aerators have a diffuser assembly with four horizontal outlets that create an airlift column roughly 9 inches in diameter, or about 64 square inches (which is over 20 times the size of an Aero-Stream column). In a septic tank, too much airlift in the tank creates substantial circulation, causing the solids to be swept off the tank bottom into the bubble path. These solids stay in suspension and cause grief. By way of comparison, the difference between a 3-square-inch, the controlled aeration column and a 64-square-inch column is similar to the difference of the wind created by a semi-truck versus a small subcompact car passing by as you are standing roadside!

The science of converting a septic tank into an aerobic treatment plant should not be left to imitation companies. Aero-Stream has the expertise and knowledge to ensure your system works as required. Call us at **1-877-254-7093** day or night to explain your septic system problems. We have the solution!



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Our Credibility

Aero-Stream patented the first retrofit septic remediation system in 2002. Since then, we've installed thousands of Aero-Stream systems across North America. They operate in conditions from -30° below in Canada's frozen tundra to blistering 120-degree Phoenix summers—all with a 95% success rate, and all supported with our easy money-back guarantee and commitment to customer satisfaction.

You don't have to take our word for how well Aero-Stream works. Our website has testimonials from nearly 200 happy customers. In the pages that follow, we share some of their letters.

Our website has the full results from case studies performed by accredited laboratories and independent third parties. We are accredited by the Better Business Bureau with an A+ rating and have earned the Handyman Club of America seal of approval.

Further, Aero-Stream is an Underwriters Laboratory (UL) Listed product. UL Listing means that UL has tested representative samples of the product and determined that it meets UL's requirements. These requirements are based primarily on UL's published and nationally recognized Standards for Safety.

There's a reason Aero-Stream is the #1-rated control septic aerator and a leading authority: We are an engineering company dedicated to solving septic system problems using proven scientific principles. Founder, president and Aero-Stream inventor Karl Holt is an engineer with more than 25 years of product design, development and manufacturing experience. He has worked for or provided engineering services to some of Wisconsin's most iconic companies, including Harley-Davidson, Master Lock, Strattec Security Corporation, Kohler and Lawn-Boy, to name just a few.

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Customer Testimonials



★★★★★★ WILL RECOMMEND AERO-STREAM

★★★★★★ OVERALL EXPERIENCE WITH AERO-STREAM

★★★★★★ CUSTOMER SERVICE

“This product truly beat our expectations and saved us thousands.”



We bought the Septic System Saver (Aero-Stream's retail product line) last year as we had a few chronic wet spots on our septic field. Professionals were telling us that the field was saturated and we would have to add additional lines (even though it should have been plenty big for the 2 of us). We bought the Septic System Saver hesitantly as we didn't know what to expect, but after one season the field is dry everywhere even after the snow melt. This product truly beat our expectations and saved us thousands.

—Amy L., Cold Lake, AB

“... this past summer was the first year my yard has been dry in 15 years.”



We have lived in our home for 15 years and have had a wet yard from our failing septic system. When I found Aero-Stream on the internet I read the reviews and talked to them a few times... they were extremely nice and helpful and the system has a money back guarantee and the price was around \$1500.00 so we decided to give it a try, what did we have to lose, nothing we decided. After installing the system which was really easy within a few days the yard started drying out... here we are after about 7 months and this past summer was the first year my yard has been dry in 15 years. If you have a wet yard from your septic this will solve your problems! Not to mention they take payments... it couldn't get any better!

—Michele B., Hanoverton, OH

“I can't say thank you enough to Aero-Stream.”



We saved \$30,000 with the \$1,000 unit we bought from Aero-Stream. In 7 years (which is a year more than they told us) the pump went out. It cost \$225 to refurbish, it came looking and functioning like new. I can't say thank you enough to Aero-stream!

—Bonnie K., Morrison, CO

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Customer Testimonials



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“Installed it the day I got it. It has been 14 months. No problems.”



We had been getting our tank cleaned out every 6 months, not by choice, but necessity...every one was an emergency call. Our septic service told us we had 2 options, dig a new leach field, or dig up and redo the existing. Either way the price was \$27-30K. My wife NEVER, EVER asked me such a serious question .. "What are you going to do?" .. I went to work. I searched online for a solution... "I Googled it!" (the usual 21st Century answer). What impressed me first about Aero-Stream, was seeing the owner Karl Holt on a national "Good morning..." show. I mean, these people just don't have anybody! They do their research... Ok, so I bought the unit, same day, didn't wait, installed it the day I got it. It has been 14 months. No problems. Tank level is always at its lowest, except after snow melt or a heavy rain storm, but in less than 48 hrs. it is back to normal. No tank back-ups, lines are always 100% clean. I am Very, Very Pleased!!!

—Russell J., Port Jervis, NY

“I would recommend any and everyone to look at the Aero-Stream product line . . . ”



I own and manage residential rental properties and after my first failed drainfield, the fear of another failed drainfield previously caused much stress. However, when I did my research and came across the Aero-Stream products, it was a blessing. I installed my first Aero-Stream system back the 3rd Quarter of 2013 and the system is working perfect. I would recommend any and everyone to look at the Aero-Stream product line before spending any of your hard earned dollars anywhere else.

—Samuel R., Orlando, FL

“This was the only real solution . . . thank you, Aero-Stream!”



The septic contractors wanted to put in a \$30K system due to "high water table." They scoffed at the idea that "bubbles don't solve a septic problem." Well, after installing the Aero-Stream my water table dropped 23 inches and has remained constant now for over 7 months. Dave and the entire team at Aero-Stream could not have been more helpful and provided the best customer service support I have ever gotten from any company! This was the only real solution . . . most economical, eliminated all the odors from my tank and field and has made all of the fear, uncertainty and doubt that I felt before disappear! Thank you, Aero-Stream!

—Michael B., Yorktown Heights, NY