

JONES & BEACH ENGINEERS INC.

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603.772.4746 - JonesandBeach.com

Town of Rye
Septic Social
June 22, 2016
Christopher Albert

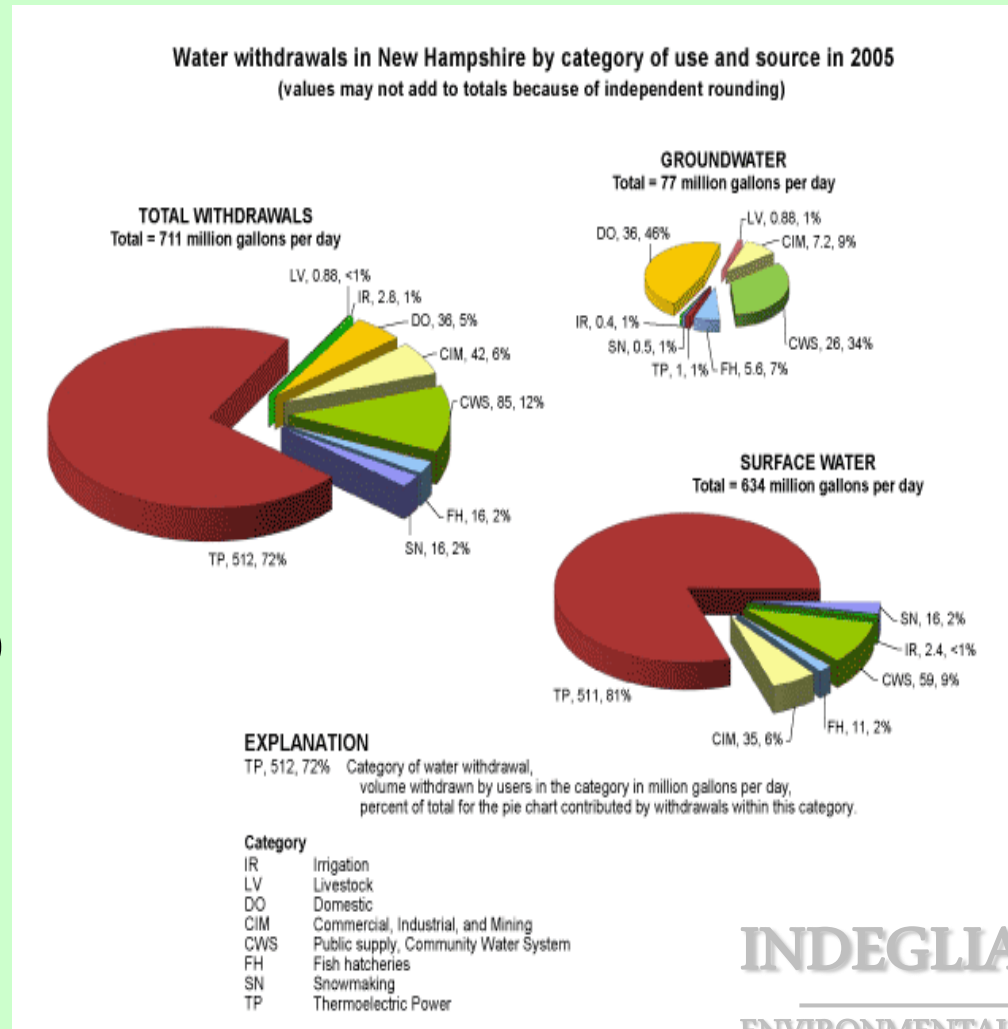


We are here to get you Pumped Out



Uses of Water

- Agricultural
- Commercial/Industrial
- Ecological
- Municipal
 - Domestic (Residential)
 - Recreational
 - Institutional



SOURCE:

<http://nh.water.usgs.gov/project/nhvtwateruse/nhproj.htm>

Onsite Septic Systems –

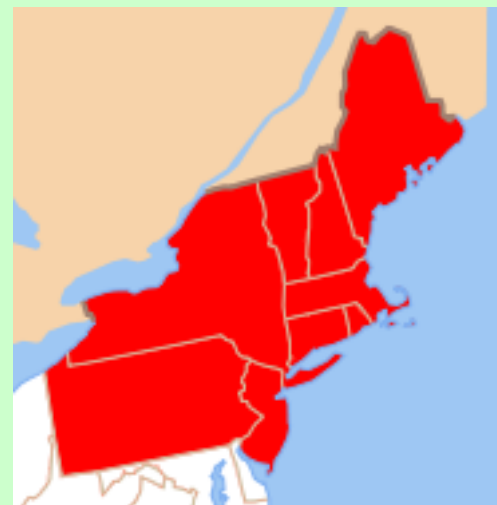
Northeast – 19 percentage of households have an onsite septic system.

Vermont >55%

Maine > 51%

Massachusetts < 27%

New Hampshire > 49%



SEPTIC SYSTEMS

Over 1 trillion gallons of septic tank effluent disposed from individual septic systems per year.

Septic systems performance depends upon

- Location on the landscape
- Design
- Constructed
- Used or Abused - Homeowner
- Maintained / Serviced
- Technology

SEPTIC SYSTEMS / HEALTH ISSUES

Diseases and infections can be transferred by failing septic systems.

Most infect the stomach and intestinal tract illnesses'

Less than 1% of the ground and fresh water is useable for drinking water.

can efficiently remove disease-causing bacteria
and
prevents the spread of disease.

Dissolved Oxygen (DO)

one of the most important water chemistry compounds!!

- maintaining aquatic life

- aesthetic value

- limiting factor for many chemical processes

- determines chemical pathways (aerobic/anaerobic)

- highly temperature-dependent

dissolved oxygen is a critical part of any water quality management plan

Eutrophied Water Bodies



SOURCE: www.lifeinfreshwater.org.uk; www.followgreenliving.com;
www.sevenhillslake.org

Biochemical Oxygen Demand (BOD)

amount of oxygen used to metabolize biodegradable organics

a measure of oxygen required for carbonaceous oxidation of nonspecific mixtures or organic compounds (vs. pure chemical)

end-products are generally CO_2 , NH_3 , and H_2O

reported BOD values are only for the biodegradation of carbonaceous material; some government agencies require that this be reported as CBOD (carbonaceous biochemical oxygen demand)

BOD Level in mg/liter	Water Quality
1 - 2	Very Good: There will not be much organic matter present in the water supply.
3 - 5	Fair: Moderately Clean
6 - 9	Poor: Somewhat Polluted - Usually indicates that organic matter present and microorganisms are decomposing that waste.
100 or more	Very Poor: Very Polluted - Contains organic matter.

Septic Systems

- Outhouse



Commercial Outhouse

- Two Seater



CESS POOLS pre 1970

MATERIALS USED

- CINDER
BLOCKS
- FIELD STONES
- RAILROAD
TIES
- BARRELS



DRYWELLS

WILL HAVE A PRIMARY SEPTIC TANK BEFORE
DRYWELL

- Precast Concrete Structure – 1970's
 - PRECAST CONCRETE
 - CINDER BLOCKS
 - FIELD STONES
 - RAILROAD TIES



Pipe and STONE

Leach Beds or Trenches 1970's – 1980's



Chambers

Concrete Chamber or Plastic Chambers 1980's – 1990s



Fabric Base Systems

Early 1990's – present



Alternative Technology

Late 1990's – present



LOTS OF LAND GIVEN AWAY! At LITTLE ISLAND POND!



— PELHAM, N. H. —
The Chance of a Lifetime. A Fine Camp or House Lot
on the Shores of a Beautiful Pond Given
FREE With the Purchase of
Three Pounds of

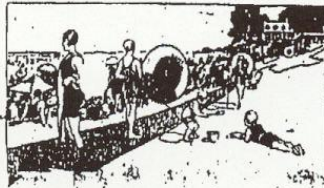


This Is Not a Lottery

At Regular Prices **55^c lb** **Monarch Coffee** At Regular Prices **55^c lb**

20 GOOD REASONS WHY YOU SHOULD INVESTIGATE THIS OFFER:

1. Each lot is over 1600 square feet of land.
2. Each lot is high and dry.
3. Each lot has a view of the lake and the shore.
4. Each lot has a view of the lake and the shore.
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17. Each lot has a view of the lake and the shore.
18. Each lot has a view of the lake and the shore.
19. Each lot has a view of the lake and the shore.
20. Each lot has a view of the lake and the shore.



ELECTRIC LIGHTS AVAILABLE ON THE PREMISES

No Lucky Numbers



EXPLANATION

We have surveyed this property into camp sites, nearly every one of which commands a fine view of the lake, and many of which are covered with beautiful trees, white birch, pine, cedar, etc. In fact there are many trees. We have reserved a large space for a boat landing, bathing and an avenue all along the pond, etc., so that those who have a cottage back from the water may all have ample shore privileges.

ALL THE JOYS OF NEW HAMPSHIRE CAMP LIFE AT YOUR OWN DOOR.

This beautiful lake of clear, pure water located as it is in wild country surrounding and so handy to Lawrence, offers an opportunity for camping with all the joys that come with an outing in New Hampshire at a great reduction of time and expense in railroad travel. The importance of outdoor life not only as a recreation but as a health preserver is becoming more and more appreciated by the THINKING people. There are enough camps already on this lake so that you will not be becoming and the site of the lake is such as to ensure you plenty of camp at all times. Don't wait until they are all gone.

HOW TO GET THERE FROM LAWRENCE.

TAKE BROADWAY TO METHUEN; THEN TAKE PELHAM STREET TO HAYES' STORE; THEN TAKE LEFT ROAD AT HAYES' STORE TO DRACUT STREET; THEN FOLLOW SIGNS TO LITTLE ISLAND POND PARK.

GANEM'S MARKET HAS COME FORWARD AT CONSIDERABLE EXPENSE TO GIVE LAWRENCE PEOPLE AN OPPORTUNITY TO OBTAIN LOTS FREE BY PURCHASING THREE POUNDS OF MONARCH COFFEE

Sale Starts FRIDAY!

Note—Not Over 2 Lots of Land to a Customer

No Taxes To Pay!
We've Done That For You!
EVERY LOT GUARANTEED
1600 SQUARE FEET OR OVER

BEAUTIFUL AND HIGH SHADY CAMP SITES

Sale Starts FRIDAY!



You Will Enjoy the BOATING Here
Long, lazy hours can be spent standing or rowing on the clear waters of this beautiful lake. And the Boating! After a day's work in the city you can come back to your cool summer house—make a plunge in the lake and enjoy a real evening at rest.
We Want Everyone In Lawrence to Know and Like Monarch Coffee
That's why we make this offer to you. We want you to buy this Coffee because once you know it, you will always want it.
Used and approved by thousands of people in Greater Lawrence, Monarch Coffee put you under the most sanitary conditions. We know you will buy more.

We want as many of our customers as possible to share in this great opportunity, so we limit the number of lots that a person may receive. ONE LOT free with three pounds of coffee. TWO LOTS free with six pounds of coffee. NO MORE TO ANY ONE. That is, you may have two lots, say one of the family may have two lots, a relative, a friend may have two lots and YOU CAN ALL BE TOGETHER. ALL HAVE ADJOINING LOTS.

Nature Created This Spot for You
Take Advantage of It!

Every inch of this tract of land is high and dry, and so lot is more than 300 yards from the shore. Full rights to the sandy beach go with every lot. Every convenience. Pure spring water may be obtained.

Investigation Is the Quickest Road to Realization in This Case.

Already more than 600 people own lots on Little Island Pond with many beautiful settings.



Sale Starts Friday Morning at 10 O'clock
GANEM'S MARKET

392 ESSEX ST.

LAWRENCE

PHONE 23471

Lawrence Evening Tribune on January 3, 1929.

This advertisement offered a free camp or house lot on Little Island Pond.

When you purchased three pounds of Monarch Coffee. (Not over 2 lots to a customer.)

ABSORPTION – AREA REQUIREMENTS

From 1968 to February 1976

- 4 bedroom home with 2 min perc. rate required = 340 sq.ft - pipe and stone

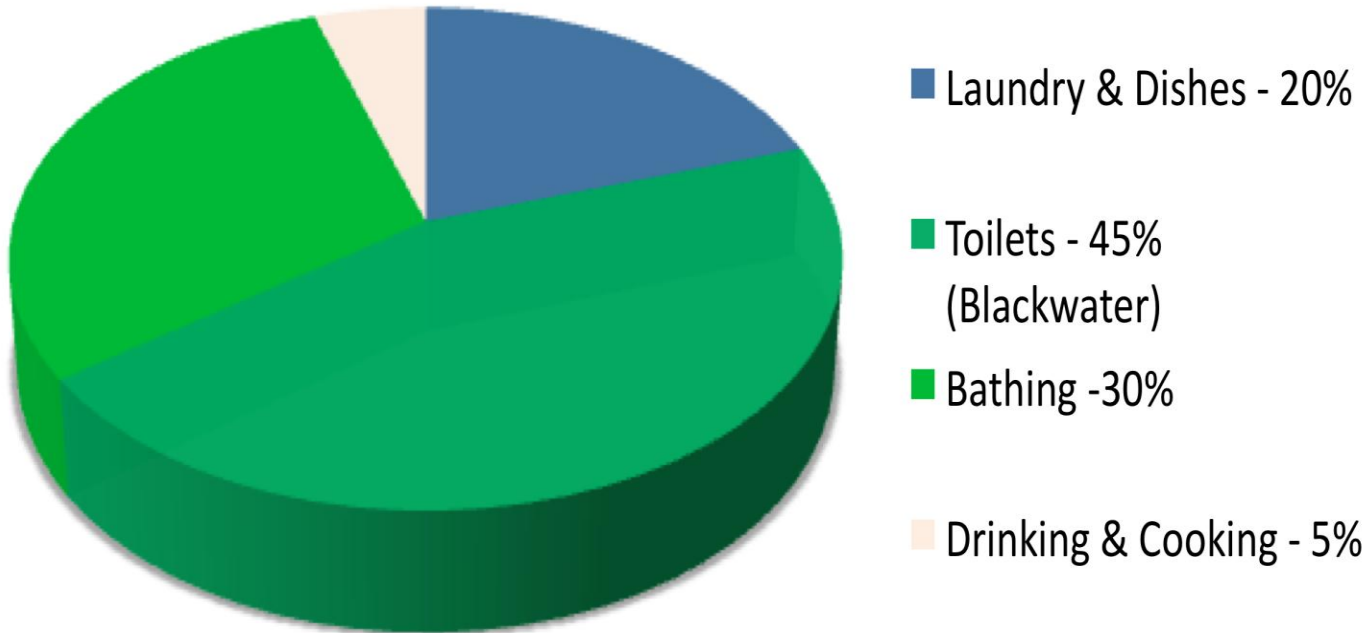
LEACHING AREA REQUIREMENTS

From 1976 to present

- 4 bedroom home with 2 min perc. rate required = 750 sq.ft pipe and stone

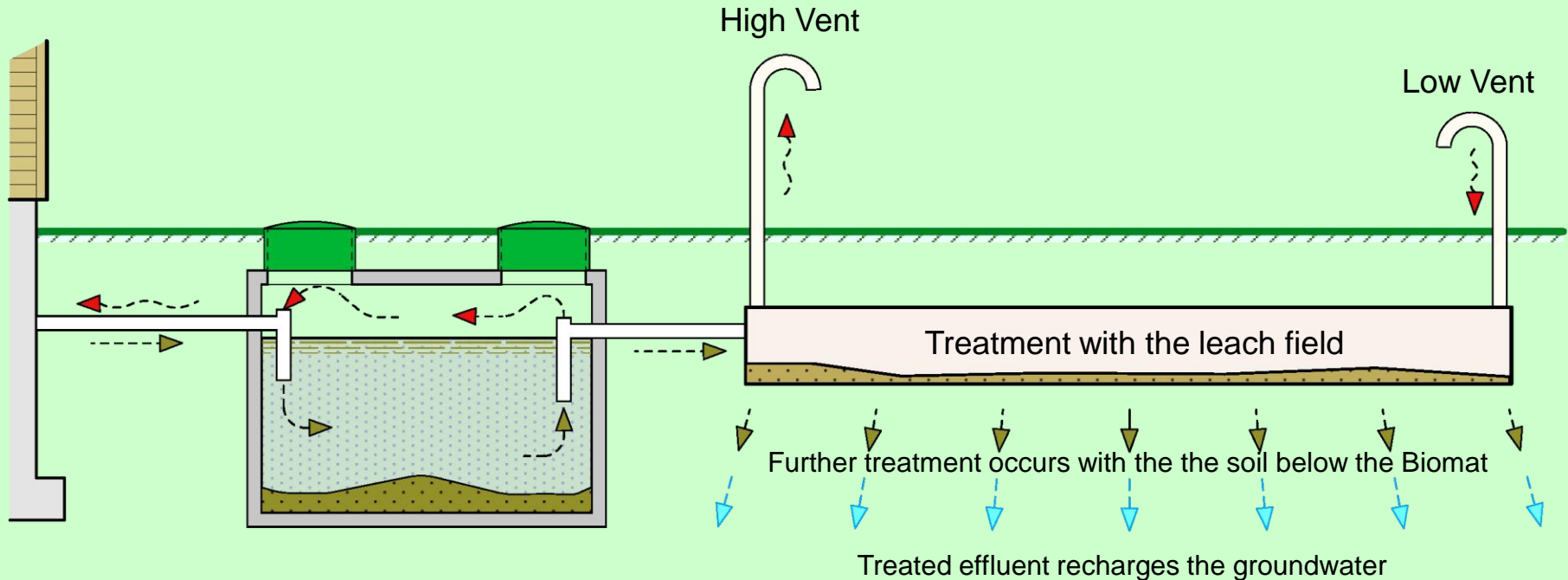
WATER USE IN A HOME

150 gpd/bedroom – design



CONVENTIONAL LEACH FIELD SEPTIC SYSTEM

Treatment occurs within the leach field components



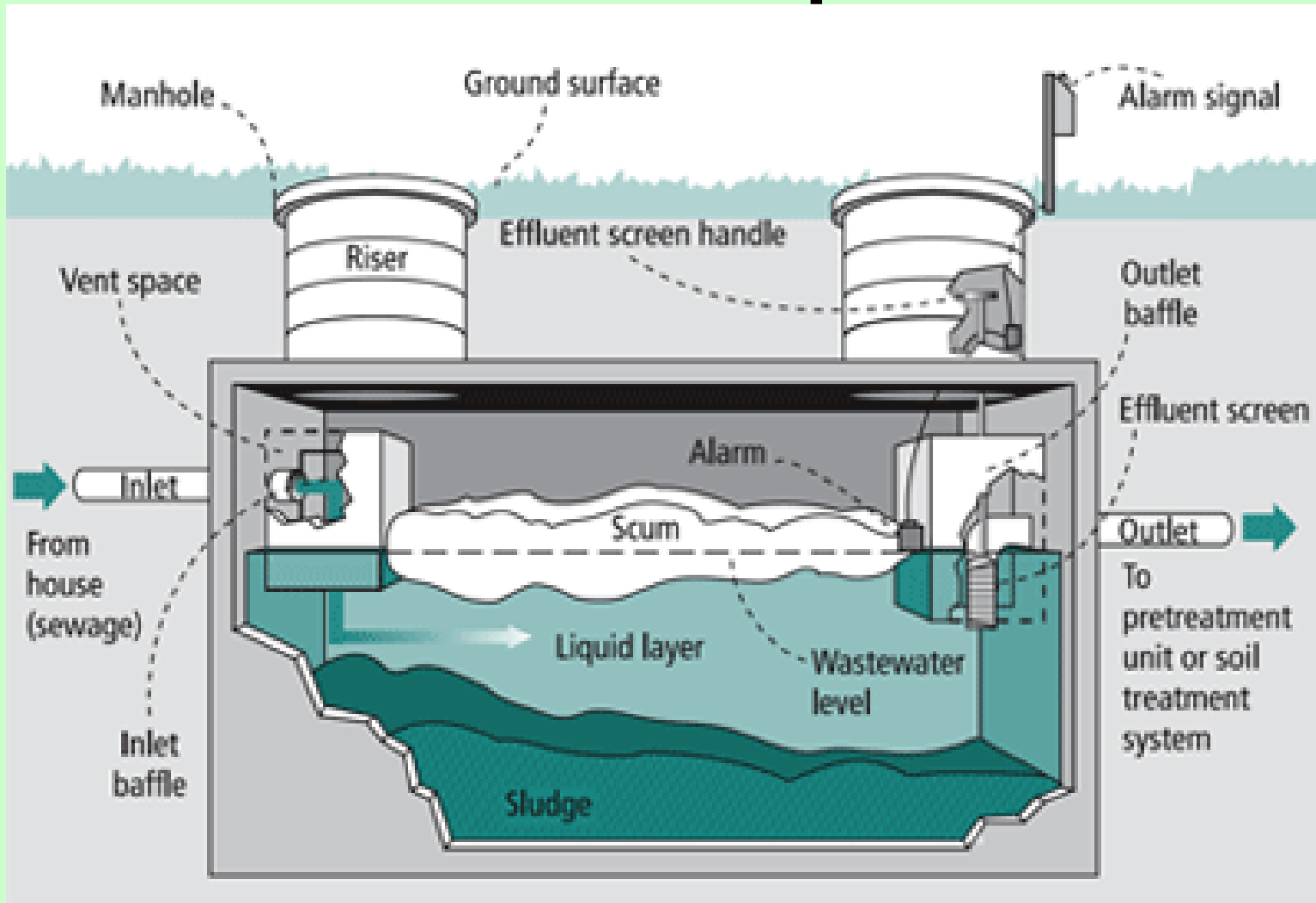
Septic Tank

Solids settle out in an Anaerobic environment – partial treatment

Leach Field

Aerobic treatment occurs along the interface between the leaching component and the sand at the "Biomat" (bacterial film)

Function of a Septic Tank



WHY MAINTAIN YOUR SYSTEM?

- \$\$\$\$\$\$\$\$ to replace a failed system.
- to maintain your system safeguards the health of your family, community, and the environment.
- maintain your septic system to protect a major property investment.
- Prevents odor problems

SIGNS THE SYSTEM IS FAILED or FAILING

- warning signs of a failing system:
 - Slowly draining sinks and toilets
 - Gurgling sounds in the plumbing
 - Plumbing backups
 - Sewage odors in the house or yard
 - Ground's wet or mushy underfoot
 - Grass growing faster and greener in one particular area of the yard

**DOES IT HAVE TO BE A SURFACE
FAILURE TO MEET NHDES
FAILURE DEFINITION?**

NO

Existing Effluent Disposal Area
(EDA) could be in the Water Table

or

within 24" of the Seasonal High
Water Table

- **The Do's**

- Maintain Records of your Septic System

- Obtain design plans
 - NHDES Construction Approval
 - NHDES Operational approval
 - Town Approvals (if required)
 - Pumping
 - Repairs

- Know the Location of

- Septic Tanks and Pump Chambers – access
 - Locate edge of leach field
 - Locate distribution box
 - Filters
 - Venting
 - Pump Alarms

- **The Do's**

- Have your system inspected not just pumped

- Inspect condition of tank
 - Inlet and outlet baffles
 - Scum layer
 - Sludge layer
 - Inspect D-box for signs of flooding
 - Unequal flow
 - Inspection into field for signs of flooding
 - Have a couple of observation holes dug

- **The Do's**

- Have it pumped when needed not when there is a problem.
- Conserve water.
 - Fix dripping Faucets- can add 100's gal/day
 - Leaky Toilets – can add over 2,500's gal/day
 - Spread Wash Loads out over the week.
 - Replace old dishwashers and washing machines with high efficiency models
 - Replace old toilets and shower heads with low flow
- Install a drywell for water treatment systems

- **Flush Responsibly**

- Don't Flush

- Coffee grounds
 - Diapers
 - Handi wipes
 - Cat litter
 - Cigarette butts
 - Feminine hygiene products
 - Kleenex
 - Grease / Oil / Fats

All these items are non-organic and non-biodegradable

- Garbage disposal – Increase Septic Tank Size 50%

DO'S

- Direct surface water runoff away from the leach bed or access covers to the septic tank
- Keep records of when the system was inspected and pumped
- Bring access covers to grade for easy access and also as a reminder that the tank is there
- Don't drive on the leach bed.
- **YOU DON'T NEED SEPTIC TANK ADDITIVES**

- **THE Don'ts**

- Flush Household chemicals down drain
- Paints
- Paint thinners
- Use of heavy bleach cleaners
- Use toilets bowl fresheners
- Pesticides
- Unused Medications
- These products will stress a septic tank and destroy anaerobic biological treatment in a septic tank and could contaminate surface or groundwater

When should you pump?

- There is no set time schedule
 - Guideline 1.5 to 3 years
 - NHDES recommends getting your system inspected yearly
 - What will impact the frequency of pumping
 - Garbage disposals
 - High-water use fixtures
 - Number of people living in the home
 - Families with younger children / Teenagers
 - Medications used by occupants

SYSTEM REPLACEMENT

- Your system has failed:
 - Contact a Licensed Septic Designer:
 - Test Pit to verify the adjacent Water Table
 - Conduct an as-built survey of the Site
 - Coordinate with Local Town officials
 - Prepare the State application
 - Five to Ten days for a State Approved Plan
 - Cost for the Approved Plan: \$2,000
 - Installation Time Frame and Cost
 - Actual Installation Time Frame – Is only 2-3 days
 - Don't need to Move out
 - Cost ranges from \$8,000 to \$20,000



Innovative Technology For Difficult Sites In NH

***Solutions for Decentralized Wastewater
Treatment***

HIGH GROUNDWATER

IMPAIRED WATERS AND SENSITIVE AREAS

GROUNDWATER SOURCE PROTECTION

SMALL LOTS OF RECORD

The **CLEAN SOLUTION™** - Alternative Septic System

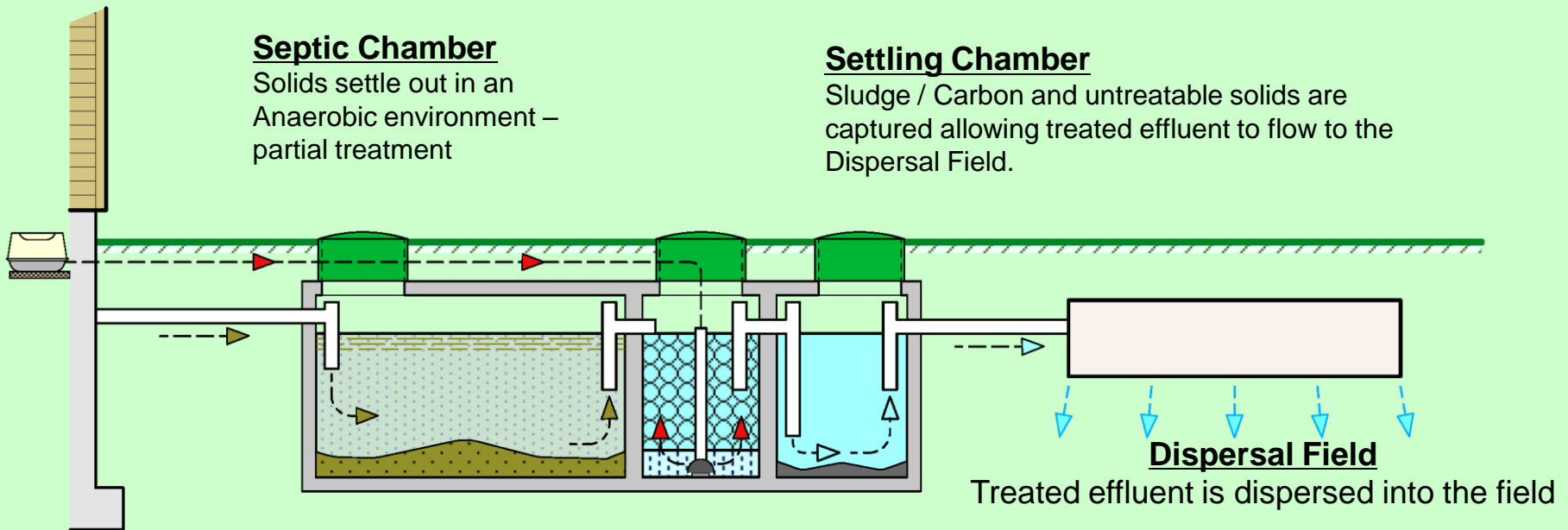
Treatment occurs within the BioCon™ Aerobic treatment chamber

Septic Chamber

Solids settle out in an Anaerobic environment – partial treatment

Settling Chamber

Sludge / Carbon and untreatable solids are captured allowing treated effluent to flow to the Dispersal Field.



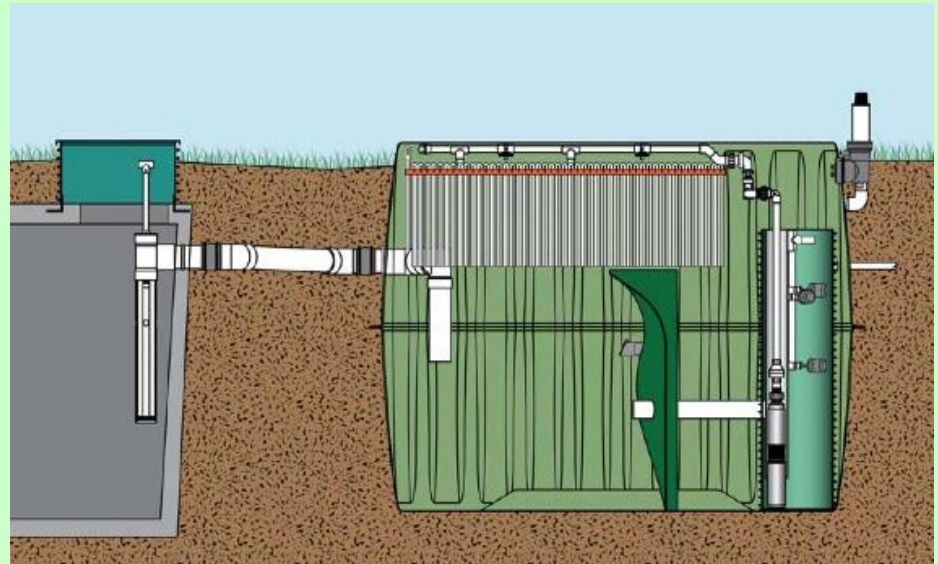
BioCon Chamber

Aerobic treatment occurs within the Biofilm growth on the plastic media. Air is pumped to the chamber by a small compressor providing dissolved oxygen to promote growth of the Biofilm

Orenco AdvanTex®

Main Components

- Control panel
- Primary tank
- AdvanTex RT Filter
- Pump System
- Recirc-return valve
- Passive Vent



Residential System Overview



Primary Septic Tank

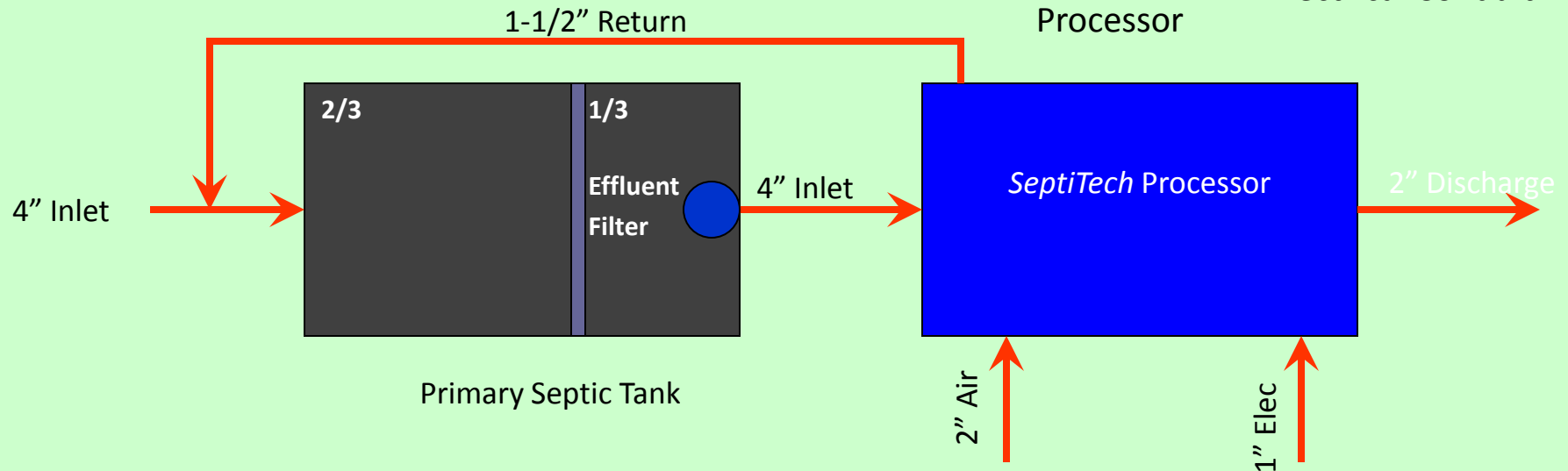
- ✓ 2 Compartment
- ✓ Effluent Filter

SeptiTech Processor

- ✓ Polystyrene Bead Treatment Media
- ✓ Self Cleaning Processor

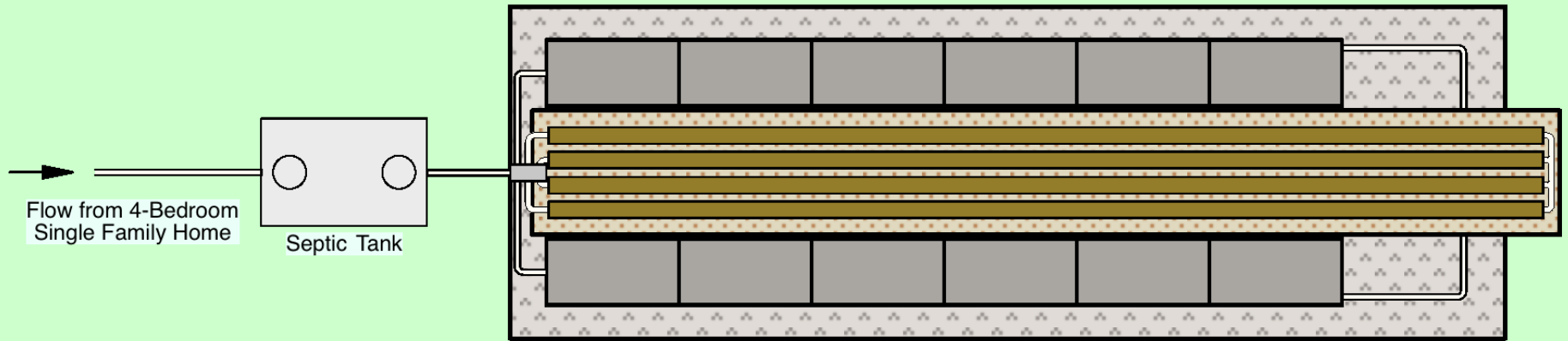
External Piping

- ✓ Inlet / Discharge Line
- ✓ Return Line
- ✓ Air Intake
- ✓ Electrical Conduit



Leach Field vs Dispersal Field

4 – Bedroom Single Family Home with 12 min/in perc. rate



Pipe & Stone Leach Field

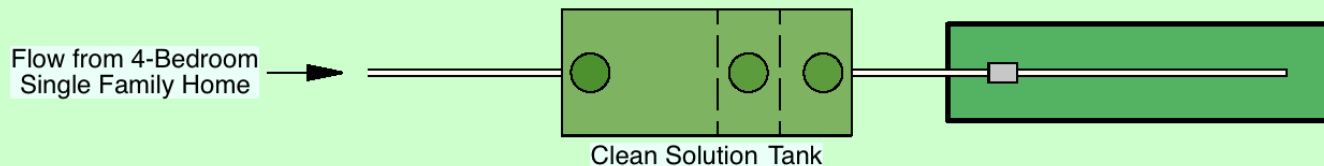
1,200 SQ.FT. Req'd (20' x 60')

Chamber Leach Field

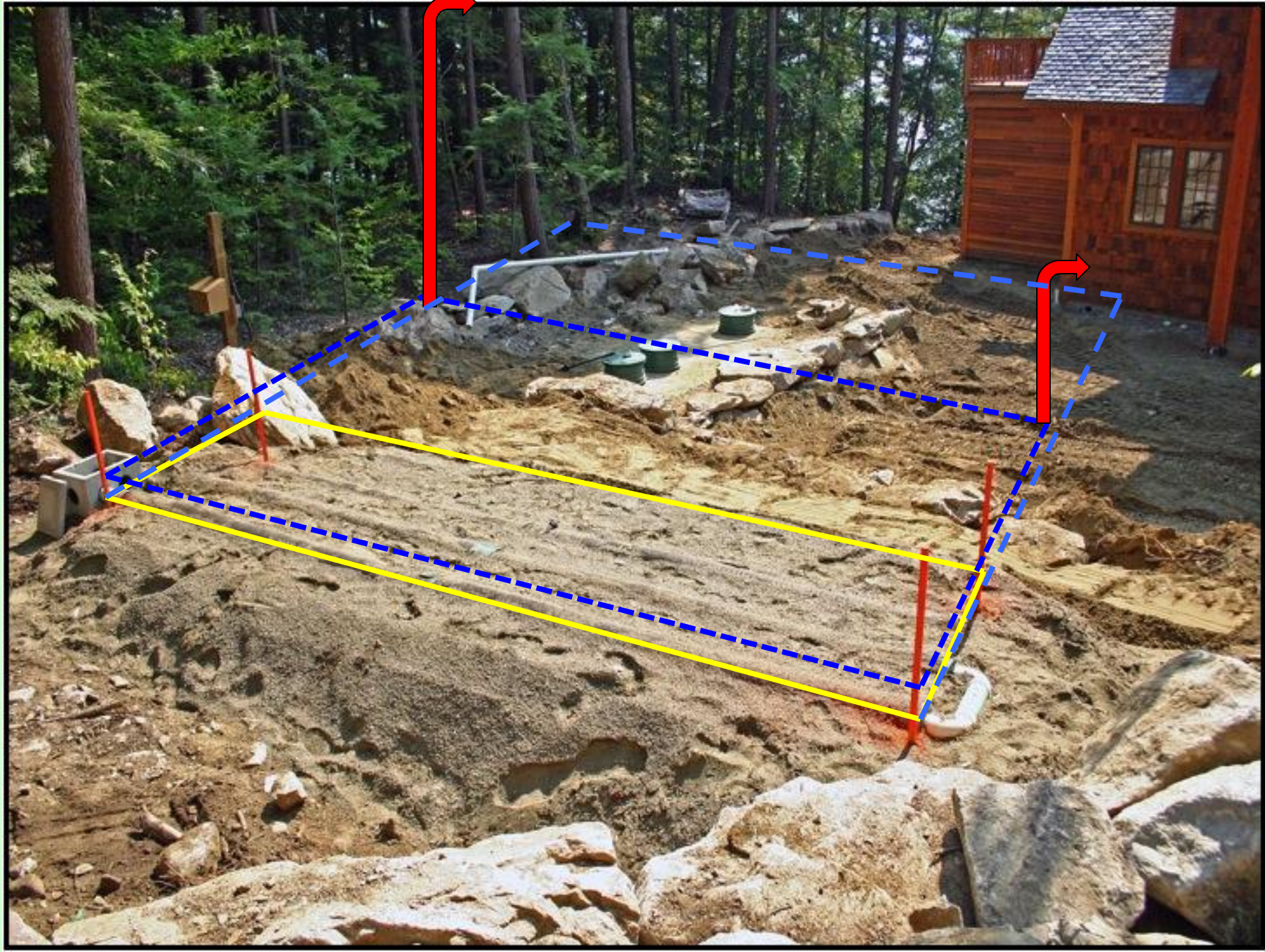
768 SQ.FT. Req'd (16' x 48')

Fabric Wrapped Pipe Leach Field

220 L.F. Req'd (7.5' x 62')



Aerobic systems can receive between 75 to 90% reduction





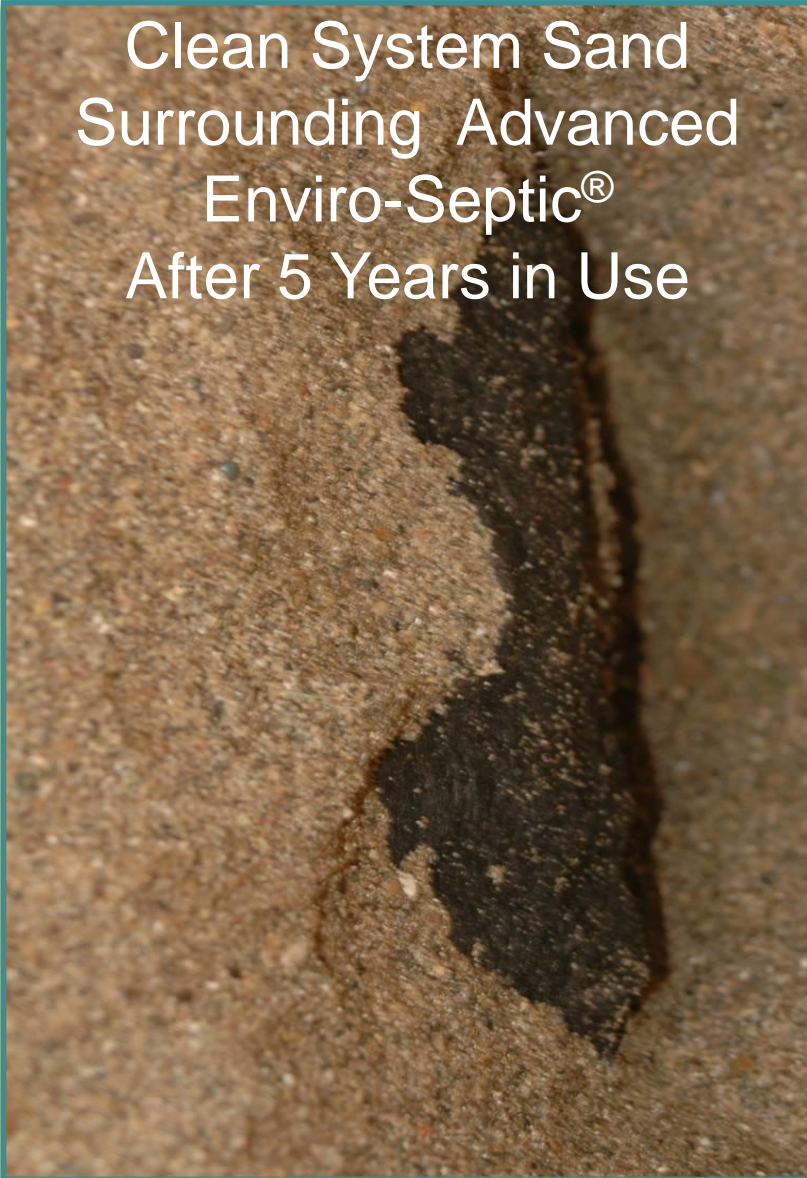
BOD₅ - range 160 to 210 mg/l
TSS - range 230 to 270 mg/l

BOD₅ - range 2.5 to 8 mg/l
TSS - range 0 to 2.5 mg/l

Percent reduction 96 to 99%

Highly Treated Effluent Protects System Sand

Clean System Sand
Surrounding Advanced
Enviro-Septic®
After 5 Years in Use



Side View of the First Row on a
Serial System in Indiana



Treated Effluent Leaving an AES
Test Site in New Zealand

Presby NSF Test Results

(2013 Mass Alt. Septic System Test Center – MASSTC)

Parameter Measured	Average Influent Strength	Average Effluent Strength	NSF 40 Class 1 Standard	Reduction
BOD ₅	176 mg/L	11 mg/L	<25 mg/L	94%
TSS	206 mg/L	7 mg/L	<30 mg/L	97%
Escherichia coli (E.coli)	4,128,571 CFU/100 mL	168,856 CFU/100 mL	N/A	96%

- 6" of System Sand below all Presby pipes
- Field loaded at 100% of daily design flow (450 GPD)







04/22/2009



10/14/2008







**SEPTIC SYSTEMS PROTECT THE
PARSONS CREEK WATERSHED
AND GROUNDWATER**



**FOR
FUTURE GENERATIONS**

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Thank You

Christopher Albert

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