


Presby Onsite Wastewater Treatment System Inspection and Evaluation

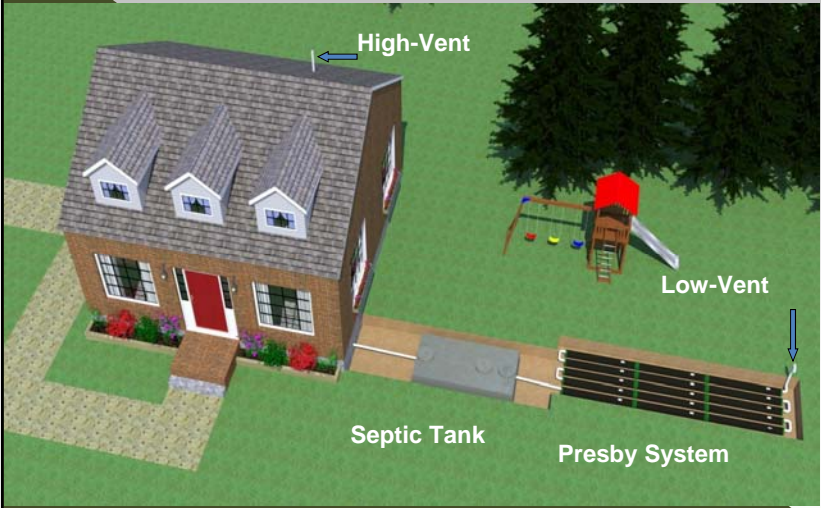
**Advanced Enviro-Septic[®], Enviro-Septic[®],
Simple-Septic[®] and EnviroFin[™] Passive Wastewater
Treatment and Dispersal Systems**

Dennis Fogg, Don Prince, Mark Vander-Heyden
Presby Technical Team


**Presby Environmental
2016**




Passive Treatment and Dispersal



NSF
SPD & CTD Models
Certified to NSF/ANSI
Standard 40, Class 1*
*See NSF Fact Sheet for details



BNQ Certified
NQ 3680-910



CE
European Conformity

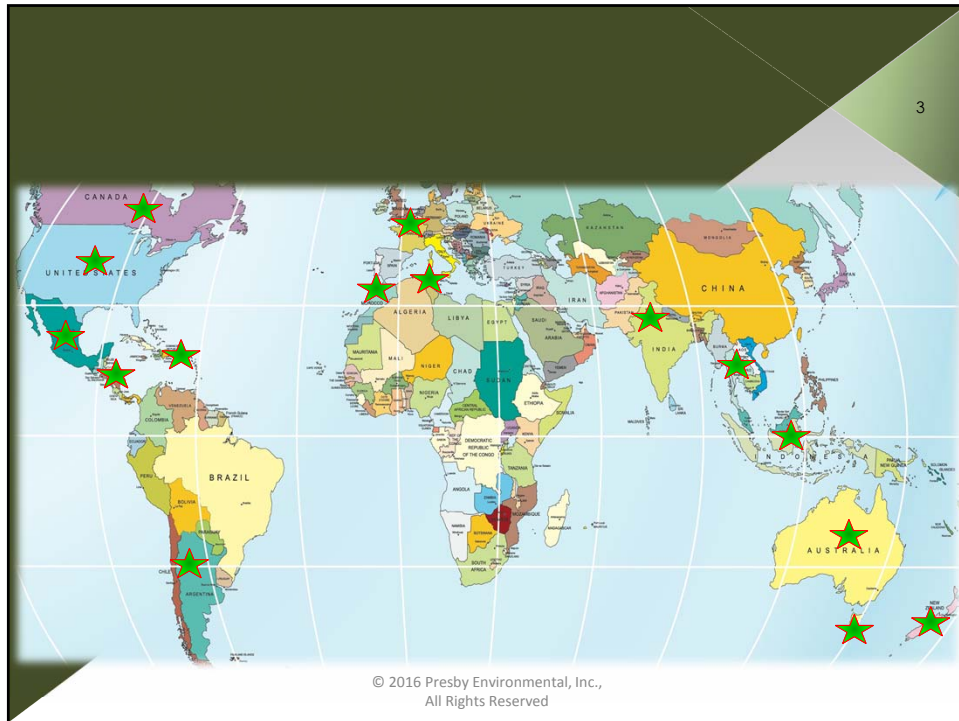


Certified Product
Australian
Standard
AS/NZS 3500
LIC:SMK40495

250,000+ Systems Worldwide

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Summary

- Introduced in 1995 (Enviro-Septic)
- **Third Party Tested and Certified**
- Passive Treatment Processes
- **Reliable, Maintenance-Free Operation**
- Over 250,000 Systems in Use Today
- **Scalable Technology**
- Components are Non-Biodegradable
- **H10/H20 Load Bearing Capacity**
- 2016 EnviroFin™ Wastewater Treatment System

Over 100,000,000 gallons of wastewater are treated by Presby Technology everyday using no energy and needing no special maintenance or replacement parts!

AES

ES

SS

EF

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Engineered to Strip Out and Digest Wastewater Contaminants

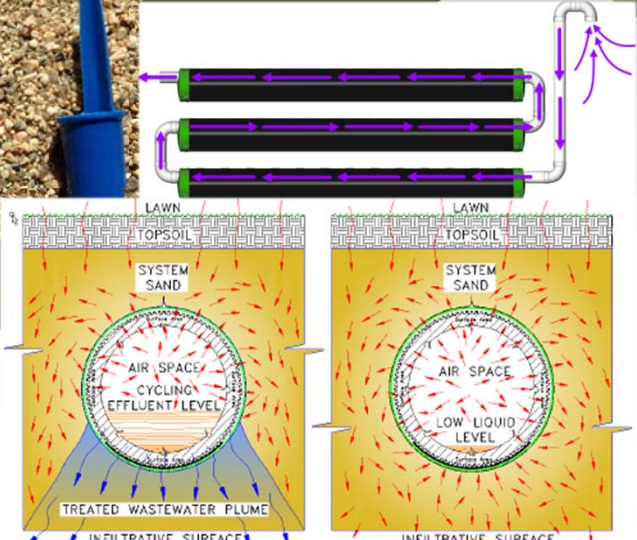



Ridges
Skimmers
Black Geotextile
Green Plastic Fiber Mat
Bio-Accelerator™ Fabric



NSF
BNG Certified
European Conformity

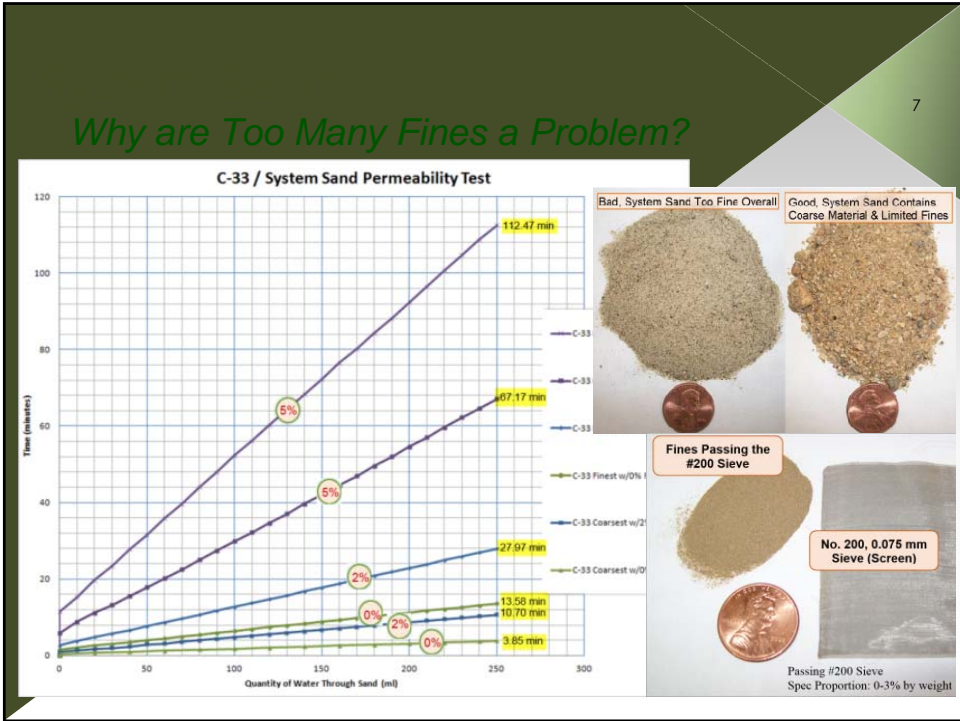
6



System Sand: the "Lungs" of the System

LAWN
TOPSOIL
SYSTEM SAND
AIR SPACE
CYCLING EFFLUENT LEVEL
TREATED WASTEWATER PLUME
INFILTRATIVE SURFACE

LAWN
TOPSOIL
SYSTEM SAND
AIR SPACE
LOW LIQUID LEVEL
INFILTRATIVE SURFACE



Presby Systems Treat Effluent to *better-than* Secondary Treatment Standards with 6" of System Sand Below the Pipes.

Aerobic bacteria need the same things as you...

1. Oxygen

Maintains aerobic bacteria which digest suspended solids much more efficiently than anaerobic bacteria. Aerobic bacteria consume the anaerobic biomat, making it permeable and creating balance within the system.

2. Food and Water (with wet and dry cycles)

The food and water the bacteria need exist naturally in wastewater, while wet & dry cycles stimulate the eco-system

3. Surface Area

Provides the area for bacteria to grow, strip, and digest suspended solids and other contaminants



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Clean System Sand surrounding Advanced Enviro-Septic® after 5 years in use



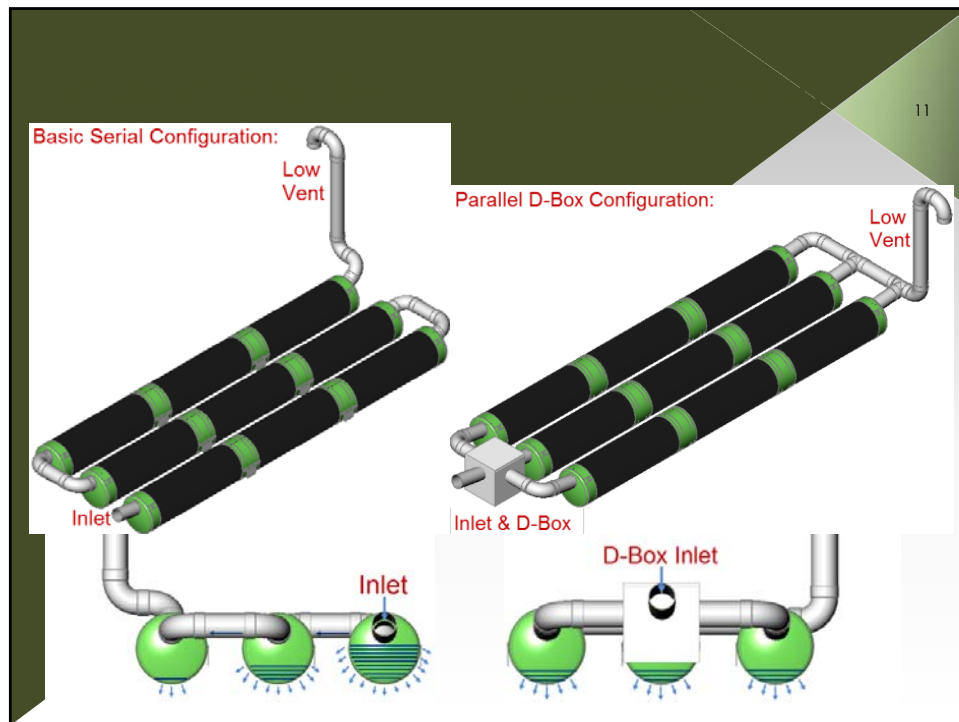
Side View of the First Row of a Serial System in Indiana



Treated Effluent Leaving an AES Test Site in New Zealand

10

...and Protects the Native Soil Interface



- 12
- *All systems require two vents (high and low)*
 - *Gravity system's roof stack is high vent, low vent at field*
 - *Pumped systems require Bypass Venting or High Vent*
 - *Low vent opening 3' min. above final grade*
 - *Vent diameter is 4", (multiple or 6" dia. for large systems)*
 - *Schedule 40 or equivalent PVC pipe for all vent stacks*
 - *Recommend all vent joints be glued or equivalent*
 - *Charcoal filters are never recommended*
 - *Effluent filters block passive air flow to the roof vent and should not be used*

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**Differential or By-Pass venting
required for all pump systems**

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WHEN USING BY-PASS VENTING THE ROOF VENT REPLACES THE "HIGH" VENT AND PUMP CHAMBER VENT (IF REQ'D). THE OPENING OF ROOF VENT MUST BE AT LEAST 10 FT. ABOVE OPENING OF LOW VENT

BY-PASS VENTING REPLACES BOTH THE HIGH VENT AND PUMP CHAMBER VENT (IF REQUIRED)

ATTACH BY-PASS VENT TO PUMP CHAMBER OR UNUSED OPENING IN SEPTIC TANK

NO EFFLUENT FILTER
SEPTIC TANK WITH SANITARY TEE BAFFLES

PUMP CHAMBER

BY-PASS VENT
PUMP LINE

ELIMINATED LOW VENT IS AIR INTAKE

FINISH GRADE
3"
10' MIN
Enviro-Septic Field

OPTIONAL CONFIGURATION
(IF EFFLUENT FILTER USED)

SEPTIC TANK TO D-BOX

PUMP LINE

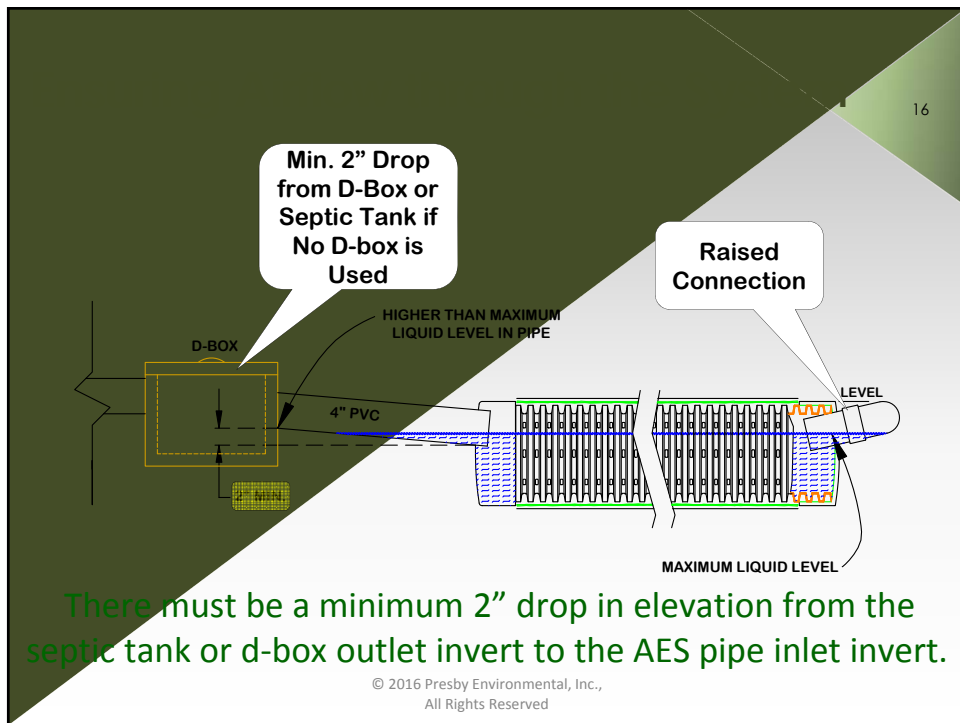
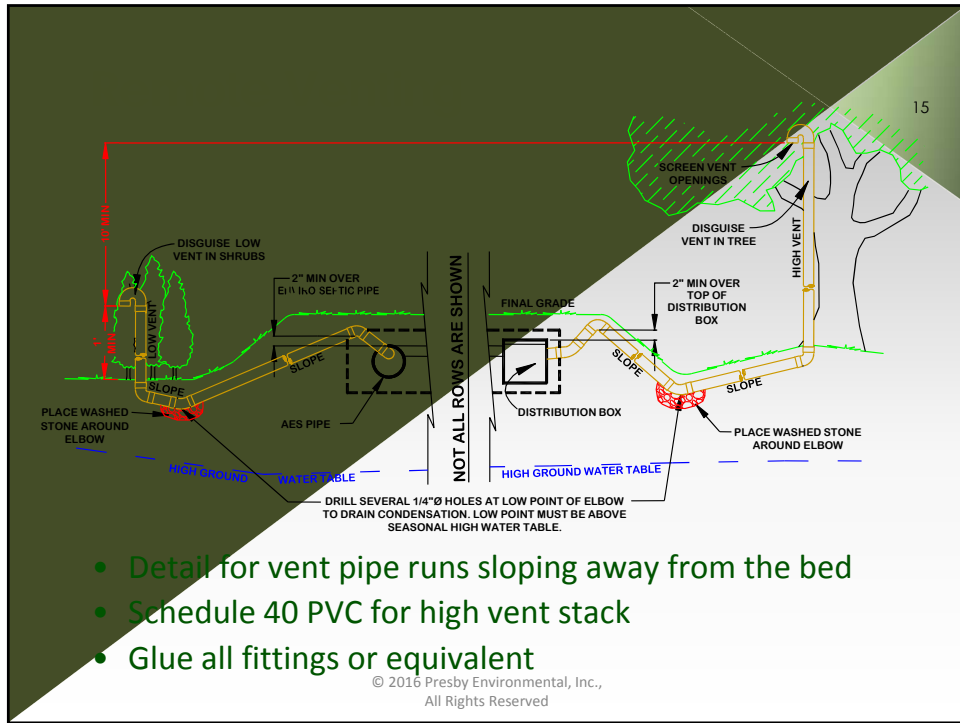
PUMP CHAMBER BY-PASS VENT HIGHER THAN INLET & ABOVE TOP OF TANK

VIEW A-A (ROTATED 90°)

ADD PUMP CHAMBER BY-PASS VENT IF EFFLUENT FILTER IS USED ON SEPTIC TANK OUTLET BAFFLE

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1. Not to be used with gravity systems.
2. Invert of pipe exiting d-box must be 2" minimum above d-box
3. Use 4" Schedule 40 PVC or equal for bypass venting
4. Glue all PVC joints or equivalent



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Sagging Lines Create Water Traps

Water Traps Block all air flow to the Building Roof Vent

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Reason for Inspection:

- ▶ Septic System Performance Impacting Household
- ▶ Evidence of Effluent Breakout on Property
- ▶ Septic Tank Maintenance Revealed Problem
- ▶ Real Estate Transaction!!!
 - Liability *Favors* an Unfavorable Septic System Inspection Determination

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- ✓ Gathering Information Before Site Visit
- ✓ Desk Audit of Available Documents
- ✓ Presby System Inspection
- ✓ Lab Work (if required)
- ✓ Report
- ✓ Recommendations / Remediation (if required)

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✓ Use NH DES Website



New Hampshire Department of Environmental Services | 603.271.3505 | TDD Access: Relay NH

[NH.gov](#) | [privacy policy](#) | [accessibility policy](#)

The Department of Environmental Services is dedicated to making more environmental information more readily available to you and standards of each of the contributing programs and of this system. The different programs are regularly maintaining the website always provide access to all existing information, and it may occasionally contain unintentional inaccuracies. The Department has no responsibility, however, for the misuse or misinterpretation of the information presented by this system.

- Approval Status
- Designer / Installer Contact Info.
- E-Files may have Design Plan & Other Documents

Water - Subsurface Onestop - Application Detail

Web's Number: 00000007
 Status: SUBMITTER REQUEST
 Application Type: CONSTRUCTION
 Approval Number: 000000000000
 00 PROJECT USE CODE

Owner Name: 000000000000
 Site Street Address: 000000000000
 City: 000000
 State: NH
 County: 0000
 Zip: 00000
 Parcel ID: 000000000000
 Parcel Name: 000000000000
 Parcel Address: 000000000000
 Parcel Phone: 000-000-0000

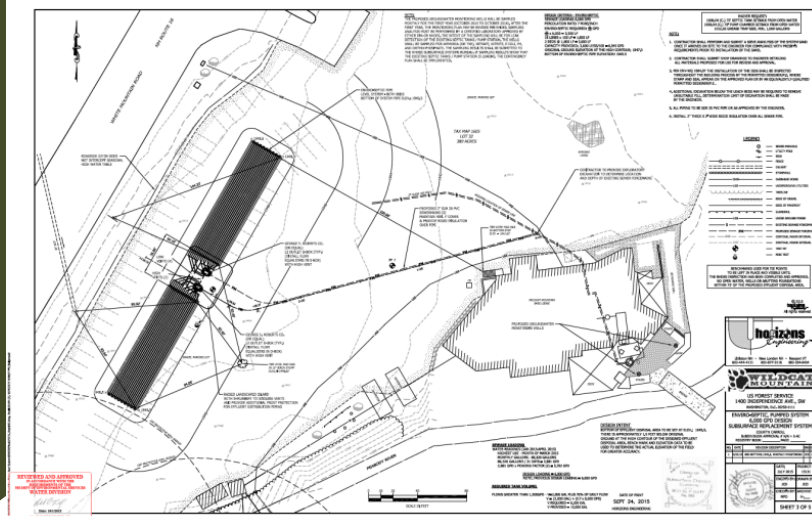
Application Status: 000000000000
 Application Date: 000000000000
 Design Date: 000000000000
 Approval Condition: 000000000000
 Operational Condition: 000000000000

DES Number: 000000000000

Application Document	Title	Date	Document Type	View
000000000000	000000000000	00-00-00	REQUEST FOR PROPOSAL INFORMATION	0
000000000000	000000000000	00-00-00	PROPOSITION	0000
000000000000	000000000000	00-00-00	PLAN	0000
000000000000	000000000000	00-00-00	MANUALS	0000
000000000000	000000000000	00-00-00	TRANSmittal LETTER	0000
000000000000	000000000000	00-00-00	PROPOSITION ACCEPTANCE LETTER	0000
000000000000	000000000000	00-00-00	PLAN CORRECTED	0000
000000000000	000000000000	00-00-00	MANUALS	0000
000000000000	000000000000	00-00-00	MANUALS	0000
000000000000	000000000000	00-00-00	MANUALS	0000
000000000000	000000000000	00-00-00	TRANSmittal LETTER	0000
000000000000	000000000000	00-00-00	DESIGN	0000
000000000000	000000000000	00-00-00	CONSTRUCTION APPROVAL	0000
000000000000	000000000000	00-00-00	PLAN APPROVED	0000

You will need a PDF reader in order to view any documents. You can download a free reader from [Adobe](#).

✓ Acquire System Design Plan

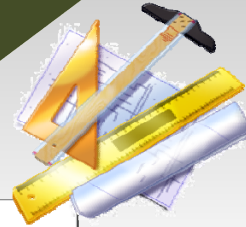


- ✓ Specific Details About System
 - Commercial, Residential, Loading, Age, Maintenance, etc.
 - Presby System Checklist
- ✓ Water Meter Readings (if possible)
- ✓ Contact Information, Address, Directions, Google Maps



Presby Wastewater Treatment System Site Inspection Report (N4)		Presby Environmental, Inc. (800) 471-5285	
System Ownership: www.presbyenvironmental.com		Regist. System Evaluation:	
Property Address: Mailing Address: Preferred phone # Email:	Certification: Address: Preferred phone # Email:	Operational Approval Date: ____/____/____	Date of Inspection: ____/____/____
Permit/Approval Number:	Copy of Plan Available? Yes No	Designer: Name: Company: Address: Telephone: Email:	
Installer: Name: Company: Address: Telephone: Email:	Primary Reason for System Inspection:	Is System in Failure? YES NO	
Person Initiating Contact: Person Responsible for Fee:	System Check/Interview: Notes:	Understanding of Required Use and Maintenance? YES NO Maintenance performed as needed? YES NO Are there additional open blocks or plumbing fixtures? YES NO Vacuity, Seasonal, Intermittent or Exceptional (Crew) Use? YES NO Water Service discontinued or open to system? YES NO Susp. (Unfilled) Tap (contributing to septic system)? YES NO Public Use (e.g., swimming pool)? YES NO	

- ✓ Use Presby Design & Installation Manual to Verify System Design Meets Criteria
 - Verify Amount of Pipe (Table A)
 - Verify Spacing & Slope (Table B)
 - Configuration, Venting, etc.
 - Septic Tank Sized per NH Rules



4.0 Tables A & B: Presby Pipe and Row Spacing (Single Level 1 - 60 MPI)

Table A: Presby Pipe Required Min. (Single Level)						Table B: Row Spacing Min. (Single Level)								
Perc. Rate MPI	Number of Bedrooms					Add'l Room	Commercial Per 160 GPD	Percentage of System Slope	Percolation Rate					
	2	3	4	5	6				1-10	11-20	21-30	31-40	41-50	51 to 60
1 - 2	89	112	150	188	226	38	42	0 - 10%	1.50	1.50	1.75	2.00	2.50	3.00
3 - 4	85	123	165	207	249	42	47	11 - 15%	1.50	1.75	2.00	2.25	2.75	3.25
5 - 6	80	135	180	225	270	45	50	16 - 20%	1.75	2.00	2.25	2.50	3.00	3.50
7 - 9	100	150	200	250	300	50	55	21 - 25%	2.00	2.25	2.50	2.75	3.25	3.75
10 - 13	110	165	220	275	330	55	60	Center-to-Center Row Spacing Minimum (ft.)						
14 - 19	120	180	240	300	360	60	65	Ex: System Slope of 10% or less @ 7 MPI requires row spacing of 1.5 ft. min.						
20 - 30	120	185	260	325	390	65	71							
31 - 40	140	210	280	350	420	70	77							
41 - 50	150	225	300	375	450	75	83							
51 - 60	160	240	320	400	480	80	89							

* Presby Pipe Required Minimum (ft.)
 * Consult factory for high strength effluent requirements.
 Ex: 4 Bedrooms @ 7 MPI requires 200 ft. of Presby Pipe.

5.0 Table C: Row Length and Pipe Layout Width (Single Level)

Total Linear Feet of Presby Pipe														
20	40	60	80	100	120	140	160	180	200	220	240	260	280	300
25	50	75	100	125	150	175	200	225	250	275	300	325	350	375

- ✓ Take Pictures of Site before Doing Any Work



- ✓ A Picture is Worth A Thousand Words: Use Photographs to Document Your Work



??
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Take a minute to notice what is hooked into plumbing drains headed to the septic tank ...

- Water Softener
 - Backwash
 - Saltwater

Is There One ???



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...or Are There Three !!!

A Significant Impact to the System that Wasn't Planned for in the Septic System Design



- Typical Garbage Disposal
 - Organic Loading

This Model Advertised as
 “SEPTIC SAFE

Unit Dispenses a Dose of
 Enzymes Automatically Each
 Time it is operated...



Is it “Septic Safe”?

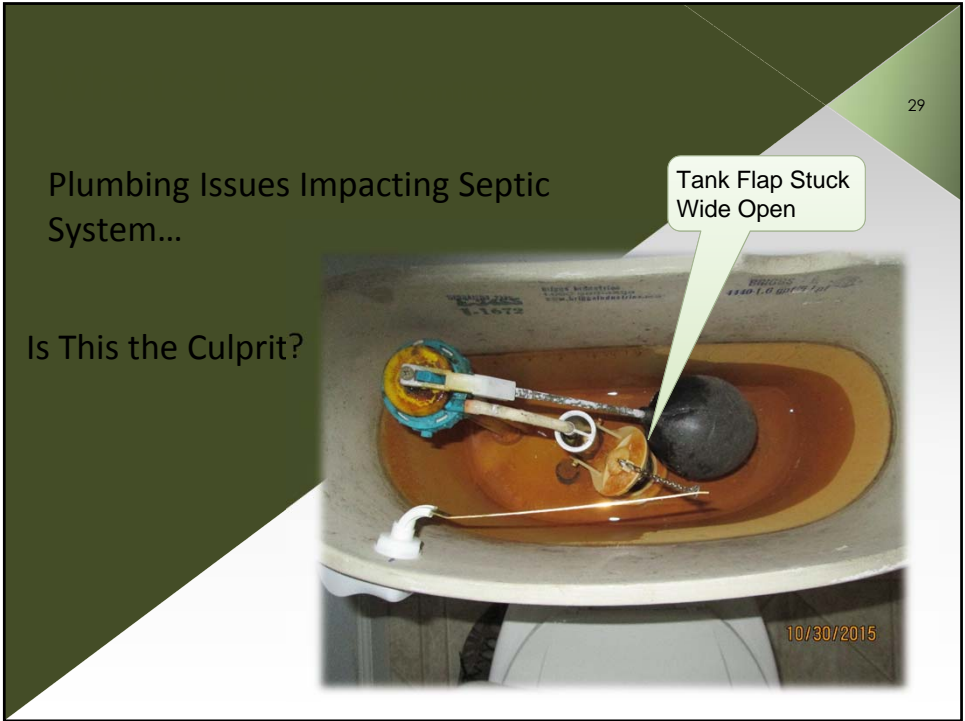
...Consider this:

Potential Increase in Pollutant Loading

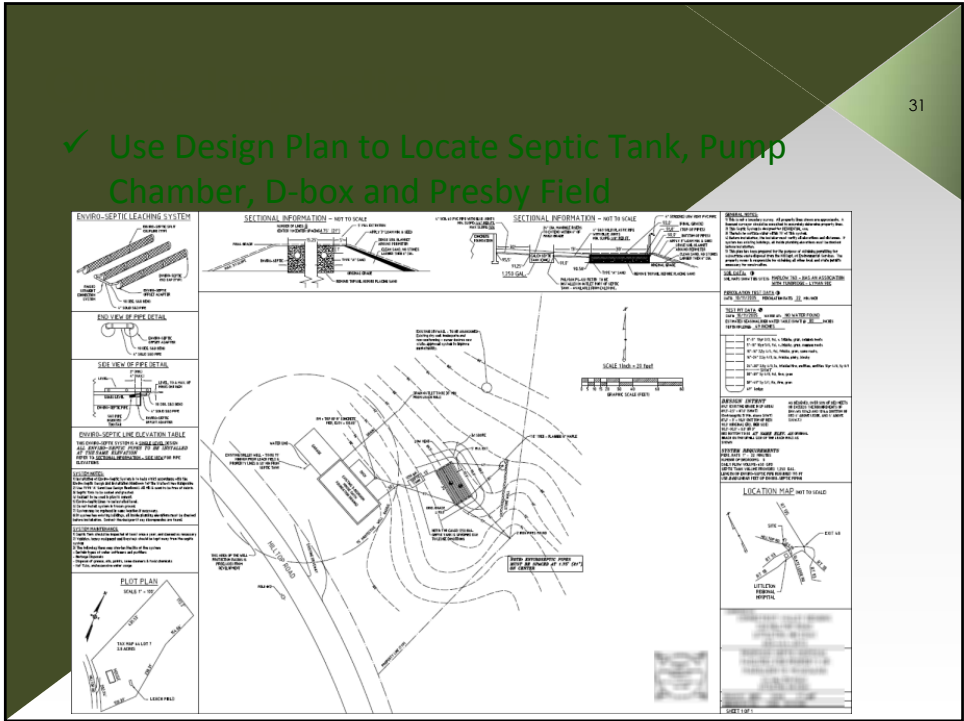
Table 14. Increase in Pollutant Loading Caused by Addition of Garbage Disposal

Parameter	Increase in Pollutant Loading (%)
Suspended solids	40-90
Biochemical oxygen demand	20-65
Total nitrogen	3-10
Total phosphorus	2-3
Fats, oils, and grease	70-150

Reference: Hazeltine, 1951; Rawn, 1951; University of Wisconsin, 1978



✓ Use Design Plan to Locate Septic Tank, Pump Chamber, D-box and Presby Field



Roof Stack Pipe(s)

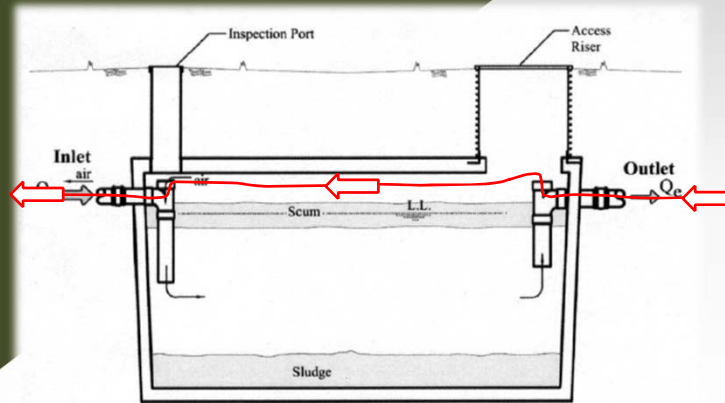
Septic Tank Gases Historically Have Been Expelled Via The House Plumbing Vent Stack

1 of Six Vents



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Most Septic Tanks Constructed with Provision For Air and Gas Movement.

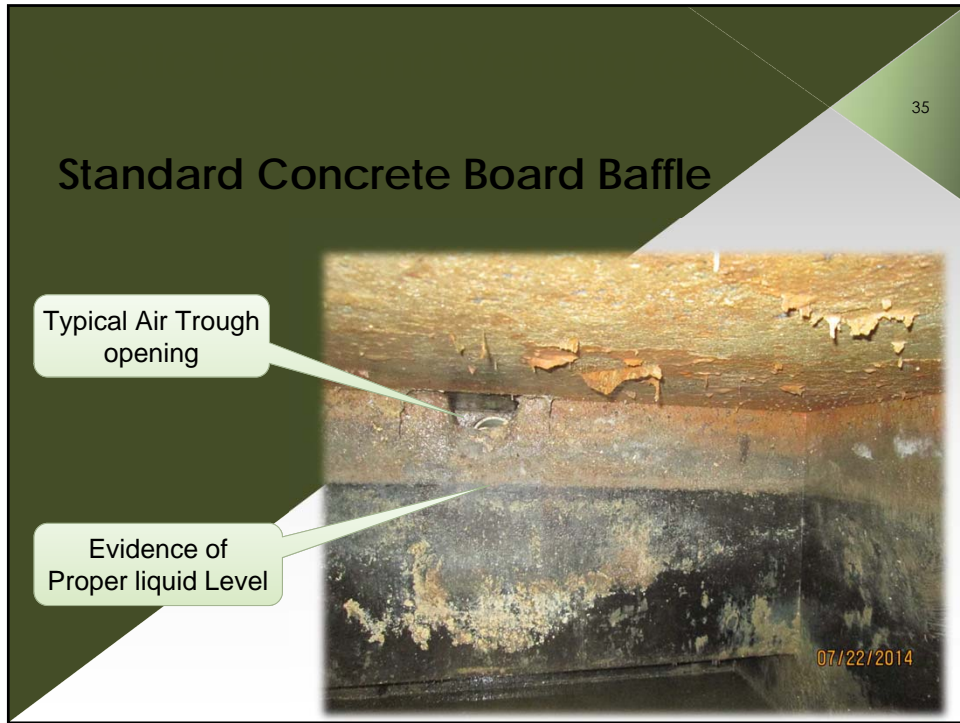


34

Old Mahogany Board Baffle

Replaceable board allows for air movement





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Airway to the House Vent Stack Was Blocked for 12 Years

Cover Will Set Right Down on Baffle; Blocking Airway.

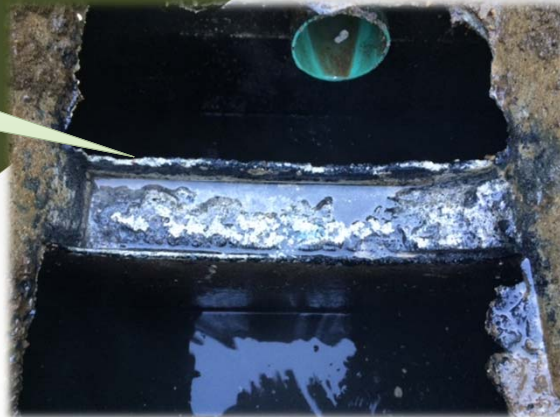
Very Common to See Concrete "Slag" Not Chipped Away At Time of Tank Installation

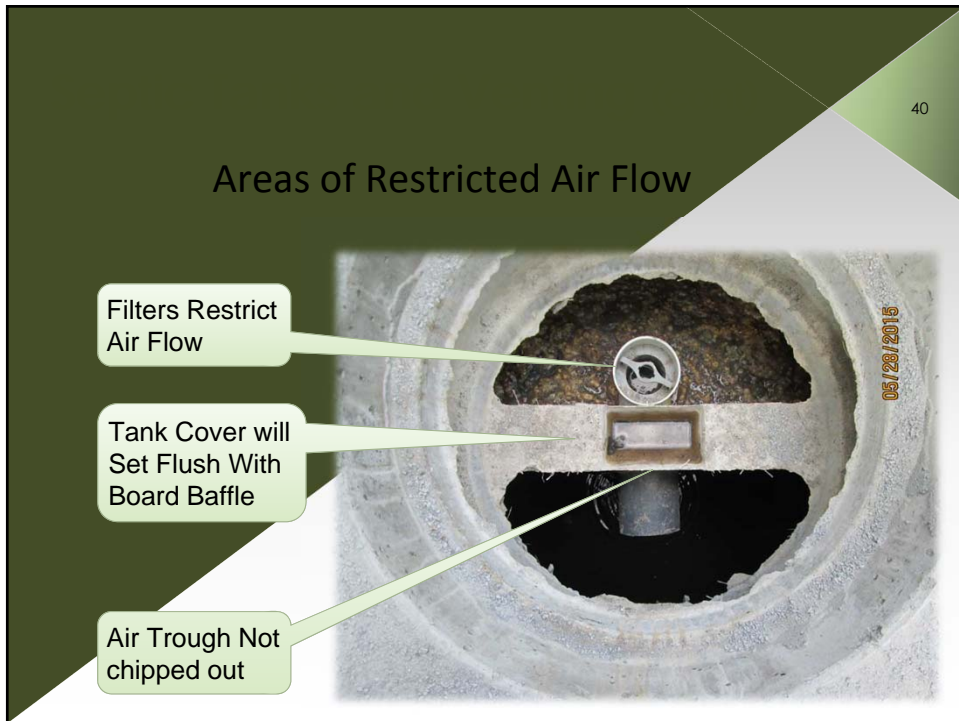
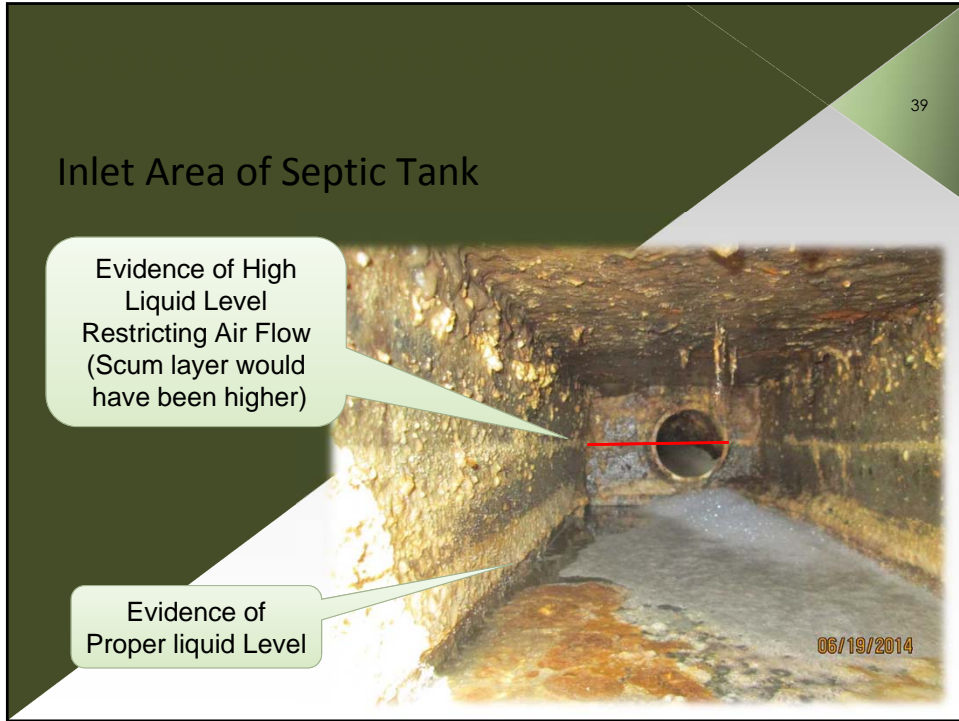


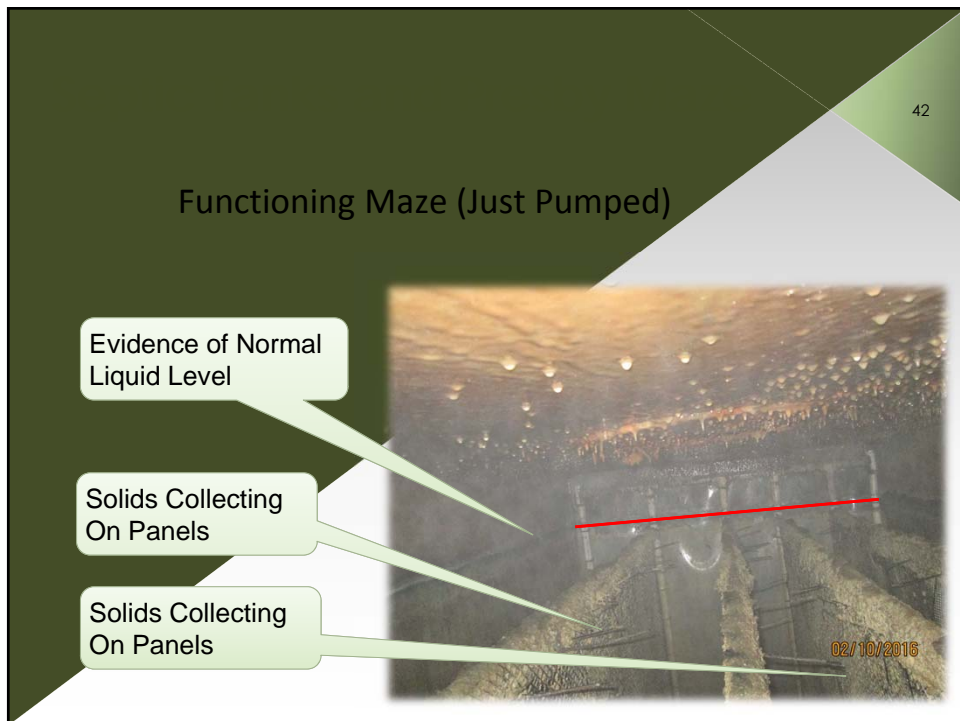
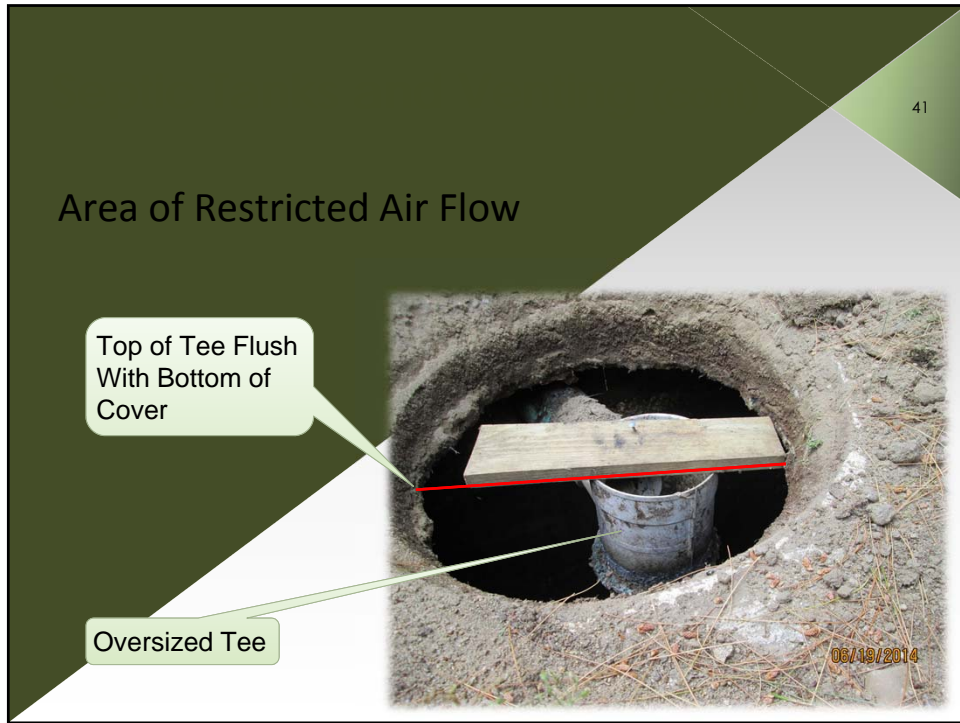
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Much Better...

Homeowner Did a Pretty Good Job; Still a Little left to Knock Off.







43

Groundwater Infiltration – System Flooding

Steady Stream of Clear Water

1 Pint / Min
Generates 180 gpd !
That's Another
Bedroom Design Flow
+ !!



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Solids Introduced Into Pump Chamber

Excess Solids
Present In Pump
Chamber

Pump Should Only Be
Pumping Primary
Treated Effluent To
Any System



45


Many Types and Sizes (small Plastic)

Flow Equalizers not Needed When Not Splitting Flows

High Vent Outlet

Pump Line Inlet

Single Outlet to Serial System




This image shows a close-up of a small, rectangular plastic flow equalizer. It features several circular openings on its top surface, some of which are covered with orange caps. A callout box points to one of these openings, stating that flow equalizers are not needed when not splitting flows. Three other callout boxes on the left side identify specific features: a 'High Vent Outlet' at the top, a 'Pump Line Inlet' on the side, and a 'Single Outlet to Serial System' at the bottom.

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Many Types and Sizes (Large Manifolded D-Boxes)

Note: 3 Outlets Manifolded back to Feed 1 Large D-box

Splitting Large Flows and Feeding Multiple "Sections" Utilizing Large Manifolded D-Boxes



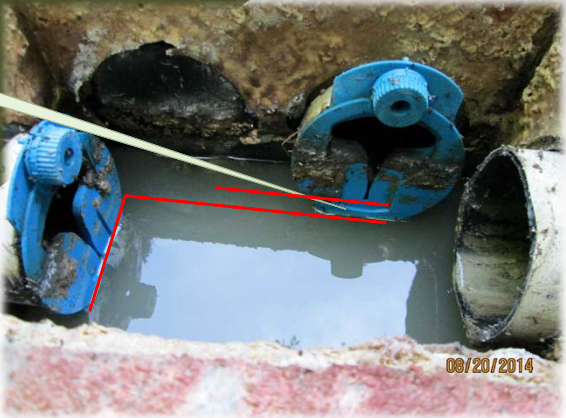
This image shows a construction site for a large-scale water management system. Several large, rectangular concrete or plastic manifolded D-boxes are being installed in a trench. The boxes are interconnected with a network of pipes. A callout box on the left notes that three outlets are manifolded back to feed a single large D-box. Another callout box explains that these boxes are used to split large flows and feed multiple sections of the system.

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Splitting flows (Can be problematic)

Out of adjustment

This d-box was dead level; the pipe on the right pitched steeper to the Presby Pipe; Raising the invert $\frac{3}{4}$ " !

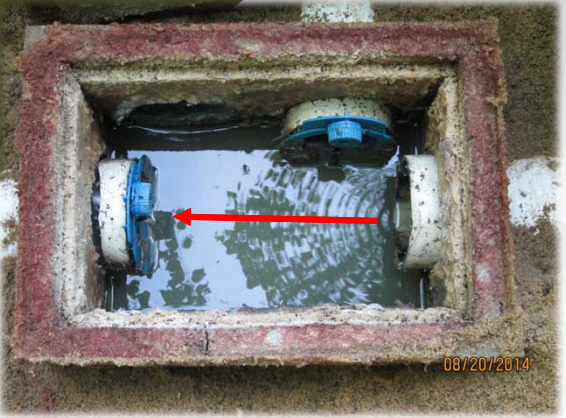


09/20/2014

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Majority of Trickle Flow Exited via The Lower pipe

Equalizers still Tended to Mitigate the Problem



09/20/2014


49

Flow "Unequalizers"

You just cannot make this stuff up !

One Equalizer Installed Sideways; the Others Just Tossed in the D-box. We Found Them 12 Years Later!


Note position



04/23/2014 13:31

50

Flow Equalizer installed on Vent Outlet; Restricts Airflow



06/29/2015

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D-Box Out of Level

Flooded
Vent Pipe;
Restricted
Airflow



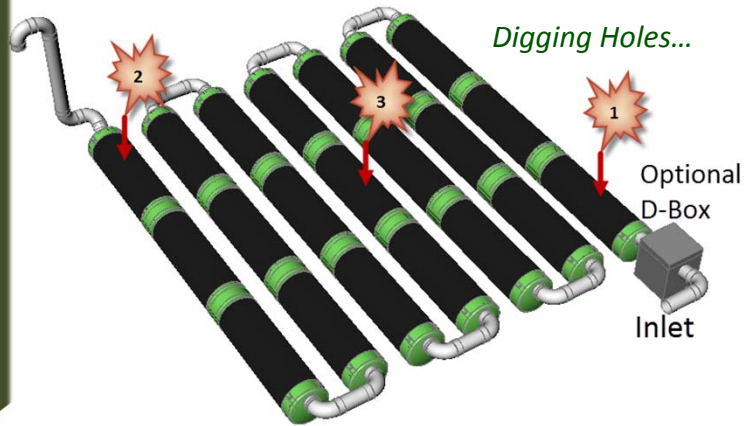
52

Disintegrating Concrete D-Box



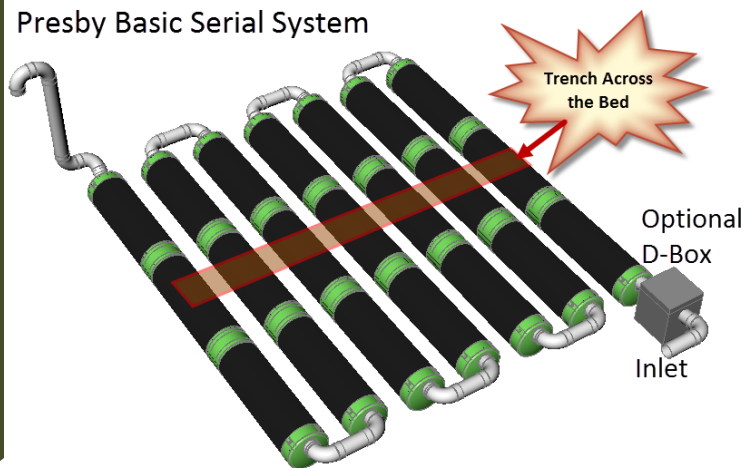
➤ Where to dig?

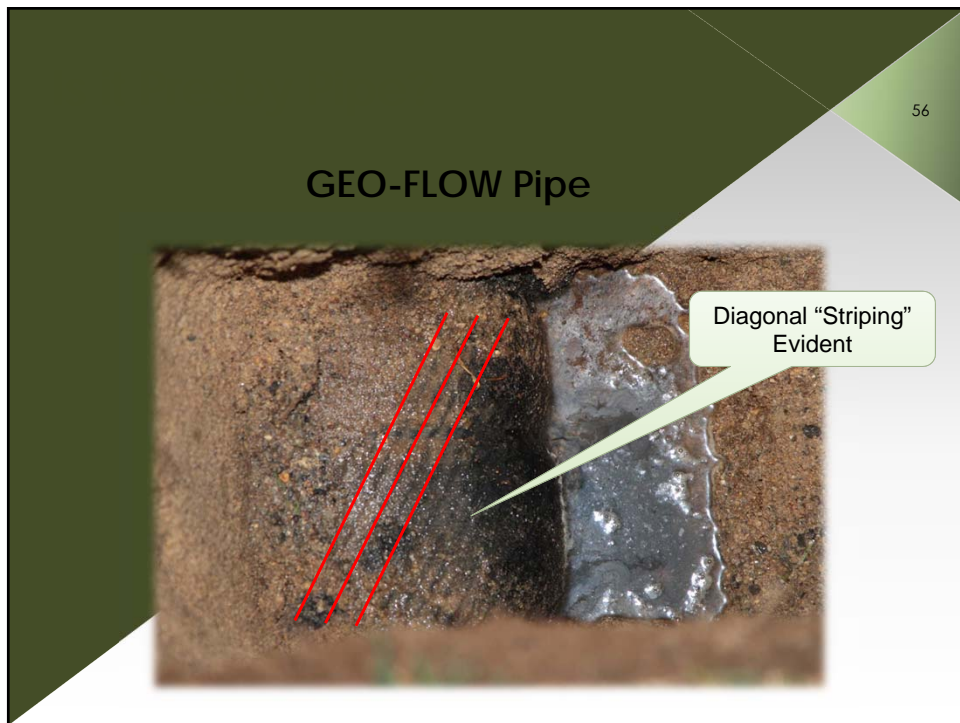
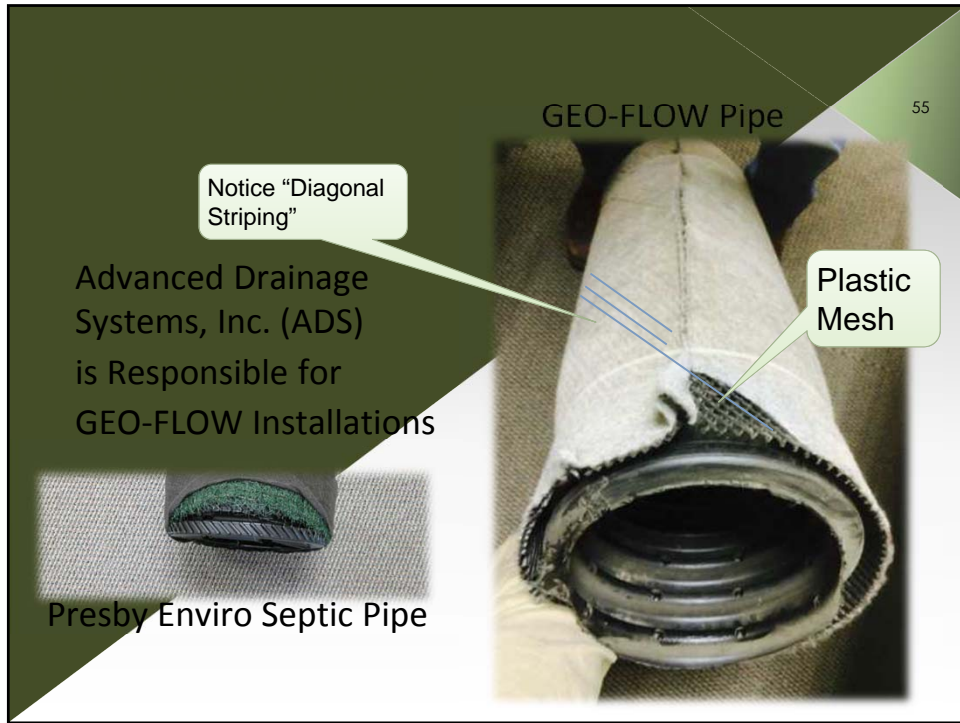
Presby Basic Serial System



➤ Where to dig?

Presby Basic Serial System





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Too Much Landscaping Without Consideration of Design Parameters

Systems Must be Vented with More than 18 Inches of Cover Over Pipes

Notice: Otherwise Perfectly Functioning System




32" Cover (no vent)

06/05/2014

58

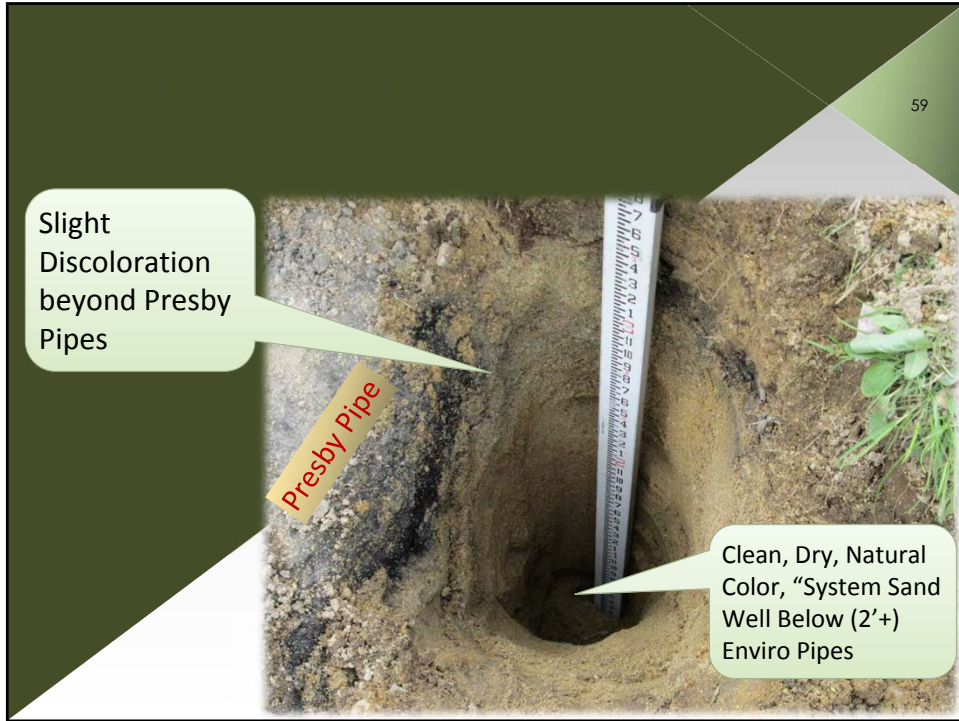
Too Much Backfill Without Consideration of Design Parameters

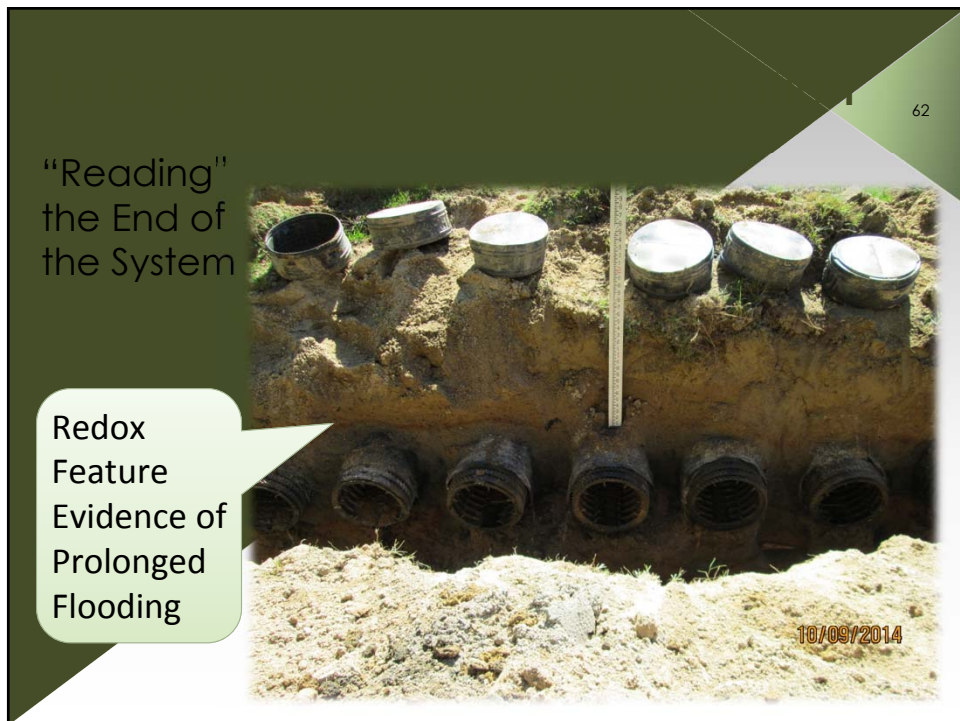
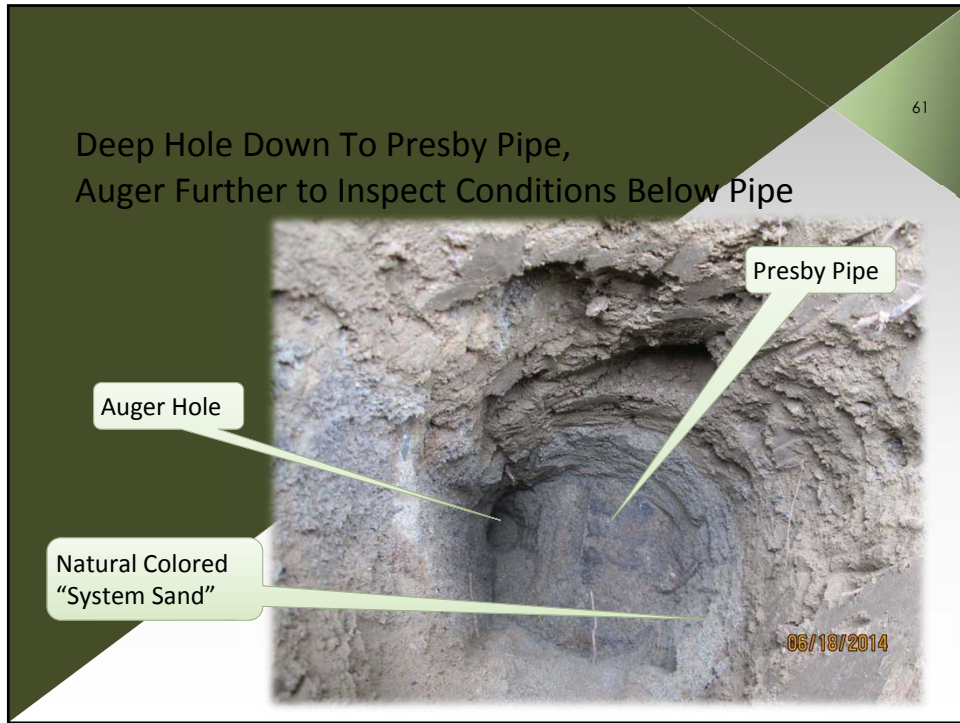
Note: Often Otherwise A Good Installation

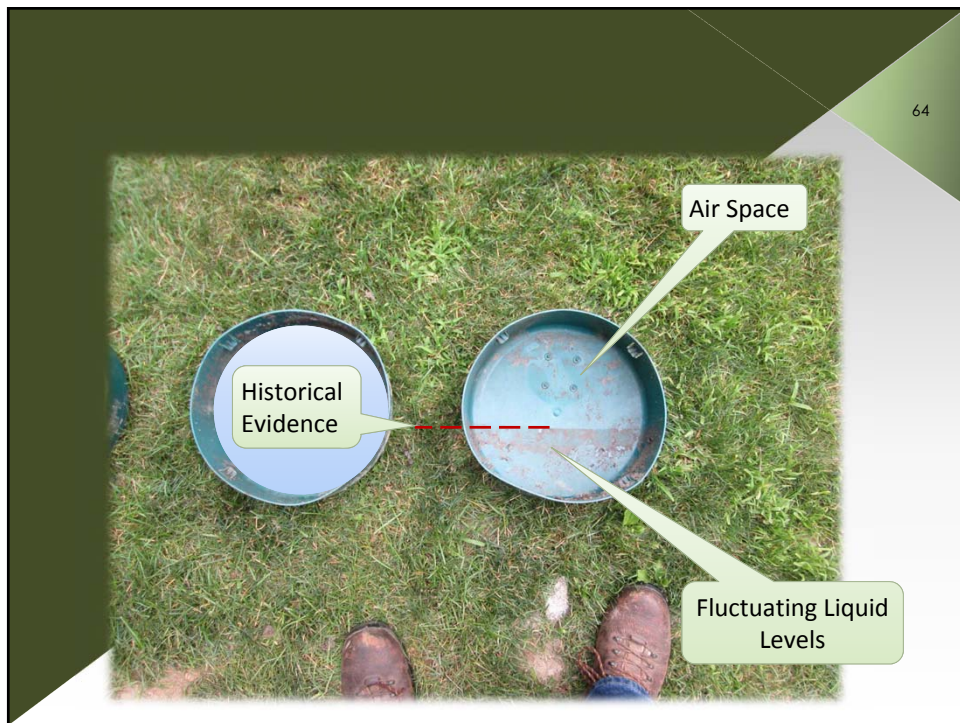
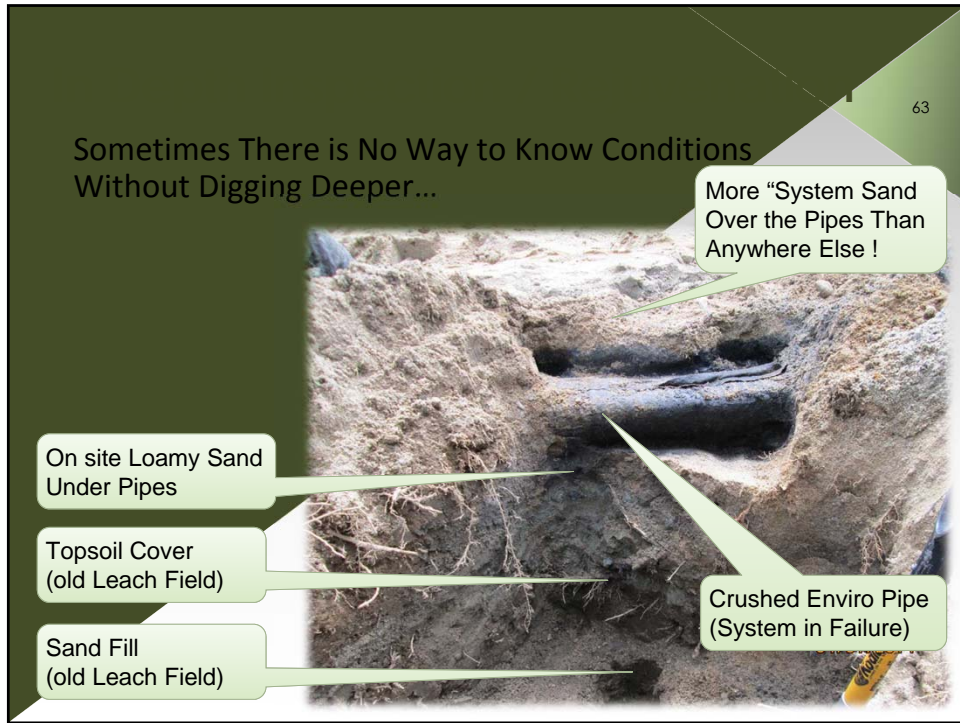


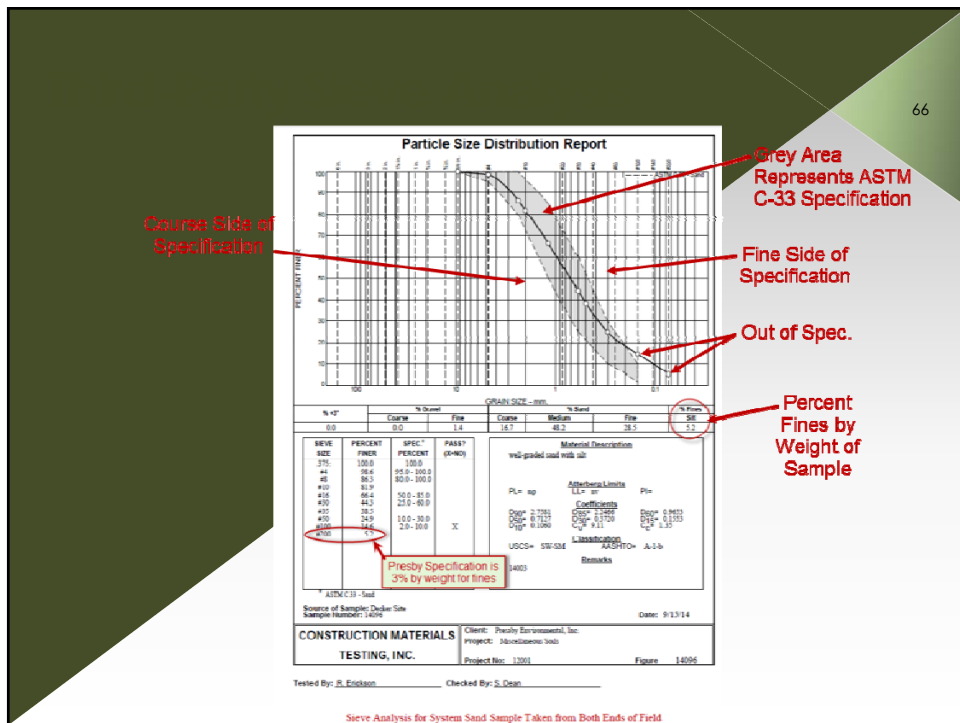
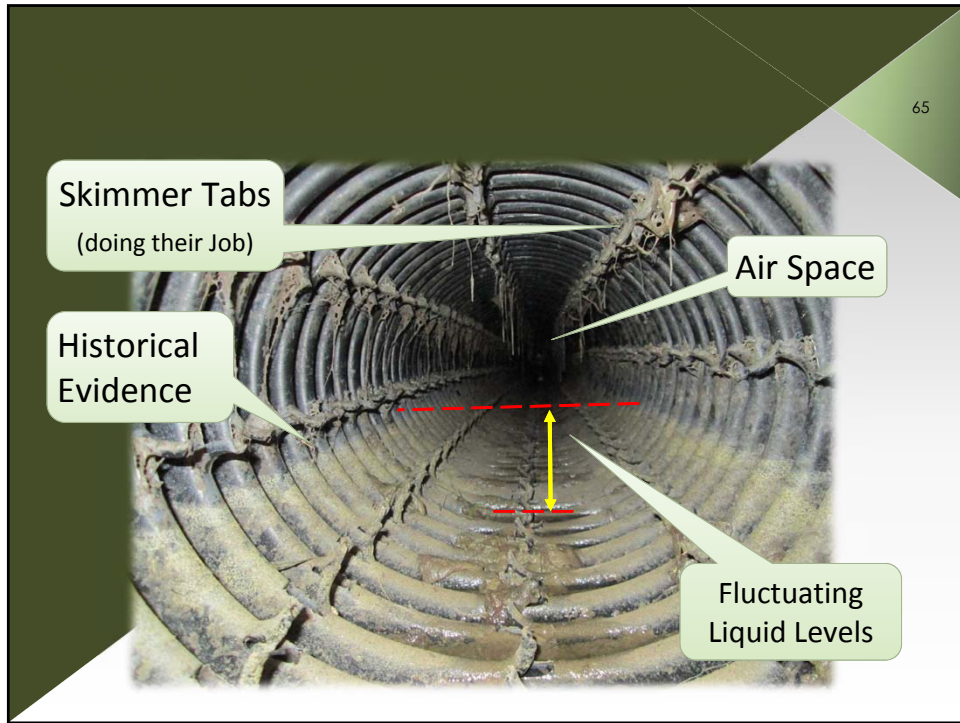
27" Cover (no vent)

10/09/2014









✓ Use Checklist, Field Notes and Pictures

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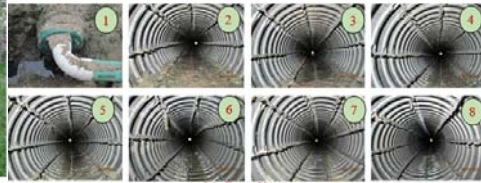
Panoramas from the Back & Front of House



Inlet End of System Showing Order of Effluent Flow



End Opposite from Inlet Showing Order of Effluent Flow



Inlet End of System

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- Offset Adapters Show Flooded Conditions for Extended Period
- Shallow Ledge Tank, not Pumped in 10 Years
- Pumper Reports Effluent Filter Clogged, Liquid Level at Top Tank, Solids Going to Field



Offset Adapters End Opposite from Inlet



Septic Tank Showing Effluent Filter



Inside Septic Tank View toward Inlet Side Showing Evidence of Past High Water Conditions

- Spacing Good, Raised Connections Good,
- Not Enough System Sand & Cover in Certain Areas



1.75 Ft. Center-to-Center Spacing Consistent Throughout



Raised Connections Constructed Properly



Inlet End at Row #1 Shows Correct Amount of System Sand Over Pipes



Inlet End at Row #8 Shows Insufficient System Sand & Cover Over Pipes

- Not enough System Sand in Certain Areas
- Black Sand at Interior of Bed Indicates Anaerobic Conditions Still Exist



End Opposite from Inlet at Row #1 Shows Insufficient Amount of System Sand Over Pipes



End Opposite from Inlet at Row #8 Shows Insufficient System Sand & Cover Over Pipes



End Opposite from Inlet Between Rows #2 & #3 Showing Plenty of System Sand Under the Pipes



End Opposite from Inlet Between Rows #3 & #4 Showing Black Anaerobic Sand at 1 FT Depth

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- **System Sand**

From Inspection Report:

3. System Sand – The System Sand appeared black between the pipes at a horizontal depth of 6-12 inches indicating anaerobic (without oxygen) conditions were still present within the bed four full days after opening the ends of the bed. Samples of the System Sand were taken from locations at each end the bed and a third-party sieve analysis was conducted. The results of the testing showed that the sample did not pass the specification for System Sand. The sieve analysis indicated a **finer content (any material passing the #200 / 0.075 mm - sieve) of 5.2% by weight**. The specification for System Sand in the Presby NH Design and Installation manual states a fines content of not more than 3% by weight (see sieve analysis below). Areas of the bed were lacking the correct amount of System Sand over the pipes (6 inches) and in some areas lacked sufficient cover as well (see pictures below).

From Inspection Report (Recommendations):

9. System Sand – An insufficient amount of System Sand above the ES pipes, while not considered a major contributing factor to the failing conditions of this system, may have contributed to the breakout due to lack of cover in that area. It also may have inhibited air flow in parts of the field where a lack of System Sand allowed loam cover material to be located in close proximity to the top of the pipe. The specification for the amount of System Sand is 6 inches above the pipes, which should be present for proper function of the system.

Although the System Sand in this bed contains fines above the Presby specification (3% of the sample by weight), at 5.2%, the fines are not considered to impact the performance of the system to a significant degree and certainly any improvement would be so small as to not justify replacement of the existing System Sand.

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- **Recommendations**
 - Recommend Rejuvenation
 - Increasing Amount of System Sand & Cover in Areas Where it Was Lacking
 - Removal of Effluent Filter
 - Creating Surface Water Diversion Upslope from the System

From Inspection Report:

Recommendations:

8. Rejuvenation – The evidence seems to indicate that insufficient septic tank maintenance, a clogged effluent filter, lack of oxygen (anaerobic conditions) and heavy organic loading to the field were the main causes of failing conditions and effluent breakout experienced with your Enviro-Septic system. Since these root causes are capable of being eliminated, your system is a good candidate for the rejuvenation process. Rejuvenation re-establishes aerobic (with oxygen) conditions within the Enviro-Septic Pipes and System Sand by draining and allowing the field to rest for at least 72 hours (see Rejuvenation procedure in the Presby NH Design & Installation manual).



EnviroFin™
Specialized. Affordable. Effective.

Prepackaged Filter (Air Ports)

- Allows air to enter unit and provides aeration for aerobic bacteria growth



Fin Distribution Unit (FDU)



Slotted Filter

- Provides high surface area for aerobic bacteria growth
- Prevents excessive algae from growing on filter
- Prevents excessive algae from growing on filter



(6) Treatment Fins



Air Ports

- Allows air to enter the treatment line to promote aerobic bacterial growth

Coarse Green Fibers

- Fibers more suspended solids
- Prevents water gushing to bacterial treatment surface
- Creates massive bacteria treatment area




Ships Easily!
EnviroFin™ Fits in 1 Box (~65 lbs)

Meets and Exceeds NSF/ANSI Standard 40

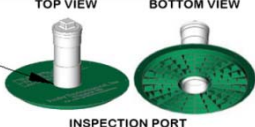



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Inspection Port in Top Cover of Fin Distribution Unit (FDU)

TOP VIEW **BOTTOM VIEW**



APPLY SILICONE CAULKING (OR EQUAL) TO MATING SURFACES

INSPECTION PORT (INSTALLED)

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The Next Generation of Wastewater Treatment Technology

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Commercial

We offer scalable solutions for all types and sizes of businesses, from hotels and shopping malls to restaurants and supermarkets. Our technical advisers and network of certified professionals will work with you to customize our products to your site, use and budget.

News
Dave Presby will be speaking at the Maine Associate of Site Evaluators Field Day!
Information on our Newest Product: EnviroFin™

Products
Advanced Enviro-Septic®
Enviro-Septic®

Videos/Media

Free Technical Support

- Technical Recommendations and Phone Support
- Site Visits With Training and Education
- CAD Drawings
- Regulatory Support
- Installation and Operation Guidance and Manuals
- Onsite During Construction
- Post Sale Support for the Life of the System

PEI has a team of dedicated experts to help you with your project!

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