

Advanced Onsite Sewage Treatment Systems in Florida

Onsite Sewage Program
Bureau of Environmental Health

November 3, 2016

Division of Disease Control and Health Protection

To protect, promote and improve the health of all people in Florida through integrated state, county, and community efforts.

Acknowledgment

Slides created by:

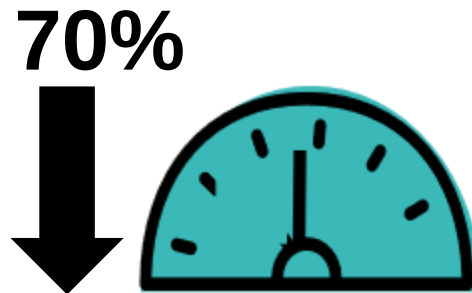
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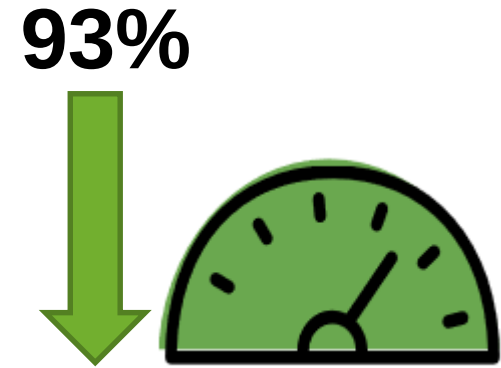
Nitrogen Reduction Options for Onsite Wastewater



Conventional
systems



Lined drainfield
& existing
advanced
technologies



Nitrogen
reducing
systems

Nitrogen Removal

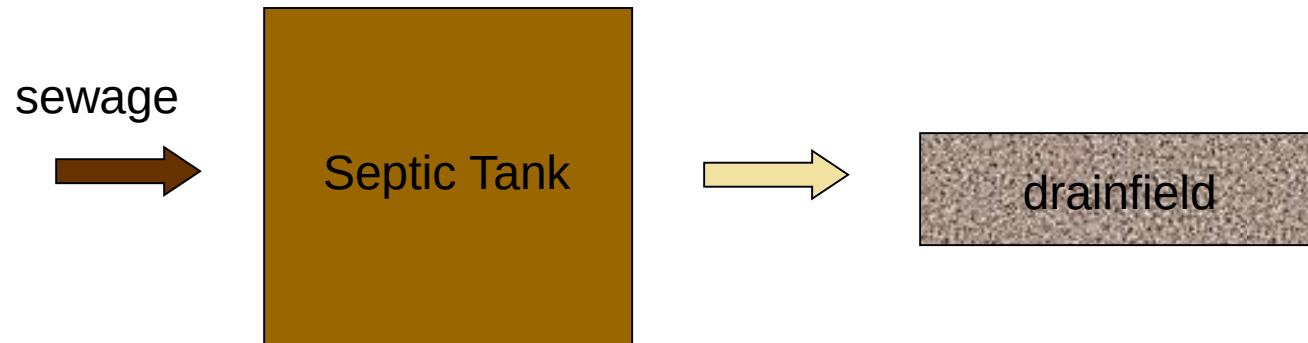
Nitrogen exists in various forms and must be dealt with progressively in each form to ensure removal

Conceptually:

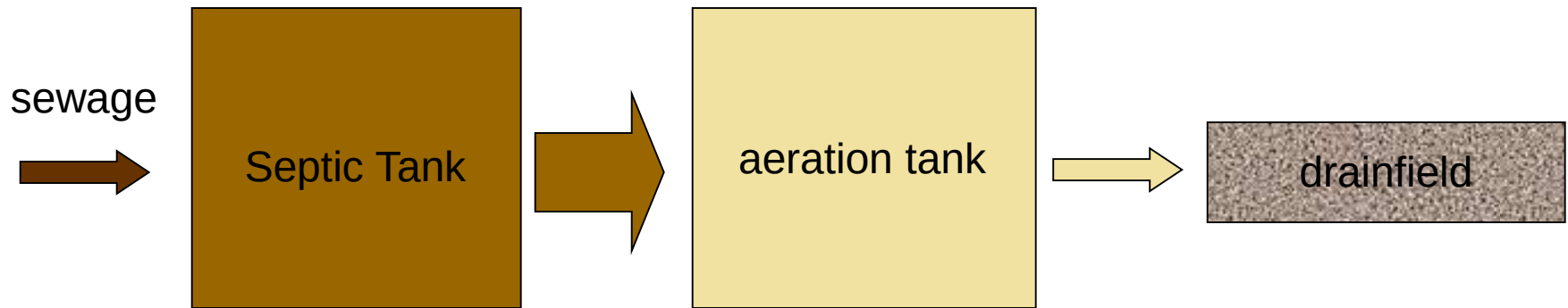
organic nitrogen -> ammonia -> nitrate -> nitrogen gas

<i>ammonification</i>	<i>nitrification</i>	<i>denitrification</i>
<i>septic/anaerobic</i>	<i>aerobic</i>	<i>anoxic (need food)</i>

Conventional OSTDS

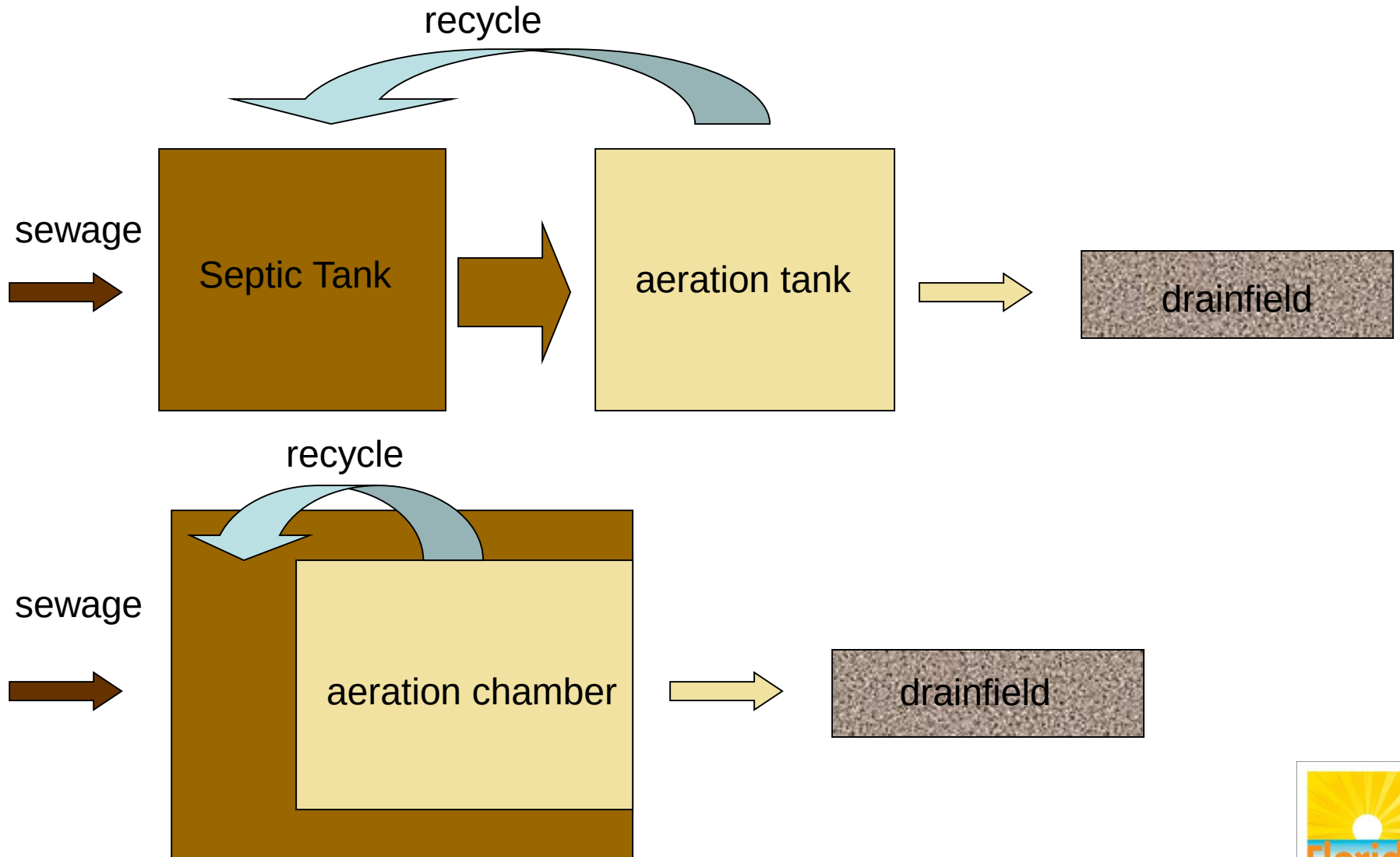


Aerobic Treatment Unit (ATU)



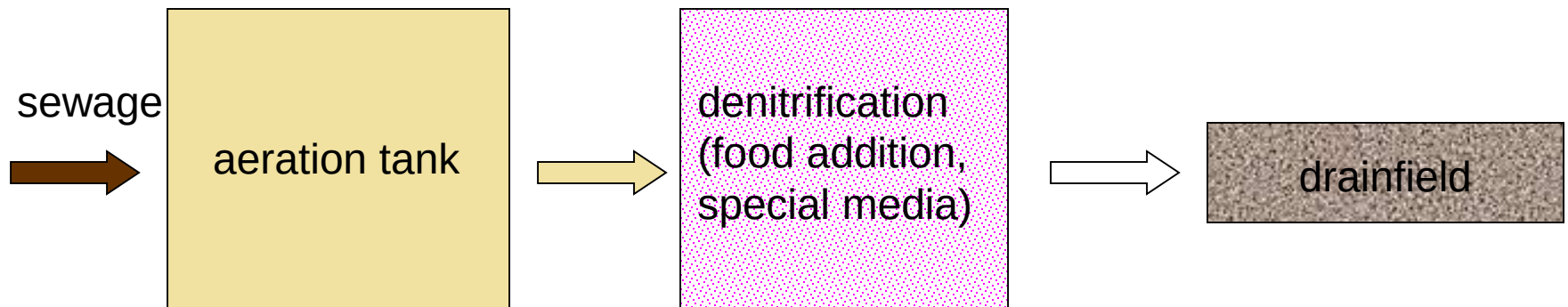
NSF40 Certification

NSF245 Certified ATU



Additional Nitrogen Removal Processes

Performance Based Treatment System (PBTs)



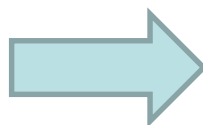
“Passive” Nitrogen Reduction Systems

Reduce effluent N using reactive media for denitrification and a single liquid pump, if necessary.

Wastewater from home



Stage 1
(nitrification)



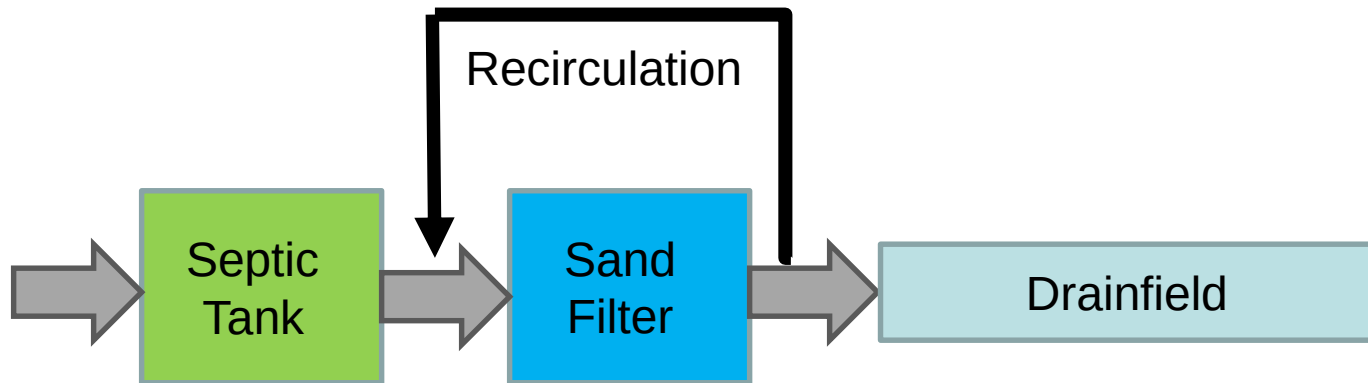
Dispersal



Stage 2
(denitrification)



In-Tank Passive Nitrogen System

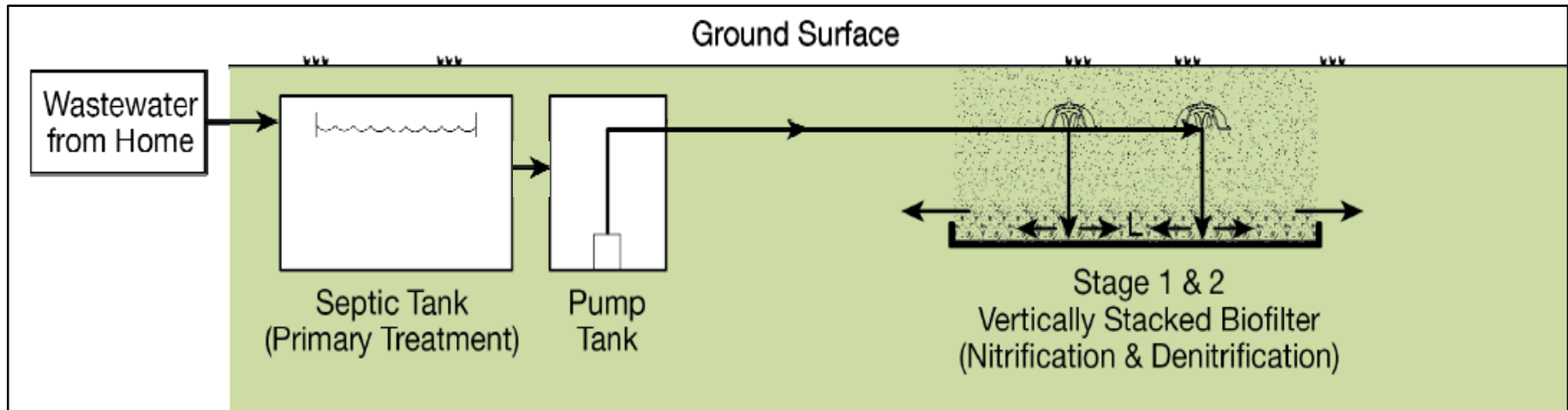


Conventional OSTDS + In-Tank Sand Filter

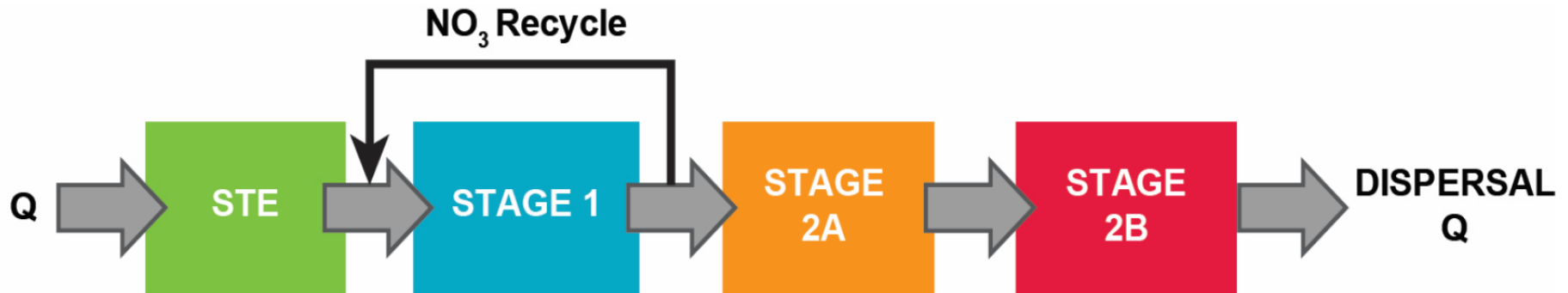
In-Ground Passive Nitrogen System



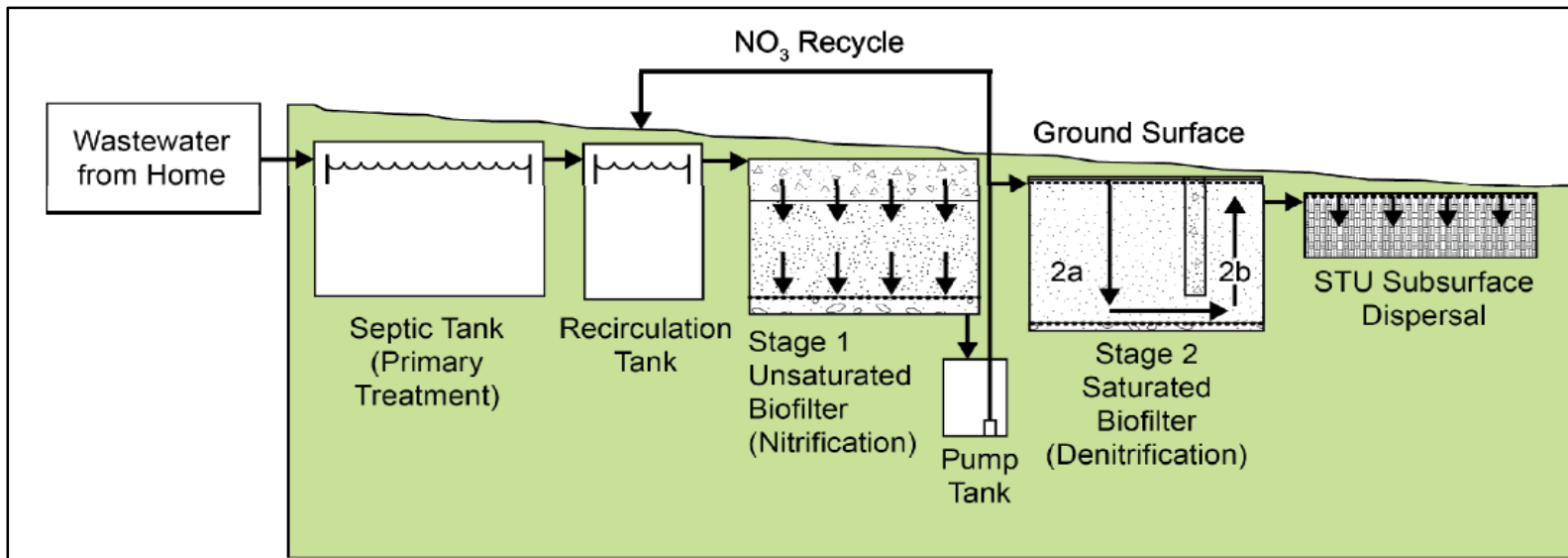
Conventional OSTDS + In-Ground Two Stage System: Stage 1 Sand, and Stage 2 Lignocellulosic Materials



In-Tank Passive Nitrogen System



In-Tank Two Stage Biofilter with Recirculation Stage 1, Dual Media Stage 2 Lignocellulosic (2a) followed by Elemental Sulfur (2b)



Combined Passive Nitrogen System

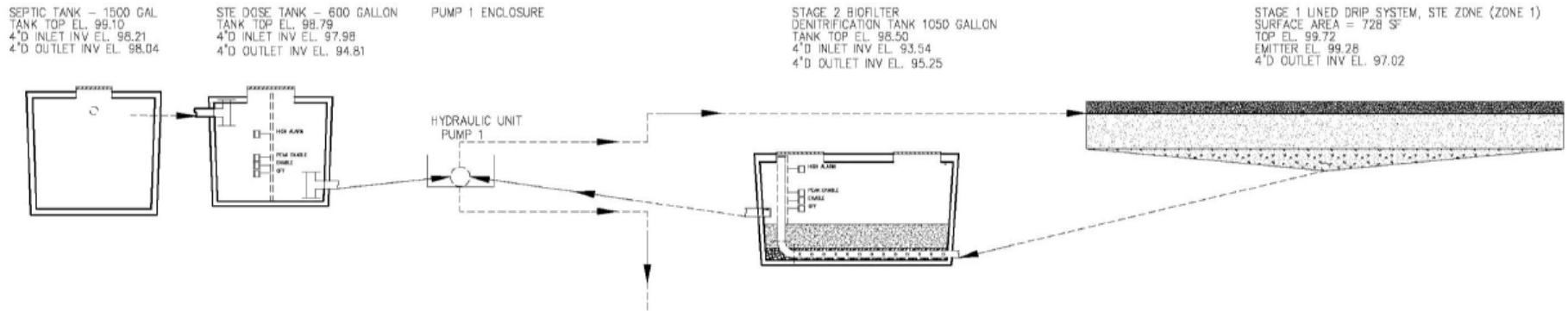


Image from Hazen and Sawyer (2013)

Permitting Categories

Three categories include elements of performance-based permitting

- Aerobic Treatment Unit (ATU)
- Performance-Based Treatment System (PBTS)
- Innovative System (sub-category of performance-based treatment system)

ATU Definition

- “A sewage treatment unit which introduces air into sewage to provide biochemical stabilization within a treatment receptacle”
Florida Administrative Code (FAC) Rule 64E-6.002(2)
- Sprinkle water through air or loose filter material
- Bubble air through water
- Certification by NSF International or other certification organization for CBOD₅ and TSS Treatment based on NSF40 standards
- Some NSF40 certified systems may also be certified for NSF245 standard for nitrogen.

Performance-Based Treatment System (PBTS) Definition

- Specialized onsite sewage treatment and disposal system
- Achieves a specific and measurable established performance standard for multiple parameters.
- Designed by a professional engineer with a background in wastewater engineering, licensed in Florida
- Using appropriate application of sound engineering principles
- Additional requirements in FAC Chapter 64E-6 Part IV

Innovative Systems: A Special Category of PBTS

- “Employ materials, devices, or techniques that are novel or unique and that have not been successfully field-tested ... in this state”
Section 381.0065(2)(g), Florida Statutes (FS)
- Require NSF/Environmental Technology Verification (ETV) data for approval as innovative systems
FAC Rule 64E-6.026(1)(b)
- Included in permitting category PBTS
FAC Rule 64E-6.025(10)



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