2008

Ohio Environmental Protection Agency

Interim Onsite Sewage Treatment System Guidance Document

Division of Surface Water

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Preface

In 1993, the Ohio EPA Division of Surface Water's Greenbook was last updated. That version outlined basic onsite sewage treatment system information regarding leach fields and contained a small reference to mound systems. In 2006, the Ohio Department of Health (ODH) was tasked by House Bill 231 to develop a new set of rules governing Home Sewage Treatment Systems (HSTS) and was given the regulatory authority for Small Flow Onsite Sewage Treatment Systems (SFOSTS). Ohio EPA concurrently was developing their Onsite Sewage Treatment System (OSTS) rule to replace the existing Greenbook guidance document. In March 2007, the HSTS rules were rescinded by the legislature and a Sewage Study Commission created to re-evaluate the ODH rules. Ohio EPA has therefore delayed the OSTS rule development until ODH develops their HSTS/SFOSTS rules. In the mean time, Ohio EPA saw the need to provide an interim guidance document that reflects more current technologies and viewpoints regarding the OSTS program. This Interim Onsite Sewage Treatment System guidance document is intended to bridge the gap between the Greenbook and the future Ohio EPA OSTS rule.

Definitions

At-grade system: Defined as an OSTS where wastewater is conveyed to a soil absorption system that is constructed on in-situ soil at the ground surface and covered by soil.

Certified Professional Soil Scientist: Defined as an individual with a baccalaureate degree with a major in agronomy, soils, or a closely allied field of principles of pedology to soil classification, investigation, education, and consultation and on the effect of measured, observed and inferred soil properties and their use, and who is a member of the Ohio Association of Pedologists and/or ARCPACS.

Failure: Defined as an OSTS which exhibits one or more of the following but not limited to:

- The system refuses to accept wastewater at the rate of design application thereby interfering with the normal use of plumbing fixtures.
- Wastewater discharge exceeds the absorptive capacity of the soil, resulting in ponding, seepage, or other discharge of the effluent to the ground surface or to surface waters.
- Wastewater is discharged from the system causing contamination of a potable water supply, ground water, or surface waters.

Fill: Defined as soil other than in-situ soils. Fill may be evident by one or more of the following but not limited to:

- No soil horizons or indistinct soil horizons (e.g. surface mine reclamation)
- Depositional stratification
- Presence of a soil horizon which has been covered.
- Materials in a horizon such as cinders or construction debris.
- Position in the landscape

Hydric Soils: Defined as soils that are formed under conditions of saturation, flooding, or ponding long enough to develop anaerobic conditions in the top twelve inches of the soil.

Infiltrative Surface: Defined as the contact area where the wastewater is applied to the soil, sand, or other medium for treatment and dispersal purposes.

In-situ soils: Defined as soils that are naturally occurring and have not been placed and have not been disturbed.

Limiting Condition: Defined as bedrock, normal groundwater, a restrictive soil layer, seasonal high groundwater or any other condition that severely limits the soils ability to treat and/or disperse wastewater.

Onsite Sewage Treatment System: "OSTS" means a disposal system which treats and disperses wastewater into a soil absorption system.

Small Flow Onsite Sewage Treatment System: "SFOSTS" means a system, other than an home sewage treatment system, that treats not more than one thousand gallons of sewage per day and that does not require a national pollutant discharge elimination system permit issued under section 6111.03 of the Revised Code or injection well drilling or operating permit issued under section 6111.043 of the Revised Code.

Severe Soils: Defined as soils with permeability rates of < 0.2 in/hr and with a limiting condition of < 24 inches or less.

Vertical Separation: Defined as the distance between the bottom of the infiltrative surface and the top of the most limiting condition.

General Recommendations

This interim guidance document outlines Ohio EPA's opinion of what design standards, siting restrictions, operation, and management requirements are needed for any OSTS. Onsite sewage treatment system designs vary according to the site and wastewater characteristics encountered, however, all designs should strive to incorporate the following features to achieve satisfactory long-term performance:

- Shallow placement of the trench or infiltration surface (<2 feet below final grade)
- Organic loading comparable to that of septic tank effluent at its recommended hydraulic loading rate.
- Trenches installed parallel to surface contours
- Narrow trenches (<3 feet wide)
- Timed dosing with peak flow storage
- Even distribution of wastewater over the infiltration surface.

- Multiple cells to provide periodic resting, standby capacity, and space for future repairs or replacement.

The designer should attempt to include as many of the above features as possible to ensure optimal long term performance and minimal impact on public health and environmental quality. Additional concepts to consider when designing an OSTS include:

- A certified professional soil scientist should conduct the soil evaluation, especially in locations where depth to limiting condition(s) is likely to be < 24". Systems being designed for 200 gpd or less may not need a soil scientist to conduct a soil evaluation.
- A minimum of 1:1 ratio (lineal feet gravity leach line to gpd) should be included. Unfiltered septic tank effluent should have a 2:1 ratio in severe soils if system is greater than 200 gpd.
- A minimum storage capacity of 2.5x the ADF in septic tank should be included and minimum 1,000 gallon septic tank is recommended.
- Dual compartment septic tanks are recommended. Two single compartment septic tanks may also be recommended on a case by case basis.
- Septic tank effluent filters are recommended, especially where no other pretreatment is provided.
- Tankage pumping/inspection schedules should be addressed in the permit, PTI forms, and on detailed plans (grease interceptor, septic tank, dosing tank if needed).
- OSTS over 1,000 gpd should incorporate pressure distribution, however with proper justification, dosed gravity may be recommended. OSTS greater than or equal to 2500 gpd should only incorporate pressure distribution.
- Systems proposed over 1,000 gpd, which deviate from this guidance document, should be discussed with Central Office's Division of Surface Water's PTI Unit before approval.
- Equalization may be allowed to justify smaller soil dispersal areas for systems with uneven flow distribution throughout the operation of the system.
- 100 % replacement area is recommended.
- The maximum length of any gravity leaching lateral should not exceed one hundred feet.
- Trenches should be as high as possible in the soil to maximize the usable soil for treatment.
- Gravelless technology may be used in lieu of the requirement for aggregate. No reduction in soil distribution area should be permitted.
- A grease interceptor and pretreatment component are strongly recommended for any OSTS that will have restaurant strength wastewater (high BOD/TSS).

Prohibitions

- Curtain drains should not be installed to overcome site restrictions (if ground water is an issue, the installation of an **up-gradient** drain is acceptable).
- Soil absorption systems should not be installed in hydric soils. Soils that no longer maintain those anaerobic conditions may be acceptable for onsite sewage treatment systems, if a soil scientist can confirm adequate aerobic conditions exist to provide treatment.

- The soil dispersal portion of the treatment system should not be placed on fill (unless the certified professional soil scientist determines the fill soil shows signs of proper structure and features of a classified soil).
- A pretreatment component should not be placed in the septic tank (other than effluent filters) as not to reduce the systems' storage capacity.
- Clean water connections should be prohibited from discharging to an OSTS.
- Only domestic sewage or wastewater that has the same characteristics as domestic sewage should be permitted to go to the soil absorption system.
- Industrial waste is prohibited from entering an OSTS which includes but not limited to:
    - Beauty Shops (chemical rinse, wash bowls)
    - Dental Offices (surgical & medical waste)
    - Medical Offices (surgical & medical waste)
    - Animal Care Facilities (chemical flea dips)
    - Funeral Homes (embalming fluids)
    - Slaughter House (animal fluids)
    - Floor Drains in vehicle maintenance areas (others similar recommended by UIC)
- Construction/installation of the soil treatment and dispersal components should be prohibited (in the permit) when the ground is frozen and/or saturated.
- Soil absorption area should not be located within 20 feet of any occupied building. For additional setback distances and recommendations, see Tables 7-10 at the end of this document.

Site Evaluation

A preliminary site evaluation will help determine the best suitable location and layout for the proposed OSTS. The site evaluation will also show what site specific conditions are present that may impact the placement of the system. The site evaluation should determine the following, but is not limited to:

- Property set-backs
- Any existing tankage or soil absorption systems on site.
- Low lying areas
- Trees, rocks, etc. that would block the placement of the system in the area
- Any disturbed area
- Contour and elevation of site
- Any existing or proposed buildings, side walls, driveways, paved areas or other hardscapes.
- Locations of streams, wells, or other features that need to be avoided

Note: The site/soil evaluation data should be filled out using Form B2 and the soil evaluation form developed by ODH. The applicant should also refer to OAC 3745-42-03 for a complete list of information that will need to be included in a permit to install application.

Soil Evaluation

A certified professional soil scientist should conduct the soil evaluation to determine the site specific characteristics of the soils and determine the proper location for the OSTS. A non certified professional soil scientist may perform the evaluation as long as they can demonstrate training and knowledge of

soils as they are related to wastewater treatment and transport. The soils professional or qualified individual should be able to identify the following soil characteristics, including but not limited to:

- Depth to limiting condition
- Nature of limiting condition
- Soil classification per USDA nomenclature
- Estimated permeability of soil horizons that will be used for soil absorption
- Estimate the soil's linear loading rate

A limiting condition is defined as any condition present in the subsurface soil that limits the treatment and/or dispersal of wastewater. Limiting conditions include:

- Seasonal high ground water
- Ground water
- Sand/gravel lenses
- Bedrock
- Fractured bedrock
- Compacted soils (impervious layer)

A suitable area should be chosen and marked with visible markers so that the soil absorption area is not compromised during construction, however, if the area is disturbed or compacted, then the soils should be deemed unsuitable unless the soil scientist evaluates the soil again and demonstrates it is still suitable.

Design Recommendations

Many factors go into the design of an OSTS making no two systems ever the same. Listed below are several general rules of thumb to keep in mind during the design. Any design recommendation not listed, can also be determined from the list of acceptable guidance documents. Anyone deviating from these design recommendations should provide justification as to the deviation.

- Design flows shall be based on OAC 3745-42-05 (Note: water use records or other information may be used in place of design flow rule values if done in accordance with the rule).
- No more than 2 feet of sand fill should be used for mound systems.
- A minimum of 50 feet should be maintained between the septic system and ground water well and a minimum of 10 feet from buildings and property lines.
- Disinfection may be utilized, but on a case by case basis.
- Severe soils should utilize pressure distribution for systems greater than 1000 gpd.
- Supplemental guidance documents suggested for design of OSTS include:
    - OSU Bulletin 896 "Suitability of Ohio Soils for Treating Wastewater"
    - US EPA Onsite Wastewater Treatment Systems Manual
    - OSU Bulletin 813 "Mound Systems for On-site Wastewater Treatment"
    - OSU Bulletin 829 "Mound System: Pressure Distribution of Wastewater Design and Construction in Ohio"
    - US EPA "Subsurface Flow Constructed Wetlands for Wastewater Treatment"
    - Ohio EPA Guidance Document for "Small Subsurface Flow Constructed Wetlands with Soil Dispersal System"

- OSU Bulletin 876-99 “Sand Bioreactors for Wastewater Treatment for Ohio Communities”
- Ohio EPA Guidance Document for “Drip Distribution Systems”

- The soil dispersal system should be installed on the same property in which the sewage is being generated.

Pretreatment Recommendations

Pretreatment may be required on a case by case basis. Determining factors for pretreatment may include but are not limited to:

- High strength wastewater
- Aquifers near soil dispersal system
- System located in sensitive watershed

Ohio EPA has historically approved numerous types of pretreatment units. The tabulated list below represents the most common pretreatment units approved. Any pretreatment component not appearing on the list potentially can be used in the design of an OSTS. Technical reports/specifications on the proposed component should be submitted to the Ohio EPA prior to the submittal of the proposed OSTS PTI. Approvable pretreatment/additional components include but are not limited to:

- Sand Filter- SPSF (Single Pass Sand Filter) (A)
- Sand Filter- RSF (Recirculating Sand Filter) (B)
- Peat Biofilters (C)
- Fixed Film Media Filters (D)
- Aerobic Treatment Unit (ATU) (E)
- Ultra Filtration (F)
- Subsurface Flow Constructed Wetlands (G)
- UV disinfection[1] (H)

Note 1: UV should only be considered when the proposed OSTS has the potential to discharge into a usable aquifer or is located within a sensitive watershed.

Pretreatment components that are listed per the Ohio Department of Health’s approvable components for HSTS may be allowed. For a complete list of ODH’s list of pretreatment components, please visit the following website: http://www.odh.ohio.gov/odhPrograms/eh/sewage/sewmore.aspx

It should be noted that the pretreatment components referenced above are typically used for soil based dispersal systems and not discharging systems to the waters of the state.

Soil Treatment & Dispersal

There are numerous ways in which wastewater can be dispersed away from the wastewater treatment system. Below is a list of soil treatment and dispersal components that Ohio EPA has traditionally approved in the past and are comfortable with the approval of these components. To determine when

and where these components may be utilized, refer to Tables 1A & 1B for an exact determination. The components include but are not limited to:

• Gravity leach tile field	(1)
• Pressure leach tile field	(2)
• At-grade leach tile field (gravity)	(3)
• At-grade leach tile field (pressurized)	(4)
• Gravelless trench lines	(5)
• Shallow Trench System (gravity)[1]	(6)
• Shallow Trench System (pressurized)[1]	(7)
• Unlined constructed wetland cell (for SSFCW systems only)	(8)
• Mound System	(9)
• Serial Distribution (gravity) (for systems > 15% slope)	(10)
• Drip Distribution[2]	(11)

Note 1: Shallow Trench Systems are formally known as Evapo-transpiration systems.

Note 2: Drip distribution systems should include pretreatment and incorporate ultra-filtration prior to discharge to soils.

Table 1A: Limiting Condition: Seasonal High Ground Water

≤ 200 gpd Vertical Separation (in)	Minimum Soil Dispersal Systems (All systems require Septic Tanks)	
	Pretreatment Component[2]	**Soil Dispersal System[1,3]**
≥ 24	Not required for domestic sewage	(1) – (11)
(24 > x ≥ 6)	*See Footnote*	(1) – (11)
(< 6)	No **new** systems recommended	No **new** systems recommended

201 gpd – 999 gpd Vertical Separation (in)	Minimum Soil Dispersal Systems (All systems require Septic Tanks)	
	Pretreatment Component[2]	**Soil Dispersal System[1]**
(≥ 36)	Not required for domestic sewage	(1) – (11)
(36 > x ≥ 12)	(A)(B)(C)(D)(E)(F) or (G)	(1) – (11)
(12 > x ≥ 6)	(A)(B)(C)(D)(E)(F) or (G)and possibly (H)	(4)(9)(11)
(< 6)	No **new** systems recommended	No **new** systems recommended

≥ 1000 gpd Vertical Separation (in)	Minimum Soil Dispersal Systems (All systems require Septic Tanks)	
	Pretreatment Component[2]	**Soil Dispersal System[1,4]**
(≥ 24)	Required for systems >2500 gpd or sensitive areas (A)(B)(D) (E)(F) and(H) where justified	(2)(4)(7)(11)
(24 > x ≥ 12)	(A)(B)(D) (E)(F) and(H) where justified	(11)
(12 > x ≥ 6)	No **new** system recommended	No **new** system recommended
(< 6)	No **new** system recommended	No **new** system recommended

Note 1: **If the limiting condition is determined to be seasonal high ground water, soil dispersal system options may be less restrictive for vertical separations distances ≤ 12 inches, but all efforts should be made to keep the point of dispersal above the water table. For systems >1000 gpd, DSW's Central Office should be consulted.**

Note 2: **Pretreatment components should always be required for higher strength sewage (restaurant, facilities with food service, etc.). Also, a minimum of a septic tank effluent filter is recommended for all but very small systems with vertical separation greater than 24".**

Note 3: **The minimum recommended total lineal feet for a tile field should be 200 feet for any new system.**

Note 4: **If drip distribution is used, refer to pretreatment list on previous page for recommended components.**

Footnote **Pretreatment recommended (A)(B)(C)(D)(E)(F) or (G) as flows increase and vertical separation decreases.**

Table 1B: Limiting Conditions: Bedrock, Ground Water, Sand & Gravel, Compacted Soils

≤ 200 gpd	**Minimum Soil Dispersal Systems (All systems require Septic Tanks)**	
Vertical Separation (in)	**Pretreatment Component[2]**	**Soil Dispersal System**
(≥ 36)	Not required for domestic sewage	(1)-(11)
(36 > x ≥ 24)	(A)(B)(C)(D)(E)(F) or (G)	(1)(2)(3)(4)(6)(7)(8)(9)(10)(11)
(< 24)	No **new** systems recommended	No **new** systems recommended

201 gpd – 999 gpd	**Minimum Soil Dispersal Systems (All systems require Septic Tanks)**	
Vertical Separation (in)	**Pretreatment Component[2]**	**Soil Dispersal System**
(≥ 36)	Not required for domestic sewage	(1)-(11)
(36 > x ≥ 24)	(A)(B)(C)(D)(E)(F) or (G)[5]	(2)(4)(7)(9)(11)
(< 24)	No **new** systems recommended	No **new** systems recommended

≥ 1000 gpd	**Minimum Soil Dispersal Systems (All systems require Septic Tanks)**	
Vertical Separation (in)	**Pretreatment Component[2]**	**Soil Dispersal System**
(≥ 36)	Required for systems >2500 gpd, sensitive areas (A)-(H), and/or drip components	(2)(4)(7)(11)
(< 36)	No **new** system recommended	No **new** system recommended

Note 2: Pretreatment components should always be required for higher strength sewage (restaurant, facilities with food service, etc.). Also, a minimum of a septic tank effluent filter is recommended for all but very small systems with vertical separation greater than 24".

Note 5: Additional pretreatment may be recommended; especially as vertical separation gets smaller.

Innovative Treatment Technologies

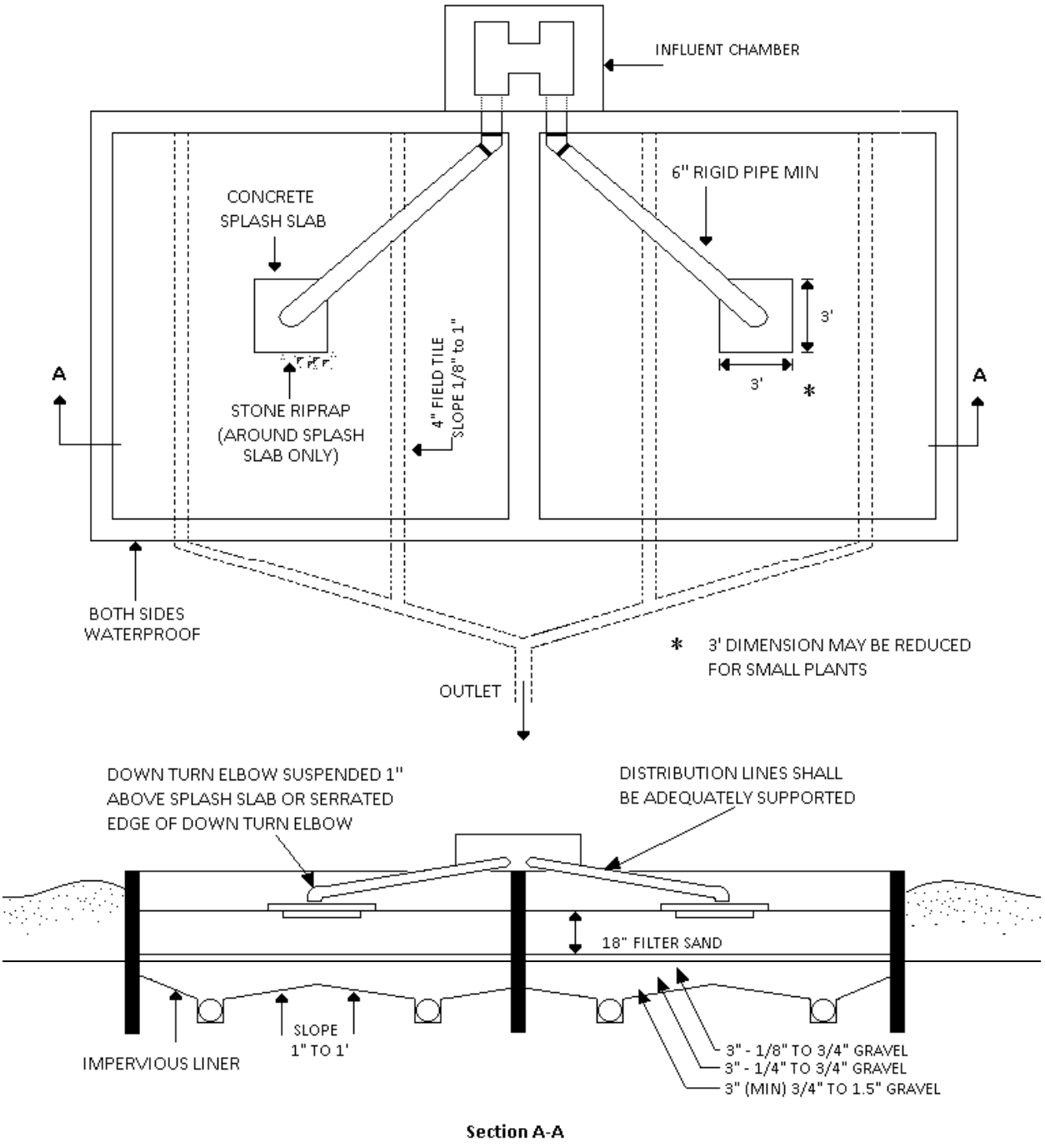
Innovative treatment technologies shall be evaluated on a case by case basis provided that the following information is submitted to the Agency:

- The criteria that will be used to design the treatment system.
- Manufacturer's literature that explains or supports the design, operation, maintenance, or reliability of the treatment system to be viable in Ohio's climate and in Ohio's site specific soils.
- A list of other similar installations in Ohio or installations in other states with similar climate and soil conditions as Ohio with the name, address, and other phone numbers of the appropriate regulatory agencies and up-to-date performance data.
- If there are special operation or maintenance requirements that would be required for this system, these requirements should be specified in writing.
- Proposed staffing levels, man hour, and process sampling frequency.
- Periodic reports concerning operation, maintenance, and performance of the treatment system will be required to be submitted to the appropriate district office and/or central office staff as specified in the permit.
- For design criteria not addressed specifically by this chapter, generally accepted design standards and methodologies should apply for the treatment, conveyance and storage facilities.
- After the innovative treatment technology has been operating under design conditions for three years or in continuous operation for five years, the engineer or manufacturer may petition the Director to remove the "innovative" designation. The Director can take this action independently at any time.

Appendix

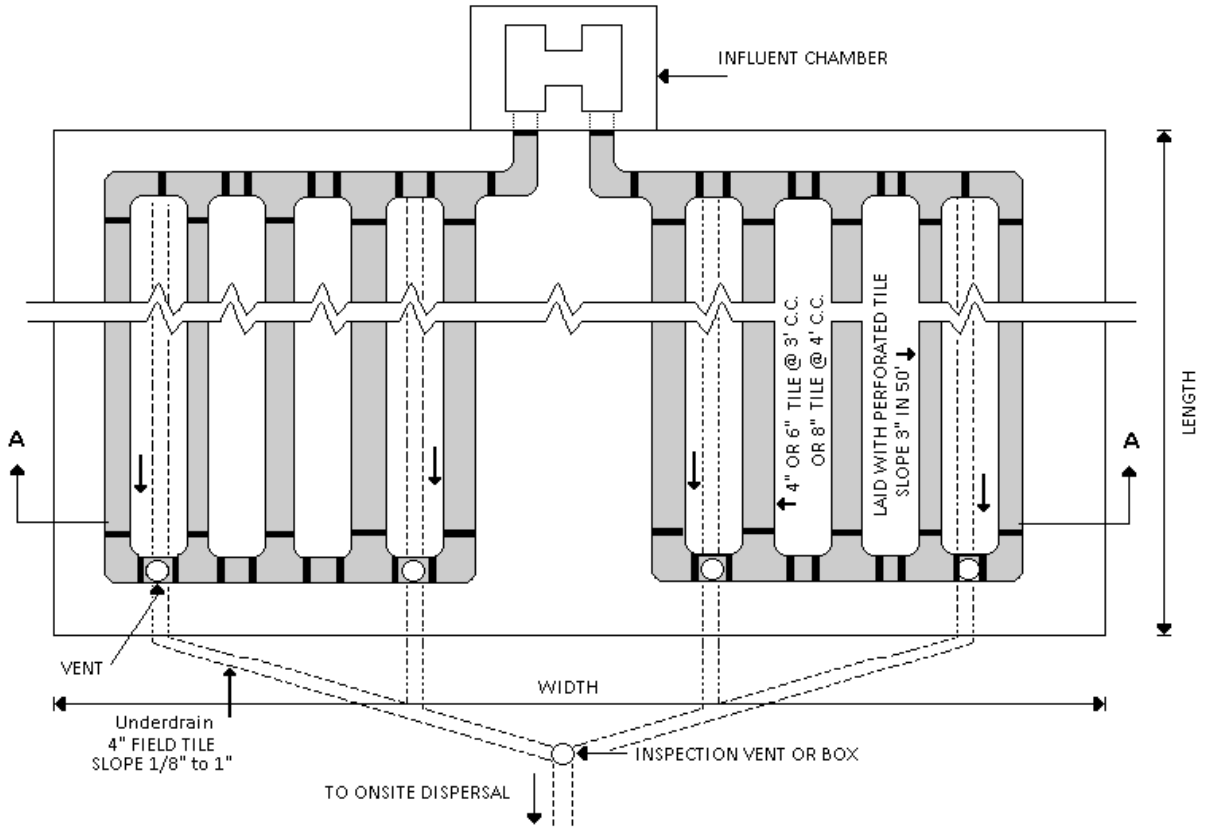
Sand Filters

Surface Sand Filters

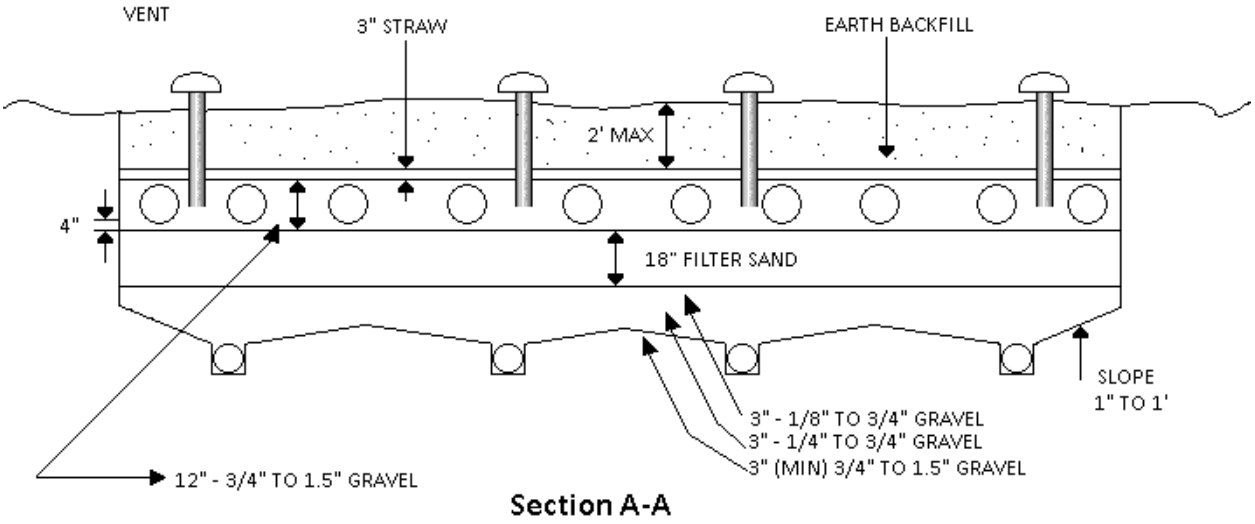


Section A-A

Subsurface Sand Filters



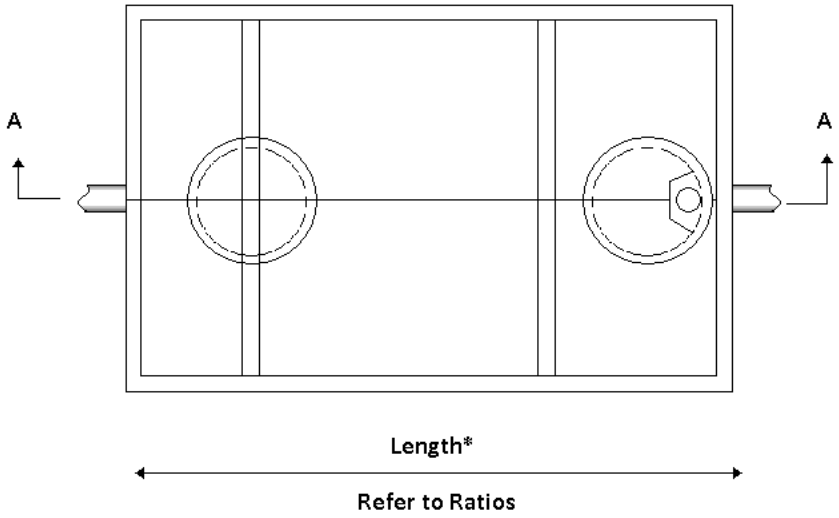
* Loading rate not to exceed 1.15 gal/sq. ft/day

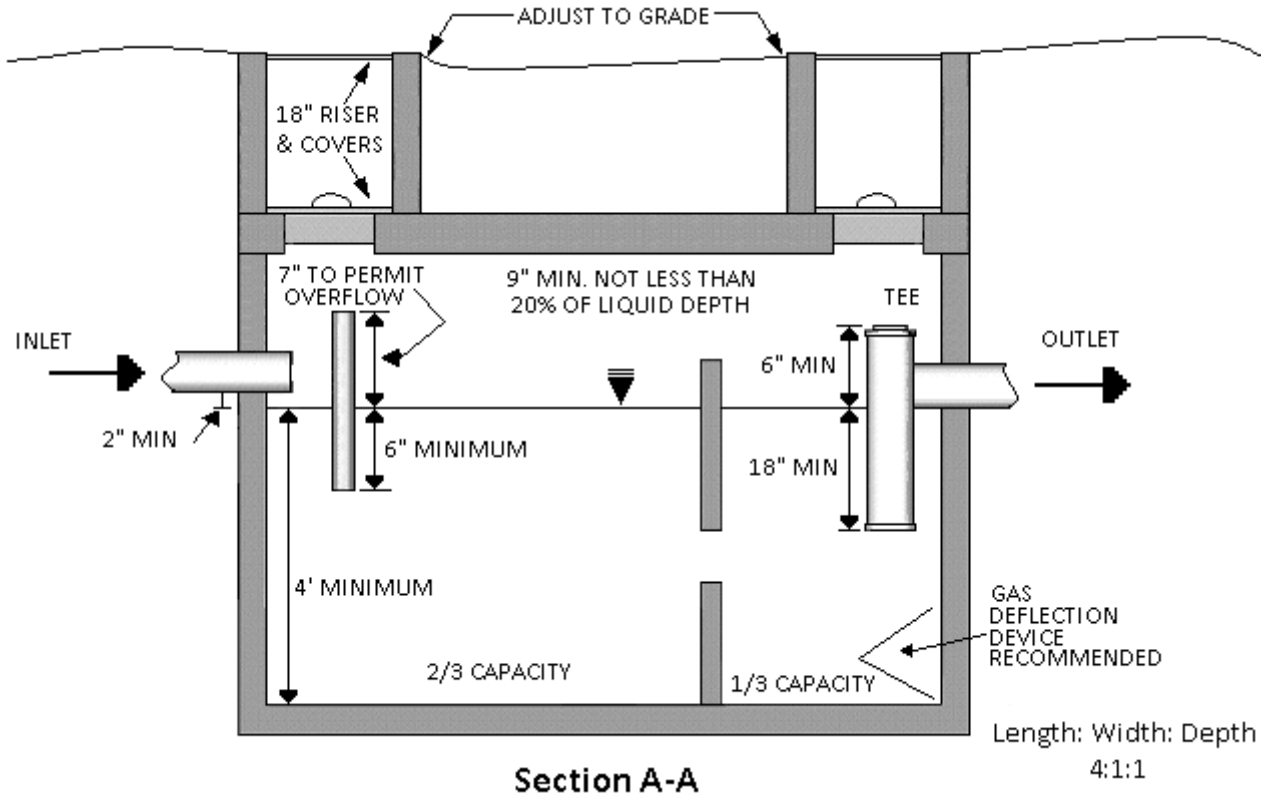


Section A-A

Tankage

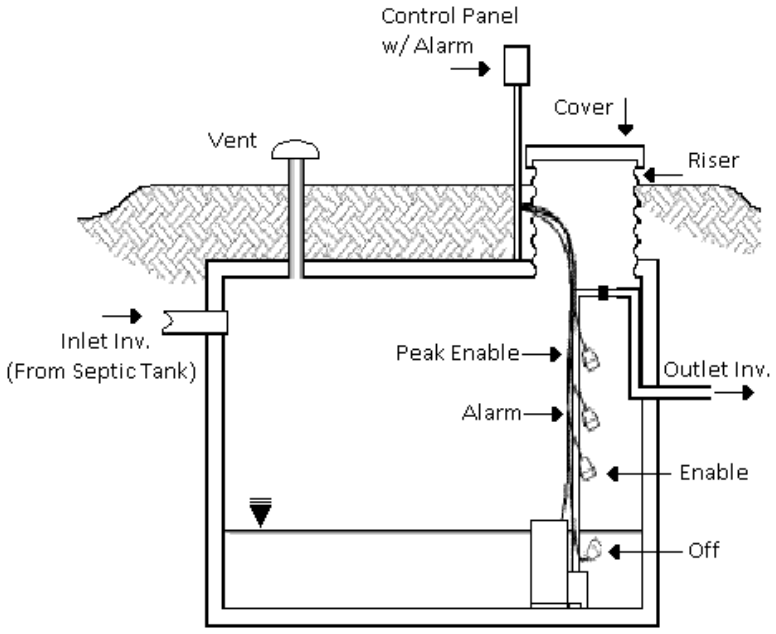
Dual Compartment Septic Tank





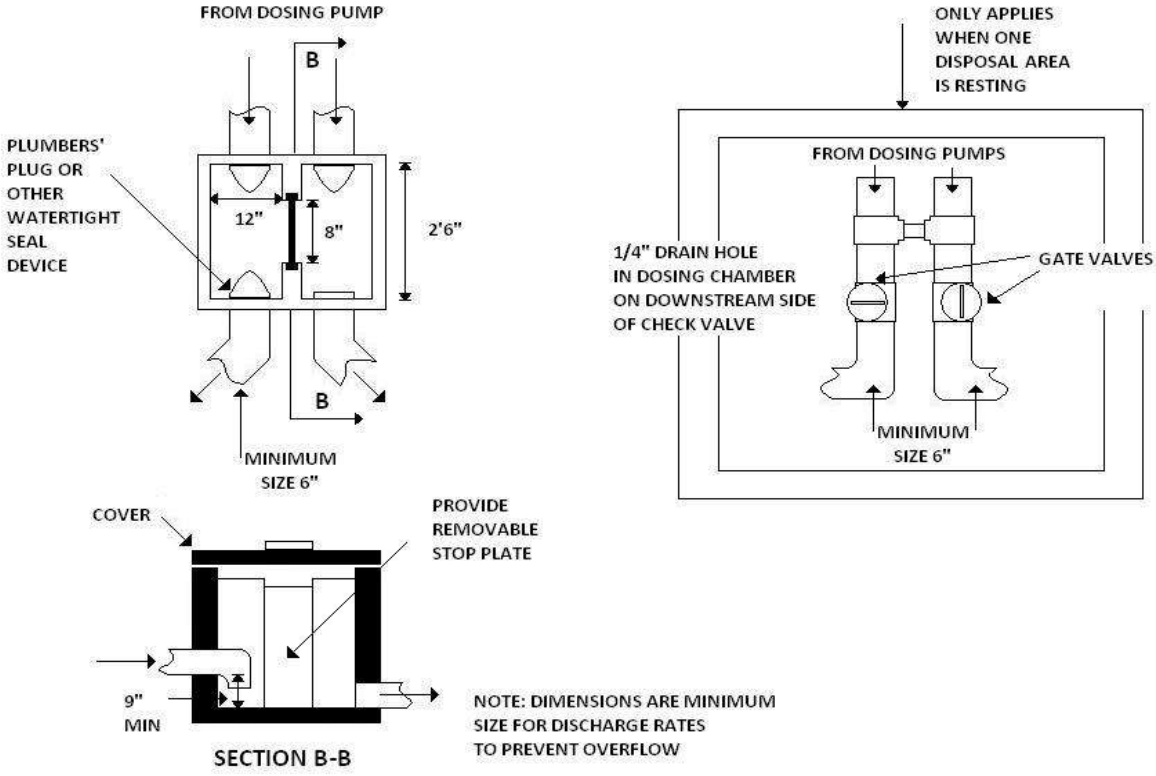
Section A-A

Dosing Chamber



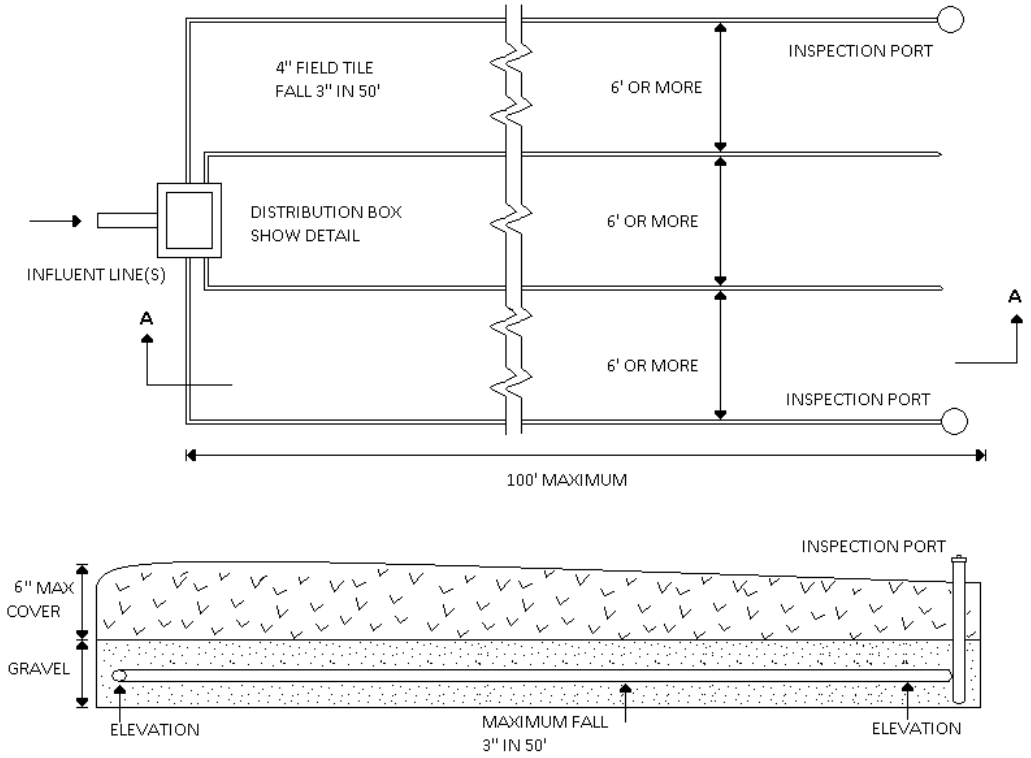
Note: The effective volume of the dosing chamber typically is based on the average daily flow and the filling time should not exceed 30 minutes unless flow equalization provided.

Influent Chamber

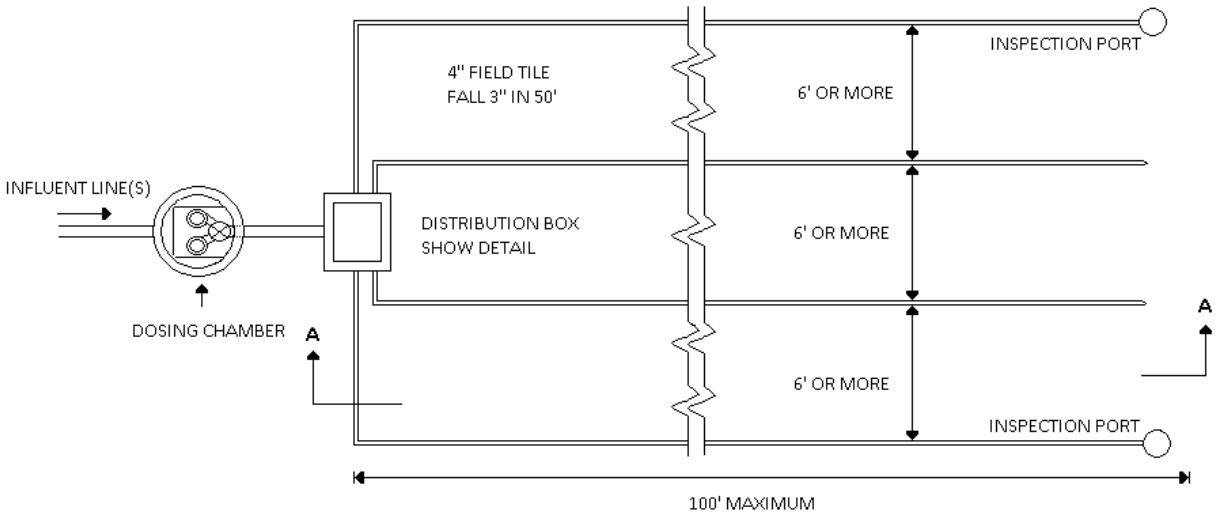


Soil Dispersal Components

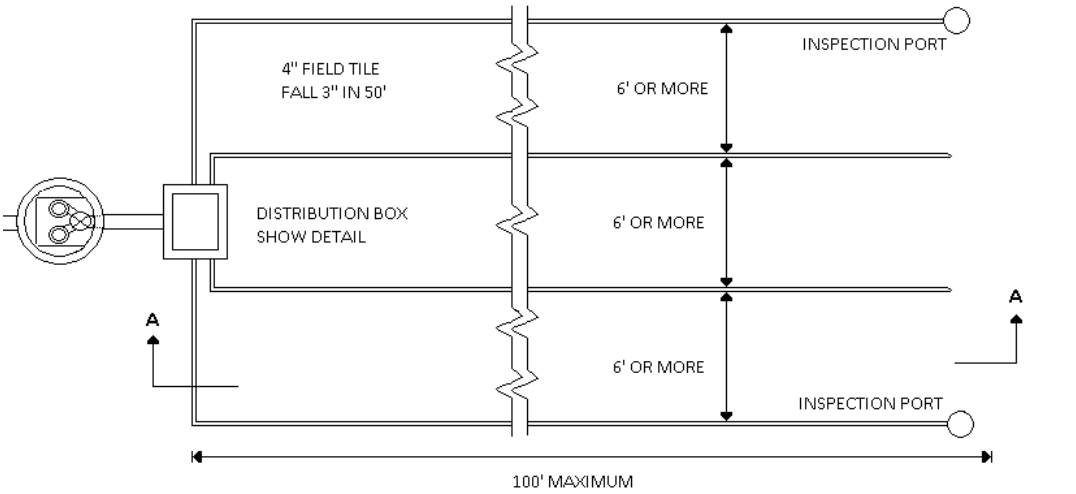
Conventional Leach Field-Gravity

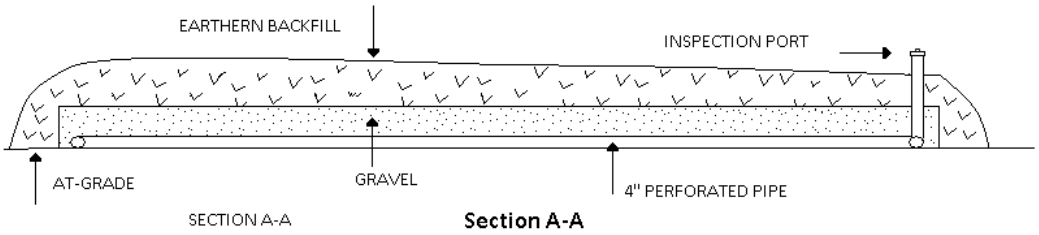


Conventional Leach Field-Pressure

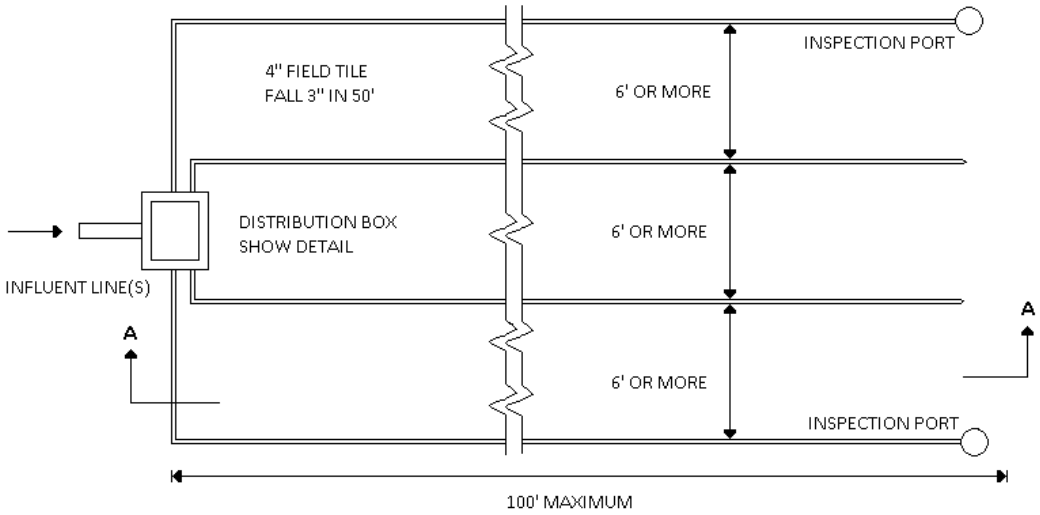


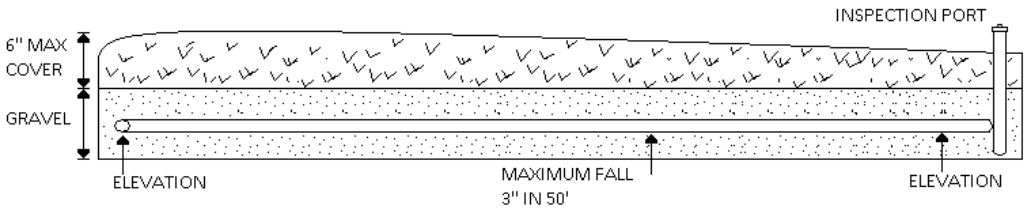
At-Grade Leach Field



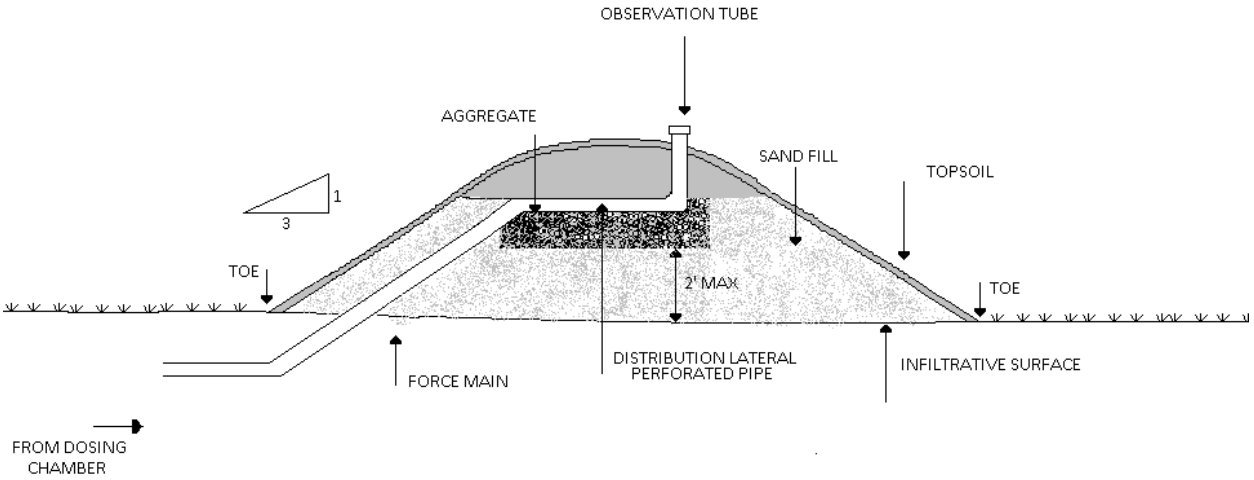


Shallow Trench Leach Field

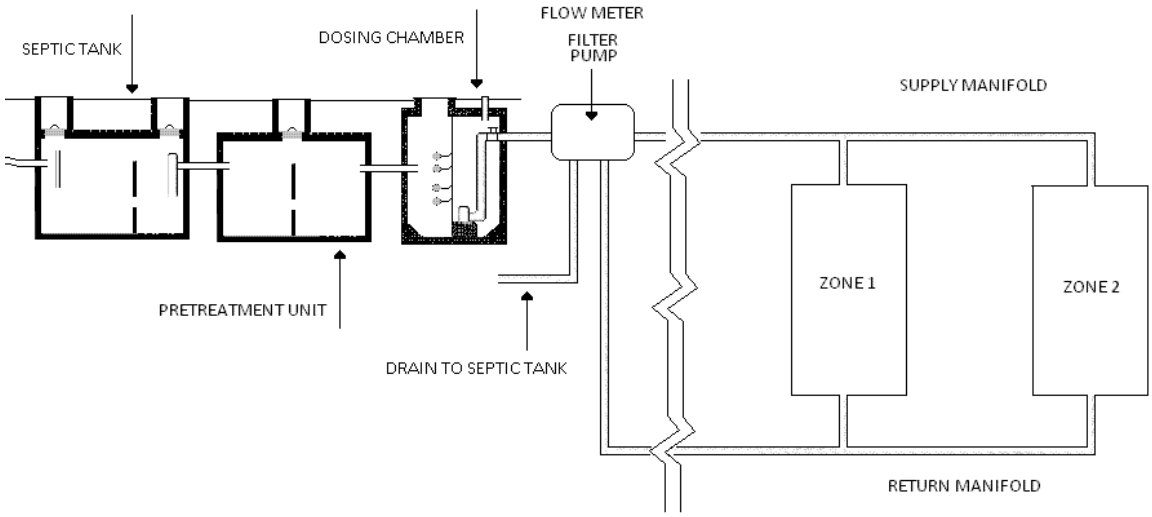


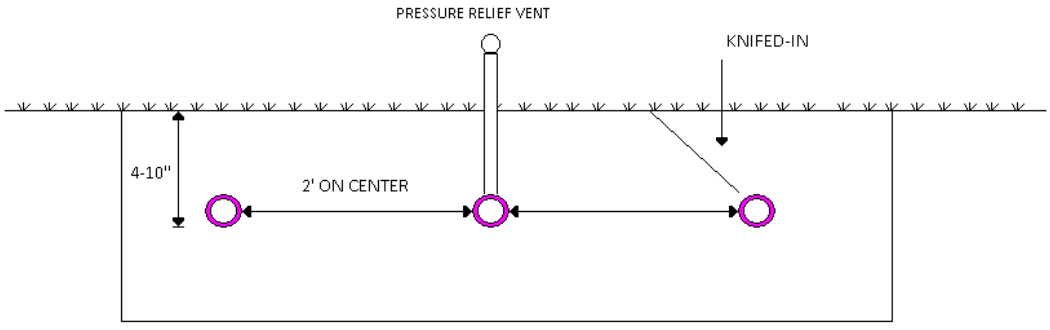


Mound Treatment System

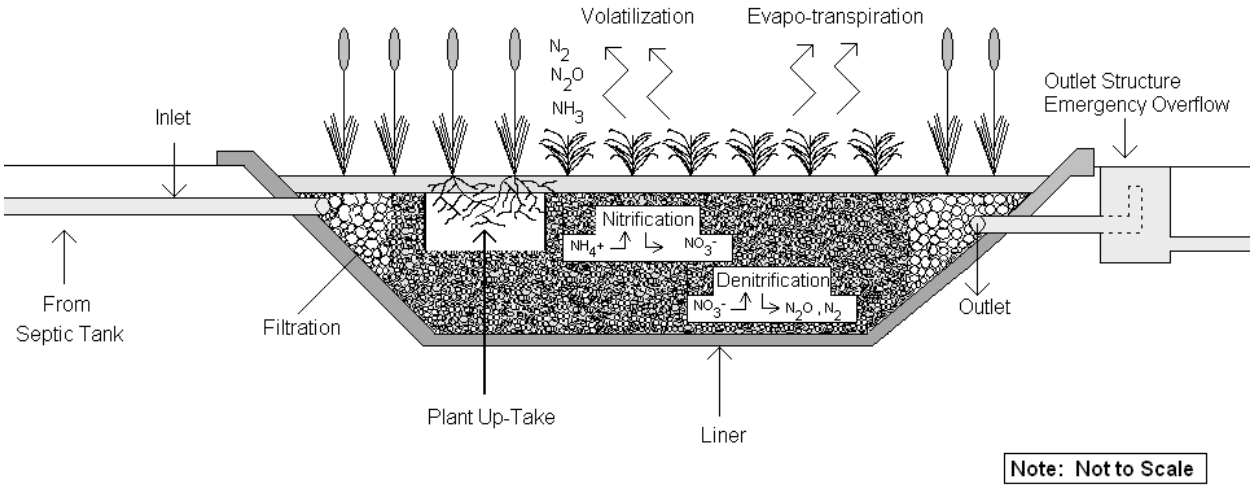


Drip Distribution System

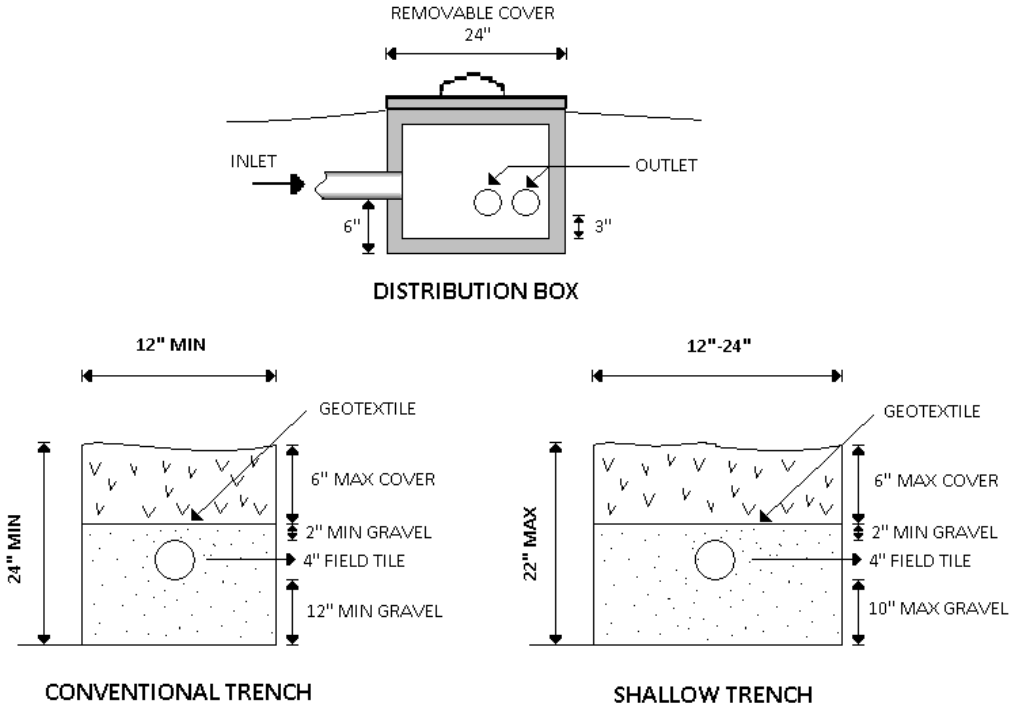




Subsurface Flow Constructed Wetlands



Trench Detail



Isolation Distances

The tables below are recommended setbacks for siting septic tanks, sewage collection systems, and soil absorption systems.

Table 7 - Siting septic tanks and sewage collection systems.

<table>
<tr><th colspan="2">These recommendations apply to:</th><th>These recommendations cover:</th></tr>
<tr><td colspan="2">Siting new septic tanks and sewage collection systems.</td><td>• Sewage collection systems (excluding service lines);
• Lift stations and other devices which may hold wastewater; and
• Household sewage storage or treatment tanks.</td></tr>
<tr><td colspan="3">Recommended setbacks:</td></tr>
<tr><td rowspan="5">Drinking Water Supply</td><td colspan="2"><u>Public Water System Drinking Water Supply Wells</u>

The location meets all sanitary isolation standards a public water system must maintain for its drinking water supply wells as established in OAC 3745-09-04. This provision applies to service lines.</td></tr>
<tr><td colspan="2"><u>Drinking Water Source Protection Area for a Community or Non-transient, Non-community Public Water System Using Ground Water</u>

No additional setbacks beyond the sanitary isolation radius unless the sewage collection system is pressurized. Pressurized sewage collection systems should not be located within an inner management zone determined to be highly susceptible to contamination.</td></tr>
<tr><td colspan="2"><u>Transient, Non-community Public Water System Drinking Water Supply Wells</u>

No additional setbacks beyond the sanitary isolation radius.</td></tr>
<tr><td colspan="2"><u>Private Water Systems</u>

The location is at least 50 feet from a water system private water system drinking water supply well.</td></tr>
<tr><td colspan="2"><u>Drinking Water Supply Intakes</u>

No additional setbacks.</td></tr>
<tr><td>Other</td><td colspan="2"><u>Known Sinkholes and Drainage Wells</u>

-The location is at least 100 feet from a known sinkhole or drainage well.
-The location is at least 50 feet from a known sinkhole or drainage well if additional engineering and management</td></tr>
</table>

Table 8 - Siting soil absorption systems handling 1,000 gallons per day or less.

These recommendations apply to:	***These recommendations cover:***
Siting new soil absorption systems handling 1,000 gallons per day or less.	Soil absorption systems handling 1,000 gallons per day or less.

Recommended setbacks:	
Drinking Water Supply	Public Water System Drinking Water Supply Wells The location meets all sanitary isolation standards a public water system must maintain for its drinking water supply wells as established in OAC 3745-09-04.
	Drinking Water Source Protection Area for a Community or Non-transient, Non-community Public Water System Using Ground Water The location is outside of an inner management zone determined to be highly susceptible to contamination unless additional engineering and management controls are included in the system's design and operation.
	Transient, Non-community Public Water System Drinking Water Supply Wells No additional setbacks beyond the sanitary isolation radius.
	Private Water Systems The location is at least 50 feet from a private water system drinking water supply well.
	Drinking Water Supply Intakes No additional setbacks.
Other	Known Sinkholes and Drainage Wells -The location is at least 100 feet from a known sinkhole or drainage well. -The location is at least 50 feet from a known sinkhole or drainage well if additional engineering and management

Table 9 - Siting soil absorption systems handling 1,001 to 10,000 gallons per day.

These recommendations apply to:	***These recommendations cover:***
Siting new soil absorption systems handling 1,001 to 10,000 gallons per day.	Soil absorption systems handling 1,001 to 10,000 gallons per day.

Recommended setbacks:	
Drinking Water Supply	Public Water System Drinking Water Supply Wells The location meets all sanitary isolation standards a public water system must maintain for its drinking water supply wells as established in OAC 3745-09-04.
	Drinking Water Source Protection Area for a Community or Non-transient, Non-community Public Water System Using Ground Water -The location is outside of an inner management zone determined to be highly susceptible to contamination unless additional engineering and management controls are included in the system's design and operation. -The location is outside of a protection area determined to be highly susceptible to contamination unless additional engineering and management controls are included in the system's design and operation.
	Transient, Non-community Public Water System Drinking Water Supply Wells The location is at least 300 feet from a transient non-community public water system drinking water supply well unless additional controls are included in the system's design and operation.
	Private Water Systems The location is at least 300 feet from a private water system drinking water supply well unless additional controls are included in the system's design and operation.
	Drinking Water Supply Intakes No additional setbacks.
Other	Known Sinkholes and Drainage Wells -The location is at least 300 feet from a known sinkhole or drainage well. -The location is at least 100 feet from a known sinkhole or drainage well if additional engineering and management controls are included in the system's design and operation.

Table 10 - Siting soil absorption systems handling more than 10,000 gallons per day.

These recommendations apply to:	***These recommendations cover:***
Siting new soil absorption systems handling 10,000 gallons per day or less.	Soil absorption systems handling more than 10,000 gallons per day.

Recommended setbacks:	
Drinking Water Supply	Public Water System Drinking Water Supply Wells The location meets all sanitary isolation standards a public water system must maintain for its drinking water supply wells as established in OAC 3745-09-04.
	Drinking Water Source Protection Area for a Community or Non-transient, Non-community Public Water System Using Ground Water -The location is outside of an inner management zone determined to be highly susceptible to contamination. -The location is outside of an inner management zone determined to have a moderate or low susceptibility to contamination unless additional engineering and management controls are included in the system's design and operation. -The location is outside of a protection area determined to be highly susceptible to contamination unless additional engineering and management controls are included in the system's design and operation.
	Transient, Non-community Public Water System Drinking Water Supply Wells The location is at least 300 feet from a transient non-community public water system drinking water supply well unless additional engineering and management controls are included in the system's design and operation.
	Private Water Systems The location is at least 300 feet from a private water system drinking water supply well unless additional engineering and management controls are included in the system's design and operation.
	Drinking Water Supply Intakes No additional setbacks.
Other	Known Sinkholes and Drainage Wells -The location is at least 300 feet from a known sinkhole or drainage well.