



Public Health

Idaho North Central District



Complex Sewage Disposal

Updates to the Technical Guidance Manual

- This information is based on the most recent version of the TGM.
- Updates from previous versions can be found on DEQ's website
 - <http://www.deq.idaho.gov/>

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Technical Guidance Manual for Individual and Subsurface Sewage Disposal Systems

This document provides guidance on the design, construction, alteration, repair, operation and maintenance of standard individual and subsurface sewage systems, their components, and alternatives. The manual is updated periodically to adapt to the dynamic and complex nature of small wastewater disposal systems; updates are cited below.

» **Technical Guidance Manual for Individual and Subsurface Sewage Disposal Systems** (Last updated: November 18, 2014)

Note: This is a large file. If you have difficulty downloading it, try opening it in a different browser or from your hard drive instead of your browser. Right-click on the link, select "Save link as," navigate to the file on your hard drive, and double-click to open.

☐ **Current Year's Updates to the Manual**

☐ **Previous Years' Updates to the Manual**

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DEQ Resources

» **2014 Idaho Permitted Septic Tank Pumper List**

» **2014 Idaho Permitted Subsurface Sewage Disposal System Installer List**

» **Non-Domestic Wastewater Application Checklist**

» **Septic Tank Inspection Procedure**

» **Domestic Wastewater Phosphorus Concentration Report**

Complex Systems and Licensing

- Complex installers may install any sewage disposal system currently listed in the Technical Guidance Manual as well as experimental systems.
- Public works contractors may install any central or municipal system while under the supervision of professional engineer licensed in Idaho.

Complex Systems Not Requiring an Engineer

- Extended treatment package systems
 - In trench sand filter
 - Pump to gravity pressure distribution
 - Two cell infiltrative system
 - Remediation components
-
- In general the TGM contains guidance for operation and maintenance of complex sewage disposal systems.

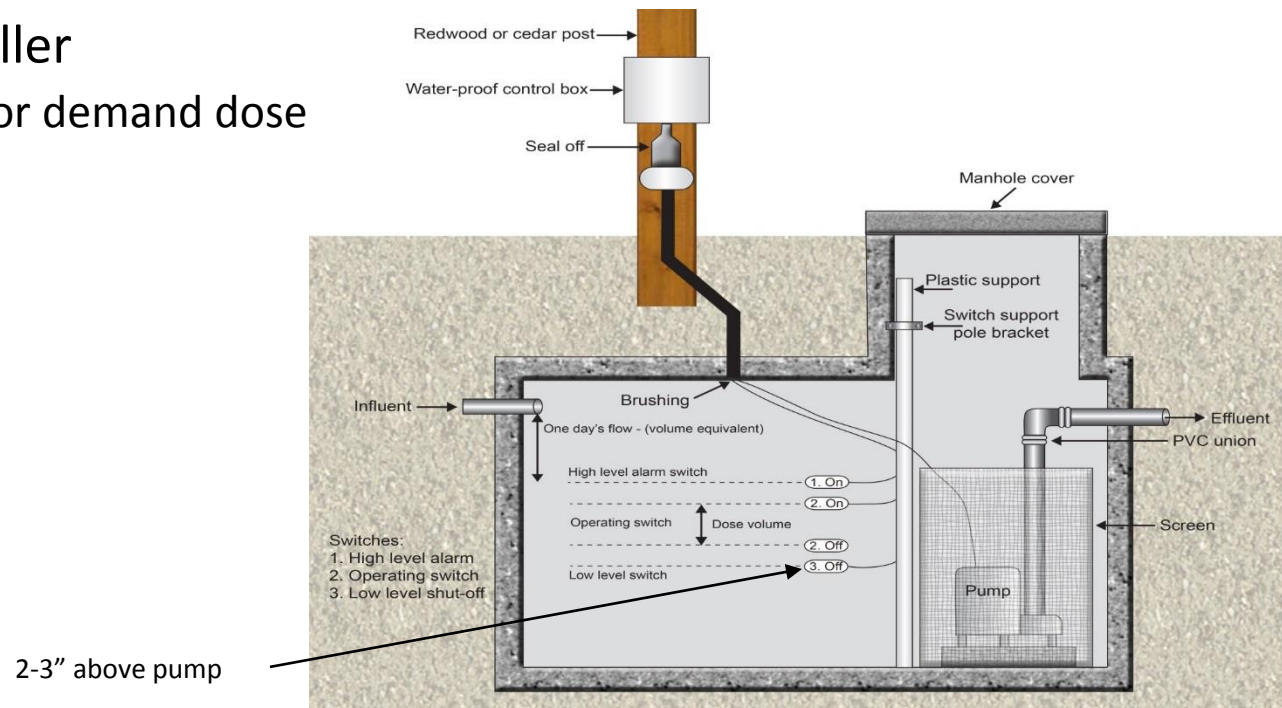
Complex Systems Requiring an Engineer

- At-grade soil absorption system
- Drip distribution system
- Evapotranspiration and evapotranspiration/infiltrative system
- Experimental systems
- Grey water systems, if they are pressurized
- Individual lagoon
- Intermittent sand filter
- Large soil absorption systems
- Pressure distribution systems
- Public systems*
- Recirculating gravel filter
- Sand mound

*Engineering is not required for public systems when the cost of construction, reconstruction, repairs and maintenance is less the \$10,000.

Pumping Sewage

- Pump
 - Total head pressure
 - Is the pump designed for sewage
- Pump controller
 - Time dose or demand dose
 - Location



Dosing Chambers

- Location
- Floatation
- Filter
- In tank pumps



Approved dosing chambers are listed in section 5.3 of the TGM

More on Pumping

- Dose volume
- Pipe volume
- Drain-back
- Siphoning

Table 4.19		Gallons Per Foot of Pipe Length						
Diameter	(inches)	1	1.25	1.5	2	3	4	6
Schedule	40	0.045	0.078	0.105	0.175	0.385	0.667	1.429
Class	200	0.058	0.092	0.12	0.189	0.417	0.667	1.429
Class	160	0.058	0.096	0.125	0.196	0.417	0.714	1.429
Class	125	—	0.098	0.13	0.204	0.435	0.714	1.667

Example

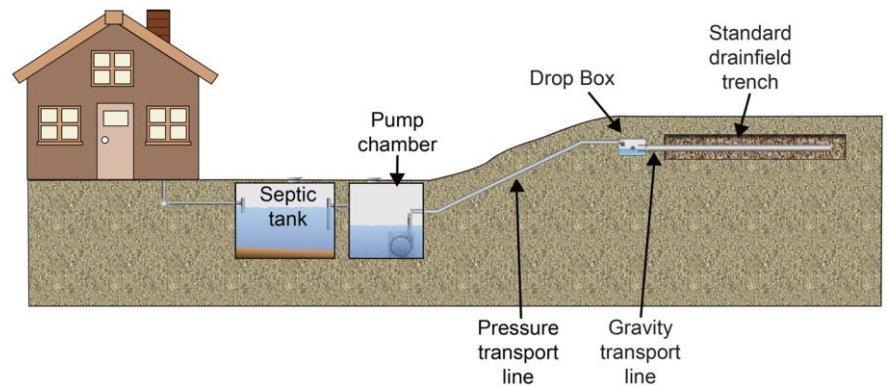
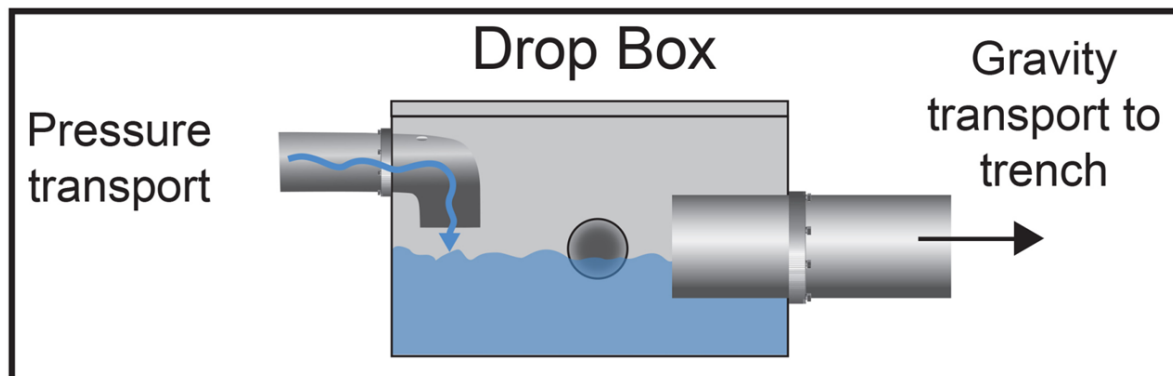
- 3 bedroom house, 250 gallons per day
- 500 gallon dose tank 5.5' L X 5' W X 4' h
- 500' between pump chamber and drainfield
- 12 inch tall pump
- 2 inch force main

A two inch sch 40 force main will hold about 88 gallons, and one foot of water in that tank is about 125 gallons.

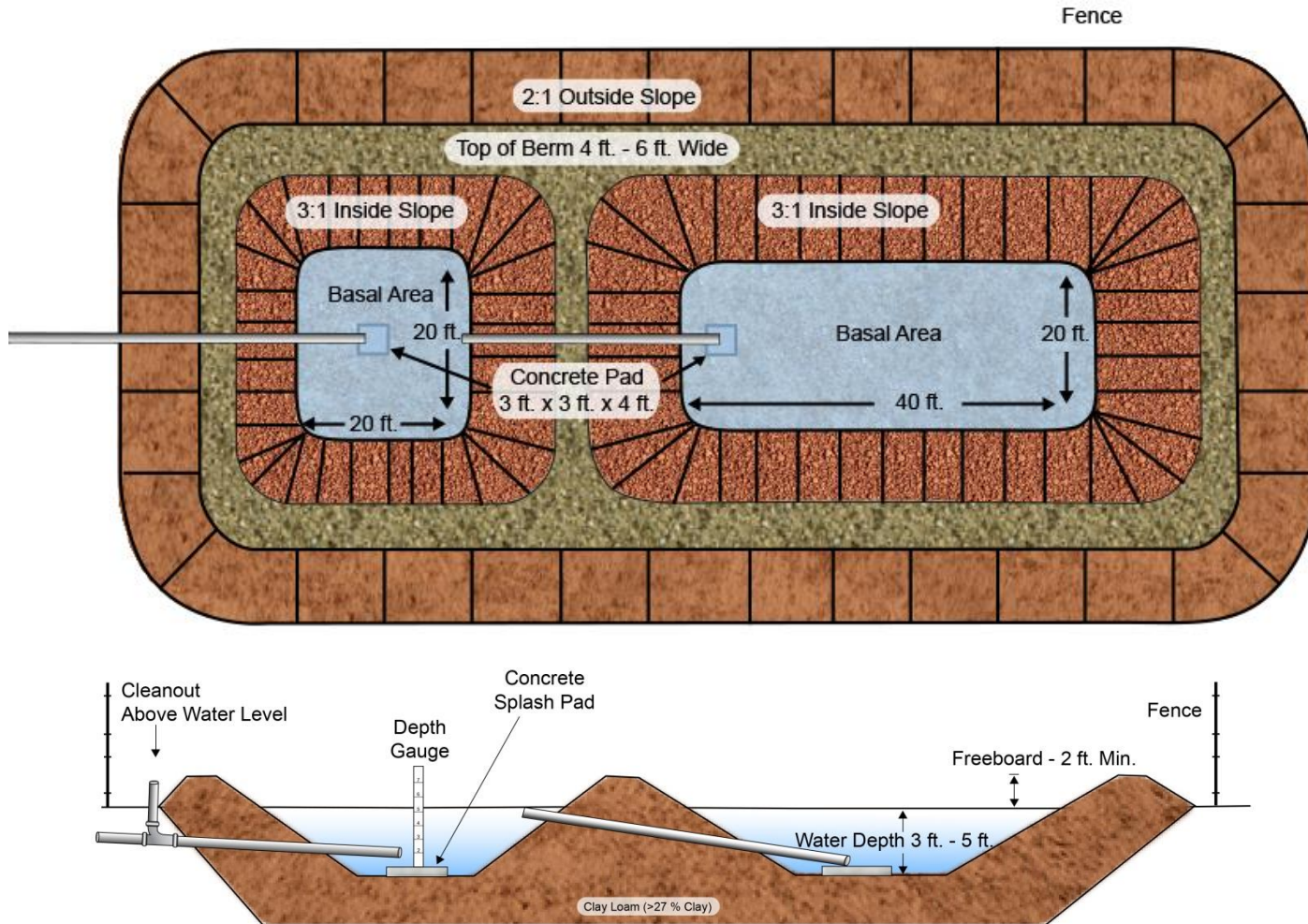
and who are you ? repair creeeeeeeew !

Pump to Gravity Distribution

- A drop or distribution box must be used.
- Engineering may be required



Two Cell Infiltrative System



Two Cell Infiltrative System

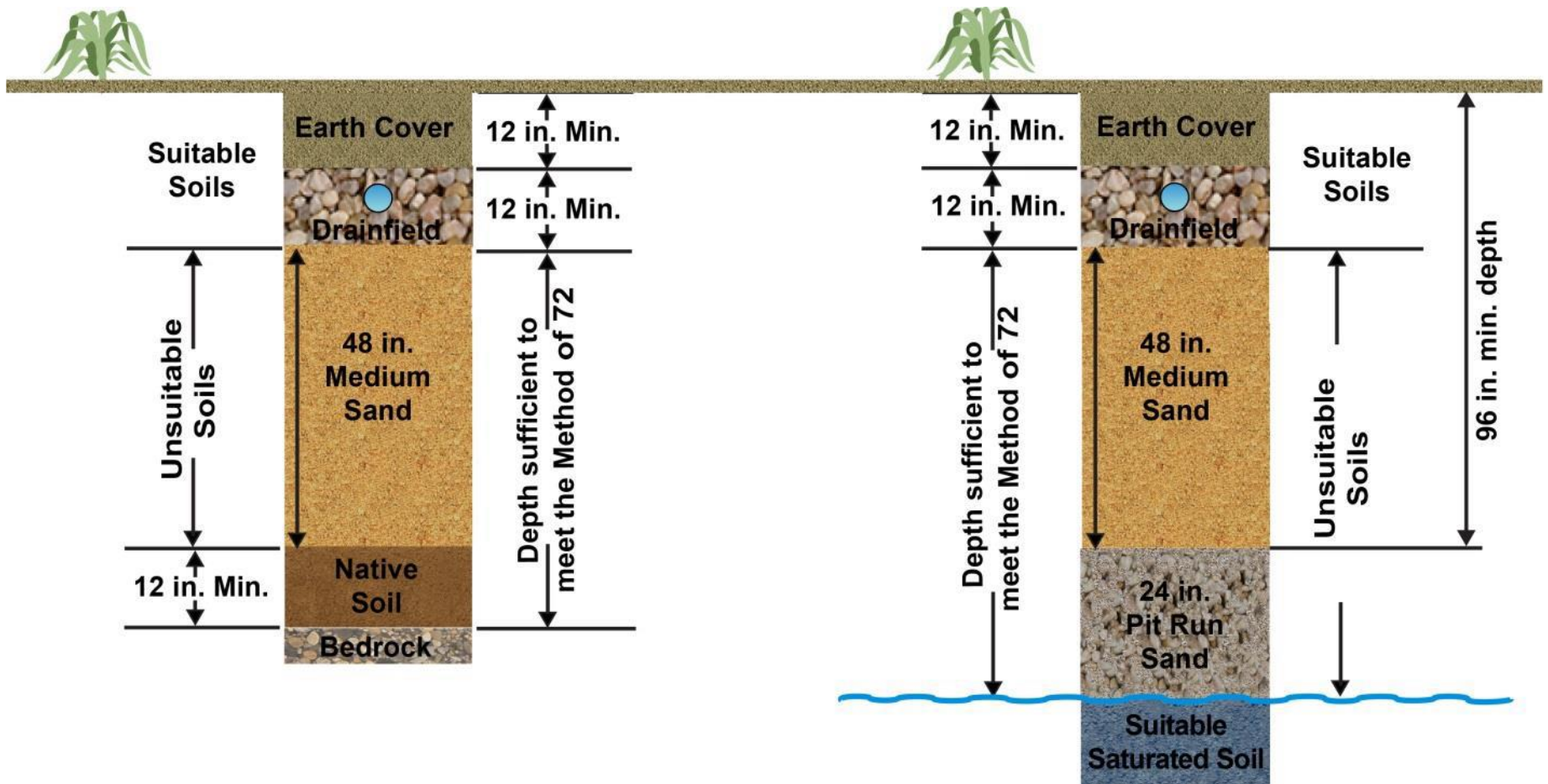
- 100 feet from property line
- 300 feet from neighboring dwellings
- Parcel must be 5 or more acres
- Located with maximum exposure to wind and sun

In-trench Sand Filter

- Used to excavate through unsuitable soils to suitable soils below 48".
- Drain field may be standard or alternative.
- Pretreatment may be used to reduce setback to groundwater.
- Medium sand must be used underneath drainfield to a maximum depth of 8'.
- Anything deeper than 8' must use pit run to 8' of depth, then medium sand.

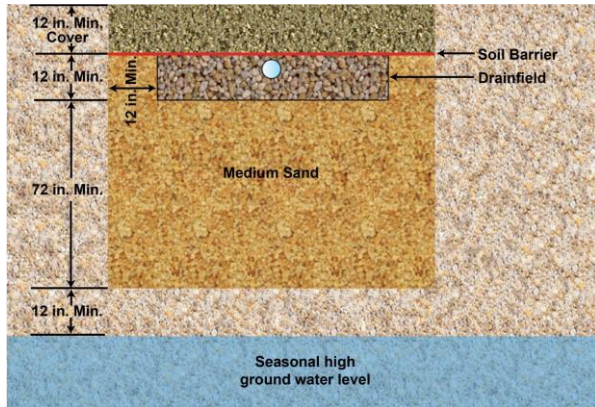
In-trench Sand Filter

Standard

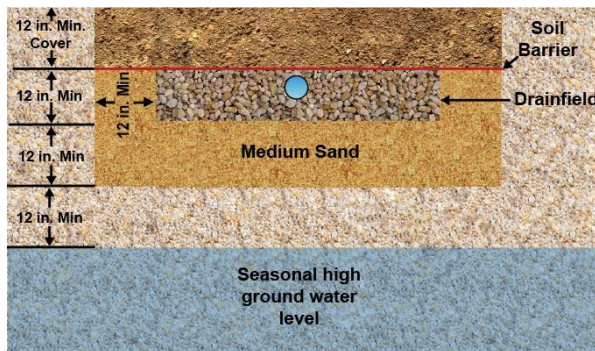


In Trench Sand Filter

Enveloped



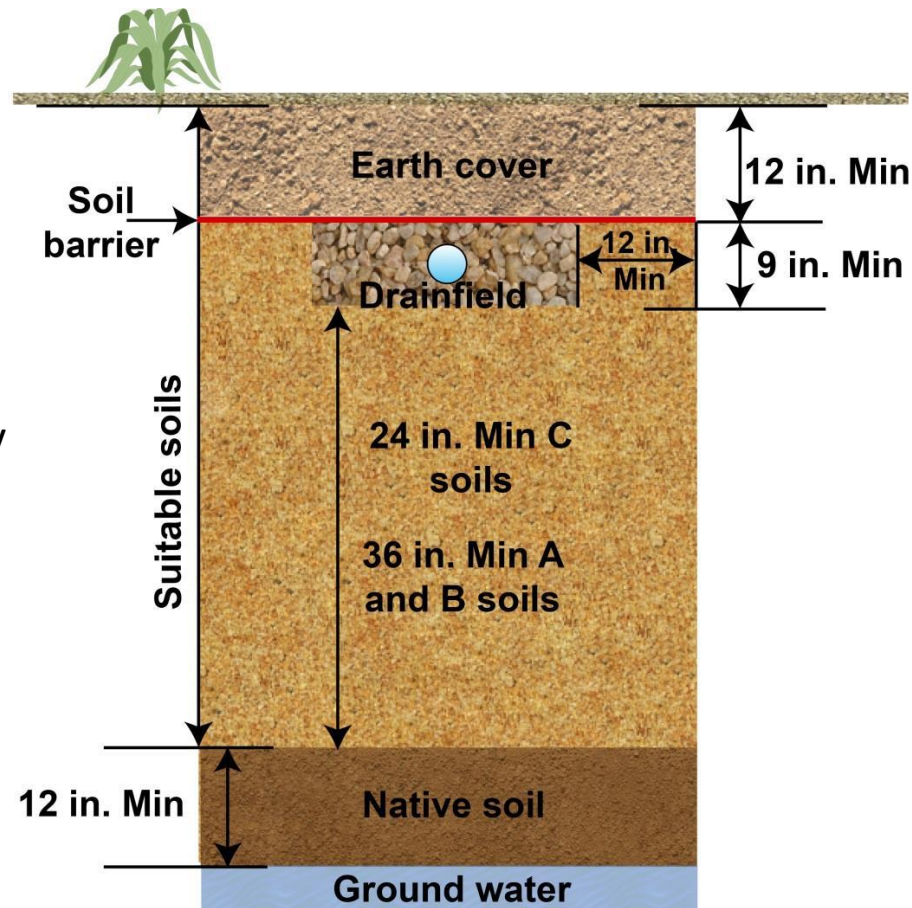
- Standard enveloped in trench sand filter
- For installation in unsuitably coarse soil
- Sized at 1.2 GPD/ft²



- Pretreated enveloped in trench sand filter
- Sized at 1.7 GPD/ft²

In-trench Sand Filter

Enveloped with pressure distribution



- May be used over any type of limiting layer

Extended Treatment Package Systems

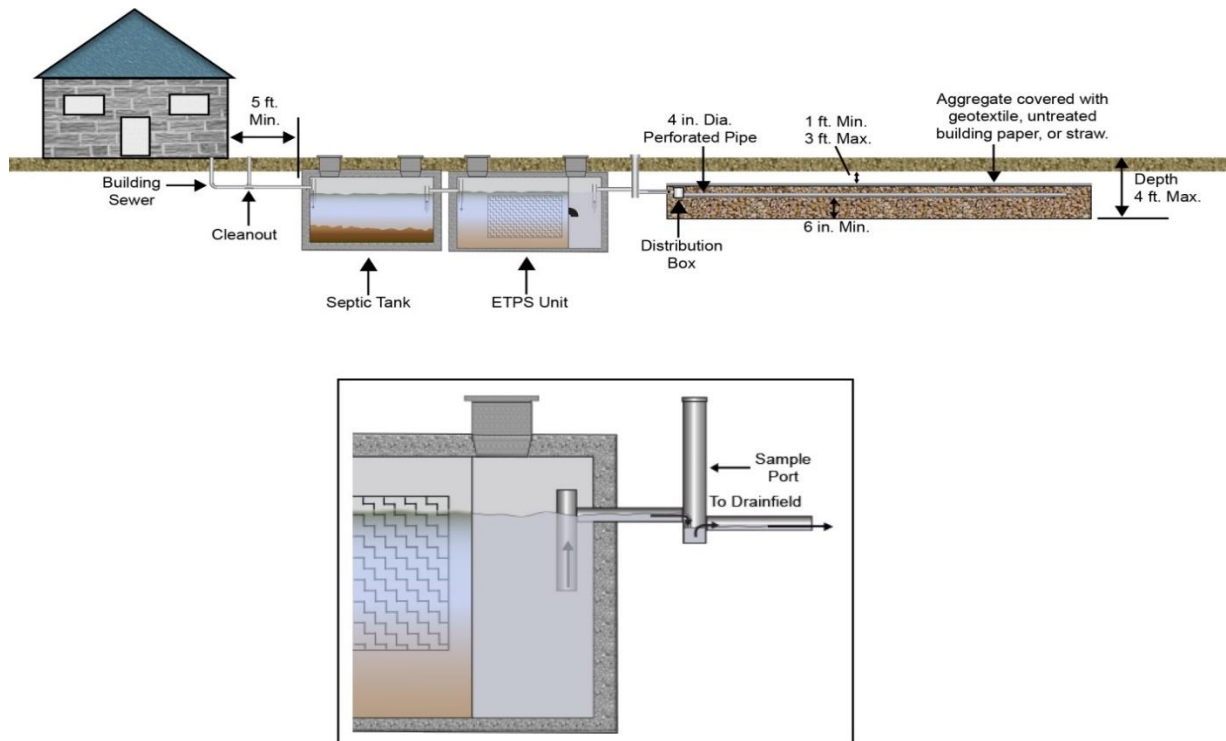
- ETPS' treat wastewater after the septic tank before disposal in a drainfield.
- Approved ETPS units are listed in section 5.4 of the TGM.

Limiting Layer	Vertical Separation Distance for All Soils Systems >2,500 gpd
Impermeable Layer	2'
Fractured Rock or Very Porous Layer	1'
Normal High Ground Water	1'
Seasonal High Ground Water	1'

Soil Design Sub Group	Application Rate (gallons/square foot/day)
A-1	1.7
A-2a	1.2
A-2b	1.0
B-1	0.8
B-2	0.6
C-1	0.4
C-2	0.3

Extended Treatment Package Systems

- Systems require a contract with an approved operations and maintenance entity as well as monitoring and annual reporting



Extended Treatment Package Systems and You

- DEQ and the Technical Guidance Committee are deliberating on how extended treatment package systems are operated and maintained
- Currently DEQ uses the O&M entity
- This is likely to change to a service provider model

Remediation Components

- Must be permitted.
- Tank must be pumped and inspected.
- Installed in accordance with the manufactures directions.
- Risers and effluent filters are required.
- A distribution box, inspection port, or other means of measuring progress may be required.
- Approved remediation components are listed in section 5.12 of the TGM.
- If the component does not remediate the drainfield within 30 days the system is considered failing.

Engineered Systems

Questions so far?

Who needs a short break?



A Note on Engineers

- The engineer must be licensed as a P.E. in Idaho
- Familiar with waste water
- The engineer is responsible for submitting an as-built at the completion of the project.

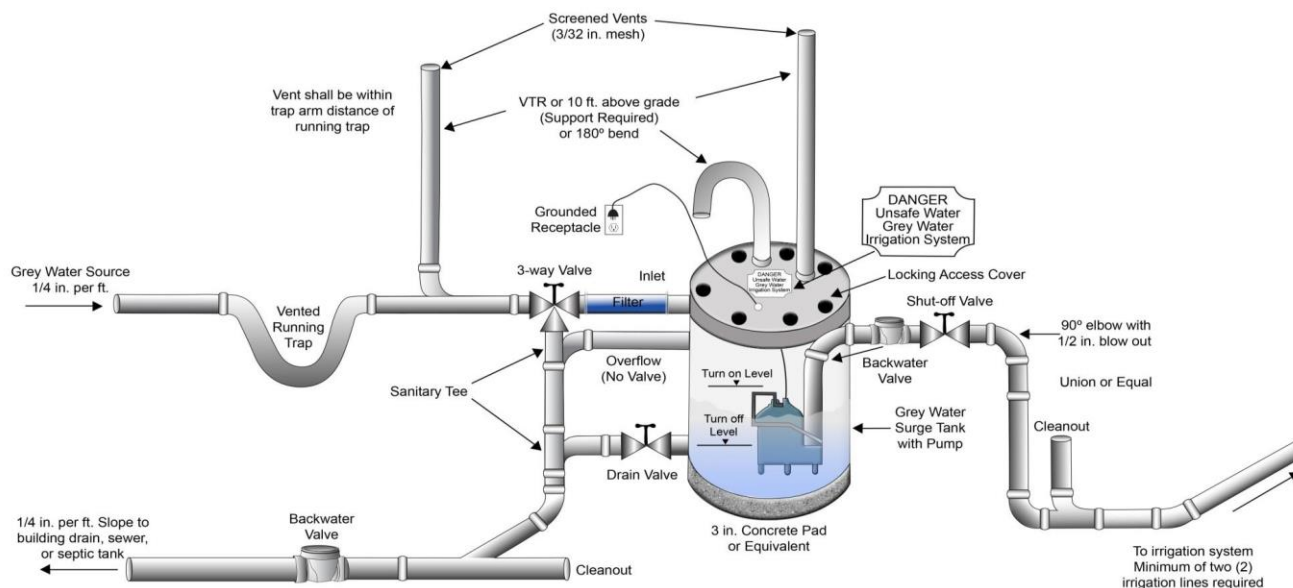
Pressure Distribution System

- Pressurized systems may be required as a part of alternative systems for pretreatment or disposal of effluent
- Required in drainfields with 1,500 or more square feet of actual trench bottom
- Minimum residual head is 5 feet



Grey Water Systems When Pressurized

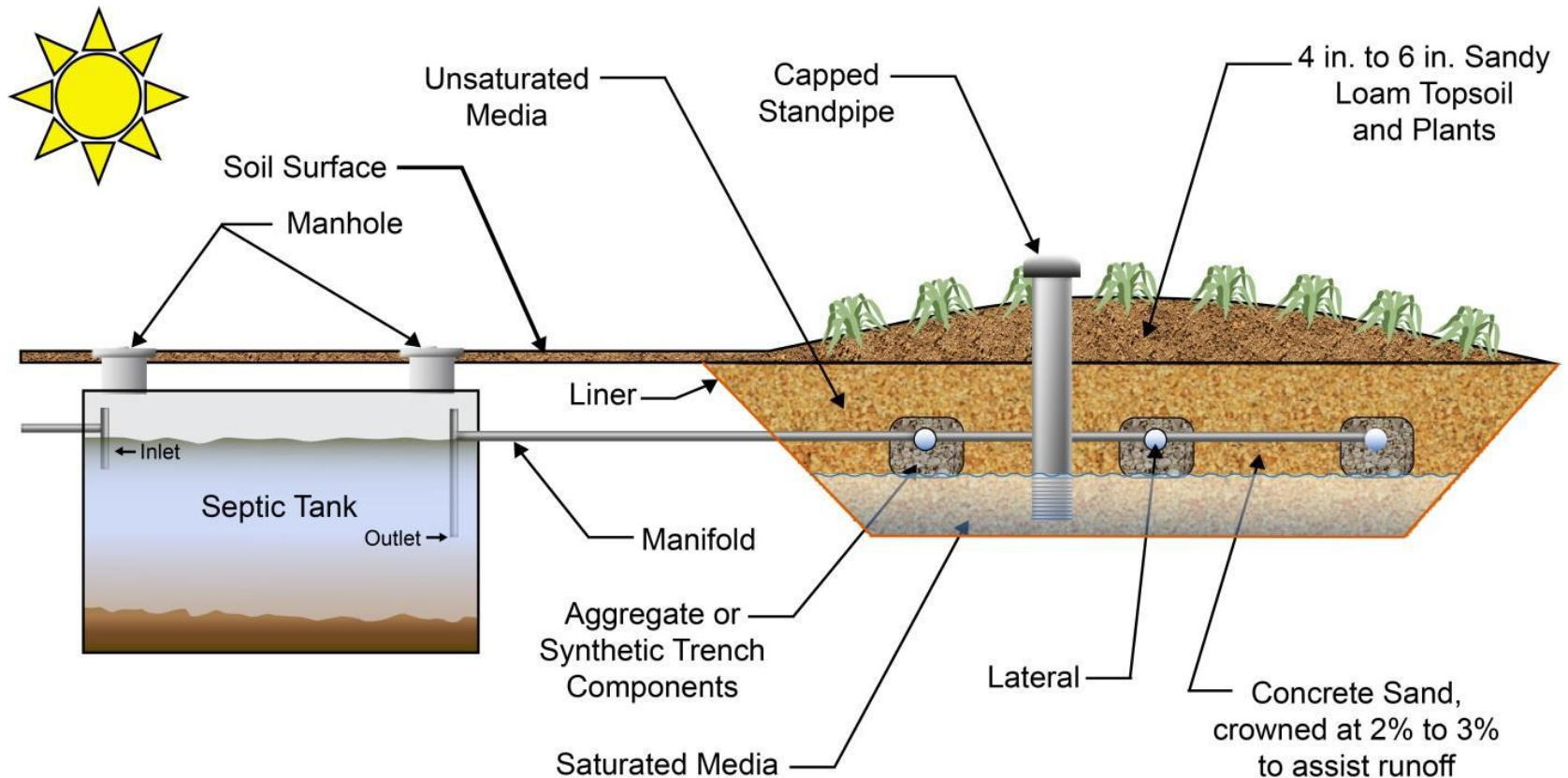
- All standard setbacks apply
- Grey water lines must be marked in accordance with the plumbing code
- The number of occupants is used to determine daily flow



Individual Lagoon

- 200' setback to property line
- Site slope may not exceed 12%
- Not to be placed in areas that freeze for more than 3 months
 - Or where precipitation is greater than evaporation
- 10 acre minimum lot size, variance required from 5 acre to 10
- Lagoon area must be compacted
- Area must be fenced

Evapotranspiration and Evapotranspiration/Infiltrative systems



Evapotranspiration and Evapotranspiration/Infiltrative systems

- Seasonal ground water must not come within 6” of liner
- 100’ setback to wells and surface water
- Site must not be subject to flooding
- High water alarm and standpipes are required
- Distribution laterals must be wrapped with geotextile fabric
- The ETI system are similar to ET just put in C type soils with no liner, or a clay based liner.

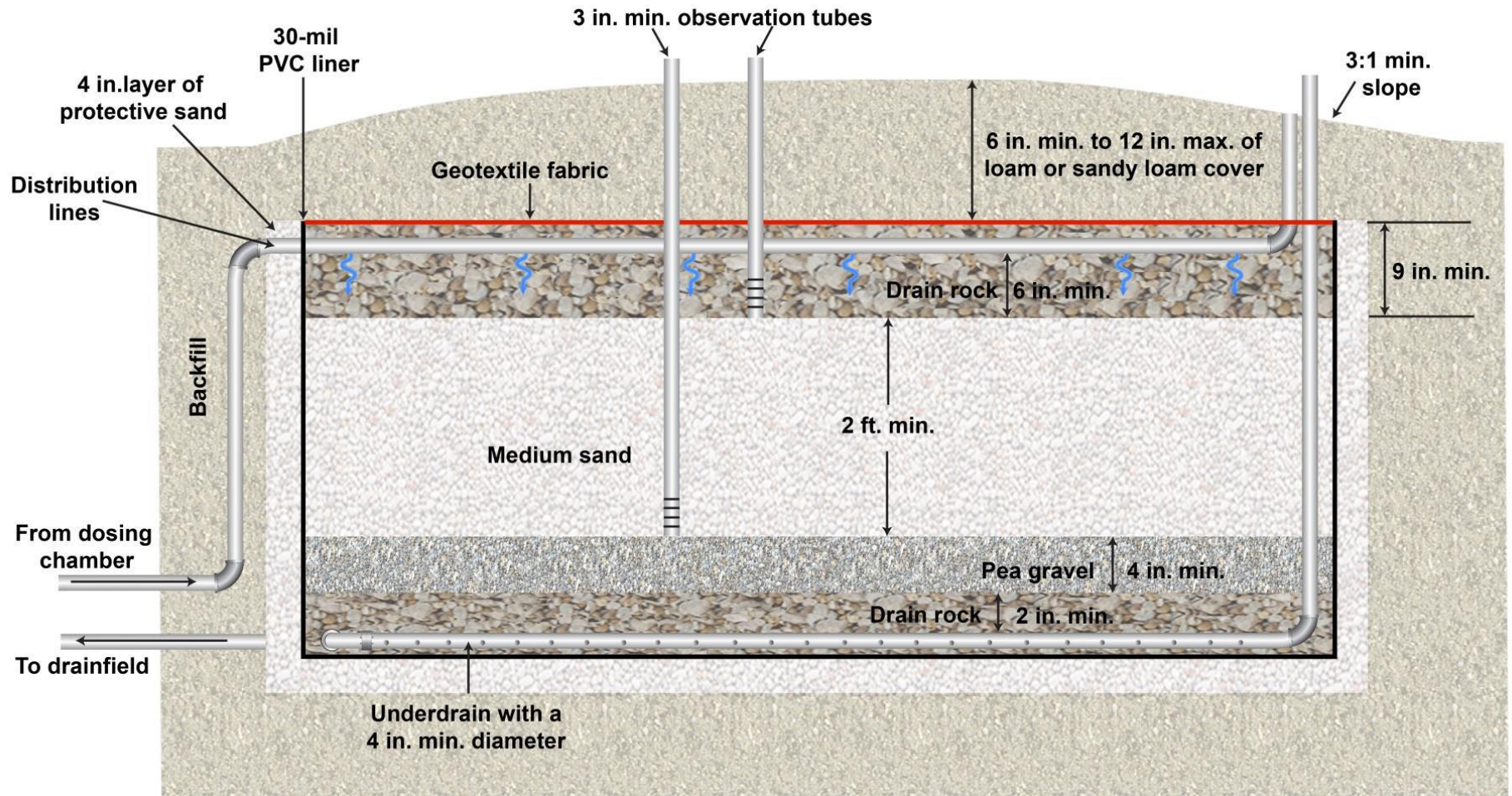
Intermittent Sand Filter

- Reduce separation distances and drainfield size
- The sand container must meet the same separation distances as a septic tank, except, the bottom of the container may not be within 12 inches of seasonally high ground water

Limiting Layer	Vertical Separation Distance for All Soils Systems >2,500 gpd
Impermeable Layer	2'
Fractured Rock or Very Porous Layer	1'
Normal High Ground Water	1'
Seasonal High Ground Water	1'

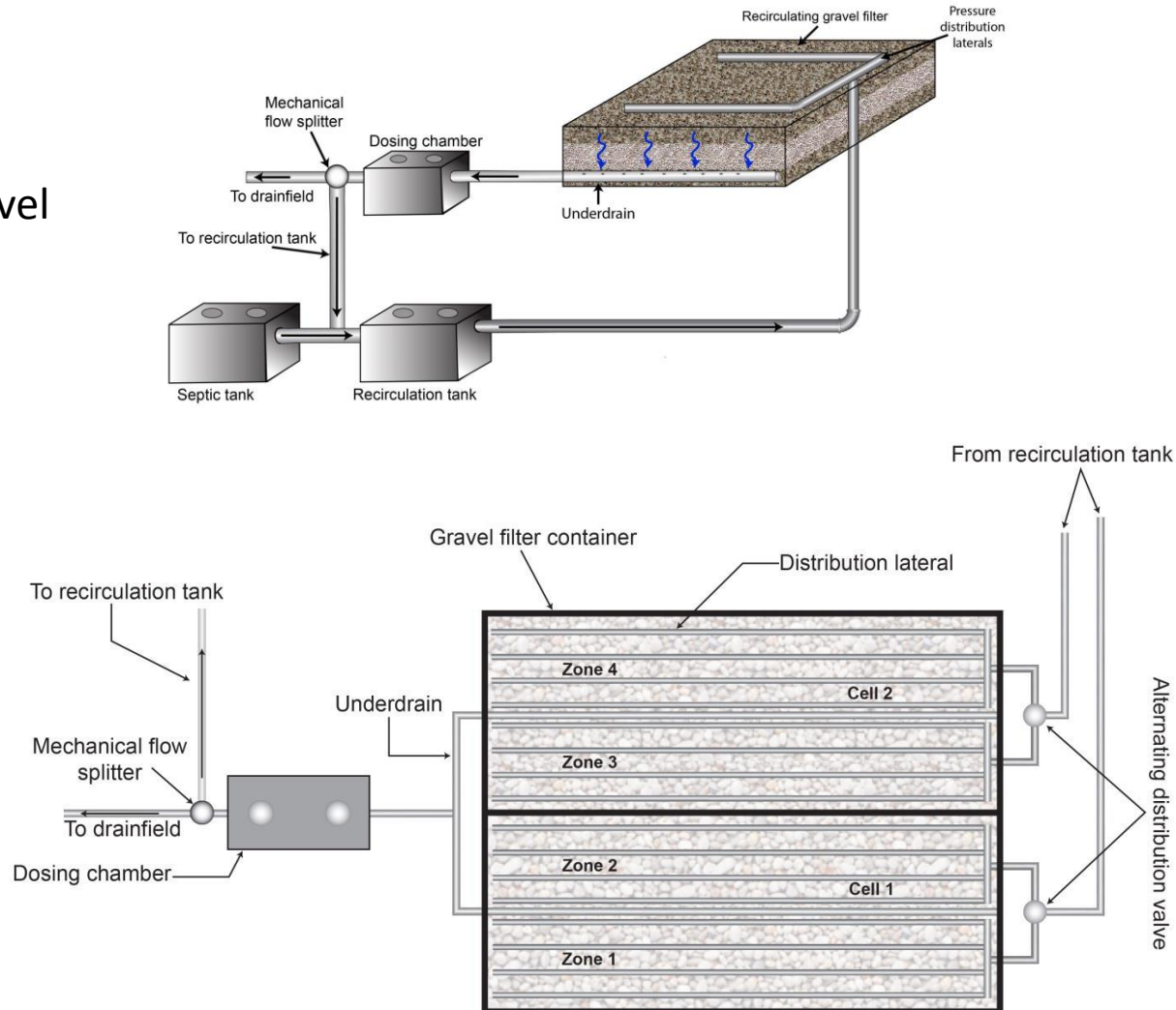
Soil Design Sub Group	Application Rate (gallons/square foot/day)
A-1	1.7
A-2a	1.2
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B-1	0.8
B-2	0.6
C-1	0.4
C-2	0.3

Intermittent Sand Filter



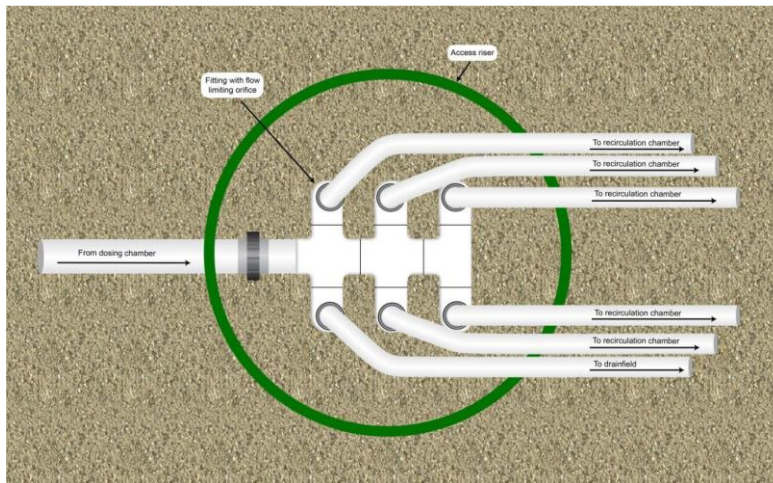
Recirculating Gravel Filter

- Pea gravel

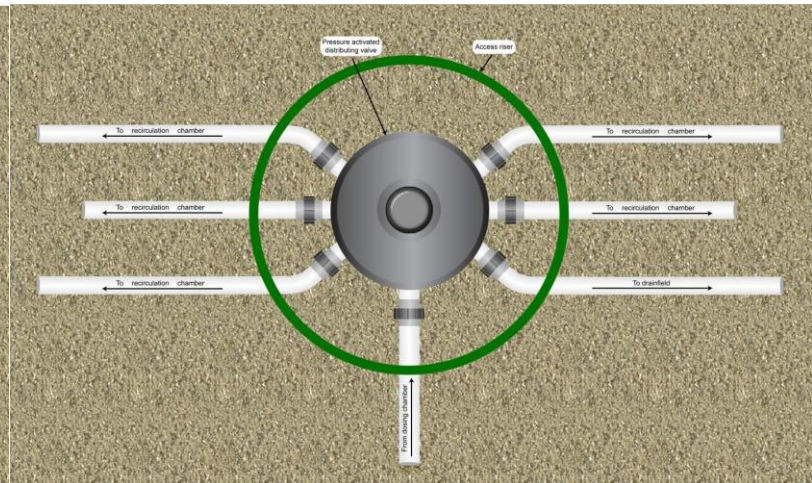


Recirculating Gravel Filter

- Minimum recirculation ratio is 5:1 Maximum 7:1
- Timed dosing is required
- Doses volume should be 10.4% of the daily flow volume



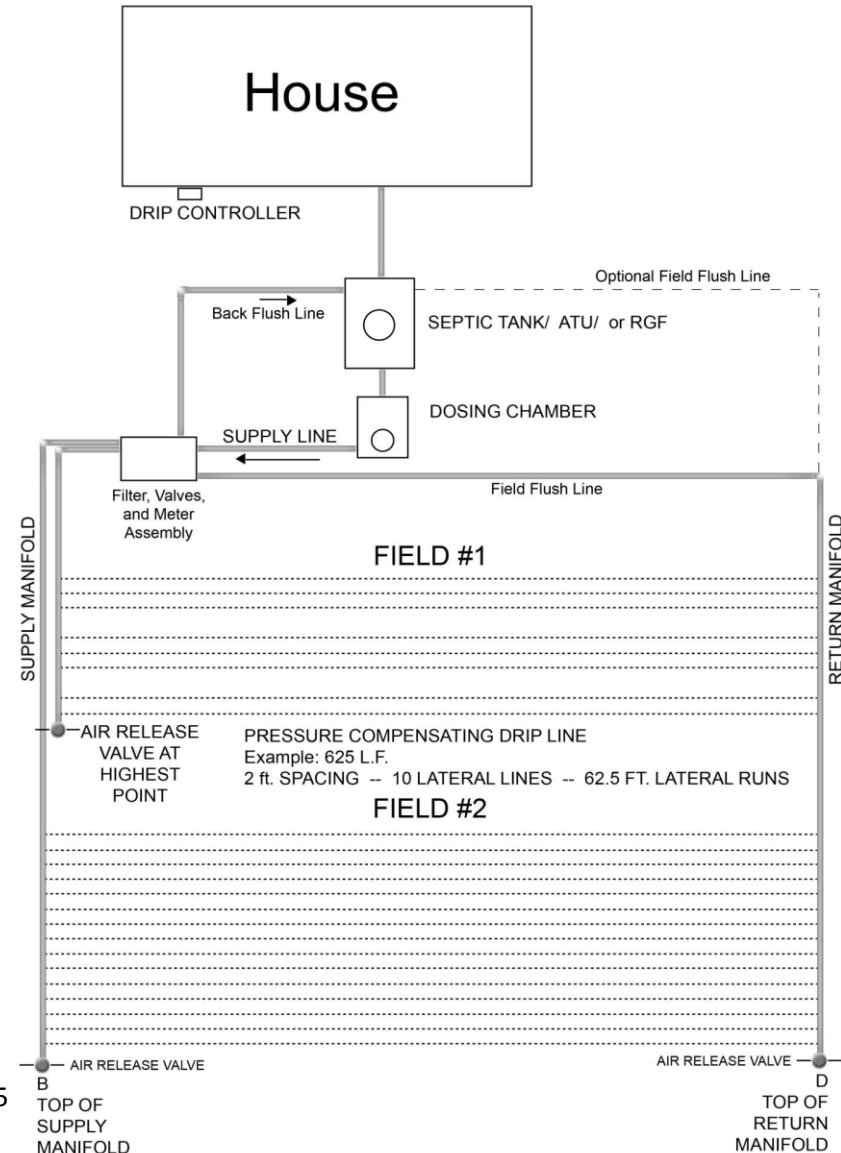
Gravity flow splitter



Pressurized splitter valve

Drip Distribution System

- 2' minimum separation of drip tubes
- Final depth of 1' minimum
- 2' set back to impermeable layers 1' to all other limiting layers
- 100 micron or smaller filter
- Vacuum relief valves required



Large Soil Absorption System

- 2,500 gallons or more per day
- Maximum disposal unit flow is 10,000 GPD
- At least two disposal systems designed to accept the daily flow will be constructed with an area for one more reserved
- Design engineer will create and O&M manual
- Monitoring is required, with an annual report to be filed by January 31 each year

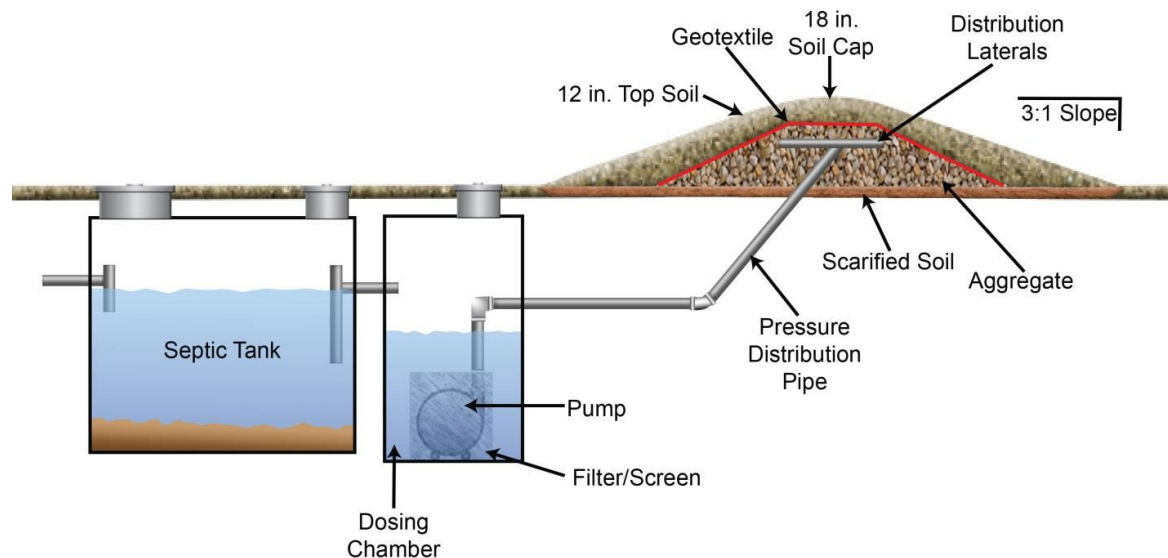
Large Soil Absorption System

TABLE -- EFFECTIVE SOIL DEPTHS			
Site Conditions	Design	Soil	Group
Limiting Layer	A	B	C
Impermeable Layer	8	8	8
Fractured Bedrock, Fissured Bedrock or Extremely Permeable Material	12	8	6
Normal High Groundwater Level	12	8	6
Seasonal High Groundwater Level	2	2	2

TABLE -- SEPARATION DISTANCES			
Feature of Interest	Design	Soil	Group
A	B	C	
All Domestic Water Supplies			
Sewage Volume - 2,500-5,000 GPD	250	200	150
Sewage Volume - 5,000-10,000 GPD	300	250	200
Property Lines			
Sewage Volume - 2,500-5,000 GPD	50	50	50
Sewage Volume - 5,000-10,000 GPD	75	75	75
Building Foundations - Basements			
Sewage Volume - 2,500-5,000 GPD	50	50	50
Sewage Volume - 5,000-10,000 GPD	75	75	75
Downslope Cut or Scarp			
Impermeable Layer - Below Base	100	50	50
Separation Distance - Between Modules	12	12	12

At Grade Soil Absorption System

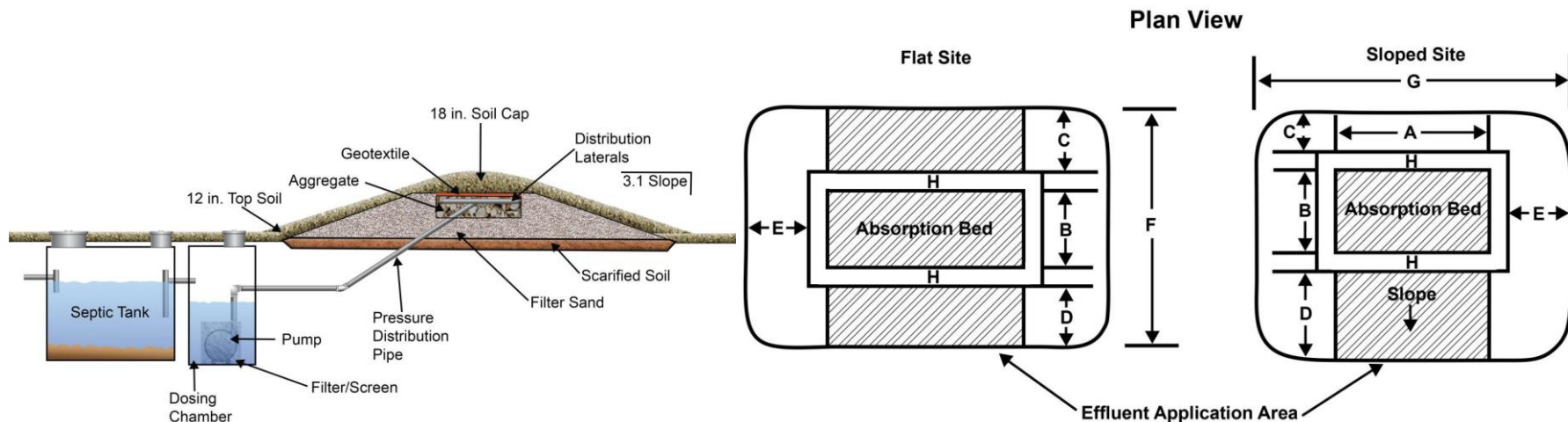
- Must be pressurized
- Designed at 1.5 time the wastewater flow
- 500 gallons per day maximum flow, excluding safety factor
- Drain rock must be used



Design Group	A	B	C-1	C-2
Maximum Slope (%)	20	20	12	6

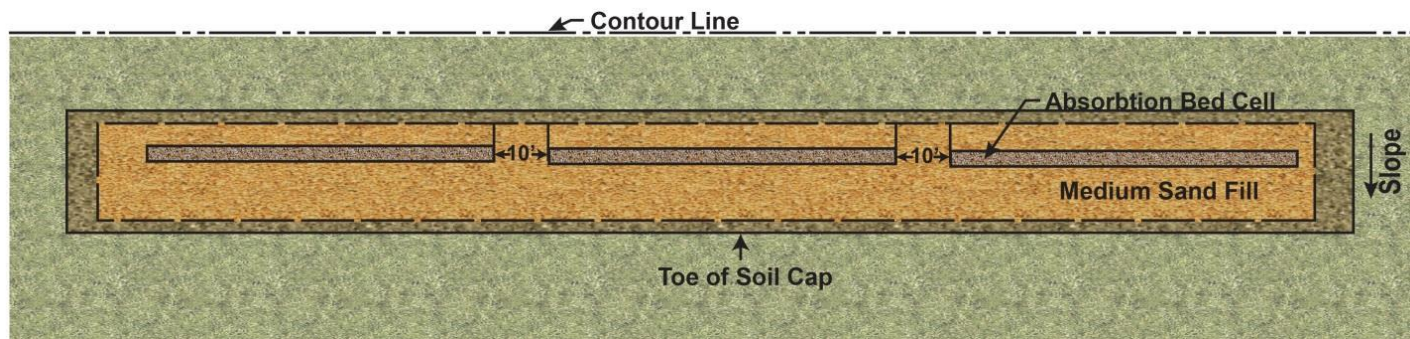
Sand Mound Systems

- Pressurized distribution is required
- Designed at 1.5 times the daily flow
- Setback reductions depend on the depth of sand beneath the bed
- Maximum slopes of 20% for A and B soils 12% for C-1 and 6% for C-2
- Sludge in septic tank should be checked annually and pumped at 40%



Sand Mound Systems

- Cells should be as long and narrow as possible
- Vegetation must be removed and the entire area scarified then plowed 6 to 8 inches deep before sand is placed.



Experimental Systems

- Site must be suitable for a standard or alternative system
- A variance is required
- Operations and Maintenance Manual must be provided with the application. This manual must be approved before a permit will be issued.
- Approval is at the discretion of DEQ

Alternative System	At-Grade Soil Absorption System (4.2)	Capping Fill System (4.3)	Drip Distribution System (4.5)	Experimental System (4.7)	Extended Treatment Package System (4.8)	Extra Drain-rock Trench (4.9)	Gravel-less Trench System (4.11)	Pressure Distribution System (4.19)	Recirculating Gravel Filter (4.21)	Intermittent Sand Filter (4.22)	In-Trench Sand Filter (4.23)	Sand Mound (4.24)	Seepage Pit/Bed (4.25)	Steep Slope System (4.26)	Drainfield Remediation Components (4.29)
At-Grade Soil Absorption System (4.2)	S	N	A*	A	A	N	N	A*	A	A	N	N	N	N	A
Capping Fill System (4.3)	N	S	A	A	A	A	A	A	A	A	A	N	N	N	A
Drip Distribution System (4.5)	A*	A	S	A	A	A*	A*	A	A**	A**	A*	A*	N	A*	A
Experimental System (4.7)	A	A	A	S	A	A	A	A	A	A	A	A	A	A	A
Extended Treatment Package System (4.8)	A	A	A	A	S	A	A	A	A	A	A	A	A	A	A
Extra Drainrock Trench (4.9)	N	A	A*	A	A	S	N	A	A	A	A	N	N	A	A
Gravelless Trench System (4.11)	N	A	A*	A	A	N	S	A	A*	A*	A	A	N	A	A
Pressure Distribution System (4.19)	A*	A	A	A	A	A	A	S	A	A	A	A	N	A	A
Recirculating Gravel Filter (4.21)	A	A	A**	A	A	A	A*	A	S	A	A	A	A	A	A
Intermittent Sand Filter (4.22)	A	A	A**	A	A	A	A*	A	A	S	A	A	A	A	A
In-Trench Sand Filter (4.23)	N	A	A*	A	A	A	A	A	A	A	S	N	N	A	A
Sand Mound (4.24)	N	N	A*	A	A	N	A	A	A	A	N	S	N	N	A
Seepage Pit/Bed (4.25)	N	N	N	A	A	N	N	N	A	A	N	N	S	N	A
Steep Slope System (4.26)	N	N	A*	A	A	A	A	A	A	A	A	N	N	S	A
Drainfield Remediation Components (4.29)	A	A	A	A	A	A	A	A	A	A	A	A	A	A	S



Questions

Free Answer

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