

Technical Guidance Committee Meeting Agenda

Thursday, August 28, 2025

9:30 a.m.

Conference Room B
Department of Environmental Quality
1410 N Hilton St., Boise, ID

The meeting will also fully accommodate remote participation. Contact Peter Adams at Peter.Adams@deq.idaho.gov to sign up for participation by telephone and web conferencing.

Call to Order and Roll Call

- Introduction of committee members, guests, and attendees

Public Comment Period – The Committee will allow up to 30 minutes for public comments on topics relevant to the Committee.

Action Item – Review, Amend, or Approve

May 29, 2025 Draft TGC Meeting Minutes (**Appendix A**)

PRODUCT REVIEW

Action Item – Review, Amend, or Approve

- PlanetCare Hybrid Coir Biofilter, presented by Tom Rankin (**Appendix B**)
- PWTP approval requested
- Vote on recommendation for DEQ approval

Action Item – Review, Amend, or Approve

- Eljen Installation Manual, presented by Jim King and Eric Daniels (**Appendix C**)
- Multiple changes to installation manual requested
- Vote on approval

OLD BUSINESS

Action Item – Review, Amend, or Approve

4.19.3.6 - Pump to Gravity Distribution (**Appendix D**)

- Item #6 should say “A complex installer’s permit is **required** for installation.”
- Vote on final approval

Action Item – Review, Amend, or Approve

Appendix C – Uncommon Flows (**Appendix E**)

- Edit Row 5 to say “Residential Workshop/Barn/Shed with a Full **or 3/4** Bathroom.”
- Vote on final approval

Action Item – Review, Amend, or Approve

Appendix C – Uncommon Flows (Appendix F)

- Edit Row 11 to say “10 GPD/camping space” to align with TGM 4.12.
- Vote on final approval

Action Item – Review, Amend, or Approve

TGM 4.17.5 – Pit Privy Abandonment (Appendix G)

- Add statement saying if a subsurface system is installed on the property, any pit privy must be abandoned.
- Vote on final approval

Action Item – Review, Amend, or Approve

TGM 4.20.2 – RV Dump Station (Appendix H)

- Amend language to clarify that only flows discharged to the subsurface count toward LSAS project.
- Vote on final approval

Action Item – Review, Amend, or Approve

TGM 2.2.4.1 Reduction in Separation Distance to Surface Water without a Variance (Appendix I)

- Amend separation distance reductions to align with the July 1st Rule
- Vote on final approval

NEW BUSINESS

Action Item – Review, Amend, or Approve

Appendix C – Uncommon Flows (Appendix J)

- Edit non-residential Row 8 to say “5 GPD/ Walk-in Customer, 0.5 GPD/Drive-thru customer, 15 GPD/Employee.” Delete note about excluding drive-thru customers.
- Vote on preliminary approval

Action Item – Review, Amend, or Approve

Appendix C – Uncommon Flows (Appendix K)

- Edit non-residential Row 12 to say “4 GPD/camping space, Using 1 GPD/person, 4 people per camping space.”
- Vote on preliminary approval

Action Item – Review, Amend, or Approve

TGM Section 2.2.4 – Effective Separation Distance to Surface Water (Appendix L)

- Add language regarding spring surface water monitoring requirements
- Vote on preliminary approval

Action Item – Review, Amend, or Approve

TGM Section 8 – New Section for Pumper Guidance Manual (Appendix M)

- Add pumper technical guidance manual as section 8 of the TGM
- Vote on preliminary approval

Action Item – Review, Amend, or Approve

TGM Section 5.12 – Total Nitrogen Reduction Approvals (**Appendix N**)

- Add drip distribution as a nitrogen reducing system, under “public domain systems”
- Suggest a 40% reduction, based on these articles:
 - 42%: <https://www.buzzardsbay.org/etistuff/results/costaenvccarticle2.pdf>
 - 51%: <https://www.sciencedirect.com/science/article/abs/pii/S0043135413010300>
 - 50%: <https://www.americanonsite.com/wp-content/uploads/2022/12/Flyer-EPA-Chesapeake-Bay-Listed.pdf>
 - 50%, PDF page 17 and 22: https://www.chesapeakebay.net/files/documents/osww_bmp_report_4-30-18.pdf
 - 38%, PDF page 58: https://d38c6ppuvigmp.cloudfront.net/documents/Final_OWTS_Expert_Panel_WQGIT_approved_07142014.pdf
- Vote on preliminary approval

Action Item – Review, Amend, or Approve

TGM Section 4.9.2, Figure 4-16 – Extra Drainrock Trench Approval Conditions (**Appendix O**)

- Correct diagram to show 18 inches of cover, to align with Figure 4-6.
- Vote on preliminary approval

Action Item – Review, Amend, or Approve

TGM Section 4.25 Seepage Pit (**Appendix P**)

- Edit language
- Vote on preliminary approval

Discussion Items

On-site Wastewater Program Update

Action Item – Approve

Schedule Next Meeting (proposed: Thursday, December 4, 2025)

Action Item – Approve

Adjourn Meeting

**Begin time will be observed. Time spent discussing each agenda item may vary.*

Conference Call Instructions

All remote participants must join the Teams conference call either by joining the meeting online or calling into the Teams phone number.

Call in number: 208-985-2810
Phone Conference ID: 417 870 303##

To reduce background noise, please remember to mute your phone unless you are speaking.

Teams Web Conference Instructions

This will allow users joining the meeting via online video conference to view the documents being shared.

For the Teams Meeting ID and Password, please contact Peter Adams at Peter.Adams@deq.idaho.gov.

Appendix A

Technical Guidance Committee

Meeting Minutes

Department of Environmental Quality
1410 N. Hilton St.
Boise, ID 83706

Thursday, May 29, 2025
9:30 a.m., MDT
Conference Room B

The meeting accommodated remote participation via phone, Microsoft Office Teams conference, as well as in-person attendance.

TGC ATTENDEES:

Peter Adams, Onsite Wastewater Coordinator, TGC Chair – DEQ
Joe Canning, P.E. – Centurion Engineers
Kellye Johnson, Director of Environmental Health – EIPH
Mitch Kiester, Environmental Health Program Manager – SWDH
Jason Peppin, Environmental Health Program Manager, Ph.D. – REHS
Kendall Unruh, Complex Installer – WEB, Inc. dba/Western Septic & Excavation

GUESTS:

Brent Copes – Senior Environmental Health Specialist, Central District Health
James Craft – Wastewater Compliance Bureau Chief, DEQ
Hannah Young – Lead Deputy Attorney General, DEQ

CALL TO ORDER AND ROLL CALL:

The meeting was called to order at 9:30 a.m. Introductions were made by each person in attendance.

APPENDIX A

Action Item – February 27, 2025, Draft TGC Meeting Minutes

- Review draft meeting minutes from February 27.
- Vote to approve/make suggestions to the meeting minutes.
- Kellye noted several typos and made suggestions to edit:
 - Appendix G, page 5, bullet point 4, should be BioMicrobics, not BioCoir Metrics.
 - Appendix G, page 6, bullet point 6, should be ports, not cortis.
 - Appendix G, page 6, bullet point 8, should be ports, not cortis.
 - Appendix H, page 6, bullet point 8, should be LSAS, not LAS.
- Changes to the draft February 27 meeting minutes will be edited.
- February 27 meeting minutes were approved with edits.

Motion: Joe Canning

Second: Jason Peppin

Verbal Vote: Unanimously approved with edits. The February 2025 meeting minutes will be posted to DEQ's website within 30 days.

OLD BUSINESS:

APPENDIX B

Action Item – Review, Amend, or Approve

TGM Appendix C – Uncommon Flows

- Created new row *“Single family home with an extra kitchen or extra laundry room”*.
- An additional 10 GPD/bedroom per kitchen or laundry.
- An additional 250 gallons in septic tank capacity per kitchen or laundry.
- The suggested changes were based on feedback from SWDH and CDH.
- Jason stated the new language would be beneficial to site systems properly.
- Mitch also agreed.
- No public comments were received.
- Vote on final approval.

Motion: Joe Canning

Second: Kendall Unruh

Verbal Vote: Final vote, unanimously approved.

APPENDIX C

Action Item – Review, Amend, or Approve

4.8.4.d – ETPS Construction

- Added language about sampling ports.
- Jason thinks the new language accounts for new technology and will be helpful.
- No public comments were received.
- Vote on final approval.

Motion: Jason Peppin

Second: Kellye Johnson

Verbal Vote: Final vote, unanimously approved.

APPENDIX D

Action Item – Review, Amend, or Approve

TGM 3.3.2 – Empirical Flows

- Added language allowing water flows to be measured at an existing facility to add additional flows to the existing system.
- No public comments were received.
- Vote on final approval.

Motion: Joe Canning

Second: Jason Peppin

Verbal Vote: Final vote, unanimously approved.

NEW BUSINESS:

APPENDIX E

Action Item – Review, Amend, or Approve

4.19.3.6 - Pump to Gravity Distribution

- Item 6 should say, “A complex installer’s permit is **required** for installation”.
- Vote on preliminary approval.

Motion: Kendall Unruh

Second: Kellye Johnson

Verbal Vote: Preliminary vote, unanimously approved.

APPENDIX F

Action Item – Review, Amend, or Approve

Appendix C – Uncommon Flows

- Edit row 5 to say, “Residential Workshop/Barn/Shed with a full or 3/4 bathroom”.
- Mitch thinks this addition will be helpful.
- Kellye suggested adding parentheses for information that is not included.
- Kendall asked if we would be adding 150 gallons for a shop.
- Peter said they don’t have to add the additional language if the dwelling isn’t habitable.
- Vote on preliminary approval.

Motion: Kellye Johnson

Second: Jason Peppin

Verbal Vote: Preliminary vote, unanimously approved.

APPENDIX G

Action Item – Review, Amend, or Approve

Appendix C – Uncommon Flows

- Edit row 11 to say, “10 GPD/camping space” to align with TGM 4.12.
- Edit to align with Grey Water flow under 4.12.2.
- Jason thinks this would be helpful with more projects being proposed, and said it seems to align with the Grey Water section. He also said that they haven’t had any issues with the Grey Water sumps.
- Joe asked about grey water for line 12, which states 8 gallons/camping space.
- Peter said he would add the edit for the next meeting in August, so the TGC could review the change.
- Vote on preliminary approval.

Motion: Joe Canning, as written

Second: Jason Peppin, as written

Verbal Vote: Preliminary vote, unanimously approved.

APPENDIX H

Action Item – Review, Amend, or Approve

TGM 4.17.5 – Pit Privy Abandonment

- Add the statement, “*If a subsurface system is installed on the property, any pit privy must be abandoned*”.
- Jason asked about rural counties; he said that they do have property owners with large properties that have asked for a pit privy. His issue is that they may be installed anyway without permits in unfavorable locations.
- Joe asked if there’s a campground host that has its own subsurface system, how would this impact that?
- Peter confirmed it would impact it. He also said he would add additional language to clarify. He proposed a change in language to “*If a subsurface system is installed on a property with a single-family home, any pit privy on the property must be abandoned unless otherwise approved based on lot size*”.
- Kellye proposed adding the language “*... it could be approved by the Health Department based on lot size*”.
- Joe asked what the lot size references were.
- Peter said we could add the language, “*... otherwise approved by the Director ...*”, instead of “*... otherwise approved by the Health Department ...*”.
- Jason agreed with Peter and said it would help with awareness and avoid specific lot sizes.
- RLT Support joined at the beginning of the meeting and commented – “*Is it possible to add more diagrams of the EPT system or alternative systems in relation to a house, including the design of the drain field? I would like to see a lot more pictures*”.

- of possible scenarios or setups for educational purposes. Also, regarding the demand and mandatory installation permit for EPT systems, as a homeowner or public, I would like to install the system myself without being certified, as it's not done for profit, but as a necessity, and the permitting should include the schematic, again easily to understand end to end, not to read an unnecessary 360 pages". RLS Support also commented, "But then you give too much power to one person – the Director".*
- Peter said that when referencing the Director, it refers to DEQ or the Health Department. He also said that they could add more diagrams. Additionally, he said that the reason we have service providers is because they have complex parts to them (e.g., electricity, and installer requirements).
 - RLS Support commented that they appreciated the clarification.
 - Vote on preliminary approval.

Motion: Jason Peppin, as written

Second: Kendall Unruh, as written

Verbal Vote: Preliminary vote, unanimously approved.

APPENDIX I

Action Item – Review, Amend, or Approve

TGM 4.25 – Seepage Pit/Bed

- Delete the entire section, as Seepage Pits will no longer be approved in the Rule that goes into effect on July 1, 2025.
- Currently, it is only approved for Health District 7 until July 1, 2025; as it stands, it wasn't an approved system in any of the other Districts.
- Jason said his only pause is in extreme situations, where they're replacing nonconforming systems, where they don't have any other alternatives, and they have had to install seepage pits. He also said that at least having this in the TGM allows these scenarios to occur where there isn't space. Additionally, he thinks the language should be reworded or that they need to get DEQs feedback.
- Peter asked if the language needed to be changed to "... as a last resort". Peter suggested tabling the topic so that he could reword the language.
- James agrees that the language should be reworded.
- Kellye appreciates the comments and that they're not issuing nonconforming permits.
- Peter will meet with Kellye and Jason to rework the language.

Motion: Jason Peppin, motion to table

Second: Kellye Johnson, seconded the motion to table

Verbal Vote: Topic tabled, unanimously approved.

APPENDIX J

Action Item – Review, Amend, or Approve

TGM 4.20.2 – RV Dump Station

- Amend language to clarify that only flows discharged to the subsurface count toward the LSAS project.
- Jason said that based on the one situation, it does help to clarify, and he approves of the language change.
- Kellye agreed.
- Joe asked if this was in the RV Dump Section. He also said he hoped that no one would read it, thinking that they could discharge to the subsurface. Additionally, he suggested an addition to the language.
- Peter confirmed that the language previously stated this in the TGM.
- Vote on preliminary approval.

Motion: Joe Canning

Second: Kellye Johnson

Verbal Vote: Preliminary vote, unanimously approved.

APPENDIX K

Action Item – Review, Amend, or Approve

TGM 2.2.4.1 Reduction in Separation Distance to Surface Water without a Variance

- Amend the separation distance reductions to align with the July 1, 2025, Rule.
- Jason agrees with the updated language and said that it helps in situations where locations are hard to find, it remains protective, with the two soil types, and the edited distance.
- Kendall had a question on an existing project. He said on the existing project, the test holes are being dug tomorrow, where an existing house is on the property, and the property owners want to build another house on the property. He also asked if the new house would be allowed. Additionally, he said that we might need to add additional language.
- Jason asked if we still need to have a reference to existing parcels with the rule change. It's a slight allowance and might address Kendall's concerns.
- Joe said the language is parcel, not build.
- Peter feels the new language is necessary for new builds.
- Vote on preliminary approval.

Motion: Kendall Unruh

Second: Joe Canning

Verbal Vote: Preliminary vote, unanimously approved.

DISCUSSION ITEM(S):

ADDITIONAL ACTION ITEMS OR COMMENTS:

On-site Wastewater Program Update:

- Rulemaking Status was discussed.
- Peter said that the new rule goes into effect on July 1, 2025. He also said that the septic tank riser addendum is still being reviewed. Additionally, he got feedback from the Health Departments, which he said has been helpful.
- Peter will make updates to the TGM.

Action Item – Motion to schedule the next meeting

- The proposal for the next meeting is slated for Thursday, August 28, 2025.

Motion: Peter Adams

Second: Kellye Johnson

Verbal Vote: Unanimously approved.

Action Item – Motion to adjourn the meeting

Motion: Jason Peppin

Second: Kendall Unruh

Verbal Vote: Unanimously approved, and the meeting was adjourned at 10:22 a.m.

Appendix B

Planet
Care



An Introduction To The

Hybrid Coir Biofilter

Simply Natural, Naturally Simple

Agenda



- Peat Biofilters
- Hybrid Coir Biofilters
 - Installation
 - Maintenance
 - Media Exchange
- There will be some crossover and repetition to make sure key points are made





PLANET CARE BIOFILTERS

An Iowa based Company

Planet Care Coir Biofilter is hybrid filter containing 90% Coco Coir / 10% Peat. The peat is included as a “ready to serve” microbial habitat, and will stimulate microbial growth throughout the filter after startup, because Coco Coir is sterile of microbes at start up. Having the peat helps to alleviate no flow, or seasonal flow startup problems from lack of microbial activity in the filter.

The Hybrid Coir unit was extensively tested at the NSF Waco test Facility and passed the Class 1 standard 40 protocol



What is in the Peat Moss?



What makes the Peat a Living Ecosystem and why its so good?



Microbiological Activity



- Organisms thrive in the sphagnum peat moss Naturally occurring eco-system
 - Fungi
 - Rotifera
 - Nematoda
 - Enchytraeids (en kee tray' id), pot worms
 - Oligochaetes (earth worms)
- Each organism plays a role to keep balance within the system



The Hybrid Coir is 10% Peat



This system is active at FLUSH 1



NSF Proof with Hybrid Coir



	Eff TSS (mg/L)	Eff CBOD (mg/L)	Eff TSS (mg/L)	Eff CBOD (mg/L)
Week 1	5.3	5.3	Passing	Passing
Week 2	6.0	12.7	Passing	Passing
Week 3	4.8	11.6	Passing	Passing
Week 4	5.4	19.8	Passing	Passing
Week 5	6.6	21.0	Passing	Passing
Week 6	6.0	11.0	Passing	Passing
Week 7	4.3	11.3	Passing	Passing
Week 8	3.6	7.4	Passing	Passing
Week 9	2.2	5.0	Passing	Passing
Week 10	2.3	4.3	Passing	Passing
Week 11	2.6	5.2	Passing	Passing
Week 12	2.2	4.8	Passing	Passing
Week 13	2.2	5.0	Passing	Passing
Week 14	3.0	4.8	Passing	Passing
Week 15	3.4	4.0	Passing	Passing
Week 16	5.0	7.3	Passing	Passing
Week 17	5.0	5.7	Passing	Passing
Week 18	7.8	12.8	Passing	Passing
Week 19	6.3	11.3	Passing	Passing
Week 20	4.8	7.0	Passing	Passing
Week 21	5.7	6.0	Passing	Passing
Week 22	9.0	7.3	Passing	Passing
Week 23	12.0	11.2	Passing	Passing

6 Month TSS Average 5.2
6 Month CBOD Average 8.3

Total Number of Dosage Days
 182

Days Eff TSS > 100 (mg/L)
 0

Days Eff CBOD > 60 (mg/L)
 0



Coir vs CocoPeat terminology



- Hybrid Coir Biofilters – what is it from?



Intermittent Use



- Planet Care Hybrid Coir Biofilters have a naturally occurring Ecosystem of organisms in the peat that allow the Biofilter to go for several months without use while still offering the same high level of treatment that a daily use system would.
- Aeration systems and inert media filters take weeks to develop treatment biotics and begin to die when a food source is not present.



Hybrid Coir Biofilter vs Peat Biofilter



- The Hybrid Coco Coir will last 12-15 years
 - This filter has large pore space
- Peat Biofilter will last 8-10 years:
 - This filter has tight pore spaces.
 - More likely to react when chemically overloading



Coir Replacement



- The Coco Coir will last 15 years
 - This is dependent on both hydraulic, biological and biochemical loading
- It may be time to replace coir when:
 - Treatment levels are poor
 - It does not percolate quickly
 - Bio-mat penetration into peat pillow elevation
- Only one-half day to replace the coir with sludge vac
- Replacement cost depends on location



Applications



- When Public Sewer In Not Available
 - Single Family Homes
 - Multi-Family Homes
 - Apartment Complexes
 - Churches
 - Office Buildings
 - Restaurants
 - Seasonal Use Homes
 - Water-Front Homes
 - Small Lots
 - High Groundwater Lots



Design Flexibility



- Gravity in, gravity discharge
- Gravity in, pump discharge
- Pump in, gravity discharge
- Pump in, pump discharge
- Can discharge into the following:
 - Pad / mound system
 - Gravity leach field
 - Pressure dosed leach field
 - Drip Irrigation System
 - Surface or water body



O & M Costs



- The lowest operating and maintenance costs of any system available
- No electricity needed for system
- No costly blowers to replace
- No sludge production to deal with



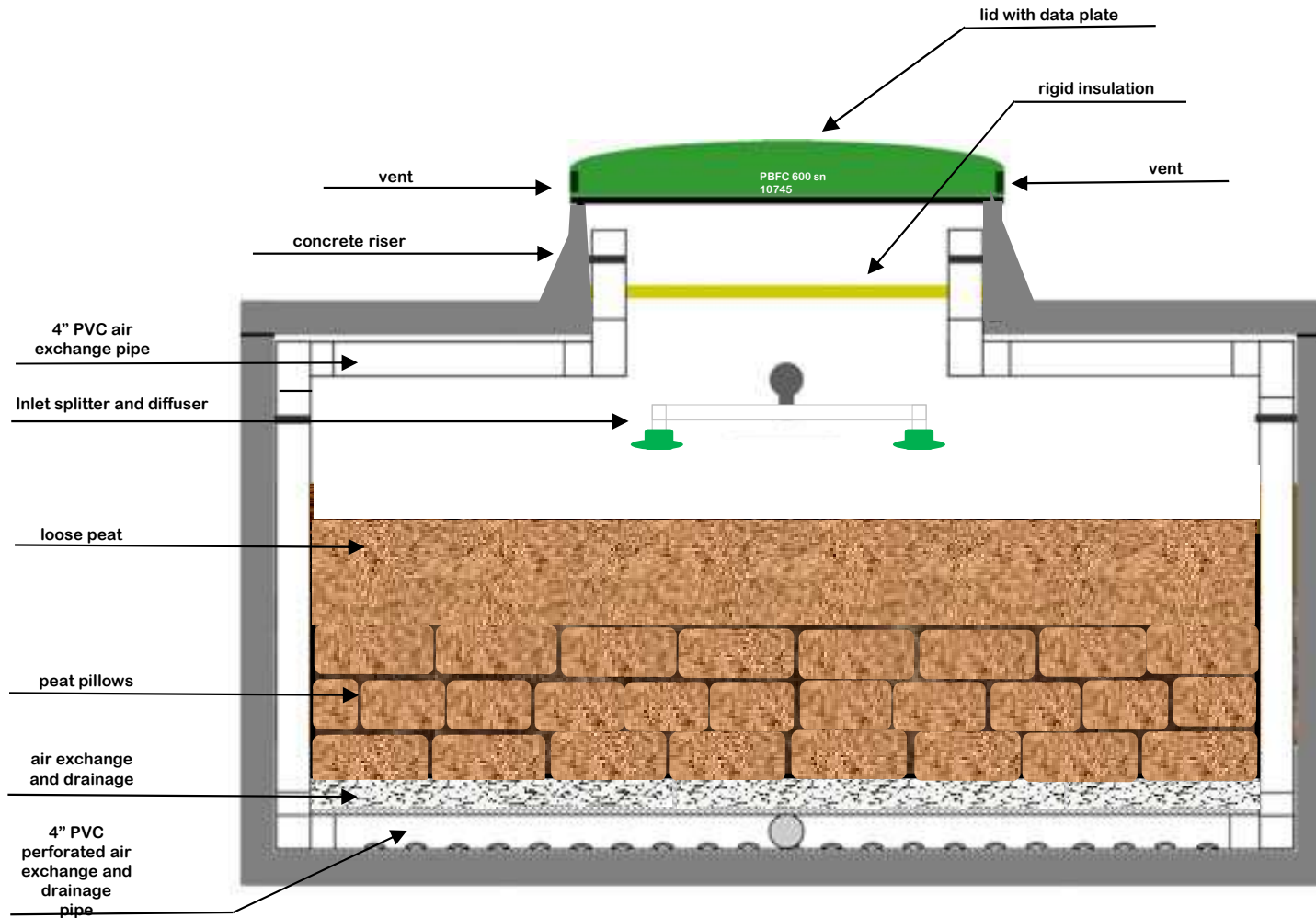
Seasonal Use



- No ramp up time
- No shut down procedures
- No inactivity concerns



PBFC Cross Section



Bottom of tank



- There is a cross shaped section at bottom of tank –
- Top connected to the airway to keep the system aerobic
- Discharge manifold works as both, air pathway as well as takes water into pipe for discharge
- End is connected to discharge pipe to outlet or secondary pump tank



HDPE Cover



- Cover has 2 air vents
 - Must be at grade
- Allows air movement throughout peat bed
- Keeps system aerobic
- Pulls air into system
 - Vented through stack
- Connected to discharge pipe



Maintenance Requirements



- Only one routine service event required per year...IT IS required for warranty
- Simple maintenance procedures
- Check with state or local requirements
- Most states require treatment units to be serviced by a licensed service provider on a regular basis or yearly contract



Maintenance



- Open and inspect septic tank to see if it needs to be pumped.
- Clean effluent filter.
- Remove green cover – make sure vents are free of debris/grass etc.
- Remove insulation cover
- Loosen the 2-inch union to bring up the inlet manifold for inspection. Rinse the manifold inside and outside with fresh water.
- Flush fresh water down the airways and see how well flow is all the way out the discharge pipe



Maintenance



- Visually inspect the filter bed for grease and or oily substance that should not be present
- Rake the bed with a 4-inch rake to stir the top 6 inches – level out the bed
- See complete maintenance to-do-list





PBFC Series



Concrete Tanks

Planet Care Concrete kits are designed to work with most state approved septic tanks. No proprietary or specialty tanks required. Relocate the inlet and outlet locations and block out an opening in the center of the lid. Concrete risers may also used with our required vented lid. All kits are designed to work off of volume to allow a wide variety of tank sizes.



Think at the sink!



- Your septic tank contains a collection of living anaerobic organisms and your treatment system contains aerobic organisms that digest and treat household waste. Pouring toxins down your drain can kill these organisms and harm your septic system. Whether you are at the kitchen sink, bathtub, or utility sink.



Installation



- **Concrete Tanks**





Installation



- **Concrete Tanks**
- **Level and install Planet Care Biofilter tank same as the septic tank**
- **In many situations, the biofilter is installed perpendicular to the septic tank (long side entry)**
- **Install a effluent filter inside septic tank prior to Biofilter.**



Installation



- **Concrete Tanks**



Exchange or Replacement



- **Peat to Coir**





Exchange

- **Peat to Coir**



Exchange



• Peat to Coir

- 2 methods of changing out the peat. Either method takes 2-3 staff, and half day to complete.
 - Snag bags with hook and remove with mini x bucket on chain.
 - Be careful not to snag the false aggregate bags. You can choose, and is recommended for coir replacement to remove aggregate, and replace with 3 inches river rock for coir. If peat to peat, just leave the false aggregate.
 - There is loose peat to clean up.
 - Use vac truck to pull up peat (or coir) – may need to add water to make it a slurry.
 - Tank needs to have a decent rinse.
-
- Second method is to cut bags and remove all loose peat with the vac truck.



Exchange



- **Hybrid Coir - Kit supplied by distributor**
- Coir – if replacing peat, you will have a different manifold, and the lid needs to be changed. Make sure to have new serial number match to address in your paperwork. Planet Care hybrid coir kits includes peat pillows so don't forget.
- Make sure river rock is leveled in the bottom of the tank. It does not need to cover PVC. (dwell time)
- Let loose Coir to flow in and level after first bulk bag is placed in tank.
- Depending on the size of the kit, and tank, a second partial bulk bag will be placed inside tank.
- Place peat pillows in upper $\frac{1}{4}$ of tank laying them perpendicular to the long side of the tank. The peat pillow will be orientated directly under the inlet manifold
- Use 6" of loose coir to cover bags.
- Level the coir with rake.
- Level the long inlet manifold connect it to union and close-up the biofilter
- Will have pictures to show you on coir slide presentation





Exchange

- **Peat to Coir**



We all live downstream





What is a Planet Care hybrid COIR/PEAT Biofilter ?

A wastewater treatment device that uses primarily Coconut Coir and Sphagnum Peat Moss. The use of both materials helps to achieve a very good level of treatment by taking advantage of the best properties of both types of media.

A proprietary mix of Coir chips - cut Coir fiber and Sphagnum Peat Moss





Coir Brick compressed

Coir Brick Hydrated





Coir Peat units available in Iowa

- | | | | | |
|------------|----------|------|-----|-----|
| • CPBF4 | HDPE | Tank | 450 | GPD |
| • CPBFC350 | Concrete | Tank | 350 | GPD |
| • CPBFC450 | Concrete | Tank | 450 | GPD |
| • CPBFC600 | Concrete | Tank | 600 | GPD |
| • CPBFC900 | Concrete | Tank | 900 | GPD |



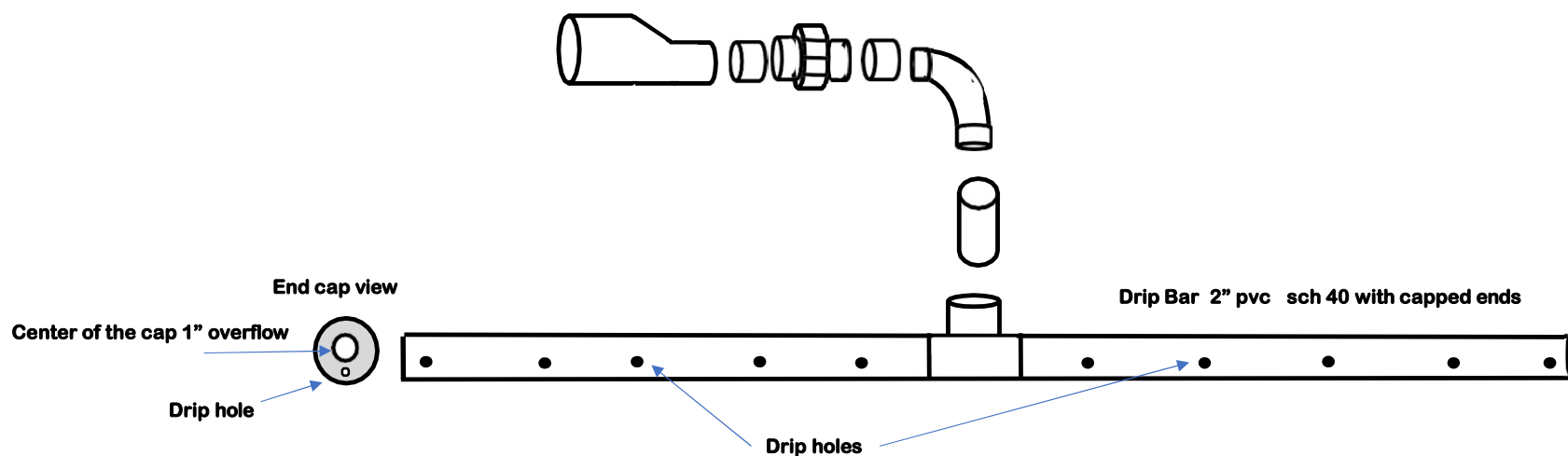


Each Biofilter is easy to identify at a glance





New Inlet Assembly -- THE DRIP BAR



4 x 2 eccentric reducer typically $\frac{1}{2}$ inch from the inside HDPE tank wall
Dripbar may rest on the media or partially covered when leveled
Drip Bar must be centered in all units





All Coir Peat Biofilters will ship in super sacks Alpha Numeric Unit Marking



35 x 35 60 inches

All Coir/Peat units will be marked as Individual units that may not be mixed with any other units – even the same gpd units.

- ③ CPBFC450 A 1 A2 A3
- ③ CPBFC450 B1 B2 B3
- ④ CPBFC600 C1 C2 C3 C4

A and B units may not be mixed . Each Sack is specific to a certain unit.



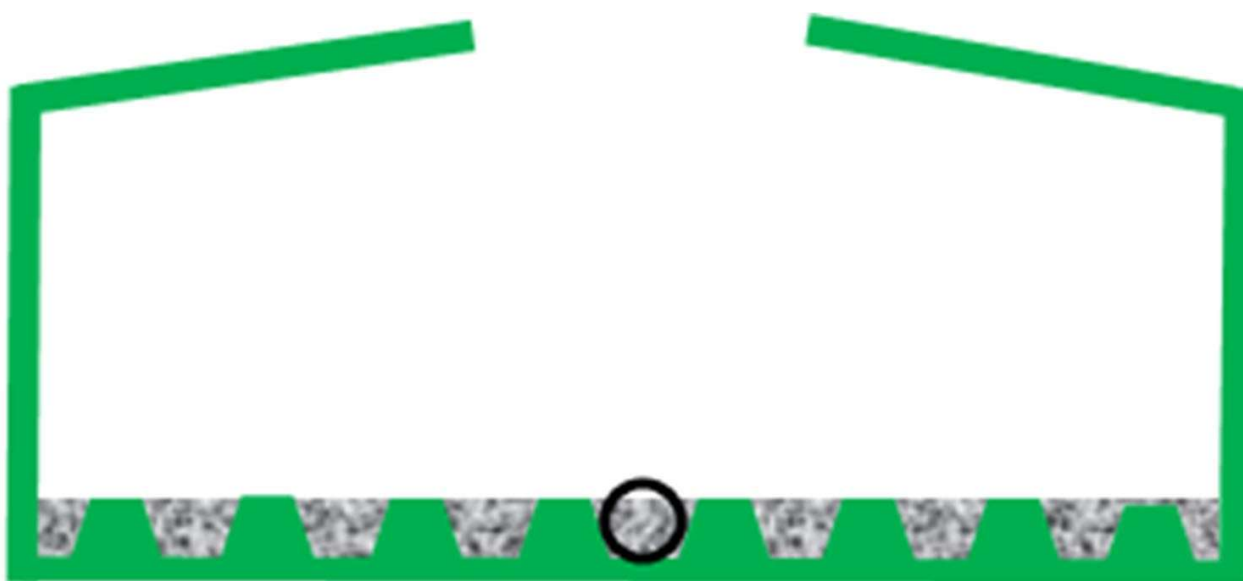


CPBF4

Concrete Tank Loading the Stone

Before Assembly
Check all pipe for
Holes Down in the floor
All connectors snapped tight

4" Corrugated pipe is
1500 lb crush rated
Stone shall be # 57 +/- 1/2 inch
and clean or washed.
River Stone is preferred.
NO PEA GRAVEL Depth of
stone shall be at minimum 4
inches.

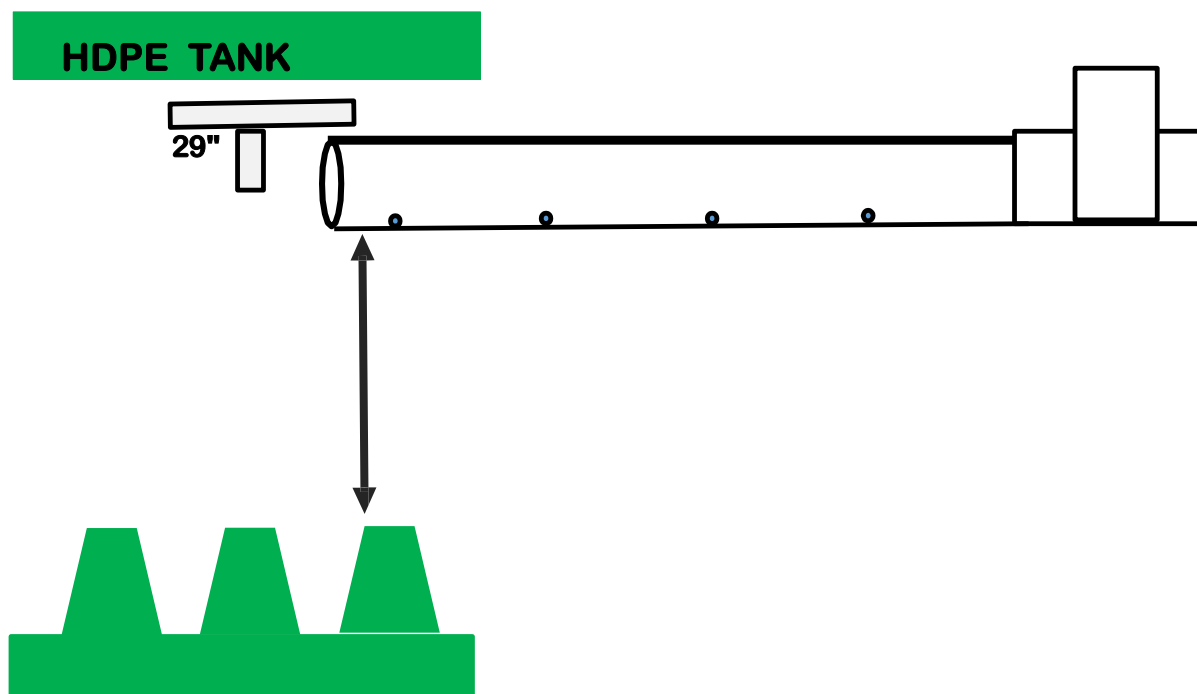


Much of the available Limestone is too soft. Hard Limestone is acceptable if it has been tested to resist acidic effluent – test and use at your own risk. No Quarries in Iowa have been tested or approved by Planet Care. Depth of stone shall be at minimum to the top of the floor ridges as shown.





Minimum depth of Coir 30 inches all Concrete Tanks and 29 inches in HDPE Tank



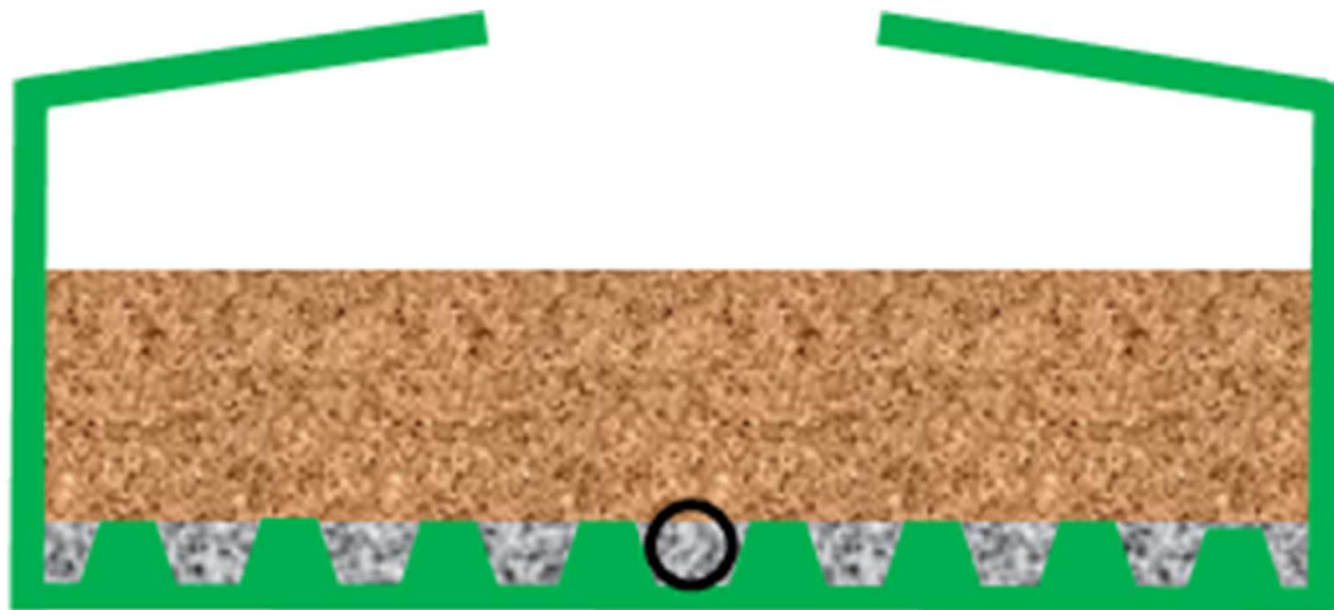


CPBF4 Loading the Coir

Add 17- 18 inches of Coir

**Make sure all side wall
channels are filled**

Level the Coir bed





CPBF4 Loading the Peat Pillows

Add the pillows that are included with the kit. Place the long side of the pillows centered in the tank so they will be perpendicular to the drip bar when installed.



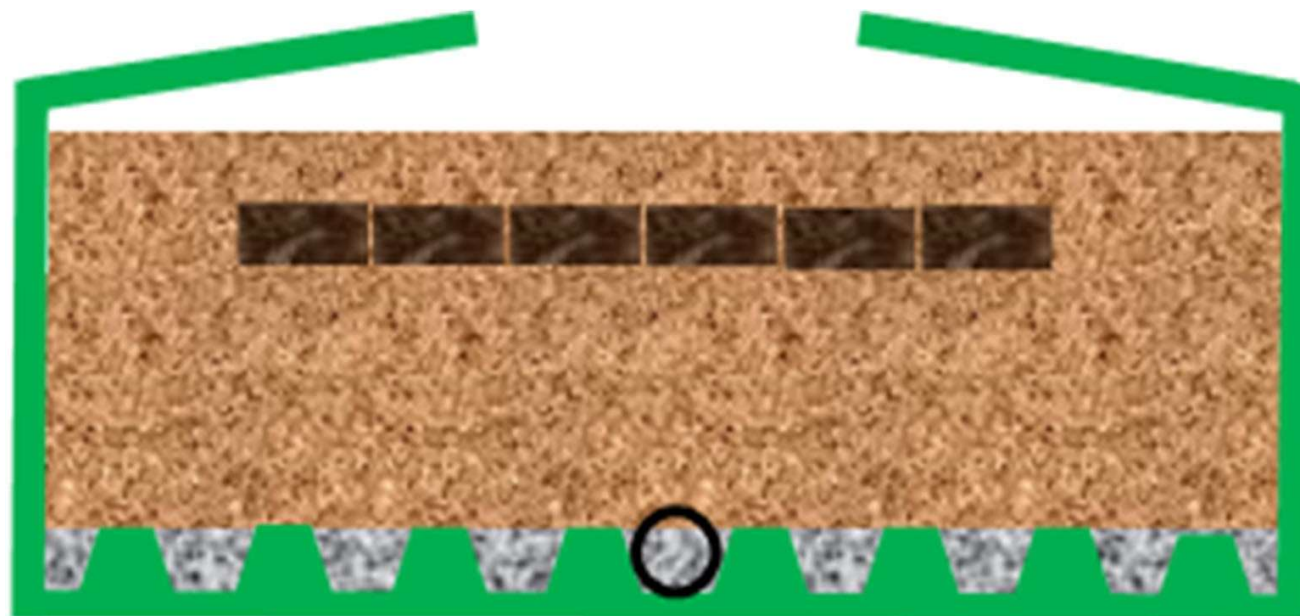


CPBF4 Placing the rest of the Coir

Add the rest of the Coir and level.

Make sure all side wall channels are filled

Install the drip Bar onto the Coir bed. Pipe may be covered when leveled.

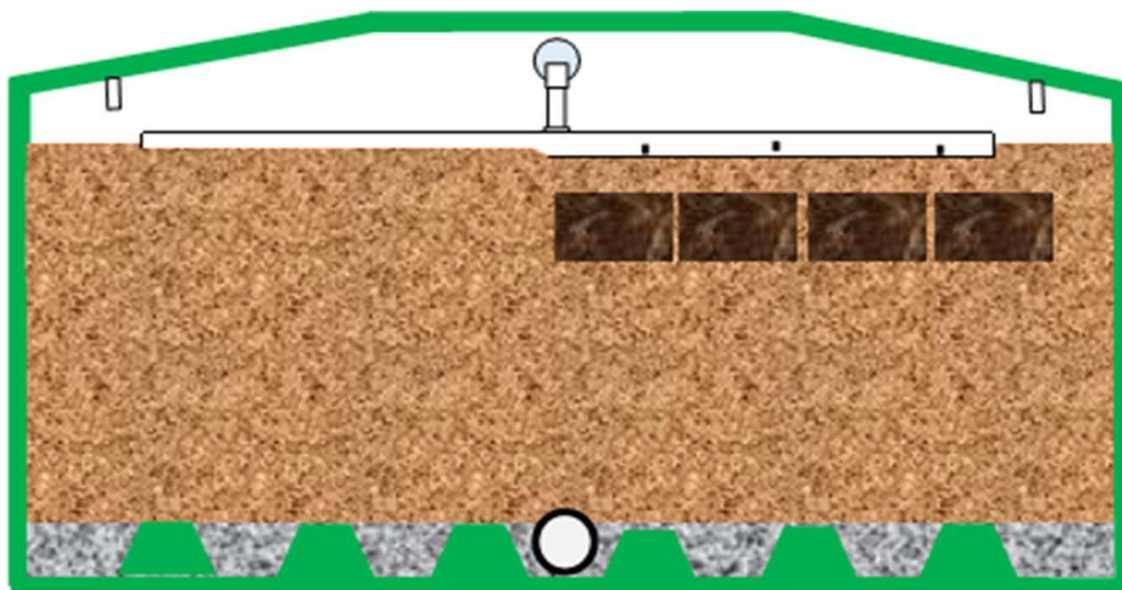




Cut Away of the CPBF4

HDPE Treatment Tank

CoirPeatBioFilter4 -- 450 GPD



NOT TO SCALE





Pipe Specifications for all Concrete units ex: CPBFC450
Coir Peat BioFilter Concrete tank450 GPD

State Approved Concrete Septic Tanks modified to Planet Care Specs

4" PVC minimum 1500 lb crush rated

Included fittings are sch 40 PVC.

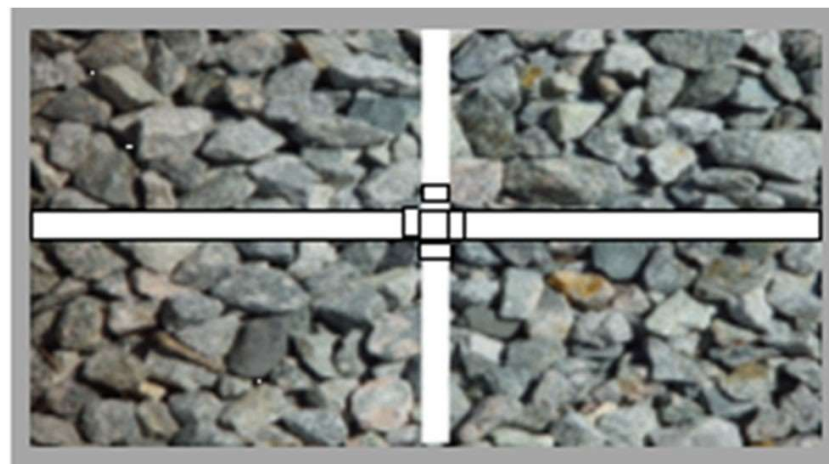
Sch 35 is available upone request.

Stone shall be # 57 +/- 1/2 inch.

Round River Stone is preferred.

NO PEA GRAVEL

Much of the available Limestone is too soft. Hard Limestone is acceptable if it has been tested to resist acidic effluent – test and use at your own risk. No Quarries in Iowa have been tested or approved by Planet Care . Depth of stone shall be at minimum 4 inches.

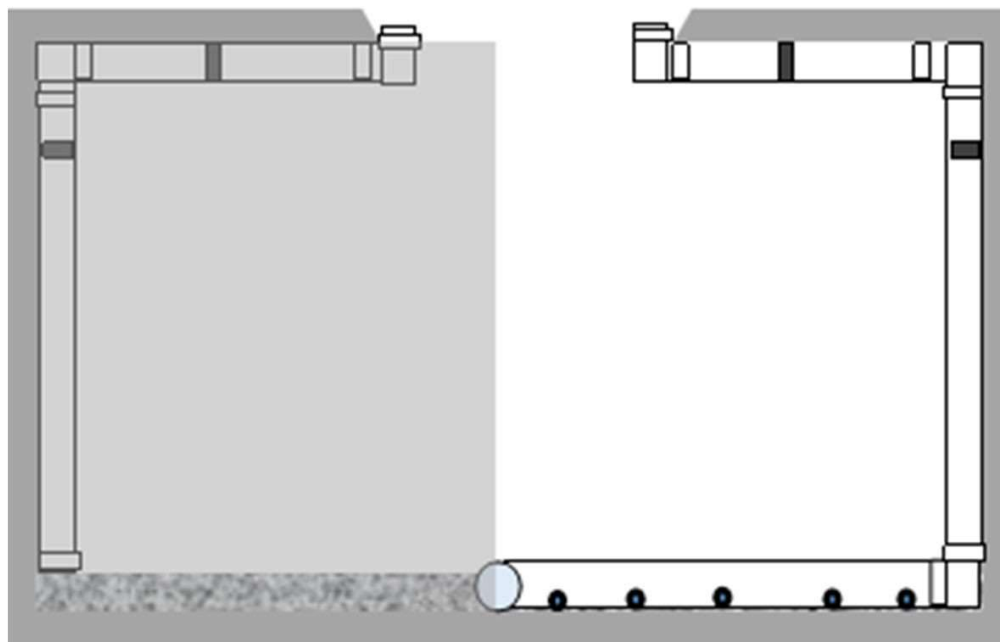




Add PVC and Stone to the CPBFC series tanks

Place PVC just like the concrete Peat Moss units, including the air exchange pipes.

Place 4-5 inches of clean washed stone around the PVC pipe and level it. Be sure the pipe is stable with the holes down.



Cutaway not to scale



Coir Peat Biofilters Installation Requirements



- **All installers must be Planet Care certificated installers. Training for the Coir- Peat Biofilter is mandatory even if you are already trained for the Peat Biofilter. Training is by Planet Care or their authorized Representative. Planet Care reserves the right to refuse anyone to be trained or Certified. Installation of all components is the responsibility of the Contractor to use best practices and standards. Always follow the state regulations while installing any wastewater components.**
- **All treatment values are based on Residential waste strength. That means 300 or less BOD and TSS influent. Some types of commercial applications may be used at reduced flows. Check with you Representative for assistance.**
- **Septic tanks are required and shall be watertight, sized 2 x the daily flow of the Biofilters stated GPD. A flow rated effluent filter and riser to grade shall be installed in the septic tank. Two compartment tanks are preferred.**
- **All tanks shall be set on solid ground no backfilled areas under the tanks. Lightly tamped # 57 stone may be used to level any holes or to raise the grade.**



Servicing any Coir Peat Biofilter



- All treatment units should have a full system inspection every year at minimum that covers all components. This is a Biofilter service requirement. Today's training is covering only the treatment tank and required septic tank outlet filter.
- A yearly inspection and servicing is required as per Planet Care Warranty. Some heavy use customers may require more than 1 service especially if they do not practice a septic friendly lifestyle. Additional servicing will prolong the useful life of almost any system.
- Remove, clean and replace the Septic tank Filter
- Remove and flush the Drip Bar.
- Check the surface of the Coir Peat Biofilter for any biomat build up, Rake and relevel the Coir media. Add Coir if there is less than 6 inches to the peat pillows.
- Replace and level the Drip Bar.
- Inspect and Clean or replace UV light if present





Planet Care Biofilters



Wastewater Treatment

- ☐ Remove, rinse, flush effluent filter in Septic Tank
- ☐ Inspect and clean air intakes on lid / and assure stainless steel screws are intact
- ☐ Remove rinse and flush drip bar assembly with fresh water
- ☐ Inspect and ensure storm water or soil is not infiltrating the system
- ☐ Inspect the filter bed for grease and or oily substances

Notes: _____

- ☐ Rake and turn the top 4" of media coir bed
- ☐ Level the bed
- ☐ Level the drip bar assembly with bubble level
- ☐ Flush all air intake pipes with fresh water
- ☐ Inspect drainage outlet to make sure it is free of debris and water flows out as expected
- ☐ Inspect drainage outlet for critter guard function
- ☐ Inspect effluent discharge
- ☐ Took an effluent sample (Required every other year)
- ☐ Take photos

Notes: _____





Peat Biofilter

vs

Coir Peat Biofilter

UV light not needed in most direct discharges

Can treat high spikes in waste strength > 300

Can go for a year or more without use and still treat effectively from flush 1

Mix and match peat pillow system – all pillows are identical and may work in any unit.

No moving parts

Very reliable 10-10 advanced secondary unit Made in the USA /Iowa

UV light needed in most Direct discharges

Less effective in treating wastewater Spikes > 300

Can go up to several months and still treat effectively from flush 1 - still better than an air unit

No mix and match on units – each Super Sack is unique in volume and weight

No Moving parts

Very reliable 20-20 unit secondary unit Made in the USA /Iowa





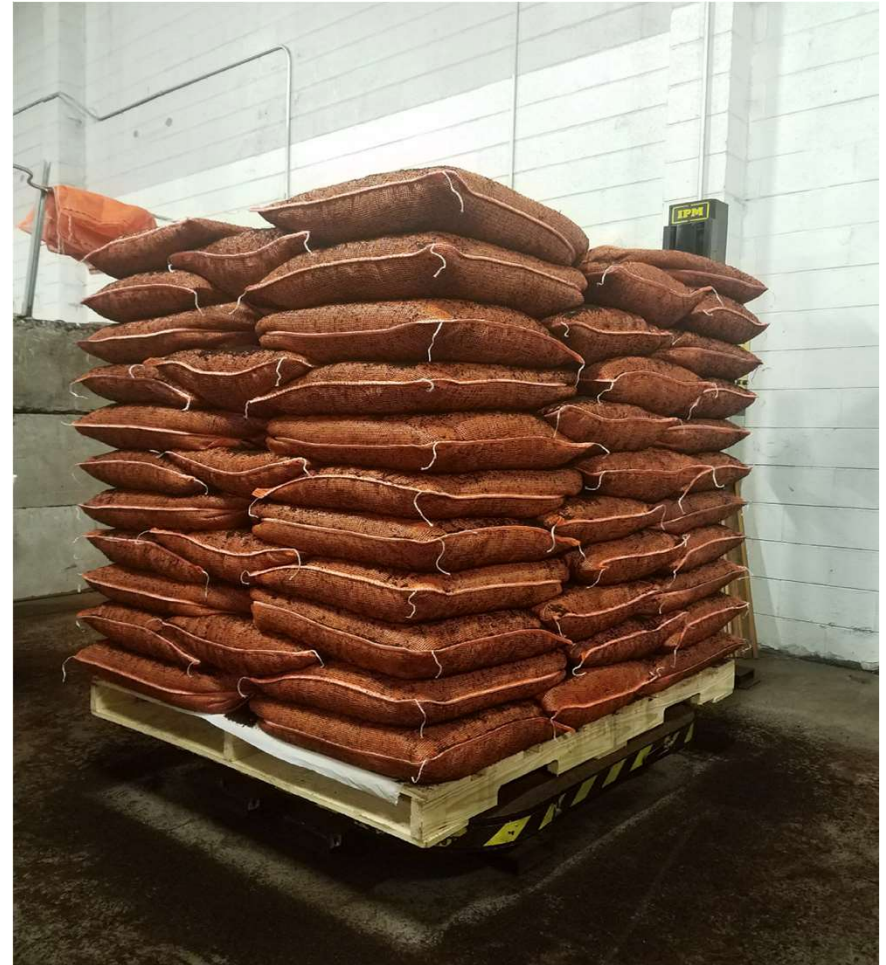
CPBFC SERIES BIOFILTER **Made In IOWA**

Keep the \$ in IOWA
SUPPORT LOCAL
BUY LOCAL



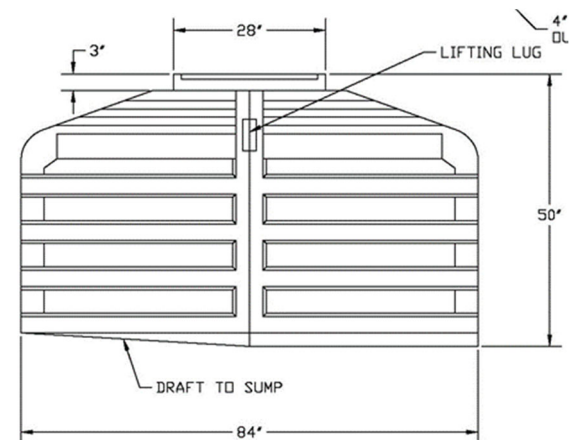
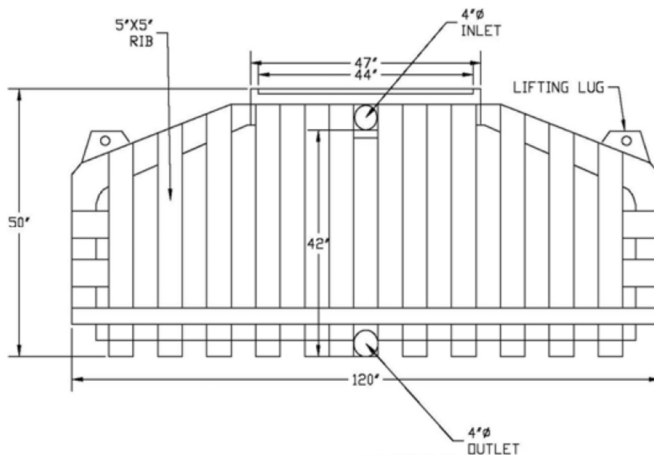
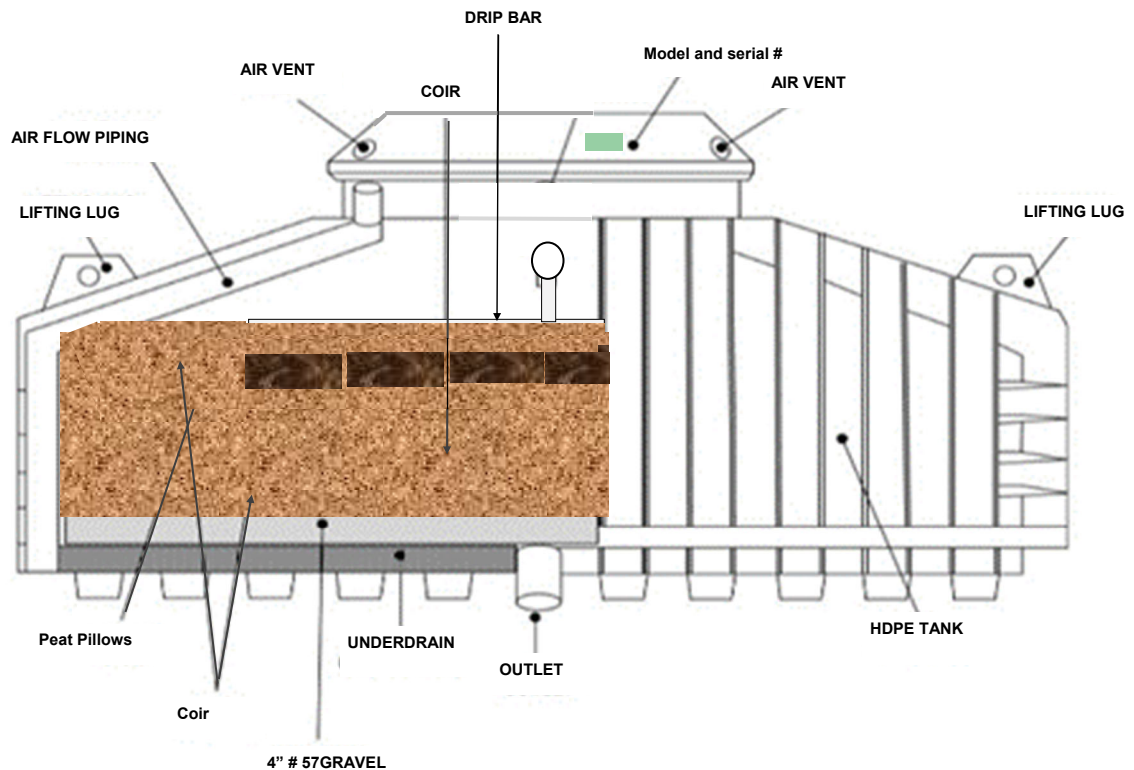






We all live downstream





Square footage for Coir/ Peat Filter bed surface area

$$118.25" \times 83.75" = 9,903.4375 / 144 = 68.77 \text{ sq ft}$$

Cubic feet for Coir/Peat Filter

$$31" / 12 = 2.58 \text{ ft} \quad \text{---} \quad 2.58 \text{ ft} \times 68.77 \text{ sf} = 177.42 \text{ cf}$$

Coir peat volume in Waco HDPE coir/peat tank 173.4

Underdrain Depth 4"

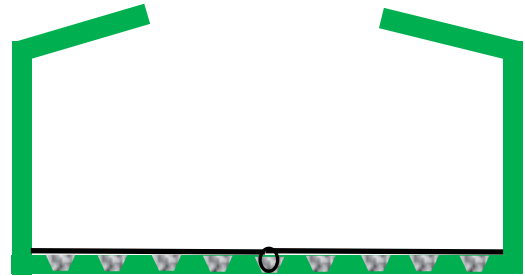
Peat Filter Depth 31"

Air Gap / top of filter to bottom of the 7"

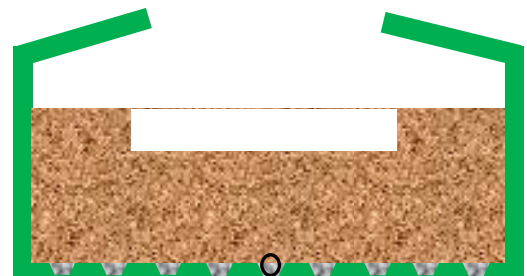
Outlet invert to Inlet invert height 42"

Minimum coir/peat depth 30 inches

Check all corrugated pipes in the tank floor for holes down—all other pipe is solid- Check that all connectors are good. Place 4 inches of #57 non reactive washed septic stone in the bottom of the tank. The top of the pipe will be visible.



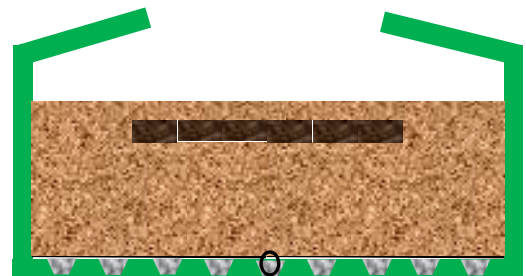
Set aside the peat pillows in each sack and fill the tank with all the coir sacks - The number of pillows in each super sack is marked in a circle on each sack - Channel out a trough for the pillows in the center of the tank opening



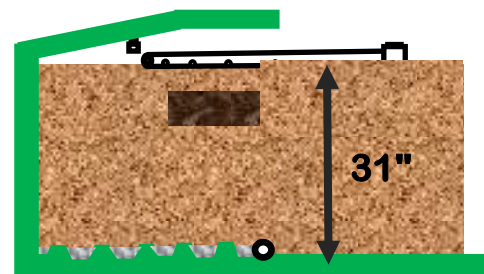
Place the 6 pillows (C/PBF450) level under the drip bar location



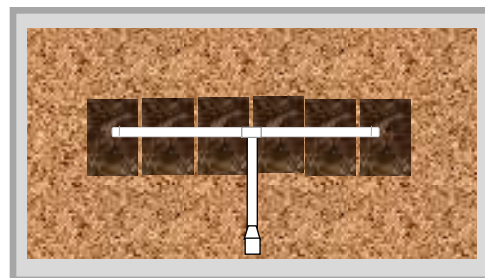
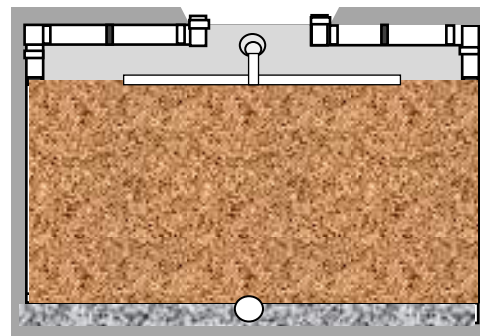
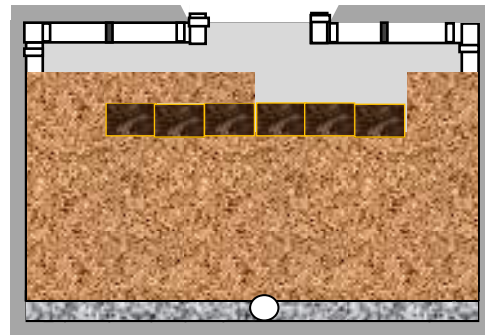
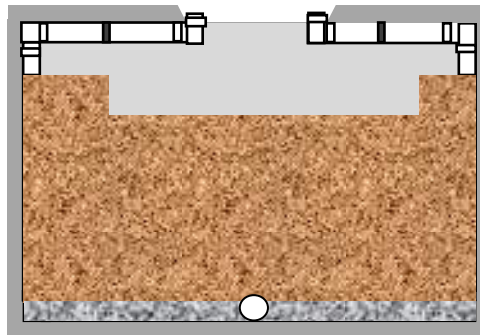
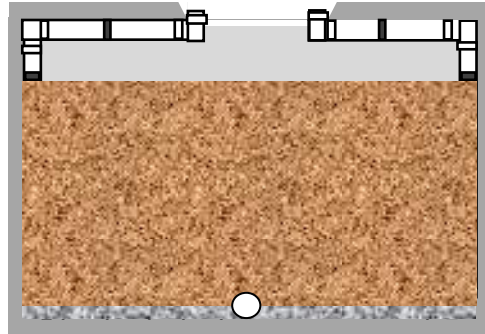
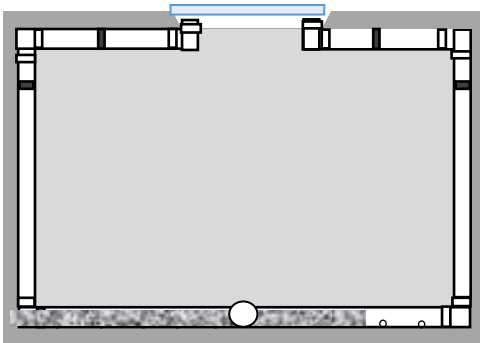
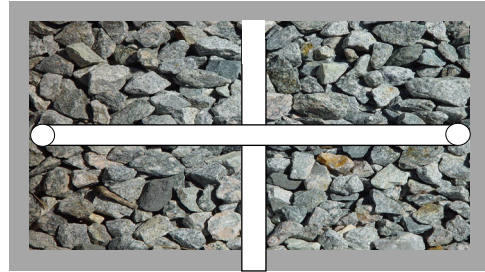
Cover the pillows and level the coir filter bed. Attach the drip bar and level. Tighten the 2" union. Recheck level.



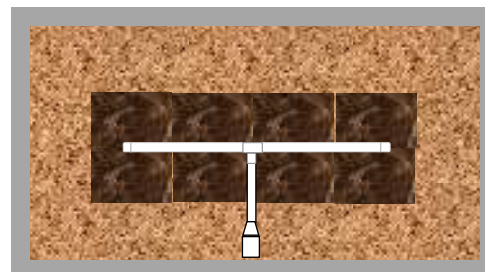
The coir should be ~ 31 inches in depth - it is ok to partially cover the drip bar. It is normal for some settling to occur during the first 6 months. No coir will need to be added during the normal life span of the Coir/Peat biofilter. Expected service life of the Coir is 12– 14 years under normal usage and loading.



Place and glue 1500 lb crush 4"perforated pipe holes down on the floor of the tank using the provided 4"cross - Place and glue ell and solid pipe upright pvc - strap to the tank wall near the top. Dry fit 90° ell and pipe for the horizontal run at the top of the tank. Dry fit the drip bar in the center of the tank. Drill the holes in the insulation cover and line up with the 4" air exchange pipe. Glue and strap the pipe. Pull the peat pillows from the super sacks and empty all of the coir into the tank— level and create a trough for the peat pillows and 6-8 inches of cover.



Place peat pillows under the drip bar location as shown - two rows may be needed as pillow count will vary by model - cover with coir to a minimum depth of 6 inches and a maximum depth 10 inches on larger units Install drip bar in the center of the tank and level with a torpedo level.



PLANET CARE BIOFILTERS

OWNER MANUAL



R 3.1.25

Plastic Tank Sphagnum Peat Moss

Serial Number

☐ **PBFP450** _____

Plastic Tank Coir/Peat Moss

Serial Number

☐ **CPBFP350** _____
☐ **CPBFP450** _____
☐ **CPBFP600** _____
☐ **CPBFP750** _____
☐ **CPBFP900** _____

Concrete Kits Sphagnum Peat Moss

Serial Number

☐ **PBFC350** _____
☐ **PBFC450** _____
☐ **PBFC600** _____
☐ **PBFC750** _____
☐ **PBFC900** _____

Concrete Kits Coir/Peat Moss

Serial Number

☐ **CPBFC350** _____
☐ **CPBFC450** _____
☐ **CPBFC600** _____
☐ **CPBFC750** _____
☐ **CPBFC900** _____

Simply Natural,

Naturally Simple



Thank you for choosing

PLANET CARE BIOFILTERS



R 3.1.25

This manual contains information about the use, operation, warranties and maintenance .

HOW IT WORKS

The PlanetCare Coco Coir Peat Moss Biofilter consists of a watertight tank which holds a Coco Coir Sphagnum Peat Moss that meets our rigid specifications for grade and processing on top of a highly efficient air exchange chamber. The naturally occurring ecosystem of microorganism's uptake nutrient. The Coco Coir's cellular structure captures and holds other particles in the wastewater from your septic tank. Highly treated effluent is now ready to discharge into the receiving environment designed for your site. All coir/peat moss kits are classified as Class 1 residential wastewater treatment systems by NSF and meet the requirements of this standard.

USING THE PEAT FILTER

The efficiency and frequency of maintenance of your Planet Care Coco Coir moss Biofilter depends on what you put in your system.

Do not allow the *following* in your system:

Backflush from a water softener • Any Septic System additives of any kind

Fats, Oils and Grease (FOG) from any source

Paints or solvents, pesticide products, any toxic substances.

RV chemicals, prescription medications.

Excessive or frequent bleach use, strong disinfectants,

Petroleum products or any non-biodegradable substances,

Pine oil or other oil based cleaners that enter the septic system

Disposable paper products, rubber or plastics such as paper towels, diapers, tampons, condoms, sanitary napkins.



THINGS TO REMEMBER

Do Not: cover or bury the Biofilter lid, drive any equipment or vehicle over the system, overload system beyond design limits, attempt your own repairs, cover any vents, plant trees, shrubs on or near your system. Always keep the lid above grade and the system accessible.

MAINTENANCE

Annual maintenance shall be provided by an authorized service representative during normal business hours by inspecting and cleaning the septic tank outlet filter to ensure proper functioning, check for biomat formation. The service provider shall at minimum clean the septic tank outlet filter, clean the Biofilter inlet components and rake the top layer, record and report any needed repairs or recommendations. Do not do laundry or allow heavy water usage 24 hours before or during a scheduled service day. This will allow the service technician to be able to rake and turn the filter media fully. The maintenance contract, sampling where required and all operational costs are paid by the owner. The Owner will keep a maintenance log and a copy will be forwarded to the local HEALTH DEPARTMENT of record and Planet Care to insure your Biofilter is compliant for warranty. Planet care Biofilters will last an average of 12-15 years. This depends on individual lifestyles, regular maintenance and loading rates contribute to the life of the Biofilter media. The owner shall maintain a maintenance agreement every year as long as they own the system when in use.

Effluent sample testing: If an effluent sample test is necessary, contact a certified PlanetCare service provider. If the effluent sample test fails, the discharge pipe will have to be evaluated for debris or sludge build up. Jet discharge pipe if necessary.

Eco-Pure Coir/Peat biofilters are suitable for residential and lite commercial, intermittent application. Eco-Pure biofilters take 30 days of active use to provide optimum effluent quality treatment.

If a planet care biofilter is used in an intermittent application, annual maintenance will have to be provided by an authorized service representative during normal business hours.

In the event of:

*Back-up in your house
Or restricted flow.*

Contact your certified PlanetCare service provider to inspect biofilter core peat media.
Inspect sewer lines for blockages and clean effluent filter.

Septic tank effluent filter may need to be serviced

Septic Odors - Outside

Your house roof vent may be blocked

On still days sewer gas may sink from the roof vent and flow to the ground when vent pipes are below the ridge line of the roof

If your system has a pump, check to be sure it is operating correctly

Septic Odors – Near Septic Tank(s) If you notice a strong sulfur or rotten smell near your septic tank(s) please contact your Planet Care service provider. Sampling of the effluent or visual inspection of the media may be necessary

Replacement of the Coir/Peat

Replacement of the coir/peat is needed when the filter bed becomes mushy and/or fails a performance test. To replace the coir/peat: Pumping the septic tank and then the coir/peat filter bed is recommended. Use a long tooth rake to pull the few peat pillows out and set on a tarp or the transport vehicle. Remove the remaining loose coir with a heavy vacuum truck or shovel if OSHA guidelines can be followed. Flush the underdrain with clean water until it runs clear. Follow the install manual for the coir/peat placement procedures. Close the unit up as per the install manual. The unit may be returned to service. Dispose of the coir/peat by state code. If no code is in place, put the pillows in direct sunlight for a day. They may be sprinkled with lime on the top of each pillow. After a few days in direct sunlight, till into the soil, unless prohibited by state code. Dispose of the coir/peat at a landfill when state code does not allow tilling back into the soil. The landfill operator should be able to incorporate the coir/peat into the soil capping the landfill to help establish a natural cover. Only Planet Care coir/peat material may be used as a replacement.

Please reference the system data plate in the event that a problem arises, or service is required.

Planet Care Biofilter Warranty

1. BY DEFINITION

For the purpose of this warranty Dealer means person who sells Planet Care Biofilter Wastewater Systems and or manages the contractors and service providers training and oversight programs, CUSTOMER means the owner of the Planet Care Biofilter system, SYSTEM means any Planet Care BIOFILTER and components except concrete tanks or pump tank or any components not supplied or manufactured by Planet Care, Inc. OWNERSHIP means current or new owner, MANUFACTURER means Planet Care, Inc.

2. WARRANTY

Planet Care, Inc. warrants that the components supplied by the manufacturer will function properly for a period of three years from the date of purchase excluding, service not sold by Planet Care Inc. pumps, floats, or any other items covered by another manufacturer's warranties. Planet Care Inc. will train authorized dealers, state licensed contractors and service providers, as such they are not Planet Care employees and are not bonded, insured or warranted by Planet Care Inc. The warranty of Planet Care, Inc. is limited to this text.

3. NOTIFICATION OF A PROBLEM

For this warranty to be valid the customer must notify Planet Care, Inc. in writing as to the nature of any problem with the system within 30 days of the problem. This notice must be sent by registered mail to Planet Care, Inc. Upon receipt of notice Planet Care, Inc. will correct the problem within the terms of this warranty.

4. EXCLUSIONS

The following will be excluded from warranty coverage: Any damage caused by an Act of War, Act of God without limitation such as floods, earthquakes, hurricane, landslide, tornado or blizzards. Any damages caused by the users or third parties such as any vehicle, modification or installation or unauthorized correction to the system not by Planet Care, Inc.

Any modifications with regard to installation by a dealer or contractor which is not authorized by the manufacture. Any damage by not allowing maintenance to be performed in accordance with the maintenance agreement. Any damage by machinery, heavy vehicles, trucks and heavy equipment. Any change of use which does not comply with original design criteria, change of intended use or excessive waste strength which is beyond residential waste strength.

5. OTHER EXCLUSIONS

It is expressly understood that the customer shall not make any attempt to maintain or repair any part of the system before notifying the dealer or Planet Care, Inc. in accordance with Section 3 until a reasonable time for a site visit is given and any problems can be solved, otherwise the warranty shall be null and void.

6. LIMITS OF DAMAGES

Planet Care, Inc. in no way shall be liable for any other damages that the customer may incur and compensation and indemnification shall be limited to the other provisions of this warranty. This warranty does not cover design or installation errors or omissions other than Planet Care Employees.

7. TRANSFER OF OWNERSHIP

All provisions of this warranty shall remain in effect upon transfer of ownership with the express understanding that the new owner submits in writing by registered mail to Planet Care, Inc. that the intended use shall not change, that the waste strength is not increased by either over use or misuse and that there shall be no change of use.

The new owner will notify Planet Care, Inc. that they have read the Owner's Manual and agree to comply with all the provisions therein.

8. WARRANTY PRIORITY

This warranty supersedes any written or verbal contracts entered into by the customer or dealer or any agent for the sale or installation of a Planet Care Biofilter and it is expressly understood in case of any contradictions whatsoever that the terms of this agreement shall prevail.

9. INDEMNITY

Liability under this warranty to correct defects shall be limited to correction or replacement of components in accordance to other provisions of this warranty agreement upon written notification.

10. INSPECTIONS

The customer shall allow the distributor and or maintenance provider of Planet Care, Inc. to carry out all necessary inspections as required in this warranty during normal business hours.
If any other request for inspection beyond the annual maintenance and inspection are requested and no problems exist, a fee shall be paid to Planet Care, Inc. by the customer based on travel and time expenses.

Planet Care Biofilter

2480 Berkshire PKWY Suite B

Clive, Iowa 50325

contact@planetcarebiofilters.com

www.planetcarebiofilters.com

[R 3.1.25](#)

Planet Care Biofilters



System Notes

Date Installed _____ Date put into service _____

Local Health Department Contact _____

Installing Contractor

Service Provider

Distributed By:



Planet Care Biofilter

contact@planetcarebiofilters.com

2480 Berkshire PKWY Suite B

Clive, Iowa 50325

www.planetcarebiofilters.com

R 3.1.25

Planet Care Biofilters



Wastewater Treatment

Operation and Maintenance Guide For Planet Care C/PBF series Biofilters

Before you service the unit

Call the customer a day or two before service to inform them the date and the approximate time you will be there. Only state approved or licensed service providers that have successfully completed the Planet Care Coir/Peat Biofilter series training are authorized to service the Planet Care Biofilters..

USING THE Planet Care Biofilter C/PBF series

The Minimum number of services required by Planet Care Inc. is 1 per year. The biofilter and frequency of maintenance of the Planet Care Biofilter depends on what the customer puts in their system. Residential applications require maintenance as long as the unit is in service.

Do NOT allow the following in any Planet Care Biofilter:

Backflush from a water softener - Floor drains or foundation drains - Ground or surface water
Fats, Oils and Grease (FOG) from any source - Paints or solvents, pesticide products, any toxic substances
RV chemicals, prescription medications - septic tank or septic system additives of any type
Excessive or frequent bleach use or strong disinfectants lye, pine oil or any oil based cleaners
Petroleum products or any non-biodegradable substances - Strong or line cleaning acids
Disposable paper products such as rubber or plastics paper towels, diapers, tampons, condoms, sanitary napkins

The Planet Care Biofilter is a passive, all natural coir/peat filter bed. There is no activated sludge produced in this treatment process. The septic tank is the only portion of this treatment process that produces and routinely requires the removal of accumulated sludge. If any sludge or grease is found on the coir/peat filter bed it can be removed with a shovel or similar tool. If any sludge is found on the coir/peat bed the septic tank and the outlet filter should be checked. If dirt is present on the filter bed check for ground and or surface water leaks. Biomat may form on top of the coir/peat filter. This is normal and will vary based on waste strength from the tank. A proper service will break up any biomat and is mixed into the filter bed with a rake during the raking and turning of the loose peat moss.

There is only regular maintenance of the Planet Care Biofilter and replacement of the coir/peat when the filter has reached its service life. Please refer to the owners guide for the biofilter model number. It is also molded into the biofilter cover to order so the correct replacement kit is ordered.

Be sure to fill out and submit a Maintenance Report. Leave a copy with the homeowner, one to Planet Care Inc. and one to the local Health Department. This is a required compliance and should be filed within 10 business days. If any repairs or service can not be done during this visit you should notify the customer on the estimated time and cost of the repair. Your local distributor will carry most replacement parts.

Planet Care Biofilters • 2480 Berkshire PKWY Suite B • Clive, IA • 24301
info@planetcareinc.com • planetcarebiofilters.com

R4.10.20

Planet Care Biofilters



Wastewater Treatment

Operation and Maintenance for the C/PBF series Biofilters

1. If using a dosing pump to dose the Planet Care module/s disconnect power.
2. Loosen the stainless steel screws and remove the green cover on the module.
This will expose the white insulation cover.
3. Remove the insulation cover that sits upon support pipes and carefully set aside.
4. Loosen and the 2" pvc union and remove the drip bar assembly.
5. Rinse and flush the inlet pipe and drip bar with fresh water. Visually inspect the filter bed for grease and or oily substances that should not be present.
6. Rake and turn the coir chips with a long , ~ 4 – 5", tine rake to break up any bio-mat, if present. The coir chips should be turned over completely down to the peat pillows unless the coir chips appear clean. A short handled rake or fork with 4 inch or longer tines.
7. Re-level the entire coir chip bed completely.
8. Rinse the inlet assembly into the septic tank and reattach the 2" union. Level the 2" drip bar with a bubble level and tighten 2" union. Recheck level.
9. Flush all air exchange and discharge pipes between the sample port and the coir/peat tank with clean water.
10. Inspect effluent. Effluent should be odor free. It may have a tea color for the first year of service is due to coir-peat "washing" and is completely normal with a slight to clear color thereafter.
11. If sampling is required grab an effluent sample from the sampling port or the closest point downstream of the Biofilter. Using a clean jar capture a sample. Place the lid on the jar and place in a cooler with ice and take immediately to the lab. Document the procedure .
12. Examine tank area for any unusual settling and any signs of water infiltration. Make sure that all surface and runoff water is diverted away from system. Replace all lids and secure as per manufacture's requirements.
13. Maintenance Completion. Examine drainfield area for any unusual settling or wet spots. Verify that trees and shrubs have not been planted on or near the Planet Care tanks or module/s or drainfields. Make sure power is reconnected if this is a pumped system. Fill out the maintenance form noting any problems or corrections done during the service visit. Send copies to Planet Care, the owner and Health Department as required by code

Troubleshooting the coir/peat system

A coir/peat treatment system is a Living Ecosystem filter. Like any filter it can become clogged with time and usage. A average life is 12 or more years when operated as per the homeowner manual and serviced regularly. Since the entire treatment of the wastewater is the Living Biofilter correct installation procedures, routine maintenance and the customer following the owners manual will keep the system functioning correctly. Check the septic tank to see if it appears normal. A septic tank that is not operating properly, leaking, not pumped, chemical sheens or lack of regular service may cause the biofilter to bind or fill up. Septic tank solids from a missing septic tank outlet filter can contribute to the binding. If the treatment system is slow perking as demonstrated by water standing on the coir/peat surface longer than a minute indicates it may be time to rake the top loose layer of coir. Check the condition of the peat pillows and replace if mushy. This does not normally occur. A garbage disposal creates many fine solids in the grinding of the waste scraps will shorten the normal life of the coir/peat and require more frequent pumping of the septic tank. Ground and surface water infiltration in any portion of the treatment system will carry fine soil that will prematurely clog the filter. If binding of the bed occurs through normal usage and servicing, finding the cause of the binding is the key to preventing reoccurrence. In cold climates good drainage around the unit, adequate cover and or insulation may be required to prevent freezing, especially on north facing sites or if the unit has not been serviced regularly. By raking the coir down to a the top layer of pillows will show how deep the restrictive layer is. Remove and replace the peat pillows and any grease or oil covered coir. If the binding is uniformly found throughout the whole top layer replacement may be required. Biomat formation is normal and may be raked and mixed back into the top layer of coir. The removal of the top layer is typically done by a snow shovel or similar tool. Rake all coir to the center opening as the clogged coir is removed. The removed coir/peat if clogged by chemicals must be disposed according to state code, typically in a landfill. Coir/peat that has reached its service life by normal operations or soil infiltration once removed should be placed in a safe area to drain and may be lightly sprinkled with lime or on a truck or trailer with a tarp to prevent effluent leaks and hauled to the disposal site. Several days of direct sunlight with turning the material or spreading thinly will make the material safe for mixing into the soil where allowed by code.

Replacement of the peat

Replacement of the coir/peat is needed when the filter bed becomes mushy and or fails a performance test. To replace the coir/peat : Pumping the septic tank and then the coir/peat filter bed is recommended. Use a long tooth rake pull the few peat pillows out and set on a tarp or the transport vehicle. Remove the remaining loose coir with a heavy vacuum truck or shovel if OSHA guidelines can be followed. Flush the underdrain with clean water till it runs clear. Follow the install manual for the coir/peat placement procedures Close the unit up as per the install manual. The unit may be returned to service. Dispose of the coir/peat by state code. If no code is in place put the pillows in direct sunlight for a day. They may be sprinkled with lime on the top of each pillow. After a few days in direct sunlight till into the soil, unless prohibited by state code. Dispose of the coir/peat at a landfill when state code does not allow tilling back in to the soil. The landfill operator should be able to incorporate the coir/peat into the soil capping the landfill to help establish a natural cover. Only Planet Care coir/peat material may be used as a replacement.

Appendix C



Geotextile Sand Filter

Idaho

Design and Installation Manual



~~March~~ ~~May~~ ~~July~~ 20~~23~~25



90 Meadow Road
Windsor, CT 06095
Tel: 800-444-1359
Fax: 860-610-0427
www.eljen.com

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Glossary of Terms

A42 Module	48" x 24" x 7" (L x W x H)
Cover Fabric	The geotextile cover fabric (provided by manufacturer) that is placed over the GSF modules.
Design Flow	The estimated peak flow that is used to size a GSF system for a 3-bedroom single family dwelling or mobile home is 250 gallons per day +/- 50 gallons/Bedroom.
Flow Dial/Equalizer	Special insert placed in the end of distribution pipes within the distribution box to compensate for possible unlevel installation and promote favorable flow to the distribution pipes.
GSF	The Eljen Geotextile Sand Filter Modules and the 6-inch sand layer at the base and the 6-inch layer along the sides of the modules.
GSF Module	The individual module of a GSF system. The module is comprised of a cusped plastic core and geotextile fabric.
Specified Sand	To ensure proper system operation, the system MUST be installed with Medium Sand as specified in the Idaho Technical Guidance Manual, 3.2.8.1.2 Medium Sand. Sand must be used with not more than 10% passing the #100 Sieve and not more than 2% passing the # 200 sieve. Ask your material supplier for a sieve analysis to verify that your material meets the required specifications.

TABLE 1: SPECIFIED SAND SIEVE REQUIREMENTS

3.2.8.1.2 MEDIUM SAND SAND SPECIFICATION		
Sieve Size	Sieve Square Opening Size	Specification Percent Passing (Wet Sieve)
3/8 inch	9.52 mm	100
No. 4	4.76 mm	95 - 100
No. 8	2.38 mm	80 - 100
No. 16	1.19 mm	50 - 85
No. 30	590 µm	25 - 60
No. 50	297 µm	10 - 30
No. 100	149 µm	2 - 10
No. 200	75 µm	< 2

GSF System Description

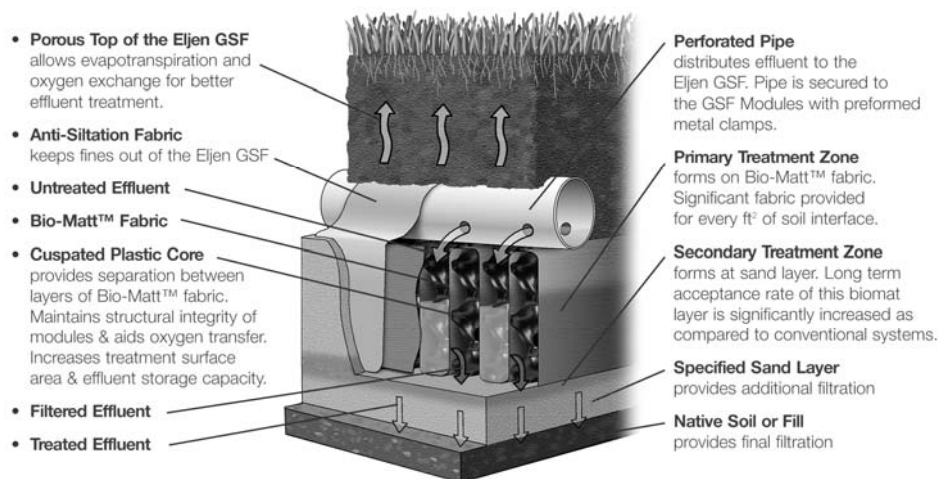
Primary Treatment Zone

- Perforated pipe is centered above the GSF module to distribute septic effluent over and into corrugations created by the cusped core of the geotextile module.
- Septic effluent is filtered through the Bio-Matt fabric. The module's unique design provides increased surface area for biological treatment that greatly exceeds the module's footprint.
- Open air channels within the module support aerobic bacterial growth on the modules geotextile fabric interface, surpassing the surface area required for traditional absorption systems.
- An anti-siltation geotextile fabric covers the top and sides of the GSF module and protects the Specified Sand and soil from clogging, while maintaining effluent storage within the module.

Secondary Treatment Zone

- Effluent drips into the Specified Sand layer and supports unsaturated flow into the native soil. This Specified Sand/soil interface maintains soil structure, thereby maximizing the available absorption interface in the native soil. The Specified Sand supports nitrification of the effluent, which reduces oxygen demand in the soil, thus minimizing soil clogging from anaerobic bacteria.
- The Specified Sand layer also protects the soil from compaction and helps maintain cracks and crevices in the soil. This preserves the soil's natural infiltration capacity, which is especially important in finer textured soils, where these large channels are critical for long-term performance.
- Native soil provides final filtration and allows for groundwater recharge.

FIGURE 1: GSF SYSTEM OPERATION



1.0 System Preconditions

1.1 REQUIREMENTS: GSF systems must meet the local rules and regulations except as outlined in this manual. The Idaho Regulations IDAPA.58.01.03.009.02 and the local regulations will be referred to as the *guidelines*.

Contact our technical department if a question arises about components and configurations not covered in this manual. Local approving authorities can request written consent regarding components and configurations from Eljen to ensure compliance.

The sizing charts apply to domestic strength wastewater only and are found in section 2.17. Please contact Eljen's Technical Resource Department at 1-800-444-1359 for design information on commercial systems.

1.2 GARBAGE DISPOSALS: The use of garbage disposals is not recommended as they can cause septic system problems by generating an increase of suspended solids, grease, and nutrients.

However, if such units are proposed to be used, other measures should be taken to mitigate the increased nutrients to the field. Consult your local and state code for garbage disposal requirements. Eljen recommends a dual compartment tank or tanks in series. Consider upsizing the field for the additional biological load.

NOTE: Eljen requires the use of septic tank outlet effluent filters on all systems. Filters with higher filtration are recommended for systems with garbage disposals.

1.3 ADDITIONAL FACTORS AFFECTING RESIDENTIAL SYSTEM SIZE: Homes with expected higher than normal water usage may consider increasing the septic tank volume as well as incorporating a multiple compartment septic tank. Consideration for disposal area may be up sized for expected higher than normal water use.

For example:

- Luxury homes, homes with Jacuzzi style tubs, and other high use fixtures.
- Homes with known higher than normal occupancy.

1.4 SYSTEM PROHIBITED AREAS: All vehicular traffic is prohibited over the GSF system. GSF systems shall not be installed under paved or concrete areas. If the system is to be installed in livestock areas, the system must be fenced off around the perimeter to prevent compaction of the cover material and damage to the system.

1.5 ELJEN INSTALLER CERTIFICATION: All installers are required to be trained and certified by an authorized Eljen representative. Contact your local distributor for training information.

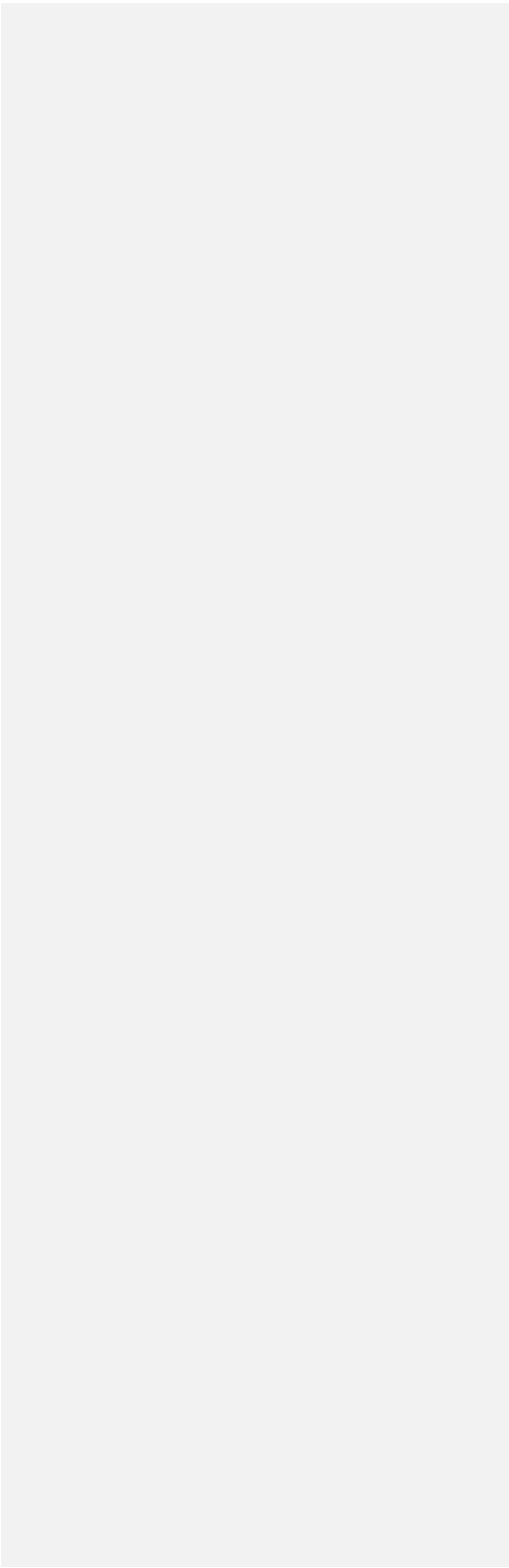
1.76 ADDITIONAL FACTORS AFFECTING RESIDENTIAL WASTE STRENGTH FACILITIES: Facilities with that exceed standard residential water use standards should consider increasing the septic tank volume as well as incorporating a multiple compartment septic tank. Consideration for disposal area should be up sized for expected higher design flows than single family homes.

For example:

- High occupancy housing
- Vacation Rental Homes (Airbnb, VRBO, etc.)
- Condo or Apartment configurations

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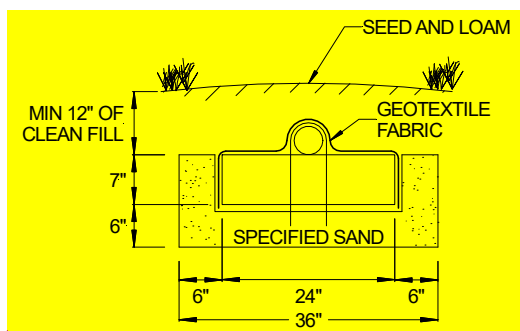
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2.0 Design and Installation

FIGURE 2: TYPICAL A42 CROSS SECTION



A42 MODULE (L x W x H) 48" x 24" x 7"

All systems are required to have a minimum of:

- 6 inches of Specified Sand is at the edges of the GSF module.
- 6 inches of Specified Sand is at the beginning and end of each GSF Row.
- ~~12-6~~ inches of Specified Sand is directly below the GSF module.
- Minimum 12 inches of cover above the module.

2.0 Design and Installation

2.1 SEPTIC TANK: Septic tanks should be fitted with an effluent filter and sized according to state regulations. Many designers are now specifying dual compartment tanks for all their systems. Eljen supports this practice as it helps to promote long system life by reducing TSS and BOD to the effluent disposal area. Gas baffles and/or effluent filters are also recommended. Tanks shall meet the requirements of TGM Section 5.2

2.2 SEPTIC TANK FILTERS: Septic tank effluent filters are **REQUIRED** on the outlet end of septic tank. Filter manufacturers require that filters be cleaned from time to time. Ask your installer or designer for specific cleaning requirements based on the type or make of the filter installed. Eljen requires the septic tank to be pumped every three years or as needed, which would be a good time to check and conduct filter maintenance. Refer to section 5.8 of the Idaho Technical Guidance Manual for approved Septic Tank Effluent Filters.

2.3 VERTICAL SEPARATION TO LIMITING LAYER:

TABLE 2: VERTICAL SEPARATION

Table 4-21 Intermittent sand filter vertical setback to limiting layers (feet).	Flow < 2,500 GPD All Soil Types	Flow ≥ 2,500 GPD All Soil Types
Impermeable layer	2	4
Fractured rock or very porous layer	1	2
Normal high ground water	1	2
Seasonal high ground water	1	2

2.0 Design and Installation

2.4 SPECIFIED SAND SPECIFICATION FOR GSF SYSTEMS: The sand immediately under, between rows and around the perimeter of the GSF system must meet 3.2.8.1.2 Medium Sand of the Idaho Technical Guidance Manual, **WITH 2-10% PASSING A #100 SIEVE AND LESS THAN 2% PASSING A #200 SIEVE.** Please place a prominent note to this effect on each design drawing. See Table 1 for more information on the sand and sieve specifications.

2.5 PLACING GSF MODULES: The “painted stripe” on the GSF modules indicates the top of the module and is not intended to indicate the location of the distribution pipe. With the painted stripe facing up, all rows of GSF modules are set level, end to end on the Specified Sand layer.

2.6 DISTRIBUTION: Gravity, pump to gravity or pressure distribution are acceptable when using the GSF System. Piping shall meet the requirements guidelines; however, Eljen strongly recommends the use of SDR 35 pipe and fittings to prevent crushing during backfill. All distribution piping must meet a minimum 2,500-pound crush test specification for polyvinyl chloride (PVC) drain, waste and vent pipe.

All systems require a perforated 4” diameter pipe centered on top of the GSF modules unless the system is curving. The distribution pipe continues along the entire length of all modules in a trench or row. Holes are set at the 4 and 8 o'clock position and secured by the Eljen provided wire clamps.

When using pressure distribution, a pressure manifold is placed inside the 4-inch distribution pipe. Section 8.0 of this manual goes into details of how to construct the distribution network. All piping must meet state and local regulations.

2.7 CONNECTIONS AND FITTINGS: Connections of lines to tanks and distribution boxes must be made using watertight seals. Use of any grouting material is not permitted.

2.8 DISTRIBUTION BOX: Set the gravity system D-box outlet invert a minimum of $\frac{1}{8}$ inch drop in elevation per linear foot to the top first module in the row. Set a 2-inch minimum drop for dosed systems from the D-box to the modules. Ensure that the distribution box and pipes feeding the system are placed on compacted soil. Flow Dials may be used in either Gravity or Dosed installations.

2.9 INSTALLING ON SLOPING TERRAIN: For trench systems, edge-to-edge trench spacing will be a minimum of 6 feet. For bed systems, edge-to-edge minimum spacing will be 1 foot (lateral to lateral of 3 feet).

Provide a D-box at the beginning of the first row of modules for effluent distribution and velocity reduction and as a system inspection port. Lower rows may also be loaded from one or more D-boxes with Flow Dials to ensure effluent is distributed per design requirements. Serial or equal distribution is permitted.

Equal Distribution: Set Flow Dials to ensure effluent is distributed equally to all rows in the system.

Serial Distribution: Set Flow Dials to ensure effluent is loaded to the upslope trench first before continuing to lower trenches within the system. Serial distribution is typically used on sites with slopes more than 20%. With this distribution method, trenches do not need to be constructed at the same length, but each trench must maintain a level installation by following an elevation contour. Eljen recommends designing the upper lateral to be the longest lateral in a serial distribution system.

Eljen recommends following Table 4-2 in the Idaho Technical Guidance Manual for At-Grade Soil Absorption System sloping systems.

TABLE 3: MAXIMUM SLOPE OF NATURAL GROUND (TGM 4-2)

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

Bed systems are not permitted on slopes more than 8%

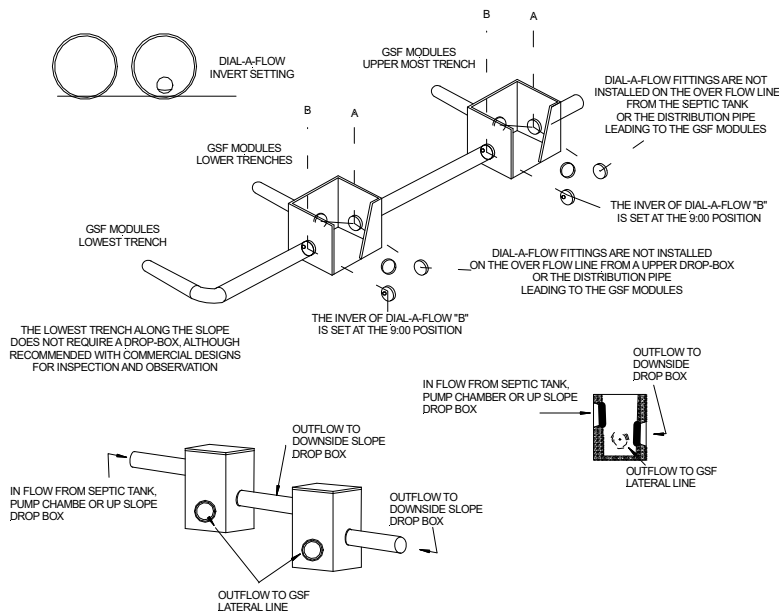
A steep slope system is a trench system for slopes greater than 20% but less than 46%. A Professional Engineer should be used for sites with slopes exceeding 20% while adhering to Section 4.26 in the TGM for approval conditions and construction of steep slope systems.

2.0 Design and Installation

2.10 EQUAL DISTRIBUTION: Parallel distribution is the preferred method of dosing to a gravity or pump to gravity system. It encourages equal flows to each of the lines in the system. It is recommended for most trench systems.

2.11 SEQUENTIAL DISTRIBUTION: Sequential Distribution using a distribution box will fully utilize the uppermost section of the system prior to spilling effluent into a lower row of modules. This is for use on any site with greater than 0.5% slope when not using parallel distribution.

FIGURE 3: SEQUENTIAL DISTRIBUTION DROP-BOX DETAIL



2.12 COVER FABRIC: Geotextile cover fabric is provided by Eljen Corporation for all GSF systems. It is placed over the top and sides of the module rows to prevent long term siltation and failure. **Cover fabric substitution is not allowed.** Fabric should be draped vertically over the pipe and must not block holes in the distribution pipe or be stretched from the top of the pipe to the outside edge of the modules. "Tenting" will cause undue stress on fabric and pipe.

2.13 SYSTEM VENTING: It is required to vent all systems that are over 18" below finished grade and systems beneath any surface condition that would not allow for surface air exchange with the system such as patios. See Section 9.0 for a more detailed explanation of venting GSF products.

2.14 BACKFILL & FINISH GRADING: Complete backfill with a minimum of 12 inches of clean, porous fill measured from the top of modules. Use well graded sandy fill that is clean, porous, and devoid of large rocks. Do not use wheeled equipment over the system. A light track machine may be used with caution, avoiding crushing, or shifting of pipe assembly. Divert surface runoff from the system absorption area. Finish grade to prevent surface ponding. Seed and loam system area to protect from erosion.

2.0 Design and Installation

2.15 SYSTEM GEOMETRY: Design systems as long and narrow as practical along site contours to minimize ground water mounding especially in poorly drained low permeability soils. If possible, design level systems with equal number of modules per row.

There is a minimum 6-foot separation between trenches, measured from sidewall to sidewall.

In bed systems, it is acceptable to space the units to maximize points of application to the basal area. Laterals shall be no greater than 6 feet on centers and no greater than 4 feet from the sidewalls.

2.16 NUMBER OF GSF MODULES REQUIRED: Residential systems use a minimum of six (6) modules per bedroom to achieve treatment. See Section 2.17 for more information on systems sizing.

2.17 SYSTEM SIZING: When determining the correct sizing for your GSF system, it is important to follow your local codes and regulations for proper surface and subsurface classifications.

TABLE 4: APPLICATION RATES

Soil Group	Soil subgroup	Soil Texture Classification	USDA Field Test Textural Classification	Application Rate
A	A1	Medium Sand	30-60 Mesh	1.7
	A2a	Medium Sand	Poorly Graded	1.2
	A2b	Fine Sand	Sand 60-140 Mesh	1.0
		Loamy Sand	Sand	
B	B1	Very Fine Sand	Sand 140-270 Mesh	0.8
		Sandy Loam	Sandy Loam	
		Very Fine Sandy Loam	Sandy Loam	
	B2	Loam	—	0.6
		Silt Loam	Silt Loam	
		Sandy Clay Loam	(≤27% Clay)	
C	C1	Silt	Silt Loam	0.4
		Sandy Clay Loam	Clay Loam (≥27% Clay)	
		Silty Clay Loam	Clay Loam	
	C2	Clay Loam	Clay Loam	0.3

1. Per IDAPA 58.01.03.008.04, the bottom of the System Sand excavation must be installed level.
2. Systems with percolation rates in excess of 120 MPI are not allowed.
3. Drainfields larger than 1,500 ft² trench area bottom are prohibited from being constructed as standard (gravity)
4. Per IDAPA 58.01.03.008.04, a "Trench" is up to 6' wide, anything wider is considered a bed.
5. Maximum site slope per IDAPA 58.01.03 rules.

2.18 TRENCH SQUARE FOOTAGE BY TRENCH WIDTH:

TABLE 5: SQUARE FOOTAGE PER A42 PER TRENCH APPLICATION

TRENCH WIDTH	SAND EXTENSION	SQUARE FOOT PER MODULE
3 FOOT	6 INCHES	12
4 FOOT	12 INCHES	16
5 FOOT	18 INCHES	20
6 FOOT	24 INCHES	24

2.0 Design and Installation

FIGURE 4: 3 FT TRENCH CROSS SECTION 12 FT²

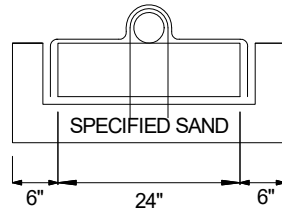


TABLE 6: NUMBER OF MODULES FOR 3 FT WIDE TRENCH (12 ft² per A42)

Soil Subgroup	1 Bedroom	2 Bedroom	3 Bedroom	4 Bedroom	5 Bedroom	6 Bedroom	7 Bedroom	8 Bedroom
A1	8	12	18	24	30	36	42	48
A2a	11	14	18	24	30	36	42	48
A2b	13	17	21	25	30	36	42	48
B1	16	21	27	32	37	42	47	53
B2	21	28	35	42	49	56	63	70
C1	32	42	53	63	73	84	94	105
C2	42	56	70	84	98	112	125	139

FIGURE 5: 4 FT TRENCH CROSS SECTION 16 FT²

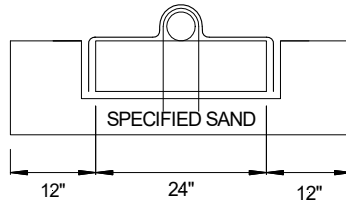


TABLE 7: NUMBER OF MODULES FOR 4 FT WIDE TRENCH (16 ft² per A42)

Soil Subgroup	1 Bedroom	2 Bedroom	3 Bedroom	4 Bedroom	5 Bedroom	6 Bedroom	7 Bedroom	8 Bedroom
A1	6	12	18	24	30	36	42	48
A2a	8	12	18	24	30	36	42	48
A2b	10	13	18	24	30	36	42	48
B1	12	16	20	24	30	36	42	48
B2	16	21	27	32	37	42	47	53
C1	24	32	40	47	55	63	71	79
C2	32	42	53	63	73	84	94	105

2.0 Design and Installation

FIGURE 6: 5 FT TRENCH CROSS SECTION 20 FT²

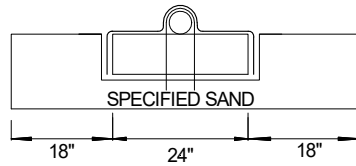


TABLE 8: NUMBER OF MODULES FOR 5 FT WIDE TRENCH (20 ft² per A42)

Soil Subgroup	1 Bedroom	2 Bedroom	3 Bedroom	4 Bedroom	5 Bedroom	6 Bedroom	7 Bedroom	8 Bedroom
A1	6	12	18	24	30	36	42	48
A2a	7	12	18	24	30	36	42	48
A2b	8	12	18	24	30	36	42	48
B1	10	13	18	24	30	36	42	48
B2	13	17	21	25	30	36	42	48
C1	19	25	32	38	44	50	57	63
C2	25	34	42	50	59	67	75	84

FIGURE 7: 6 FT TRENCH CROSS SECTION 24 FT²

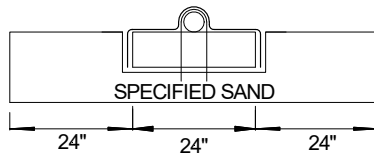
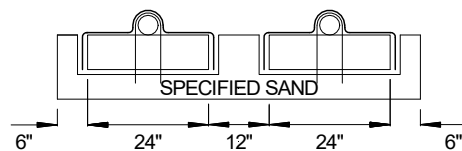


TABLE 9: NUMBER OF MODULES FOR 6 FT WIDE TRENCH (24 ft² per A42)

Soil Subgroup	1 Bedroom	2 Bedroom	3 Bedroom	4 Bedroom	5 Bedroom	6 Bedroom	7 Bedroom	8 Bedroom
A1	6	12	18	24	30	36	42	48
A2a	6	12	18	24	30	36	42	48
A2b	7	12	18	24	30	36	42	48
B1	8	12	18	24	30	36	42	48
B2	11	14	18	24	30	36	42	48
C1	16	21	27	32	37	42	47	53
C2	21	28	35	42	49	56	63	70

FIGURE 8: 6FT TRENCH CROSS SECTION WITH 2 LATERALS (12FT² PER MODULE)



3.0 Trench Installation Sizing and Guidelines

Trench Example:

House size: 3 Bedrooms
 Design Flow: 250 gpd
 Soil Type: Soil B2; Silt Loam (0.6 gpd/sf)
 Absorption Field Type: Trench

Calculate Minimum Absorption Area

Lookup loading rate from Table 4 and determine the loading rate:

Soil Group	Soil subgroup	Soil Texture Classification	USDA Field Test Textural Classification	Application Rate
B	B1	Very Fine Sand	Sand 140-270 Mesh	0.8
		Sandy Loam	Sandy Loam	
		Very Fine Sandy Loam	Sandy Loam	
	B2	Loam	—	0.6
		Silt Loam	Silt Loam	
		Sandy Clay Loam	(≤27% Clay)	

Absorption Area: Design Flow ÷ Loading Rate

$$250 \text{ gpd} \div 0.6 \text{ gpd} / \text{ft}^2 = 416.66 \text{ ft}^2$$

Calculate Number of Modules Required

TRENCH WIDTH	SAND EXTENSION	SQUARE FOOT PER MODULE
3 FOOT	6 INCHES	12
4 FOOT	12 INCHES	16
5 FOOT	18 INCHES	20
6 FOOT	24 INCHES	24

Number of units required = Absorption Area ÷ Square Foot Per Module

Units required

417 ft² ÷ 12 ft² / module = 34.7 Modules
 Round to: 35 Modules

Calculate Minimum Trench Length

35 Units x 4 + 1 141 linear feet

Trench Width

Trench width = unit width + sand extension
 36 = 24" + 12" (6" sand both sides of unit) 3 ft.

Final Dimension Layout

(Note: System layout and number of rows will vary based on site constraints)

Min. Product Length	140 ft.
(note: 6 inches of sand required at each end of trench which makes the minimum trench length 141 ft.)	
Trench Width	3 ft.
Minimum Number of Units	35 Modules
2 Trench Rows	18 Modules each row, 73 ft. per row.
Min. System Area	420 ft ²

3.0 Trench Installation Sizing and Guidelines

FIGURE 9: PLAN VIEW – TRENCH SYSTEM

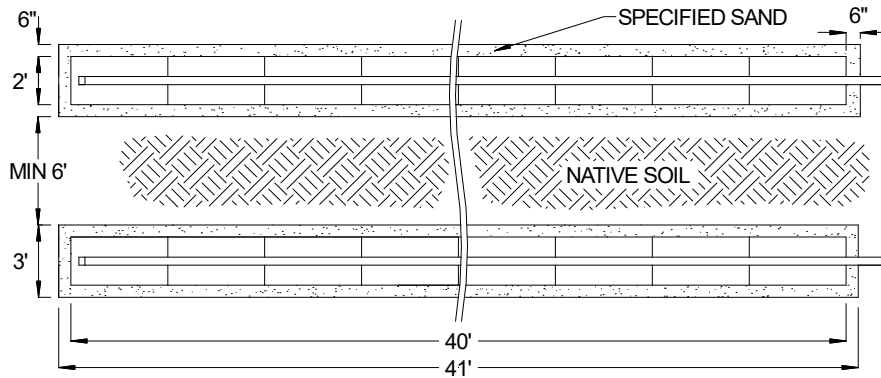
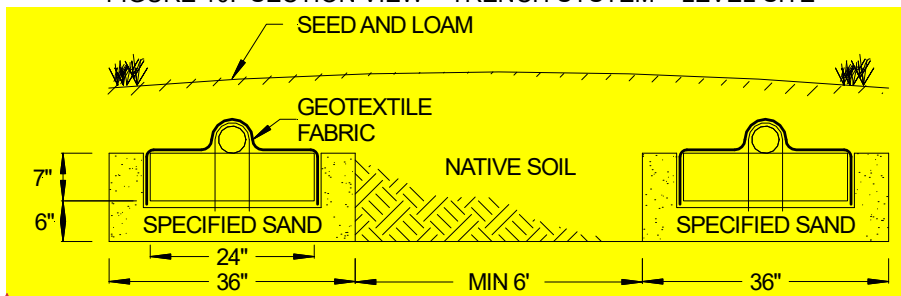
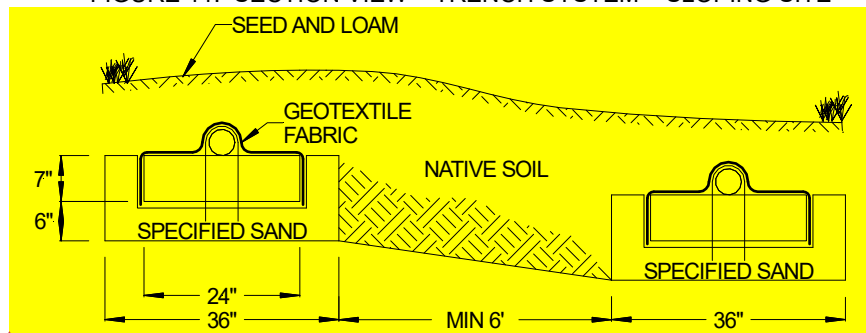


FIGURE 10: SECTION VIEW – TRENCH SYSTEM – LEVEL SITE



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FIGURE 11: SECTION VIEW – TRENCH SYSTEM – SLOPING SITE



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3.0 Trench Installation Sizing and Guidelines

1. Ensure all components leading to the GSF system are installed properly. Septic tank effluent filters are required with the GSF system.
2. Determine the number of GSF Modules required using the trench sizing example.
3. Prepare the site. Do not install a system on saturated ground or wet soils that are smeared during excavation. Keep machinery off infiltrative areas.
4. Plan all drainage requirements above (up-slope) of the system. Set soil grades to ensure that storm water drainage and ground water is diverted away from the absorption area once the system is complete.
5. Excavate the trench; scarify and prepare the receiving layer to maximize the interface between the native soil and specified sand.
6. Minimize walking in the trench prior to placement of the specified sand to avoid soil compaction.
7. Place specified sand in a 6" lift and stabilize by foot, a handheld tamping tool or a portable vibrating compactor. The minimum stabilized height below the GSF module must be level at ~~4~~⁶2".
8. Place GSF modules with **PAINTED STRIPE FACING UP**, end to end on top of the specified sand along their 4-foot length.
9. A standard 4-inch perforated pipe, SDR 35 or equivalent, is centered along the modules 4-foot length. Orifices are set at the 4 & 8 o'clock position.
10. All 4-inch pipes are secured with manufacturer supplied wire clamps, one per module.
11. (Pressure Distribution Systems) Insert a pressure pipe (size per design and code) into the standard 4-inch perforated pipe. The pressure pipe orifices are set at the 12 o'clock position as shown in Figure 19. Each pressure lateral will have a drain hole at the 6 o'clock position. Each pressure lateral shall include sweeping cleanouts at the terminal ends and be accessible from grade. The distribution pipe is capped at both ends with a hole cut throw to allow the pressure pipe through.
12. **Cover fabric substitution is not allowed.** The installer should lay the Eljen provided geotextile cover fabric lengthwise down the trench, with the fabric fitted to the perforated pipe on top of the GSF modules. Fabric should be neither too loose, nor too tight. The correct tension of the cover fabric is set by:
 - a. Spreading the cover fabric over the top of the module and down both sides of the module with the cover fabric tented over the top of the perforated distribution pipe.
 - b. Place shovelfuls of Specified Sand directly over the pipe area allowing the cover fabric to form a mostly vertical orientation along the sides of the pipe. Repeat this step moving down the pipe.
13. Place the sand extensions along both sides of the module's edge. A minimum of 6 inches of Specified Sand is placed at the beginning and end of each trench.
14. Complete backfill with a minimum of 12 inches of clean, porous fill measured from the top of the module. Backfill exceeding 18 inches requires venting at the far end of the trench. Use well graded native soil fill that is clean, porous, and devoid of large rocks. Do not use wheeled equipment over the system. A light track machine may be used with caution, avoiding crushing, or shifting of pipe assembly.
15. Divert surface runoff from the system. Finish grade to prevent surface ponding. Topsoil and seed system area to protect from erosion.

4.0 Bed Installation Sizing and Guidelines

Bed Example:

House size: 3 Bedrooms
 Design Flow: 250 gpd
 Soil Type: Silt Loam (0.6 gpd/sf)
 Absorption Field Type: Bed

Calculate Minimum Absorption Area

Lookup loading rate from the table below:

TABLE 10: BED APPLICATION RATES AND UNITS

Soil Group	Soil subgroup	Soil Texture Classification	USDA Field Test Textural Classification	Application Rate	Minimum Units Per Bedroom (Bed Applications Only)
A	A1	Medium Sand	30-60 Mesh	1.7	6
	A2a	Medium Sand	Poorly Graded	1.2	
	A2b	Fine Sand	Sand 60-140 Mesh	1.0	
		Loamy Sand	Sand		
B	B1	Very Fine Sand	Sand 140-270 Mesh	0.8	9
		Sandy Loam	Sandy Loam		
		Very Fine Sandy Loam	Sandy Loam		
	B2	Loam	–	0.6	
		Silt Loam	Silt Loam		
		Sandy Clay Loam	(≤27% Clay)		
C	C1	Silt	Silt Loam	0.4	12
		Sandy Clay Loam	Clay Loam (≥27% Clay)		
		Silty Clay Loam	Clay Loam		
	C2	Clay Loam	Clay Loam	0.3	

Absorption Area: Design Flow ÷ Loading Rate

$$250 \text{ gpd} \div 0.6 \text{ gpd} = 416 \text{ ft}^2$$

Calculate Number of Modules Required

Lookup units required per bedroom from the table below:

TABLE 10 (REPEATED): BED APPLICATION RATES AND UNITS

Soil Group	Soil subgroup	Soil Texture Classification	USDA Field Test Textural Classification	Application Rate	Minimum Units Per Bedroom (Bed Applications Only)
A	A1	Medium Sand	30-60 Mesh	1.7	6
	A2a	Medium Sand	Poorly Graded	1.2	
	A2b	Fine Sand	Sand 60-140 Mesh	1.0	
		Loamy Sand	Sand		
B	B1	Very Fine Sand	Sand 140-270 Mesh	0.8	9
		Sandy Loam	Sandy Loam		
		Very Fine Sandy Loam	Sandy Loam		
	B2	Loam	—	0.6	
		Silt Loam	Silt Loam		
		Sandy Clay Loam	(≤27% Clay)		
C	C1	Silt	Silt Loam	0.4	12
		Sandy Clay Loam	Clay Loam (≥27% Clay)		
		Silty Clay Loam	Clay Loam		
	C2	Clay Loam	Clay Loam	0.3	

Units Required: Number of Bedrooms x Units Required per Bedroom

$$3 \times 9 = 27 \text{ Units}$$

4.0 Bed Installation Sizing and Guidelines

Calculate Minimum Bed Length

Maintain a minimum of 2 rows in a bed system. (2 Rows for this example)

27 Units ÷ 2 Rows = 13.5 Mods/Row
Round up 14 Mods/Row

Calculate Minimum Row Length

14 Units x 4 ft./unit = 56 ft. + 6" sand each end = 57 ft. per Row

Bed Width

Bed Width = Absorption Area ÷ Bed Length

2 Rows

416 ft² ÷ 57 ft. = 7.29 ft., round to 8 ft.

Determine Lateral Spacing

Lateral to Lateral Spacing = Bed Width ÷ Number of Rows

2 Rows

8 ft. ÷ 2 rows 4 ft.

Lateral to Edge Spacing = Lateral to Lateral Spacing ÷ 2

4 ft. ÷ 2

2 ft.

Final Dimension Layout

(Note: System layout and number of rows will vary based on site constraints)

Bed Length	57 ft.
Bed Width	8 ft.
Minimum Number of Units	28 Units
Units per Row	14 units per row
Lateral to Lateral Spacing	4 ft.
Lateral to Edge Spacing	2 ft.
System Area	456 ft ²

4.0 Bed Installation Sizing and Guidelines

FIGURE 12: PLAN VIEW – BED SYSTEM

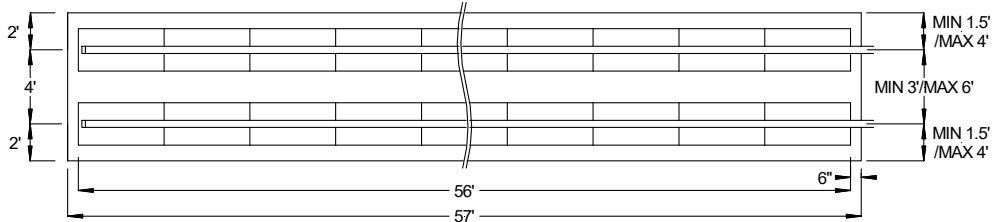
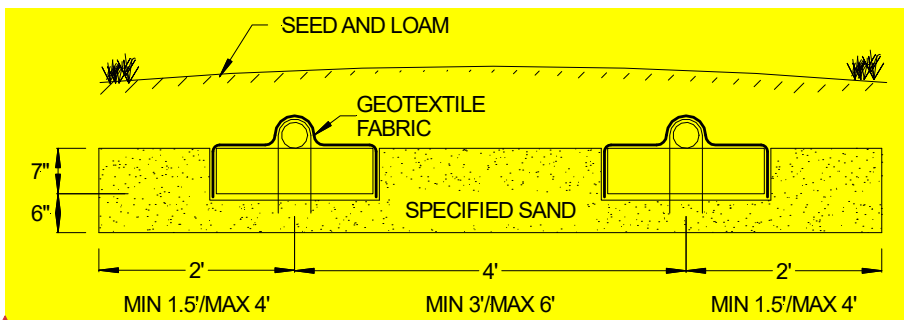


FIGURE 13: SECTION VIEW – BED SYSTEM



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4.0 Bed Installation Sizing and Guidelines

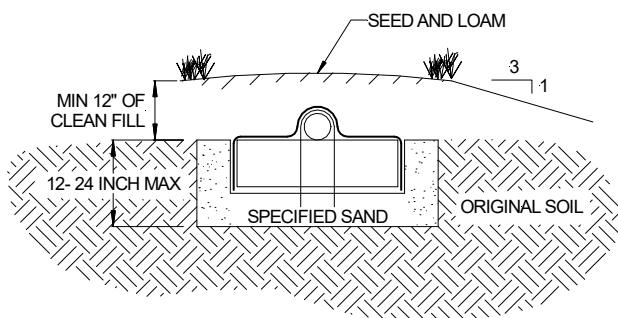
1. Ensure all components leading to the GSF system are installed properly. Septic tank effluent filters are required with the GSF system.
2. Determine the number of GSF Modules required using the bed sizing example.
3. Prepare the site. Do not install a system on saturated ground or wet soils that are smeared during excavation. Keep machinery off infiltrative areas.
4. Plan all drainage requirements above (up-slope) of the system. Set soil grades to ensure that storm water drainage and ground water is diverted away from the absorption area once the system is complete.
5. Excavate the bed absorption area; scarify the receiving layer to maximize the interface between the native soil and specified sand.
6. Minimize walking in the absorption area prior to placement of the specified sand to avoid soil compaction.
7. Place specified sand in ~~2, a~~ 6" lifts, stabilize by foot, a handheld tamping tool or a portable vibrating compactor. The minimum stabilized height below the GSF module must be level at ~~6~~ 12".
8. Place GSF modules with **PAINTED STRIPE FACING UP**, end to end on top of the specified sand along their 4-foot length.
9. A standard 4-inch perforated pipe, SDR 35 or equivalent, is centered along the modules 4-foot length. Orifices are set at the 4 & 8 o'clock position.
10. All 4-inch pipes are secured with manufacturer supplied wire clamps, one per module.
11. (Pressure Distribution Systems) Insert a pressure pipe (size per design and code) into the standard 4-inch perforated pipe. The pressure pipe orifices are set at the 12 o'clock position as shown in Figure 19. Each pressure lateral will have a drain hole at the 6 o'clock position. Each pressure lateral shall include sweeping cleanouts at the terminal ends and be accessible from grade.
12. **Cover fabric substitution is not allowed.** The installer should lay the Eljen provided geotextile cover fabric lengthwise down the row, with the fabric fitted to the perforated pipe on top of the GSF modules. Fabric should be neither too loose, nor too tight. The correct tension of the cover fabric is set by:
 - a. Spreading the cover fabric over the top of the module and down both sides of the module with the cover fabric tented over the top of the perforated distribution pipe.
 - b. Place shovelfuls of Specified Sand directly over the pipe area allowing the cover fabric to form a mostly vertical orientation along the sides of the pipe. Repeat this step moving down the pipe.
13. Place 6 inches of Specified Sand along both sides of the modules edge. A minimum of 6 inches of Specified Sand is placed at the beginning and end of each module row. A minimum of 12 inches of Specified Sand is placed in between module rows.
14. Complete backfill with a minimum of 12 inches of clean, porous fill measured from the top of the module. Backfill exceeding 18 inches requires venting at the far end of the bed. Use well graded native soil fill that is clean, porous, and devoid of large rocks. Do not use wheeled equipment over the system. A light track machine may be used with caution, avoiding crushing, or shifting of pipe assembly.
15. Divert surface runoff from the system. Finish grade to prevent surface ponding. Topsoil and seed system area to protect from erosion.

5.0 Capping Fill System Guidelines

5.1 DESIGN: Use the calculations in Sections 3.0 or 4.0 to design your systems treatment and dispersal area. Place the bottom of the excavation for your design in accordance with the sites limiting conditions.

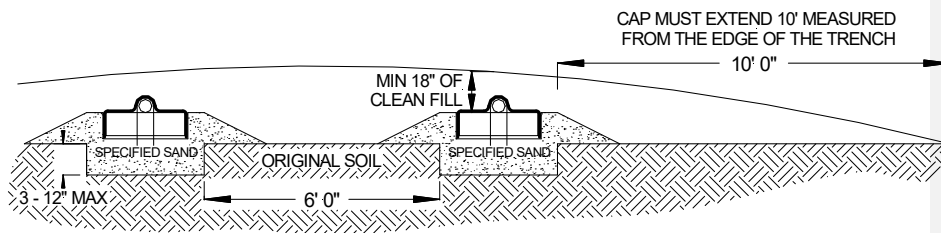
5.2 BELOW-GRADE CAPPING FILL SYSTEM: Follow the guidance located in TGM 4.3.2. The installation depth is between 12 and 24 inches below the natural soil and on no greater slope than 20%.

FIGURE 14: TYPICAL A42 CROSS SECTION



5.3 ABOVE-GRADE CAPPING FILL SYSTEM: Follow the guidance located in TGM 4.3.3. The installation depth is between 3 and 12 inches below the natural soil and on no greater slope than 12%. The minimum cover over the drainfield is 18 inches.

FIGURE 15: TYPICAL A42 CROSS SECTION



6.0 Mound Installation Sizing and Guidelines

6.3 CALCULATE VARIABLES: The following equations are from the Technical Guidance Manual.

1 – Determine soil application rate (AR)	0.6 gpd/ft ²
2 – Determine daily flow rate (DFR) DFR = GPD x 1.5	375 gpd
Eljen Bed Cell Design	
3 - Area = $\frac{\text{Daily Flow Rate (\#2)}}{\text{Sand Application Rate}} = \frac{375 \text{ gpd}}{1.0 \text{ gpd/ft}^2} =$	375 ft ²
4 – Width (B) = $\sqrt{\frac{\text{Area (\#3)} \times \text{Soil AR (\#1)}}{\text{Sand Application Rate}}}$	
Maximum bed width = 10 ft Beds may be designed narrower than determined by this equation if desired. Beds are recommended to be as long and narrow as site conditions allow.	
$\sqrt{\frac{375 \text{ ft}^2 \times 0.6 \text{ gpd/ft}^2}{1 \text{ gpd/ft}^2}} = 13.6 \text{ ft, round down to maximum,}$	10 ft
5 – Length (A) = $\frac{\text{Area (\#3)}}{\text{Width (\#4)}} = \frac{375 \text{ ft}^2}{10 \text{ ft}} =$	37.5 ft
Sand Mound Design	
6 – Total Area = $\frac{\text{DFR (\#2)}}{\text{Soil AR (\#1)}} = \frac{375 \text{ gpd}}{0.6 \text{ gpd/ft}^2} =$	625 ft ²
7 – Medium sand fill absorption bed perimeter (SFAP) area:	
Flat site: SFAP = 2 x (2ft x length (#5)) Sloped Site: SFAP = 2ft x length (#5)	
Example = 2 ft x 37.5 ft =	75 ft ²
8 – Effluent application area (EAA) = Total area – (bed area + SFAP):	
625 ft ² – (375 ft ² + 75 ft ²) =	175 ft ²
9 – <i>FLAT SITE ONLY</i> – Flat site perimeter (C, D): $0.5 \times \left(\frac{\text{EAA (\#8)}}{\text{length (\#5)}}\right)$	
Perimeter must maintain a maximum slope of 3:1 Perimeter width must result in a disposal area that meets or exceeds the minimum total area (#6). This will be verified in step 16.	

6.0 Mound Installation Sizing and Guidelines

10 – *SLOPED SITE ONLY* – Downslope Length (**D**) = $\left(\frac{EAA \text{ (#8)}}{length \text{ (#5)}} \right) \times DCF$

Downslope length must result in a maximum slope of 3:1.

Downslope length must result in a disposal area that meets or exceeds the minimum total area (#6).
This will be verified in step 17.

Downslope Correction Factors (DCF)																				
Slope (%)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Correction Factor	1.03	1.06	1.10	1.14	1.18	1.22	1.27	1.32	1.38	1.44	1.51	1.57	1.64	1.72	1.82	1.92	2.04	2.17	2.33	2.50

$$\frac{175 \text{ ft}}{37.5 \text{ ft}} \times 1.14 = 5.32 \text{ ft} \qquad 5.32 \text{ ft}$$

11 – *SLOPED SITE ONLY* – Upslope Length (**C**) = $((K + I) \times 3) \times UCF$

Upslope length must result in a maximum slope of 3:1.

Upslope Correction Factors (UCF)																				
Slope (%)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Correction Factor	0.97	0.94	0.91	0.89	0.87	0.85	0.83	0.81	0.79	0.77	0.75	0.73	0.72	0.70	0.69	0.67	0.66	0.65	0.64	0.63

K = Constant 0.583 ft

I = 1 ft

$$((0.583 \text{ ft} + 1 \text{ ft}) \times 3) \times 0.89 \qquad 4.23 \text{ ft}$$

12 – *FLAT SITES ONLY* – End Slope (**E**) = $(K + I) \times 3$

End slope length must result in a maximum slope of 3:1.

13 – *SLOPED SITES ONLY* – End slope (**E**) = $(J + K) \times 3$

End slope length must result in a maximum slope of 3:1.

J = **I** + (Slope of site stated as a decimal x Dispersal bed width)

$$1 \text{ ft} + (0.04 \times 10 \text{ ft}) = \mathbf{1.4 \text{ ft}}$$

$$(1.4 \text{ ft} + 0.583 \text{ ft}) \times 3 = \qquad 5.95 \text{ ft}$$

14 – Total width (**F**) = **B** + **C** + **D** + 2 (**H**)

H – 2 ft

$$10 \text{ ft} + 5.32 \text{ ft} + 4.23 \text{ ft} + 2 (2 \text{ ft}) = \qquad 23.55 \text{ ft}$$

15 – Total length (**G**) = **A** + (2 x **E**) + 2 (**H**) (G > F)

$$37.5 \text{ ft} + (2 \times 5.95 \text{ ft}) + 2 (2 \text{ ft}) \qquad 53.4 \text{ ft}$$

Total Area Verification

16 – *FLAT SITES ONLY* - Flat site: Design area (**DA**) = **A** x **F** (DA ≥ TA (#6))

17 - *SLOPED SITES ONLY* – Sloped Site: Design area (**DA**) = **A** x (**B** + **D** + **H**) (DA ≥ TA (#6))

$$37.5 \text{ ft} \times (10 \text{ ft} + 5.32 \text{ ft} + 2 \text{ ft}) \qquad 774 \text{ ft}^2$$

774 ft² ≥ 625 ft², design area is acceptable.

6.0 Mound Installation Sizing and Guidelines

18 – Sand mound length + 6 ft min. (G + 6)

$$53.4 \text{ ft} + 6 \text{ ft} = 59.4 \text{ ft}$$

19 – Sand mound width + 6 ft min. (F + 6)

$$23.55 \text{ ft} + 6 \text{ ft} = 29.55 \text{ ft}$$

6.4 BED CELL CONSTRUCTION –

Meets the requirements of Section 2.15 of this manual discussing spacing.

Width – 10 ft
Length – 37.5 ft

Minimum A42s needed for this system: 3 bedrooms x 6 A42s/bedroom = 18 A42 Modules

Units per row: $\frac{\text{Length} - 1}{4 \text{ ft/module}}$

$$\frac{37.5 - 1}{4 \text{ ft/module}} = 9.125, \text{ round down to } 9 \text{ A42 Modules per row}$$

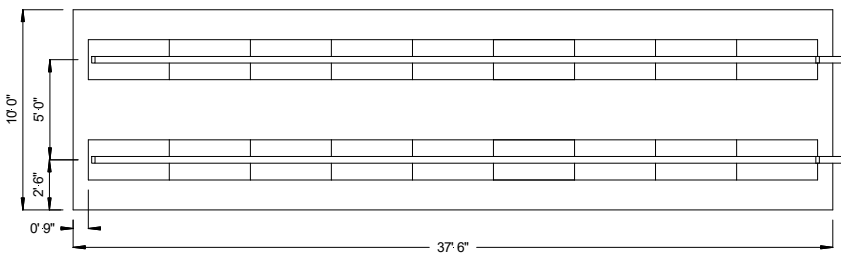
2 Rows are required to meet the minimum units required.

Determine End Spacing of A42s inside the dispersal bed:

$$(\text{Dispersal Bed Length} - \text{Modules} \times 4) \div 2$$

$$(125 \text{ ft} - 31 \text{ Modules} \times 4) \div 2 = 0.5 \text{ ft}$$

FIGURE 18: PLAN VIEW – ELJEN BED CELL



6.5 DESIGNER: An Idaho licensed Professional Engineer is required for the design of the Eljen GSF mound system.

6.6 EFFLUENT DISTRIBUTION: The system must be a low-pressure distribution system.

6.0 Mound Installation Sizing and Guidelines

1. Ensure all components leading to the GSF system are installed properly. Septic tank effluent filters are required with the GSF system.
2. Determine the number of GSF Modules required using the sizing formula.
3. Prepare the site. Do not install a system on saturated ground or wet soils that are smeared during preparation. Keep machinery off infiltrative areas.
4. Plan all drainage requirements above (up-slope) of the system. Set soil grades to ensure that storm water drainage and ground water is diverted away from the absorption area once the system is complete.
5. Remove the organic soil layer. Scarify the receiving layer to maximize the interface between the native soil and Specified Sand. Minimize walking in the absorption area prior to placement of the Specified Sand to avoid soil compaction.
6. Place fill material meeting local requirements (or Specified Sand requirements) onto the soil interface as you move down the excavated area. Place specified sand in 6" lifts, stabilize by foot, a handheld tamping tool or a portable vibrating compactor. The stabilized height below the GSF module shall meet the mound design requirements.
7. Place GSF modules with **PAINTED STRIPE FACING UP**, end to end on top of the specified sand along their 4-foot length.
8. A standard perforated 4-inch distribution pipe is centered along the modules 4-inch length. Orifices are set at the 4 & 8 o'clock position.
9. All distribution pipes are secured with manufacturers supplied wire clamps, one per module.
10. Insert a PVC Sch. 40 pressure pipe (size per design and code) into the standard perforated distribution pipe. The pressure pipe orifices are set at the 12 o'clock position as shown in Figure 19. Each pressure lateral will have a drain hole at the 6 o'clock position. Each pressure lateral shall include sweeping cleanouts at the terminal ends and be accessible from grade.

It is strongly recommended to install a 4-inch vent onto the distribution pipe. Distribution pipes can be connected to one vent or use one vent per distribution line.

11. **Cover fabric substitution is not allowed.** The installer should lay the Eljen provided geotextile cover fabric lengthwise down the row, with the fabric fitted to the perforated pipe on top of the GSF modules. Fabric should be neither too loose, nor too tight. The correct tension of the cover fabric is set by:
 - a. Spreading the cover fabric over the top of the module and down both sides of the module with the cover fabric tented over the top of the perforated distribution pipe.
 - b. Place shovelfuls of Specified Sand directly over the pipe area allowing the cover fabric to form a mostly vertical orientation along the sides of the pipe. Repeat this step moving down the pipe.
12. Ensure there is 6 inches of specified sand surrounding the GSF modules in the mound. Slope the sand away from the mound as described on the plan.
13. Complete backfill with a minimum of 12 inches of cover material measured from the top of the module. Use well graded native soil fill that is clean, porous, and devoid of large rocks. Do not use wheeled equipment over the system. A light track machine may be used with caution, avoiding crushing, or shifting of pipe assembly. Divert surface runoff from the system. Finish grade to prevent surface ponding. Topsoil and seed system area to protect from erosion.
14. Divert surface runoff from the system. Finish grade to prevent surface ponding. Topsoil and seed system area to protect from erosion.

7.0 Dosing Distribution Guidance

DOSING DESIGN CRITERIA: Dosing volume must be set to deliver a maximum of **3 gallons per Module** per dosing cycle, not to exceed 20% of the estimated average daily wastewater flow per TGM 4.19.3.3.3 Dose, No. 4. - Each dose delivered to the infiltrative surface of the drainfield should not exceed 20% of the estimated average daily wastewater flow. Head loss and drain back volume must be considered in choosing the pump size and force main diameter.

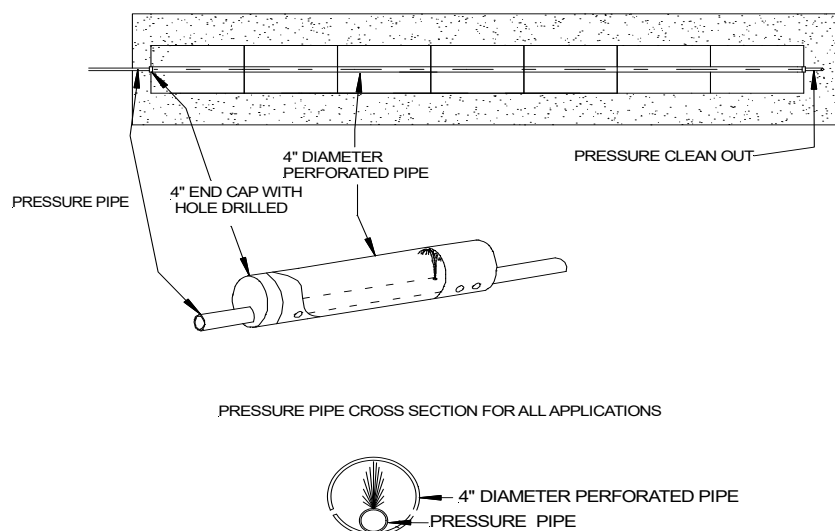
8.0 Pressure Distribution Guidance

8.1 SYSTEMS WITH GREATER THAN 1,500 FT² TRENCH AREA: Drainfields larger than 1,500 ft² trench area bottom are prohibited from being constructed as a standard (gravity) drainfield (IDAPA 58.01.03.008.04). Drainfields exceeding 1,500 ft² in total trench bottom area must be pressure dosed (section 4.19 of the Idaho Technical Guidance Manual).

8.2 PRESSURE DISTRIBUTION: Dosing with small diameter pressurized laterals is acceptable for GSF systems. The pipe networks must be engineered and follow principles established for pressure distribution. Flushing ports are required to maintain the free flow of effluent from orifices at the distal ends of each lateral. Contact Eljen's Technical Resource Department at 1-800-444-1359 for more information on pressure distribution systems.

Standard procedures for design of pressure distribution networks apply to the GSF filter. Minimum orifice and lateral pipe size is based on design. A drain hole is required at the end of each row at the 6 o'clock position of each pressure lateral for drainage purposes. The lateral pipe network is placed within a standard 4-inch perforated pipe. The perforations in the 4-inch outer pipe are set at the 4 and 8 o'clock position, the drilled orifices on the pressure pipe are set to spray at the 12 o'clock position directly to the top of the 4-inch perforated pipe as shown below.

FIGURE 19: PRESSURE PIPE PLACEMENT



8.0 Pressure Distribution Guidance

FIGURE 20: PRESSURE CLEAN OUT

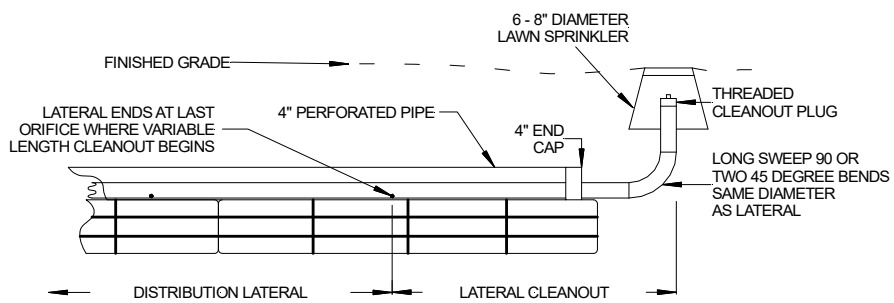
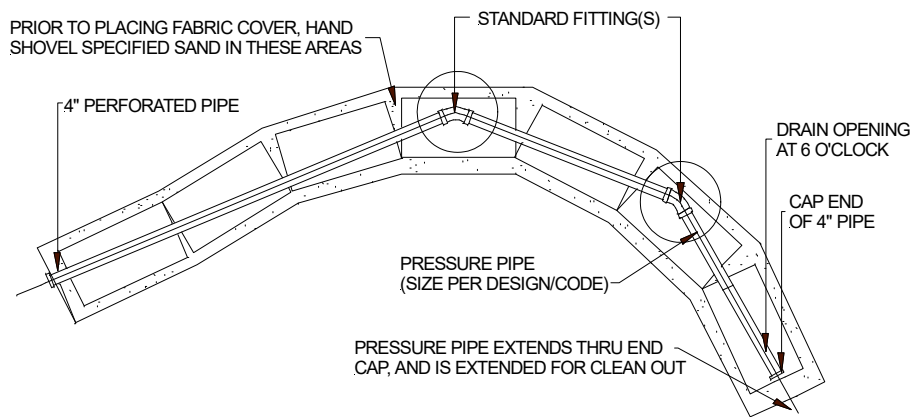


FIGURE 21: CONTOURED TRENCH PRESSURE DISTRIBUTION



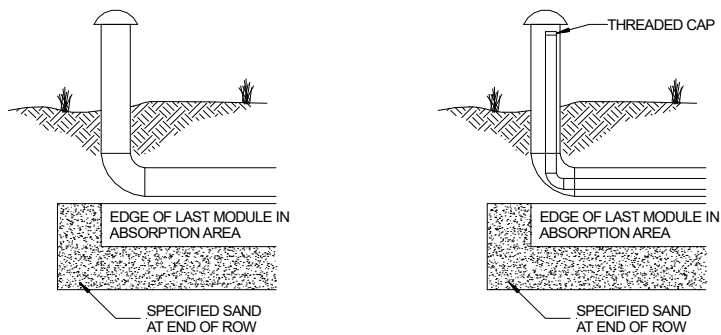
GSF Pressure Distribution trench placed on a contour or winding trenches to maintain horizontal separation distances may also be used in Dosed or Gravity system by removing the pressure pipe and using the 4-inch diameter perforated distribution pipe.

9.0 System Ventilation

9.1 SYSTEM VENTILATION: Air vents are required on all absorption systems located under impervious surfaces or systems **with more than 18 inches of cover material** as measured from the top of the GSF module to finished grade. This will ensure proper aeration of the modules and sand filter. The GSF has aeration channels between the rows of GSF modules connecting to cuspatations within the GSF modules. Under normal operating conditions, only a fraction of the filter is in use. The unused channels remain open for intermittent peak flows and the transfer of air.

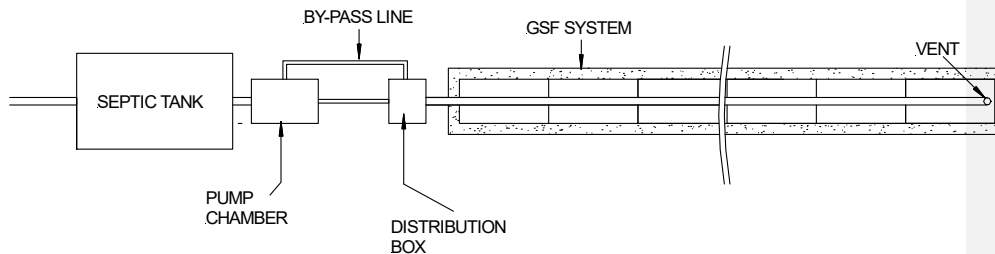
9.2 VENT PIPE FOR GRAVITY AND LOW-PRESSURE SYSTEMS: Systems with over 18" of cover over the top of the modules require a vent. If the system is a low-pressure distribution system, ensure that the LPP clean outs are located in the vent for easy access.

FIGURE 22: VENT LAYOUTS FOR GRAVITY AND LOW-PRESSURE SYSTEMS



9.3 AIR BY-PASS LINE: Systems with over 18" of cover that are pumped, or pressure dosed require an air by-pass line to continue flow from the low vent on the system to the high vent of the house. Simply plumb an airline from the distribution system back to the pump chamber or septic tank to provide unobstructed flow.

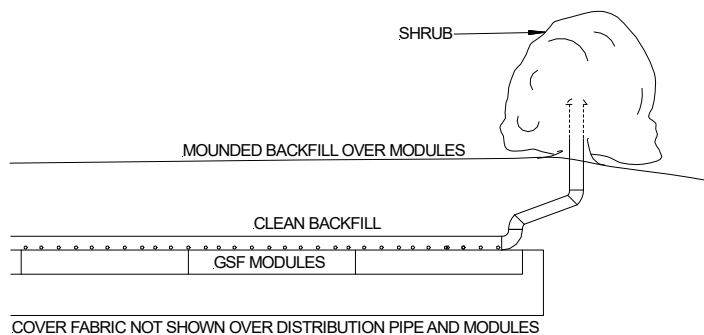
FIGURE 23: AIR BY-PASS LINE PLAN VIEW FOR VENTING OF PUMPED SYSTEMS



9.0 System Ventilation

9.4 VENTILATION PLACEMENT: In a GSF system, the vent is usually a 4-inch diameter pipe extended to a convenient location behind shrubs, as shown in the figure below. Corrugated pipe may be used. If using corrugated pipe, ensure that the pipe does not have any bends that will allow condensation to pond in the pipe. This may close off the vent line. The pipe must have an invert higher than the system so that it does not drain effluent.

FIGURE 24: GSF WITH 4" VENT EXTENDED TO CONVENIENT LOCATION



10.0 GSF Inspection Check List

Geotextile Sand Filter, (GSF) Checklist					
Facility Owner:					
Facility Address:					
Installation Date: (MDY)					
Previous Inspection Date: (MDY)					
Date of Inspection: (MDY)					
Residential Number of Bedrooms:					
Is this a Commercial Design? If yes what type:	Yes	No			
What is the estimated BOD5 and TSS strength?	BOD5	TSS	Comments		
Observation Port Location(s):	1	2	3		
Inspection Data, (complete all fields)					
Is daily flow within the system design flow? If no, explain:	Yes	No			
Does the owner verify the system use as described above? If no, explain:	Yes	No			
Septic tank last inspection date:	Date				
Inspected by:					
Septic tank last pumped date:					
Is pumping recommended?	Yes	No			
Condition of the soil absorption system: Wet, Dry, Firm, Soft, Vegetative, or Other. If Other, explain:	W	D	S	F	V
Is there evidence of storm water flows or erosion over the septic system? If yes, explain:	Yes	No			

10.0 GSF Inspection Check List

Is there evidence of soil slump or compaction by traffic or other means in the vicinity of the soil absorption system? If yes, describe:	Yes	No	Comments
Is effluent visible through the observation port? If yes, describe the condition and the fluid level:	Yes	No	Comments
Is there a garbage disposal in the home?	Yes	No	Comments
Is a water softer connected to the system?	Yes	No	Comments
Are solids visible through the observation port? If yes, describe the condition and depth of solids:	Yes	No	Comments
Is there evidence of surcharging or effluent ponding in the D-Box? If yes, describe and measure:	Yes	No	Comments
Are the system vents in place?	Yes	No	Comments
Are they operational? If no, describe conditions and location:	Yes	No	
Describe any other pertinent issues:			

Inspected by:	
License Number:	
Date:	
Time:	
Print Name & Signature of Inspector:	
<i>I certify I have inspected the system at the above address, completed this report, and the information reported is true, accurate, and complete.</i>	



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Appendix D

4.19.3.6 Pump to Gravity Distribution

A pump to drop box system may be used when an area for drainfield placement cannot be reached by standard gravity flow from the wastewater generating structure. Standard drainfields located at higher elevations than the septic tank are not required to be designed as a pressure distribution system unless the square footage of the disposal area exceeds 1,500 ft². When the drainfield is not pressurized, wastewater is conveyed by a pump through a transport (pressure) line to a drop box where effluent pressurization breaks to gravity distribution into the drainfield (**Error! Reference source not found.**). For a description of a drop box, see section **Error! Reference source not found.** Distribution boxes may be substituted as a drop box for the purpose of a pump to gravity distribution system.

1. Alternating to a larger diameter pipe is allowed to break pressurization and achieve gravity flow but is not a substitute for a drop box.
2. Pump selection, transport (pressure) line design, dosage, and dosing chamber or in-tank pump design must follow the procedures in Section **Error! Reference source not found.**, “Pressure Distribution System.”
3. A drop box should be installed that allows gravity distribution to all drainfield trenches.
4. Upon entry into the drop box, the effluent line should be angled to the bottom of the box with the effluent line terminating above the high water level of the drop box. A 0.25-inch hole may need to be drilled in the top of the angle connection to prevent a potential siphon.
6. A complex installer’s permit is required for installation.
7. Pump and transport pipe design/selection may require engineering based upon the regulatory authority’s judgment. Pump design/selection should be performed by a PE licensed in Idaho when elevation gains of greater than 100 feet or lengths of 500 feet are exceeded in effluent transport

Appendix E

Idaho DEQ - Uncommon Wastewater Flows

Residential

	Establishment	Flow Rate (GPD)	Quantity/Conditions	Notes
1	Accessory Dwelling Unit (ADU)	*	* Size as a single family dwelling. Can combine with another structure's flows into one system, but any common septic tank must be large enough to hold the required capacity from both structures	
2	Dwelling with Daycare	* 20/Student or Staff **	* Size as a single family dwelling, plus flows for students. Family daycares exempt.	** Do not include flows from live-in staff. Flows from residents are included in the dwelling flows
4	Residential Workshop/Barn/Shed with a Toilet and Sink	40 or 0 *	* 0 GPD if connecting to the primary dwelling's SSD system Require LOIU from owner stating that there is no shower.	No permit required for 0 GPD increase. No tank size increase is required if connecting to primary SSD system. The bathroom should be documented in the permit file as an accessory use. If not connected to primary system, the minimum tank size for a 40 GPD system is 750 gallons.
5	Residential Workshop/Barn/Shed with a Full or 3/4 Bathroom	150	If a single tank is used for both the bathroom and the main dwelling, the tank must be sized for two separate dwellings combined.	Consider the same as a 1-bedroom house or ADU
6	Single family home with extra kitchen or extra laundry room.	Extra Kitchen: 10 GPD/bedroom Extra Laundry: 10 GPD/bedroom	Size as single family home, add flows for extra laundry and/or kitchen.	The septic tank for the dwelling will be sized for a single family dwelling, plus an additional 250 gallon capacity per extra kitchen and an additional 250 gallon capacity per extra laundry room.

7	RV Wastewater Hookup at Private Dwelling	125/hookup	Add 250 gallons to the minimum septic tank capacity required for the dwelling	Recommend any preservative used for RV wastewater tank be free of formaldehyde and bronopol
8	Tiny Home	*	* Size as a single family dwelling	

Non-Residential (Letter of Intended Use Required)

	Establishment	Flow Rate (GPD)	Quantity/Conditions	Notes
1	Animal Processing Facility	150/Cow 25/Chicken 100/Other Animal 25/Employee	Require effluent filter in septic tank Require pretreatment of BOD and TSS	Recommend oil/water separator Recommend hair traps in sinks/floor drains Recommend separation of blood for offsite disposal
2	Animal Shelter/Kennel	25/Space 15/Employee	Require effluent filter in septic tank	Recommend hair traps in sinks/floor drains Space means a run, cage, stall, etc that can accommodate one animal
3	Bakery	2/Customer 15/Employee		
4	Barber Shop	50/Chair 15/Employee	Require effluent filter in septic tank	Recommend hair traps in sinks/floor drains
5	Brewery	See Winery	See Winery	See Winery
6	Butcher Shop	5/Customer 25/Employee	Require pretreatment of BOD and TSS	If floor drains present, recommend oil/water separator
7	Car Wash	N/A	Never allow to discharge subsurface	Motor vehicle waste disposal wells were banned by EPA nationwide after April 5, 2000. Car washes with undercarriage washing generate motor vehicle waste, and it is impossible for DEQ to regulate undercarriage washing
8	Coffee Shop / Café	5/Walk-In Customer 0.5/Drive-Thru Customer 15/Employee	~~Exclude drive-thru customers when estimating total daily customers~~	

9	Doctor's Office/Dentist	5/Patient 50/Doctor or Nurse 15/Other Employee		Assuming doctor/nurse washes hands every 15 min for 12 hours. Using 2 gal/min for faucet and 30 seconds per wash.
10	Dog Washing	200/Stall 15/Employee	Require effluent filter in septic tank	Using 10 washes per day per stall, 20 gallons per wash Recommend hair traps in sinks/floor drains
11	Grey Water Sump for a Campground with a Drinking Water Source but No Bathrooms	10/Camping Space		Using 2.5 GPD/person, 4 people per camping space
12	Grey water Sump for a Dry Campground	4/Camping Space		Using 1 GPD/person, 4 people per camping space
13	Gym / Health Club / Spa	25/Guest 20/Washing Machine Use 15/Employee		Assume towel washing on site
14	Laundry at a Campground / RV Park	17/Space	Include both RV and camping spaces	Per RV Park Memorandum
15	Marina Bathroom	20/Boat Slip * 15/Employee	* If shower available to guests, 35 GPD per boat slip.	Using 5 GPD/person, 4 people per boat
16	Public Park Bathroom	6/Parking Space		Using 2 GPD/person, 3 people per car
17	Salon	150/Chair 15/Employee	Require effluent filter in septic tank	Using 10 washes per day per chair, 15 gallons per wash Recommend hair traps in the sinks/floor drains
18	Ski Resort	*	* Due to the complex nature of ski resort design, refer to the approved engineered plans	
19	Veterinarian	250/Procedure Room 15/Employee	Require effluent filter in septic tank	Recommend hair traps in sinks/floor drains

20	Winery	2/Guest 15/Employee 3.3/Meal OR 2/Guest * Washwater **	Use max occupancy to estimate the max number of daily indoor guests. If there is outdoor space for guests, double the number of indoor guests unless a reasonable alternative is specified in LOIU. Effluent filter required in primary septic tank. Require pretreatment for high BOD and TSS from wash water. Require manufacturer's confirmation of their pretreatment product's ability to treat the BOD and TSS of winery wastewater ***	* If the establishment has a commercial kitchen capable of preparing meals, size at 3.3 GPD/meal. Assume number of meals equals number of guests unless a reasonable alternative is specified in LOIU. If kitchen sink is present but no food establishment license is required by the health department, size flows from kitchen sink at 2 GPD/guest. ** Due to the variety of equipment used in wine and beer processing, estimated flows from equipment washing and any other activities must be accounted for in detail in the LOIU. *** Wine and beer processing wastewater can have BOD >2500 mg/L, and TSS >500 mg/L. A standard ETPS or proprietary product on its own may not be able to reduce to domestic strength. Strongly recommend an engineer design the system.
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Appendix F

Idaho DEQ - Uncommon Wastewater Flows

Residential

	Establishment	Flow Rate (GPD)	Quantity/Conditions	Notes
1	Accessory Dwelling Unit (ADU)	*	* Size as a single family dwelling. Can combine with another structure's flows into one system, but any common septic tank must be large enough to hold the required capacity from both structures	
2	Dwelling with Daycare	* 20/Student or Staff **	* Size as a single family dwelling, plus flows for students. Family daycares exempt.	** Do not include flows from live-in staff. Flows from residents are included in the dwelling flows
4	Residential Workshop/Barn/Shed with a Toilet and Sink	40 or 0 *	* 0 GPD if connecting to the primary dwelling's SSD system Require LOIU from owner stating that there is no shower.	No permit required for 0 GPD increase. No tank size increase is required if connecting to primary SSD system. The bathroom should be documented in the permit file as an accessory use. If not connected to primary system, the minimum tank size for a 40 GPD system is 750 gallons.
5	Residential Workshop/Barn/Shed with a Full or 3/4 Bathroom	150	If a single tank is used for both the bathroom and the main dwelling, the tank must be sized for two separate dwellings combined.	Consider the same as a 1-bedroom house or ADU
6	Single family home with extra kitchen or extra laundry room.	Extra Kitchen: 10 GPD/bedroom Extra Laundry: 10 GPD/bedroom	Size as single family home, add flows for extra laundry and/or kitchen.	The septic tank for the dwelling will be sized for a single family dwelling, plus an additional 250 gallon capacity per extra kitchen and an additional 250 gallon capacity per extra laundry room.

7	RV Wastewater Hookup at Private Dwelling	125/hookup	Add 250 gallons to the minimum septic tank capacity required for the dwelling	Recommend any preservative used for RV wastewater tank be free of formaldehyde and bronopol
8	Tiny Home	*	* Size as a single family dwelling	

Non-Residential (Letter of Intended Use Required)

	Establishment	Flow Rate (GPD)	Quantity/Conditions	Notes
1	Animal Processing Facility	150/Cow 25/Chicken 100/Other Animal 25/Employee	Require effluent filter in septic tank Require pretreatment of BOD and TSS	Recommend oil/water separator Recommend hair traps in sinks/floor drains Recommend separation of blood for offsite disposal
2	Animal Shelter/Kennel	25/Space 15/Employee	Require effluent filter in septic tank	Recommend hair traps in sinks/floor drains Space means a run, cage, stall, etc that can accommodate one animal
3	Bakery	2/Customer 15/Employee		
4	Barber Shop	50/Chair 15/Employee	Require effluent filter in septic tank	Recommend hair traps in sinks/floor drains
5	Brewery	See Winery	See Winery	See Winery
6	Butcher Shop	5/Customer 25/Employee	Require pretreatment of BOD and TSS	If floor drains present, recommend oil/water separator
7	Car Wash	N/A	Never allow to discharge subsurface	Motor vehicle waste disposal wells were banned by EPA nationwide after April 5, 2000. Car washes with undercarriage washing generate motor vehicle waste, and it is impossible for DEQ to regulate undercarriage washing
8	Coffee Shop / Café	5/Walk-In Customer 0.5/Drive-Thru Customer 15/Employee	~~Exclude drive-thru customers when estimating total daily customers~~	

9	Doctor's Office/Dentist	5/Patient 50/Doctor or Nurse 15/Other Employee		Assuming doctor/nurse washes hands every 15 min for 12 hours. Using 2 gal/min for faucet and 30 seconds per wash.
10	Dog Washing	200/Stall 15/Employee	Require effluent filter in septic tank	Using 10 washes per day per stall, 20 gallons per wash Recommend hair traps in sinks/floor drains
11	Grey Water Sump for a Campground with a Drinking Water Source but No Bathrooms	10/Camping Space		Using 2.5 GPD/person, 4 people per camping space
12	Grey water Sump for a Dry Campground	4/Camping Space		Using 1 GPD/person, 4 people per camping space
13	Gym / Health Club / Spa	25/Guest 20/Washing Machine Use 15/Employee		Assume towel washing on site
14	Laundry at a Campground / RV Park	17/Space	Include both RV and camping spaces	Per RV Park Memorandum
15	Marina Bathroom	20/Boat Slip * 15/Employee	* If shower available to guests, 35 GPD per boat slip.	Using 5 GPD/person, 4 people per boat
16	Public Park Bathroom	6/Parking Space		Using 2 GPD/person, 3 people per car
17	Salon	150/Chair 15/Employee	Require effluent filter in septic tank	Using 10 washes per day per chair, 15 gallons per wash Recommend hair traps in the sinks/floor drains
18	Ski Resort	*	* Due to the complex nature of ski resort design, refer to the approved engineered plans	
19	Veterinarian	250/Procedure Room 15/Employee	Require effluent filter in septic tank	Recommend hair traps in sinks/floor drains

20	Winery	2/Guest 15/Employee 3.3/Meal OR 2/Guest * Washwater **	Use max occupancy to estimate the max number of daily indoor guests. If there is outdoor space for guests, double the number of indoor guests unless a reasonable alternative is specified in LOIU. Effluent filter required in primary septic tank. Require pretreatment for high BOD and TSS from wash water. Require manufacturer's confirmation of their pretreatment product's ability to treat the BOD and TSS of winery wastewater ***	* If the establishment has a commercial kitchen capable of preparing meals, size at 3.3 GPD/meal. Assume number of meals equals number of guests unless a reasonable alternative is specified in LOIU. If kitchen sink is present but no food establishment license is required by the health department, size flows from kitchen sink at 2 GPD/guest. ** Due to the variety of equipment used in wine and beer processing, estimated flows from equipment washing and any other activities must be accounted for in detail in the LOIU. *** Wine and beer processing wastewater can have BOD >2500 mg/L, and TSS >500 mg/L. A standard ETPS or proprietary product on its own may not be able to reduce to domestic strength. Strongly recommend an engineer design the system.
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Appendix G

4.17.5 Abandoning a Pit Privy

1. The privy building should be dismantled, and the portions of the building that may have come into contact with human sewage should be disposed of in a landfill.
2. The pit must be filled with soil that is free of rock and graded to allow for about 12 inches of settling.
3. The site should be marked and protected from traffic or excavation activities.
4. If a subsurface system is installed on a property with a single-family home, any pit privy on the property must be abandoned, unless otherwise approved by the Director.

Appendix H

4.20.2 Approval Conditions

1. An arrangement to provide maintenance and pumping of the dump station tank by a permitted septic tank pumper should be provided to the health district prior to permit issuance.
2. An RV dump station tank must not have wastewater conveyed to it through a collection system.
3. RV dump stations may not be located in a floodway
- .
4. The RV dump station tank lid must be sloped to the dump point and have a wastewater spill containment rim.
5. A source for dump station wash-down water must be provided to the RV dump station location.
6. If the proposed wastewater flows are greater than or equal to 2,500 GPD, a full-sized LSAS must be installed to serve all wastewater flows ~~generated~~ discharged to the subsurface by the project. Any proposed RV dump station will not be considered as a factor when sizing the LSAS. For more information, please refer to the DEQ memorandum titled “RV Park On-Site Wastewater Disposal Systems.”

Appendix I

2.2.4.1 Reduction in Separation Distance to Surface Water without a Variance

Table 2-7 shows the criteria for reducing separation distances from a drainfield to permanent or intermittent surface water based on soil design subgroups. This table is intended to be used only when the Rule cannot be met. Subdivisions and parcels recorded after February 24, 2022 must meet the separation distances in the Rule.

Table Error! No text of specified style in document.-17. Criteria for reducing separation distances from a drainfield to permanent or intermittent surface water.

Rule Separation Distance (feet)	Soil Design Subgroup	Maximum Allowable Separation Reduction (feet)	Minimum Separation Distance to Surface Water (feet)
~~300~~ 200	A-1	~~100~~ 0	200
~~300~~ 200	A-2	~~125~~ 25	175
~~200~~ 125	B-1	~~75~~ 0	125
~~200~~ 125	B-2	~~100~~ 25	100
100	C-1	0	100
100	C-2	0	100

The distance to permanent surface water may also be reduced to not less than 100 feet for any soil type when it can be demonstrated:

1. Either
 - a. The surface water is sealed so there is no movement of groundwater into the surface water body, or
 - b. The surface water body is discharging into the groundwater, and
2. There are no limiting layers between the drainfield elevation and the surface water elevation.

Appendix J

Idaho DEQ - Uncommon Wastewater Flows

Residential

	Establishment	Flow Rate (GPD)	Quantity/Conditions	Notes
1	Accessory Dwelling Unit (ADU)	*	* Size as a single family dwelling. Can combine with another structure's flows into one system, but any common septic tank must be large enough to hold the required capacity from both structures	
2	Dwelling with Daycare	* 20/Student or Staff **	* Size as a single family dwelling, plus flows for students. Family daycares exempt.	** Do not include flows from live-in staff. Flows from residents are included in the dwelling flows
4	Residential Workshop/Barn/Shed with a Toilet and Sink	40 or 0 *	* 0 GPD if connecting to the primary dwelling's SSD system Require LOIU from owner stating that there is no shower.	No permit required for 0 GPD increase. No tank size increase is required if connecting to primary SSD system. The bathroom should be documented in the permit file as an accessory use. If not connected to primary system, the minimum tank size for a 40 GPD system is 750 gallons.
5	Residential Workshop/Barn/Shed with a Full or 3/4 Bathroom	150	If a single tank is used for both the bathroom and the main dwelling, the tank must be sized for two separate dwellings combined.	Consider the same as a 1-bedroom house or ADU
6	Single family home with extra kitchen or extra laundry room.	Extra Kitchen: 10 GPD/bedroom Extra Laundry: 10 GPD/bedroom	Size as single family home, add flows for extra laundry and/or kitchen.	The septic tank for the dwelling will be sized for a single family dwelling, plus an additional 250 gallon capacity per extra kitchen and an additional 250 gallon capacity per extra laundry room.

7	RV Wastewater Hookup at Private Dwelling	125/hookup	Add 250 gallons to the minimum septic tank capacity required for the dwelling	Recommend any preservative used for RV wastewater tank be free of formaldehyde and bronopol
8	Tiny Home	*	* Size as a single family dwelling	

Non-Residential (Letter of Intended Use Required)

	Establishment	Flow Rate (GPD)	Quantity/Conditions	Notes
1	Animal Processing Facility	150/Cow 25/Chicken 100/Other Animal 25/Employee	Require effluent filter in septic tank Require pretreatment of BOD and TSS	Recommend oil/water separator Recommend hair traps in sinks/floor drains Recommend separation of blood for offsite disposal
2	Animal Shelter/Kennel	25/Space 15/Employee	Require effluent filter in septic tank	Recommend hair traps in sinks/floor drains Space means a run, cage, stall, etc that can accommodate one animal
3	Bakery	2/Customer 15/Employee		
4	Barber Shop	50/Chair 15/Employee	Require effluent filter in septic tank	Recommend hair traps in sinks/floor drains
5	Brewery	See Winery	See Winery	See Winery
6	Butcher Shop	5/Customer 25/Employee	Require pretreatment of BOD and TSS	If floor drains present, recommend oil/water separator
7	Car Wash	N/A	Never allow to discharge subsurface	Motor vehicle waste disposal wells were banned by EPA nationwide after April 5, 2000. Car washes with undercarriage washing generate motor vehicle waste, and it is impossible for DEQ to regulate undercarriage washing
8	Coffee Shop / Café	5/Walk-In Customer 0.5/Drive-Thru Customer 15/Employee	~~Exclude drive-thru customers when estimating total daily customers~~	

9	Doctor's Office/Dentist	5/Patient 50/Doctor or Nurse 15/Other Employee		Assuming doctor/nurse washes hands every 15 min for 12 hours. Using 2 gal/min for faucet and 30 seconds per wash.
10	Dog Washing	200/Stall 15/Employee	Require effluent filter in septic tank	Using 10 washes per day per stall, 20 gallons per wash Recommend hair traps in sinks/floor drains
11	Grey Water Sump for a Campground with a Drinking Water Source but No Bathrooms	10/Camping Space		Using 2.5 GPD/person, 4 people per camping space
12	Grey water Sump for a Dry Campground	4/Camping Space		Using 1 GPD/person, 4 people per camping space
13	Gym / Health Club / Spa	25/Guest 20/Washing Machine Use 15/Employee		Assume towel washing on site
14	Laundry at a Campground / RV Park	17/Space	Include both RV and camping spaces	Per RV Park Memorandum
15	Marina Bathroom	20/Boat Slip * 15/Employee	* If shower available to guests, 35 GPD per boat slip.	Using 5 GPD/person, 4 people per boat
16	Public Park Bathroom	6/Parking Space		Using 2 GPD/person, 3 people per car
17	Salon	150/Chair 15/Employee	Require effluent filter in septic tank	Using 10 washes per day per chair, 15 gallons per wash Recommend hair traps in the sinks/floor drains
18	Ski Resort	*	* Due to the complex nature of ski resort design, refer to the approved engineered plans	
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20	Winery	2/Guest 15/Employee 3.3/Meal OR 2/Guest * Washwater **	Use max occupancy to estimate the max number of daily indoor guests. If there is outdoor space for guests, double the number of indoor guests unless a reasonable alternative is specified in LOIU. Effluent filter required in primary septic tank. Require pretreatment for high BOD and TSS from wash water. Require manufacturer's confirmation of their pretreatment product's ability to treat the BOD and TSS of winery wastewater ***	* If the establishment has a commercial kitchen capable of preparing meals, size at 3.3 GPD/meal. Assume number of meals equals number of guests unless a reasonable alternative is specified in LOIU. If kitchen sink is present but no food establishment license is required by the health department, size flows from kitchen sink at 2 GPD/guest. ** Due to the variety of equipment used in wine and beer processing, estimated flows from equipment washing and any other activities must be accounted for in detail in the LOIU. *** Wine and beer processing wastewater can have BOD >2500 mg/L, and TSS >500 mg/L. A standard ETPS or proprietary product on its own may not be able to reduce to domestic strength. Strongly recommend an engineer design the system.
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Appendix K

Idaho DEQ - Uncommon Wastewater Flows

Residential

	Establishment	Flow Rate (GPD)	Quantity/Conditions	Notes
1	Accessory Dwelling Unit (ADU)	*	* Size as a single family dwelling. Can combine with another structure's flows into one system, but any common septic tank must be large enough to hold the required capacity from both structures	
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7	RV Wastewater Hookup at Private Dwelling	125/hookup	Add 250 gallons to the minimum septic tank capacity required for the dwelling	Recommend any preservative used for RV wastewater tank be free of formaldehyde and bronopol
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Non-Residential (Letter of Intended Use Required)

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5	Brewery	See Winery	See Winery	See Winery
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8	Coffee Shop / Café	5/Walk-In Customer 0.5/Drive-Thru Customer 15/Employee	~~Exclude drive-thru customers when estimating total daily customers~~	

9	Doctor's Office/Dentist	5/Patient 50/Doctor or Nurse 15/Other Employee		Assuming doctor/nurse washes hands every 15 min for 12 hours. Using 2 gal/min for faucet and 30 seconds per wash.
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11	Grey Water Sump for a Campground with a Drinking Water Source but No Bathrooms	10/Camping Space		Using 2.5 GPD/person, 4 people per camping space
12	Grey water Sump for a Dry Campground	4/Camping Space		Using 1 GPD/person, 4 people per camping space
13	Gym / Health Club / Spa	25/Guest 20/Washing Machine Use 15/Employee		Assume towel washing on site
14	Laundry at a Campground / RV Park	17/Space	Include both RV and camping spaces	Per RV Park Memorandum
15	Marina Bathroom	20/Boat Slip * 15/Employee	* If shower available to guests, 35 GPD per boat slip.	Using 5 GPD/person, 4 people per boat
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17	Salon	150/Chair 15/Employee	Require effluent filter in septic tank	Using 10 washes per day per chair, 15 gallons per wash Recommend hair traps in the sinks/floor drains
18	Ski Resort	*	* Due to the complex nature of ski resort design, refer to the approved engineered plans	
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Appendix L

TGM Section 2.2.4

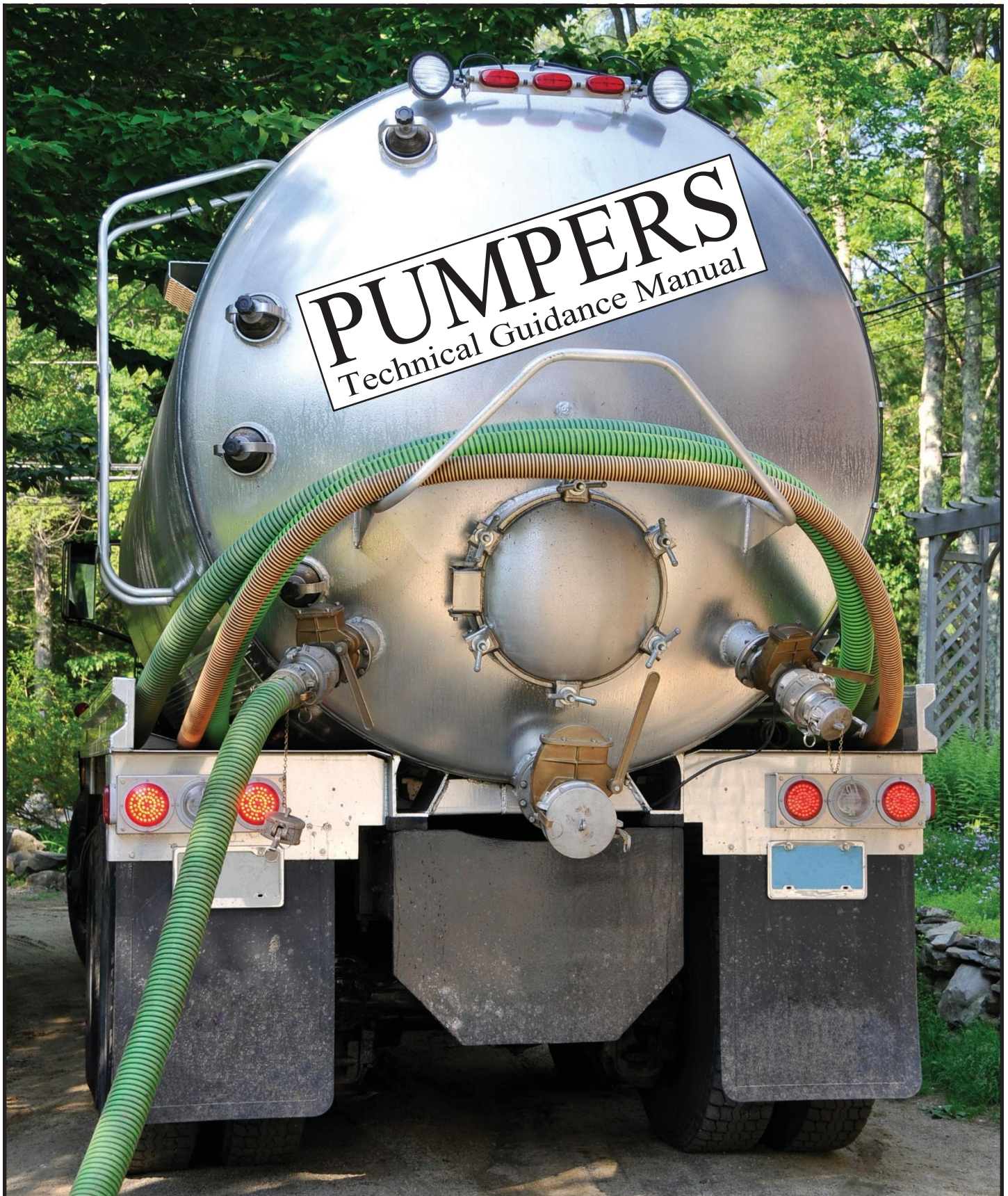
2.2.4 Effective Separation Distance to Surface Water

Surface water monitoring may be required by the Health District prior to issuance of a subsurface sewage disposal permit, in order to accurately determine effective separation distances from septic tanks and drainfields to surface water. Surface water monitoring may be required as a result of Health District observations of the property, historical information from surrounding properties, aerial imagery, and other factors determined by the Health District. If surface water monitoring is required, monitoring will be the responsibility of the applicant and will typically take place in the spring and may last between two and six months. Monitoring frequency must take place at least weekly.

Reduction in separation distances to surface water from the requirements of IDAPA 58.01.03 are allowed as provided in section 2.2.4 as long as the hierarchy and documentation practices described in section 2.2.1 of this manual are followed. Each site should be reviewed on its own merits. Additional criteria, such as population density, watershed characteristics, and reasonable access to municipal sewer must be examined before an allowance for the reduction of separation distance to surface water is granted. The following conditions are in place for all surface water allowances:

1. Separation distance to surface water must not be less than 100 feet.
2. Alternative systems may be required to achieve the reduction allowance.
3. No additional technical allowance may be granted to the reductions included in the sections below without following the formal variance procedure outlined in IDAPA 58.01.03.010.
4. Application for a variance under IDAPA 58.01.03.010 does not guarantee that a reduction in separation distance will be allowed.

Appendix M



IDAHO SEPTIC PUMPER'S TECHNICAL GUIDANCE MANUAL
AUGUST 2025

8 Septic Tank Pumping and Septage Disposal

8.1 Introduction

Revision: August 28, 2025

A septic system requires periodic maintenance that includes pumping out the accumulated scum, sludge, and wastewater from the septic tank (cumulatively called septage). Septage generates offensive odors and presents public health hazards. To prevent nuisance conditions and public health hazards, septage must be collected (pumped), transported, stored, and disposed of according to the following rules:

- Individual/Subsurface Sewage Disposal Rules and Rules for Cleaning of Septic Tanks (IDAPA 58.01.03) (section 050)
- Wastewater Rules (IDAPA 58.01.16)
- Standards for the Use or Disposal of Sewage Sludge (40 CFR 503)

Septic tank pumpers have the important task of not only helping the homeowner maintain the system by pumping the septic tank but protecting the property owner and public from the various health hazards associated with septage. To protect and help the property owner, a pumper needs to understand how the septic system operates and proper procedures for pumping the septic tank and septage disposal.

8.2 Septage and Public Health

Pathogens that pass in urine, feces, or bodily fluids can be found in sewage. Septage may contain any number of these pathogens. The following list provides an example of pathogens present in septage including, but not limited to, the following:

- Bacterial organisms (*Salmonella*, *Shigella*, and *Clostridium*) and typhoid (*Salmonella typhi*)
- Parasites (pinworm, roundworm, and hookworm), especially in the scum layer
- Organisms that cause amoebic dysentery, polio, and hepatitis

Proper management of septage upon its removal from the septic tank through its ultimate disposal or beneficial reuse is critical in ensuring the protection of public health from the pathogens present in septage.

8.2.1 Septage Classifications

While all wastewater that enters a septic tank is septage, the source of the wastewater before it enters the septic tank determines the classification of the septage. All septage that comes from domestic or residential activities is classified as domestic septage. Examples of wastewater sources that result in domestic septage include, but are not limited to, single and multifamily residential housing, restrooms (including shower facilities), and break rooms. Domestic septage includes the contents removed from septic tanks, portable toilets, vault privies, wastewater holding tanks, marine sanitation devices, RV holding tanks, very small wastewater

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treatment plants, or semipublic facilities (e.g., schools, motels, mobile home parks, campgrounds, and small commercial endeavors) that receive wastewater from domestic sources.

Industrial or commercial process wastewater is classified as nondomestic septage. Nondomestic septage includes the contents removed from septic tanks or wastewater holding tanks that receive wastewater from industrial or commercial sources. Nondomestic septage also includes, but is not limited to, the contents removed from grease traps or sand-oil separators. If industrial or commercial wastewater is mixed in any ratio with domestic wastewater, the entire mixture is classified as industrial or commercial wastewater. If nondomestic septage is mixed in any ratio with domestic septage, the entire mixture is classified as nondomestic septage.

Septage classification can have an impact on the allowable disposal or beneficial reuse of the septage. Septic tank pumpers need to be aware of the septage classifications of the materials they pump and haul so proper septage disposal can be achieved. Additionally, it is recommended that facilities producing domestic and nondomestic wastewater isolate the wastewater plumbing and discharge these wastewater sources to separate septic tanks. This allows the domestic and nondomestic septage to be segregated so that the disposal and beneficial reuse options are maximized.

8.3 Septic System Components

The most common septic system consists of a septic tank and drainfield. Septic tanks are commonly constructed of concrete, polyethylene, polypropylene, or fiberglass (see TGM section 5.2 for approved products). Drainfields are installed at varying depths under the ground, either in the form of trenches (up to 6 feet wide and 100 feet long) or absorption bed (greater than 6 feet wide and up to 100 feet long). Drainfields are also filled with gravel containing a perforated plastic pipe or gravelless system components (see TGM section 5.6 for approved products). Figure 6-1 shows the components of a standard septic system.

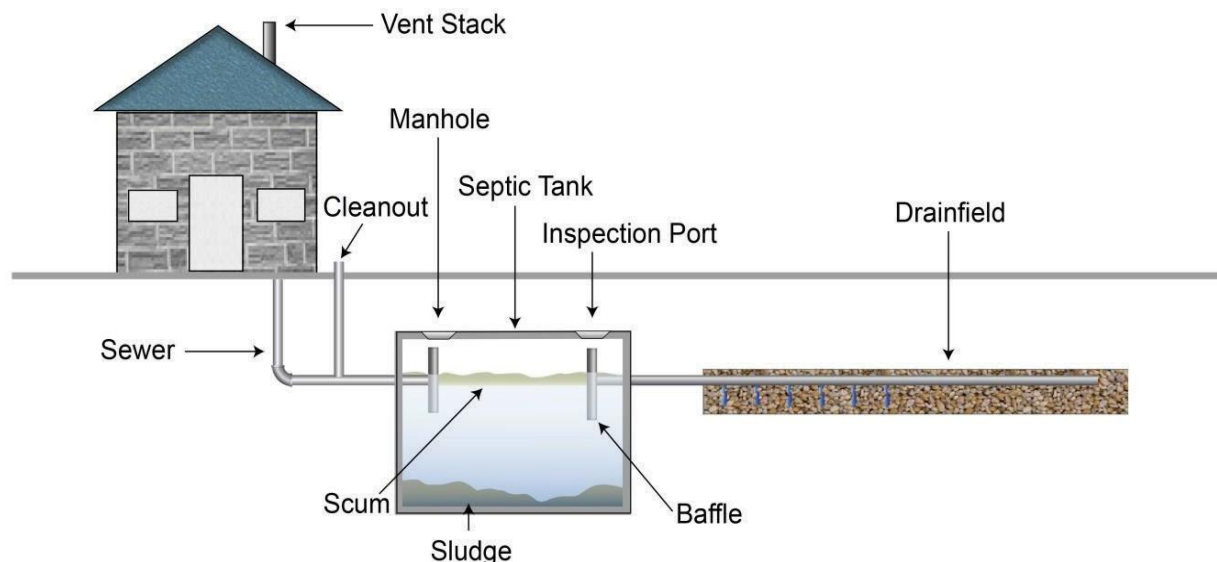


Figure 8-1. Components of a standard septic system.

Several alternative system designs may have additional tanks referred to as dosing chambers, recirculating chambers, or treatment chambers. These types of tanks typically contain less accumulation of scum and sludge but are recommended to be pumped to remove these accumulations whenever the septic tank is pumped. These types of tanks also contain mechanical components that must be considered before pumping the tank's contents. It is highly recommended that the component manufacturer's recommendations be followed when these alternative tanks are pumped. In the case of ETPS, the property owner's service provider should be contacted for approval before pumping the unit's tank.

8.4 Septic System Mechanics

Wastewater from a home or business enters the septic tank where the velocity quickly slows. Because of the slowing, material in the wastewater that is heavier than water, such as feces and garbage, settles to the bottom as sludge. Material in the wastewater lighter than water, such as grease and plastics, floats to the top as scum. The liquid in the center of the tank, now with the sludge and scum settled out, is called effluent and is the liquid that flows from the septic tank to the drainfield. Upon being dispersed to the drainfield, the effluent is treated by the soil and organisms in the soil. For a septic tank to function properly (scum and sludge settling and retention), the inlet and outlet baffles within the tank must be intact and in good condition. Proper baffle design is described in IDAPA 58.01.03.007.11 and 58.01.03.007.12. Anytime a septic tank is pumped or a drainfield is repaired, the inlet and outlet side of the septic tank should be uncovered, and the baffles should be inspected to ensure the septic tank is in good working order.

The septic tank will function satisfactorily until the sludge fills over 40% of the volume of the tank (as measured from the bottom of the septic tank to the invert of the tank outlet), or the scum reaches the top of the inlet or outlet baffle in the tank.

Before the tank reaches these levels, it should be pumped by a permitted pumper. If the tank is not pumped, it will be unable to perform its wastewater separation function, which will allow the solids and greases to be carried out into the drainfield. If solids and greases reach the drainfield, they will fill and clog the soil pores causing the drainfield to fail resulting in sewage backing up into the home or business, the tank to overflow, or effluent to reach the ground surface around the drainfield. Under regular use (two people in the first bedroom and one person in every other bedroom), it is recommended that the septic tank be inspected every 3–5 years and pumped as needed.

8.5 Checking the Level of Scum and Sludge in a Septic Tank

The scum and sludge levels in the septic tank should be checked at least once every 3 years under regular use. If the septic system receives more than regular use, the scum and sludge levels should be checked annually. A property owner, permitted septic tank pumper, or permitted septic system installer can check the scum and sludge levels in the septic tank.

The following outlines the procedure for locating a septic tank:

1. Review the final as-built drawing located on the final inspection form for the property owner's septic permit. If the property owner does not have a plot plan of the tank location, often the health district will have its location on file.
2. If no drawings can be found, a guess as to where the tank is located can be made by finding the 3- or 4-inch vent stack on the roof, or a cleanout near the foundation. The tank is often located directly out from the stack or cleanout.
3. If the previous methods do not work, the sewer can also be located in the crawl space by noting the place where the sewer pipe exits under the building's foundation.
4. With a steel rod, probe the ground to locate the tank. The tank, or the manhole cover on a riser, should be within 18 inches of the ground surface. Once located, excavate to the top of the tank and pull off the manhole cover.

The following outlines a procedure for checking the scum and sludge levels in the septic tank:

1. With a shovel, break through the scum layer, making a hole about 1 foot in diameter.
2. Wrap a strip of terry cloth toweling spirally around a pole and lower the pole into the tank. If the pole is fitted with a hinged flapper about 2 feet from its bottom, the flapper swings down, and the scum level can be checked.
3. Lower the pole into the septic tank liquid until the flapper is about 1 foot below the scum. Pull the pole towards you a little to get the flapper under the scum, then raise the pole until the scum begins to move up, indicating that the flapper has made contact with the scum. Mark the pole at the top of the scum so that the depth of the scum can be measured from the pole after it is removed.
4. Continue to lower the pole into the septic tank until it meets the bottom. Tap the bottom of the tank two or three times with a sharp rap, which permits the sludge to enter into the coarse weave of the terry cloth. Slowly remove the pole. The depth of the sludge will then be seen in the terry cloth.
5. Alternatively, manufactured products are available for obtaining a representative profile of the septic tank sludge, liquid, and scum depths in place of the tool described above. These manufactured products are recommended for professionals who pump septic tanks or install septic systems because the tool can be cleaned and maintained for repeated use.

Calculate the depth of the sludge as a percent of the liquid depth (measured from the bottom of the tank to the top of the liquid/bottom of the scum layer). Equation 6-1 can be used to determine if a septic tank needs pumping.

$$\text{Percent sludge depth} = \frac{\text{Depth of sludge (inches)}}{\text{Liquid depth of tank (inches)}} \times 100$$

Equation 8-1. Percent sludge depth.

When sludge is greater than 40% of the liquid volume, or the scum layer is at or above the top of the inlet or outlet baffle, the tank should be pumped.

Figure 8-2 illustrates methods used to check scum and sludge depths.

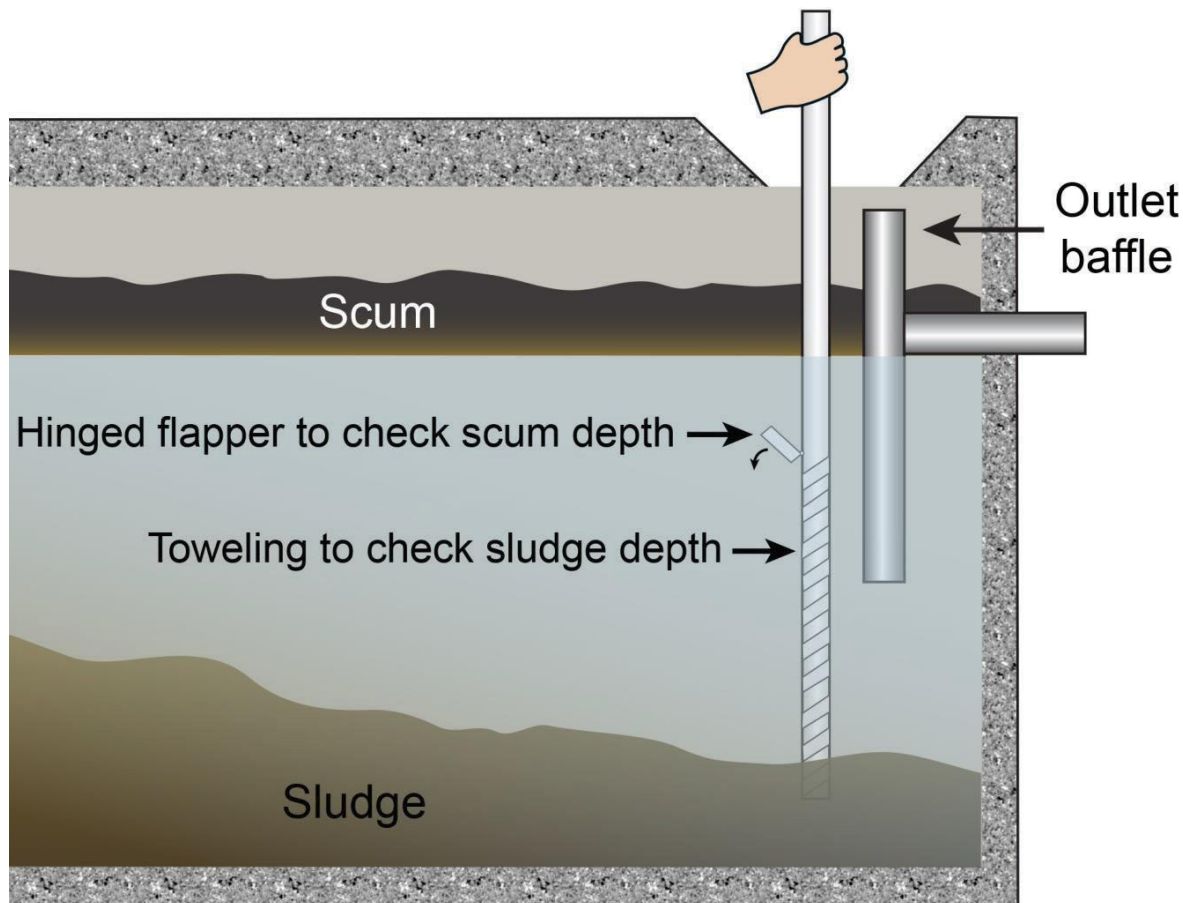


Figure 8-2. Methods used to check scum and sludge depths.

8.6 Septage Pumping

All persons, firms, or corporations operating any tank truck, device, or equipment used or intended to be used for the purpose of pumping and transporting septage must comply with the IDAPA 58.10.03.050. The following subsections provide guidance and recommendations on septage pumping and transporting equipment requirements.

8.6.1 Equipment for Pumping and Transporting Septage

The major and most expensive piece of equipment needed to pump septage is the pumper's truck. Capacity of a truck used to pump septic tanks, RV dump stations, or wastewater holding tanks should be at least 1,000 gallons. The capacity of a truck used to pump portable toilets or vault privies should be at least 500 gallons. The truck should also have the following:

- An access port for the periodic inspection, maintenance, and cleaning of its interior. The truck should also have a gauge to indicate the volume of liquid it contains.
- The tank should have a gravity drainage valve that can be safely locked during transportation and storage. The discharge valve used to dispose of the septage should be at least 2.5 inches in diameter and equipped with a cam-lock quick couple or screw cap.

The valve should be located so that the discharge stream is not blocked in any way, unless it is necessary for disposal.

- The pumping equipment on the truck should be sized to provide at least 15 feet of suction lift and should be able to reverse flow.
- There should be a water trap between the tank and pump to prevent liquid from entering the pump in case the pump pulls a vacuum on the tank.
- Several lengths of hoses should be available that can stretch from the pumping vehicle to a client's tank. The hoses from the tank and pump should be at least 3 inches in diameter.

All equipment used to pump or transport septage must be watertight and constructed so that spilling or leaking of septage during pumping, transportation, or unloading is prevented (IDAPA 58.01.03.050.01). Additionally, all equipment used to pump or transport septage must be constructed to allow every portion of the interior or exterior of the equipment to be cleaned and maintained in a clean condition when not in use (IDAPA 58.01.03.050.02). All permitted vehicles used to pump or transport septage must also have the permit number for each vehicle displayed at all times on the door of the vehicle in a manner that is easily legible (IDAPA 58.01.03.050.06). Easily legible is considered to be letters at least 3 inches high on both sides of the truck. It is also recommended that the name of the firm, address, business phone number, and tank capacity be displayed on the side of the truck.

Septage pumpers may also want to consider including several other pieces of equipment with their pumping and transportation vehicles. These recommended pieces of equipment will help pumpers complete the job and provide their clients with information regarding the condition of their septic tank. Other recommended equipment includes the following:

- Flashlight
- Steel lid probes
- Manhole sealer
- Bucket
- 50-foot garden hose
- Long-handled shovel
- Pry bar or pick
- Container of Quick Lime
- Pole, hoe, or rake for scum mixing
- A pole or equipment that allows the depth of scum and sludge to be determined
- Extension mirror used to inspect the tank's inlet and outlet baffles
- A spray bar or splash plate for use in domestic septage land application (if contracted with an approved site and approved by the health district)

8.6.2 Permit Requirements

A permit is required throughout Idaho for pumping, transportation, and disposal of septage (IDAPA 58.01.03.050.04.a). A permit can be obtained from any health district within Idaho and allows the permittee to pump, transport, and dispose of septage throughout the

state. Permits must be renewed annually and applications for renewal must be submitted to the health district on or before March 1 of each year (IDAPA 58.01.03.050.04.a). An application must be submitted to obtain a permit from a health district for pumping, transportation, and disposal of septage (IDAPA 58.01.03.050.04.a). Permit applications must include the following information:

- Number of tank trucks operated
- Vehicle license number of each tank truck
- Name and address of the owner and/or operator of the tank trucks
- Name and address of the business
- Method of septage disposal to be used in all areas of the operation
- Location of all disposal sites used by the applicant (location information must be accompanied by signed approval from the disposal site operator indicating that all the trucks included in the application can dispose of septage at that location.)
- Payment of the permitting fee as set by each health district

Upon submission of a permit application to a health district, an EHS will inspect the tank trucks and associated equipment before issuing the permit. A permit will not be issued until all the requirements of IDAPA 58.01.03 are met by the applicant.

8.6.3 Septic Tank Pumping

Once a septic tank has been located, and the manhole cover exposed and removed, the depth of scum and sludge should be determined using the following procedure:

1. Draw down the liquid level 6 inches to 1 foot.
2. Break up the scum using a pole, rake, or hoe.
3. Mix the scum with the tank's contents.
4. Continue pumping the tank until most of the contents are removed. If needed, force septage back into the tank to mix up and remove the sludge on the bottom of the tank.
5. After the tank's contents have been mixed, do not let the septage come back up to the outlet because sludge may run into the drainfield.
6. Leave a few inches of sludge in the bottom of the tank as seed to restart bacterial action as the tank refills.
7. Do not disinfect the interior of the tank.

When pumping is completed, thoroughly inspect the tank and note the following on a pumping receipt for the client:

- Date.
- Volume of septage removed from each tank.
- Depth of scum and sludge in each tank.
- Condition of the inlet and outlet baffle in each tank.
- Condition of the walls and floor of the tank for the presence of cracks, corrosion, or damage.

- Is water running back into the tank from the drainfield? (Possible sign of high groundwater in the drainfield or back pressure from a failing drainfield)
- Is water running in through the sides of the tank? (Sign of a leaking tank in high groundwater)
- Does the sewer line from the house appear to be free-flowing? (Turn a fixture on inside the structure to ensure that there is no obstruction.)

NEVER enter a tank as the methane gas produced by the septage can kill quickly! Entry into any tank requires a confined space entry permit through the Occupational Safety and Health Administration and proper personal protective equipment.

If a manhole cover of a tank is found to be more than 18 inches belowground (as may be the case with older tanks or tanks serving basements), the property owner should be advised to add a concrete or plastic standpipe/riser that would place the manhole cover at ground surface. The standpipe/riser is recommended for both the inlet and outlet sides of a tank.

After the manhole cover is replaced, replace soil and sod if the manhole is belowground. Apply Quick Lime on any places where septage may have spilled.

8.7 Septage Storage

Some septage pumpers, transporters, composters, or land application site operators may find it necessary for their operation to store septage before disposal or beneficial reuse. If a pumper, transporter, composter, or land application site operator needs to store septage, the facility they construct to accomplish this must meet the requirements of “Septage Transfer Stations” (IDAPA 58.01.16.519). Any proposed septage transfer station must also meet IDAPA 58.01.16 requirements, and the associated documents must be submitted to the DEQ regional office along with their septage transfer station plans:

- Review of plans for municipal wastewater treatment or disposal (IDAPA 58.01.16.400).
- Demonstration of technical, financial, and managerial capacity (IDAPA 58.01.16.409).
- Facility plans (IDAPA 58.01.16.410).
- Preliminary engineering reports (IDAPA 58.01.16.411).
- Submission of plans and support documents (IDAPA 58.01.16.420).
- O&M manuals (IDAPA 58.01.16.425).
- If a screening facility is also to be constructed in association with a septage transfer station, the designs for that facility must be included with the transfer station plans but is exempt from the requirements of “Screening and Grit Removal” (IDAPA 58.01.16.460).

The act of screening septage is defined as treatment (IDAPA 58.01.16.010.85). Based on this designation of screening as treatment, any septage transfer station that employs screening must have a properly licensed wastewater operator in charge of the wastewater system and screening facility (IDAPA 58.01.16.203). DEQ exempts all stand-alone septage transfer stations and associated septage screening facilities from the licensed operator requirement as long as the septage transfer station meets the following:

- Located at a permitted pumper's place of business, or
- Located at a permitted domestic septage land application site or approved composting site.
- Is owned, operated, and maintained by the permitted pumper, land application site, or composting site operator.
- No additional wastewater treatment components or processes are included in the septage transfer station design.
- Septage transfer stations located at, or associated with, a wastewater treatment plant are not subject to these exemptions.

8.8 Septage Disposal

Septage may only be disposed of in conformance with the methods allowed by IDAPA 58.01.03.050.03. Those methods include the following:

1. Discharging to a public sewer
2. Discharging to a sewage treatment plant
3. In a location and by a method approved by DEQ

The first two methods of disposal require approval from the owner or superintendent of a wastewater treatment plant or the owner/operator of the public sewer. It is important for a pumper to note that discharging to a public sewer without the proper approvals puts the pumper in violation of the National Pollutant Discharge Elimination System pretreatment requirements and associated federal codes. Disposal at a wastewater treatment plant should be used whenever practical.

Disposal method 3 is associated with disposal or land application of domestic septage. Nondomestic septage may not be approved for one-time disposal or beneficial reuse. Approval for one-time disposal of domestic septage must be obtained through the health district that the one-time disposal site is located within. Written approval from the property owner must be supplied to the health district along with the request for one-time domestic septage disposal. Pumpers seeking approval of continuous domestic septage land application sites need to contact the DEQ regional offices.

One-time disposal accomplished through burial shall ensure the following:

- Complete burial is accomplished within 6 hours of domestic septage disposal.
- The disposal depth meets the separation distance requirements of IDAPA 58.01.03.008.01.c for groundwater and IDAPA 58.01.03.008.01.d for surface water.

One-time disposal accomplished through drying shall ensure the following:

- The domestic septage is pH adjusted to a pH of at least 12 for a full 30 minutes before domestic septage disposal.
- The disposal depth meets the separation distance requirements of IDAPA 58.01.03.008.01.c for groundwater and IDAPA 58.01.03.008.01.d for surface water.

Appendix N

5.12 Total Nitrogen Reduction Approvals

Revision: October 26, 2018

On-site wastewater systems that qualify as best practical methods for the targeted nitrogen reduction amount appear in Table 5-16. Areas of concern, such as nitrate priority areas, areas with shallow soils over bedrock, or a shallow depth to groundwater, may be required to use one of these best practical methods to reduce the development's or home's environmental impact. Values listed in the TN column should not be exceeded to ensure that the required TN reduction percentage is attained. These TN values may be used in NP evaluations to evaluate the impact on groundwater resources. Products installed for reduction of TN less than 27 mg/L are subject to effluent testing (section 4.8).

Table 5-16. On-site wastewater systems approved for total nitrogen reduction.

System or Manufacturer Product and Model	Total Nitrogen Reduction from influent to effluent ^a (%)	Avg. Total Nitrogen concentration of effluent ^a (mg/L)	Minimum Source Water Alkalinity ^b (mg/L)
Public Domain Systems			
Intermittent Sand Filters (ISF)	15 ^c	38	108
Recirculating Gravel Filters (RGF)	40 ^c	27	189
Drip Distribution	40^c	27	-
Extended Treatment Package Systems			
AquaKlear (245-series)	59 ^e	20	216
SeptiTech STAAR	55 ^{e,f}	20	100
Orenco–AdvanTex	65 ^{e,f}	16	269
BioMicrobics RetroFAST	65 ^f	16	110
BioMicrobics MicroFAST	65 ^f	16	110
BioMicrobics BioBarrier MBR	79 ^f	9	100
Norweco–Singulair 960 series	65 ^d	16	269
Norweco–Singulair TNT	65 ^d	16	269

a. Quantifiable values (milligram per liter [mg/L]) will indicate compliance with the qualitative total nitrogen reduction limit expressed as a percentage (%) reduction. An average influent value of 45 mg/L is used to calculate total nitrogen concentration.

b. Minimum recommended source water alkalinity to support nitrification in the denitrification process. Use of water softeners is not recommended due to potentially detrimental effects on the biological processes.

c. Literature value

d. Idaho testing

e. Third-party data

f. National Science Foundation data

Appendix O

Appendix P

4.25 Seepage Pit/Bed

Revision: April 18, 2013

Installer registration permit: Property owner or standard and basic

Licensed professional engineer required: No

4.25.1 Description

An absorption pit filled with standard drainfield aggregate.

4.25.2 Approval Conditions

1. Seepage pit disposal facilities may be used only for replacement systems on a case-by-case basis ~~within the boundaries of Eastern Idaho Public Health District (District Health Department 7) as a last resort if no other subsurface discharging alternatives are available when an applicant can demonstrate to the district director's satisfaction that the soils and depth to groundwater are sufficient to prevent groundwater contamination.~~ The district director will document all such cases ~~(IDAPA 58.01.03.008.11).~~
 - a. ~~For all other districts, replacement seepage pits may be allowable as a last resort if no other alternatives are feasible, and the site meets conditions of approval 1.a through 6 as stated herein. The district director will document all such cases (IDAPA 58.01.03.008.11) and issue the installation permit as a nonconforming permit.~~
2. ~~For all other districts, t~~The site must meet the requirements of a standard system except that it is not large enough in surface area ~~(IDAPA 58.01.03.008.11.b).~~
3. ~~Area must not have any shallow domestic, public wells, or sink holes connected by underground channels.~~ Seepage pits must meet all horizontal setback requirements in IDAPA 58.01.03.007 and IDAPA 58.01.03.008.
4. Pit bottom must be no deeper than 18 feet below the natural ground surface. The bottom of the pit must conform to the effective soil depth chart (IDAPA 58.01.03.008.012.c). *The top of the pit may be more than 4 feet below ground surface.*
5. Seepage pits may not be installed in design group C soils.
6. A test hole must be performed excavated to a depth of 6 feet below the proposed termination of the bottom of the seepage pit prior to permit issuance.

4.25.3 Sizing

The effective area of the pit may be determined from Table Error! No text of specified style in document.-1 ~~Table 4-29~~ (for round pits) and by the square footage of the pit sidewalls below the effluent pipe (rectangular beds).

Seepage bed example:

Pit dimensions are 10 feet wide x 15 feet long, and the pit is 8 feet deep below the effluent pipe:

$$(10 \text{ feet wide}) \times (8 \text{ feet deep}) = 80 \text{ ft}^2 \rightarrow (80 \text{ ft}^2) \times (2 \text{ sidewalls of the same dimension}) = 160 \text{ ft}^2$$

$$(15 \text{ feet wide}) \times (8 \text{ feet deep}) = 120 \text{ ft}^2 \rightarrow (120 \text{ ft}^2) \times (2 \text{ sidewalls of the same dimension}) = 240 \text{ ft}^2$$

$$(240 \text{ ft}^2) + (160 \text{ ft}^2) = 400 \text{ ft}^2$$

Round seepage pit example:

$$(\pi d) \times h = \text{effective disposal area}$$

d = diameter, h = height, $\pi = 3.14$

Table Error! No text of specified style in document.-129. Effective area of round seepage pits.

Diameter of Seepage Pit (feet)	Effective Depth Below Effluent Line (feet)									
	1	2	3	4	5	6	7	8	9	10
3	9	19	28	38	47	57	66	75	85	94
4	13	25	38	50	63	75	88	101	113	126
5	16	31	47	63	79	94	110	126	141	157
6	19	38	57	75	94	113	132	151	170	188
7	22	44	66	88	110	132	154	176	198	220
8	25	50	75	101	126	151	176	201	226	251
9	28	57	85	113	141	170	198	226	254	283
10	31	63	94	126	157	188	220	251	283	314
11	35	69	104	138	173	207	242	276	311	346
12	38	75	113	151	188	226	264	302	339	377

4.25.4 Construction

1. Standard drainfield aggregate must be used to fill the entire pit/bed excavation.
 - a. If seepage pit rings or structural blocks are used in pit/bed construction the aggregate will only be required to fill the excavation void around the seepage rings or structural blocks and above the seepage ring lid to a point 2 inches above the effluent pipe.
 - b. In pit/bed installations using seepage pit rings a minimum depth of 12 inches of standard drainfield aggregate must be placed below the seepage rings.
2. Effluent pipe must be covered with a minimum of 2 inches of aggregate.
3. Seepage pit/bed excavation must be covered with geotextile, straw, or untreated building paper.
4. The distribution laterals within the pit/bed should meet the requirements for the standard absorption bed (IDAPA 58.01.03.008.1009).
5. If seepage pit rings or structural blocks are used in pit/bed construction the effluent pipe may discharge into the central dump point in the ring structure lid.

6. Effluent and distribution piping used in seepage pit/beds with installation depths greater than 3 feet from grade to the top of the pit/bed installation must utilize ASTM D3034 or stronger piping to prevent piping collapse.

Appendix Q