State of Idaho
Department Of Environmental Quality
Technical Guidance Committee

Technical Guidance Committee Meeting

Agenda*

Thursday February 6, 2014

9:15 a.m. – 4:45 p.m.

Department of Environmental Quality
Conference Room C
1410 N. Hilton
Boise, Idaho

8:15 AM Call to Order/Roll Call
- Sign in sheet for attendees who wish to comment or present to the committee members
- Introduction of committee members, guests, and attendees

8:20 AM Open to Public Comment – ½ hour reserved for public to provide comments to the TGC on subjects not on the agenda

8:50 AM October 31, 2013 Draft TGC Meeting Minutes: Review, Amend, or Approve (**Appendix A**)

9:00 AM 4.24 In-Trench Sand Filter (**Appendix B**)
- Review for final approval

9:20 AM 4.4 Easement (**Appendix C**)
- Review for final approval

9:40 AM 4.25 Sand Mound (**Appendix D**)
- Review for preliminary approval

10:10 AM Break – Ten Minutes

10:20 AM 2.2 Separation Guidelines (**Appendix E**)
- Review for preliminary approval

10:45 AM 4.20 Pressure Distribution System (**Appendix F**)
- Review for preliminary approval

12:00 to 1:00 P.M. Lunch

1:00 PM 4.5 Capping Fill Trench (**Appendix G**)
- Review for preliminary approval

1:30 PM 4.9 Experimental System (**Appendix H**)
- Review for preliminary approval

2:00 PM 4.7 Drip Distribution (**Appendix I**)
- Review for preliminary approval

2:30 PM 3.2.7 Drainfield Cover and 3.2.8 Drainfield Excavation Backfilling Materials and Alternative System Construction Media (**Appendix J**)
- Review for preliminary approval

3:00 PM Break – Ten Minutes

3:10 PM 4.28 Two-Cell Infiltrative System (**Appendix K**)
- Review for preliminary approval

3:30 PM 4.22 Recirculating Gravel Filter (**Appendix L**)
- Review for preliminary approval

4:00 PM 4.10.3 Extended Treatment Package System – Operation, Maintenance, and Monitoring (**Appendix M**)
- Review for preliminary approval

4:15 PM 4.10.8 Extended Treatment Package System – Installation (**Appendix N**)
- Review for preliminary approval

4:20 PM Failure to Resample Letter (**Appendix O**)
- Review for TGC input

4:30 PM Failure to Submit Annual Report (**Appendix P**)
- Review for TGC input

4:45 PM Adjourn
- Meeting may adjourn early dependent upon discussion, interest, and participation for each agenda item
- If needed meeting will run until 4:45 PM to resolve any lingering discussions or issues on the agenda items

*Begin and end time will be observed. Agenda items and their allotted times my vary dependent upon the amount of interest and participation for each item.

The call in number is (208) 373-0101 Bridge # 1

To Join a Conference Call

1) Auto-Attendant Transfer Option

Conference Call Auto-Attendant Number:

- Extension 0101: Inside DEQ phone system
- (208) 373-0101: Outside callers

Participants call auto-attendant number and are then prompted to enter their pre-arranged conference call bridge number and in this case press the number **1**. Once the bridge number has been entered, callers are automatically connected to their conference call.

Notification

As participants are added to a conference call, an audible chime is heard by participants already connected to the call. If the conference is in progress when the chime is sounded, it is advisable to acknowledge the new participant and ask who has joined the call. This will ensure that the new caller has gained access to the proper call.

HP Rooms Instructions

To Join HP Rooms

This will allow users joining the meeting via conference call to view the same computer material that the subcommittee members are seeing at the meeting location. To hear audio users will still need to call the conference call number above from their telephone.

Due to the time limitations of this program there are two sessions that must be attended. The morning session runs from 9:00 a.m. – 12:30 p.m. (Mountain Time) and the afternoon session runs from 1:00 p.m. – 4:45 p.m. (Mountain Time). Each user must log in to each session individually once the session time begins. Login information is below.

1) Visit the Website Below

- rooms.hp.com/attend
- Enter your first and last name in the area provided
- Enter the meeting key

Meeting Keys:

- EP9XZGVVG3 (morning)
- EPRQQ7RHBN (afternoon)

Appendix A

Technical Guidance Committee Meeting

Draft Minutes

Thursday, October 31, 2013

Department of Environmental Quality
Conference Room C
1410 N. Hilton
Boise, Idaho

TGC ATTENDEES:

Tyler Fortunati, R.E.H.S., On-Site Wastewater Coordinator, DEQ
Joe Canning, P.E., B&A Engineers
Bob Erickson, Senior Environmental Health Specialist, South Central Public Health District
David Loper, Environmental Health Director, Southwest District Health Department
Michael Reno, Environmental Health Supervisor, Central District Health Department
George Miles, P.E., Advanced Wastewater Engineering, Inc. (via telephone and GoToMeeting)

GUESTS:

Chas Ariss, P.E., Wastewater Engineering Manager, DEQ
Ryan Spiers, Alternative Wastewater Systems, LLC
AJ Maupin, P.E., Wastewater Program Engineering Lead, DEQ
Kellye Eager, Environmental Health Director, Eastern Idaho Public Health Department (via telephone and GoToMeeting)
Nathan Taylor, Environmental Health Supervisor, Eastern Idaho Public Health Department (via telephone and GoToMeeting)
Janette Young, Administrative Assistant, DEQ

CALL TO ORDER/ROLL CALL:

Meeting called to order at 8:15 a.m.
Committee members and guests introduced themselves.

OPEN PUBLIC COMMENT PERIOD:

This section of the meeting is open to the public to present information to the TGC that is not on the agenda. The TGC is not taking action on the information presented.

No public comments were submitted during the allotted agenda timeframe.

MEETING MINUTES:

July 18, 2013 Draft TGC Meeting Minutes: Review, Amend, or Approve

The minutes were reviewed and no amendments were proposed.

Motion: Michael Reno moved to accept minutes as presented.

Second: Bob Erickson

Voice Vote: Motion carried unanimously.

Minutes will post as final. See DEQ website and **Appendix A**.

August 8, 2013 Draft TGC Meeting Minutes: Review, Amend, or Approve

The minutes were reviewed and no amendments were proposed.

Motion: Michael Reno moved to accept minutes as presented.

Second: Bob Erickson

Voice Vote: Motion carried unanimously.

Minutes will post as final. See DEQ website and **Appendix B**.

OLD BUSINESS/ FINAL REVIEW:

4.2 Nonprofit Corporations

This TGM Section was posted for public comment. There were no public comments received on this section.

Joe Canning expressed concern regarding the ownership requirements listed under item 11 based on the fact that the O&M Entity always needs access to the system. Based on this the verbiage of this section was changed to state that they will always have an access easement.

Motion: Joe Canning moved that the TGC recommend final approval to DEQ for Section 4.2 Nonprofit Corporations as rewritten.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously.

Section will post to TGM as final. See DEQ website and **Appendix C**.

4.10 Extend Treatment Package System

This TGM Section was posted for public comment. There were no public comments received on this section.

Joe Canning had concerns regarding the requirements surrounding the replacement of ETPS systems that are not capable of meeting the requirements of the septic permit for the property. Clarification was added to this section to state that any replacement must be capable of meeting the requirements of the septic permit.

Motion: Michael Reno moved that the TGC recommend final approval to DEQ for Section 4.10 Extended Treatment Package Systems as amended.

Second: Joe Canning

Voice Vote: Motion carried unanimously.

Section will post to TGM as final. See DEQ website and **Appendix D**.

DEQ Service and Testing Reminder – Explanation Letter
Letter 1 – It Has Come to Our Attention
Letter 2 – Voluntary Deadline to Comply

These letters were posted for public comment. There were no public comments received on any of the letters.

The TGC made a request to combine all three letter reviews and approvals into one motion. All three letters were reviewed. No changes were recommended by the TGC.

***Action Item** Mike Reno requested an additional letter be developed to be sent when an O & M has a bad sample and has failed to resample within 30 days.

Motion: Bob Erickson moved that the TGC recommend final approval to DEQ for all three letters with no changes.

Second: Joe Canning.

Voice Vote: Motion carried unanimously.

Section will post to TGM as final. See DEQ website and **Appendix E, F, and G**.

Drainfield to Surface Water Setback Determination Guidance and Model

This proposed guidance document was posted for public comment. Public comment was received from two parties: HDR Engineering, Inc. and the Idaho Conservation League.

The letter from Michael Murray, Ph.D. Soil scientist at HDR Engineering and the letter from Susan Drumheller, North Idaho Associate at Idaho Conservation League were provided to the TGC. The public comment was discussed by the TGC.
Tyler Fortunati stated that today's motion on this guidance and model is strictly whether to implement this guidance and model in the subsurface sewage disposal program. Further guidance on how this guidance would be used in the program would be developed within the Technical Guidance Manual. The TGM section regarding this model would outline what would be considered a minimal acceptable outcome of the

model. If approved for implementation today the model would not be used until the TGM guidance regarding the model was provided final approval.

Motion: Michael Reno moved to implement the Drainfield to Surface Water Setback Determination Guidance and Model in the subsurface sewage disposal program and that DEQ move forward with development of TGM guidance regarding the model.

Second: Joe Canning

Voice Vote: Motion carried with a 4-1 vote.

See DEQ website and **Appendix H**.

9:24 a.m. Break

9:38 a.m. Meeting Resumed

1.4.2.2 Extended Treatment Package System Approvals

This TGM Section was posted for public comment. There were no public comments received on this section.

Motion: Bob Erickson moved that the TGC recommend final approval to DEQ of Section 1.4.2.2 Extended Treatment Package System Approvals.

Second: Joe Canning

Voice Vote: Motion carried with 4 ayes and 1 abstained.

Section will post to TGM as final. See DEQ website and **Appendix I**.

3.2.5 and 3.2.6 Equal Distribution and Serial Distribution

This TGM Section was posted for public comment. There were no public comments received on this section.

Motion: Bob Erickson moved that the TGC recommend final approval to DEQ of Sections 3.2.5 Equal Distribution and 3.2.6 Serial Distribution.

Second: Michael Reno

Voice Vote: Motion carried unanimously.

Section will post to TGM as final. See DEQ website and **Appendix J**.

4.3 Vested Rights and Nonconforming Uses

This TGM Section was posted for public comment. There were no public comments received on this section.

Discussion by George Miles on the process homeowner needs to go through if the septic system does not have a septic permit. Mike Reno stated that the process presented in the section is what the health districts currently require. Tyler Fortunati stated that DEQ does not support the health districts issuing approvals of nonconforming systems that were installed without a permit or that did not receive an inspection prior to the system being covered without obtaining visual verification that the installation meets the requirements of IDAPA 58.01.03.

Motion: Michael Reno moved that the TGC recommend final approval to DEQ of Section 4.3 Vested Rights and Nonconforming Uses.

Second: George Miles

Voice Vote: Motion carried unanimously.

Section will post to TGM as final. See DEQ website and **Appendix K**.

2.5 Ground Water Level

This TGM Section was posted for public comment. There were no public comments received on this section.

Discussion was held on the seasonal high water table versus normal high water table and the possibility of the normal high water table occurring over a six week period that did not include the seasonal high water table. This was addressed and presented in the meeting agenda.

Motion: Joe Canning moved that the TGC recommend final approval to DEQ of Section 2.5 Ground Water Level.

Second: Bob Erickson.
Voice Vote: Motion carried unanimously.

Section will post to TGM as final. See DEQ website and **Appendix L**.

3.3 Wastewater Flows

This TGM Section was posted for public comment. There were no public comments received on this section.

The committee discussed whether the peak daily usage was to be used in system design or an overall flow average. Modification was made to the last paragraph to “average the peak daily usage”.

Bob Erickson expressed that the section should also apply to residential structures that cannot be addressed by the IDAPA 58.01.03 flow projections. The committee added language that indicates empirical data will be accepted for non-typical residential structures.

Motion: Bob Erickson moved that the TGC recommend final approval to DEQ of Section 3.3 Wastewater Flows as amended.

Second: Michael Reno.

Voice Vote: Motion carried unanimously.

Section will post to TGM as final. See DEQ website and **Appendix M.**

4.25 Sand Mound

This TGM Section was posted for public comment. There were no public comments received on this section.

Joe Canning presented his drawings and notes on Sand Mound calculations. After some discussion, the committee recommended tabling this section until additional data could be gathered and the committee has time to fully review the changes and their effect on the sand mound design. Tyler Fortunati requested that additional comments for this section be sent in by mid-December so that they can be incorporated into the revised section prior to the next TGC meeting. George Miles will provide further review and comments prior to the next meeting.

***Action Items**

- Revise the pressure distribution system section so it can be referenced in all pressurized designs and all pressurized systems are consistent.
- Include sweeping cleanouts in all pressurized designs that are accessible from grade.
- Include a monitoring port requirement over a system orifice that points up so that residual head can be tested throughout the system's life.

Motion: George Miles moved that the TGC table Section 4.25 Sand Mound for further review and revision.

Second: Joe Canning.

Voice Vote: Motion carried unanimously.

See **Appendix M**.

11:35 a.m. Break
12:00 p.m. Meeting resumed

2.2.3 The Method of 72 to Determine Effective Soil Depths to Porous Layers and Ground Water

Public comment was received on this proposed section asking for clarification on the maximum installation depth of medium sand in an in-trench sand filter design. Clarification was added to document that medium sand may be installed to any depth as long as it meets the requirements of the in-trench sand filter section of the TGM, but the drainfield (aggregate or gravelless product) may not be installed any deeper than four feet below grade.

Motion: Michael Reno moved that the TGC recommend final approval to DEQ of Section 2.2.3 The Method of 72 to Determine Effective Soil Depths to Porous Layers and Ground Water.

Second: Joe Canning.

Voice Vote: Motion carried unanimously.

Section will post to TGM as final. See DEQ website and **Appendix O.**

NEW BUSINESS/ DRAFT REVEW

4.24 In-Trench Sand Filter

David Loper asked that Figure 4-26 be moved up in the section below section 4.24.2.7.b where the figure is first referenced.
Motion: Michael Reno moved that the TGC recommend preliminary approval to DEQ of Section 4.24 In-Trench Sand Filter with the proposed amendments.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously.
See **Appendix P** and provide public comment to Tyler Fortunati at 208-373-0140 or by email at tyler.fortunati@deq.idaho.gov .

4.4 Easement

This section was reviewed and revised by the Deputy Attorney General for DEQ. The Attorney General's modifications were provided to the committee. The committee expressed concern that there is no longer a requirement to survey the easement area. The committee revised the section to require that the easement area be surveyed and monumented to allow the district to adequately assess the proposed site.

Motion: Michael Reno moved that the TGC recommend preliminary approval to DEQ of Section 4.4 Easement as amended.

Second: Joe Canning.

Voice Vote: Motion carried unanimously.

See **Appendix Q** and provide public comment to Tyler Fortunati at 208-373-0140 or by email at tyler.fortunati@deq.idaho.gov

NEXT MEETING:

The next committee meeting is scheduled to be on February 6, 2014 from 9:15 a.m. – 4:00 p.m. at the DEQ State Office building.

Motion: Bob Erickson moved to adjourn the meeting.

Second: George Miles.

Voice Vote: Motion carried unanimously.

The meeting adjourned at 12:48 p.m.

Appendix B

4.24 In-Trench Sand Filter

Revision: ~~May 1, 2000~~February 6, 2014

4.24.1 Description

An in-trench sand filter is a standard trench or bed system receiving effluent by either gravity or low-pressure flow, under which is placed a filter of medium sand meeting the definitions provided in section 2.1.4. ~~An acceptable modification~~The standard design is typically used to excavate through impermeable or unsuitable soil layers down to ~~more~~ suitable permeable ~~or suitable~~ soils. The standard design may also ~~and~~ have~~place~~ clean pit run sand and gravel placed between the medium sand and ~~more~~ the suitable permeable soils or ground water as long as minimum medium sand depths are utilized. A basic installer's permit may be used to install gravity flow in-trench sand filters that are not preceded by any complex alternative system components.

A modified design to the standard in-trench sand filter is known as the enveloped in-trench sand filter. Enveloped in-trench sand filters consist of a disposal trench with medium sand placed below and to the sides of the ~~drainrock~~ drainfield and are utilized for sites with native soils consisting of coarse or very coarse sand. A complex installer's permit is needed to install pressurized in-trench sand filters and enveloped in-trench sand filters.

The term drainfield only applies to the aggregate as defined in IDAPA 58.01.03.008.08 or the gravelless trench components approved in section 5.6 of this manual. Medium sand and pit run may be installed deeper than 48 inches below grade as long as the drainfield maintains a maximum installation depth of 48 inches below grade in compliance with IDAPA 58.01.03.008.04. Minimum installation depths must meet the capping fill trench requirements as outlined in section 4.5.

4.24.2 Approval Conditions

1. Except as specified herein, the system must meet the dimensional and construction requirements of a standard trench, bed, or pressure distribution system.
2. The in-trench sand filter or any of its modifications may be used over very porous strata, coarse sand and gravel, or ground water.
3. The standard in-trench sand filter system ~~is~~ shall be sized ~~according to~~based on the native receiving soils at the medium sand, or pit run, and native soil interface ~~or at 1.2 gallons/ft^2, whichever is less.~~.
4. Standard in-trench sand filters must maintain a 12 inch minimum depth of suitable native soil below the filter above a porous or non-porous limiting layer (see figure 4-28).
5. Standard in-trench sand filters must maintain a minimum separation distance of 12 inches from the bottom of the drainfield to the seasonal high ground water level.

6. Standard in-trench sand filters must maintain a separation distance from the bottom of the drainfield and the normal high ground water level that is capable of meeting the Method of 72 as described in section 2.2.3.2.
    a. Approval condition 6 may be waived if the standard in-trench sand filter is preceded by an alternative pretreatment system (e.g., extended treatment package system, intermittent sand filter, or recirculating gravel filter) as long as the bottom of the drainfield still meets the minimum separation distances of the applicable alternative pretreatment system (see Figure 4-29).
7. If the enveloped in-trench sand filter modification is used the following conditions must be met:
    a. Enveloped in-trench sand filters may ~~only~~ be installed in unsuitable native soils consisting of coarse sand or very coarse sand, or in suitable soils over limiting layers.
        i. Unsuitable native site soils shall be evaluated and certified to not be any larger than the diameter of very coarse sand as described in Table 2-1.
        ii. Unsuitable soils that have application rates greater than clay loam as described in Table 2-9 are not suitable for installation of an enveloped in-trench sand filter.
    b. Enveloped in-trench sand filters installed in unsuitable soils (e.g., coarse sand and very coarse sand) as described in Table 2-1 and Table 2-10 must be preceded by an alternative pretreatment system (e.g., extended treatment package system, intermittent sand filter, or recirculating gravel filter), see Figure 4-29.
        i. Enveloped in-trench sand filters installed in unsuitable soils must maintain a minimum of 12 inches above the seasonal high water level from the bottom of the enveloped sand filter.
    c. Enveloped in-trench sand filters installed in suitable soils over ground water or a porous limiting layer to obtain a reduced separation distances to the ground water or porous limiting layer shall utilize pressure distribution throughout the drainfield (see Figure 4-30).
        i. Enveloped in-trench sand filters installed in suitable soils to obtain a reduced separation distance to ground water or a porous limiting layer must maintain a minimum of:
            1. 12 inches above the seasonal high water level from the bottom of the drainfield, and
            2. 12 inches the normal high water level from the bottom of the enveloped sand filter.
        ii. Reduced separation distances to non-porous limiting layers may not be approved through use of this design.

d. The system shall be sized at 1.7 GPD/ft[2] if pretreatment is utilized. If pretreatment is not utilized they system shall be sized at 1.2 gallons/ft[2] based on the native soils at the medium sand and native soil interface.

d.e. Enveloped in-trench sand filters may not be used in Large Soil Absorption System designs.

e.f. Effective disposal area for the installation of an enveloped in-trench sand filter shall only be credited for the width of the drainfield installed. Medium sand width enveloping the drainfield is not credited as disposal area.

8. Proof of proper permits for any electrical or plumbing components of the system that are under the jurisdiction of the Idaho Division of Building Safety shall be provided as part of the permit application prior to subsurface sewage disposal permit issuance (IDAPA 58.01.03.005.04.m).

4.24.3 Design and Construction

1. Filter Medium sand used in filter construction must conform to the gradation requirements of ASTM C-33 (less than 2% may pass a #200 sieve)as described in section 2.1.4.
2. Pit run backfill material, if used, is to meet a soil design subgroup A-1 soil classification.
   a. Pit run backfill material may only be used if the minimum medium sand fill depths are met.
2.3. The following mMinimum filter medium sand depths must be usedare dependent upon site specific soil profiles. The following site specific conditions outline the minimum sand filter depths:
   a. Gravity flow system = 4 feetExcavation through an impermeable/unsuitable soil layer to access suitable soils and seasonal ground water or a porous limiting layer is not present.
      i. No minimum medium sand depth.
      i.ii. Pit run material may notonly be installed until medium sand has been installed to a depth at depths of 8 feet below grade or more, medium sand must be used from the bottom of the drainfield to a depth of 8 feet below grade.
   b. Pressure distribution = 2 feet in design group C soils 3 feet in design group A and B soilsExcavation through an impermeable/unsuitable soil layer to access suitable soils and seasonal ground water or a porous limiting layer is present (Figure 4-28).
      i. The minimum medium sand depth is dependent upon meeting the Method of 72 as outlined in section 2.2.3.2.
      ii. Pit run material may not be installed until the Method of 72 as described in section 2.2.3.2 is met.

c. Unsuitable Nnative site soils consisting of very coarse sand.

   i. The filter sand shall envelop the drainrock so that at least 1 foot of medium sand is between the drainrock and the native soils as shown in Figure 4-29.

c.d. Suitable native site soils and a seasonal ground water level or porous limiting layer is present and the drainfield is pressurized and designed with a reduced separation distance to the ground water or porous limiting layer.

   i. The filter sand shall envelop the drainrock so that at least 1 foot of medium sand is between the drainfield and the native soil as shown in figure 4-30.

   ii. The filter sand shall maintain a depth of:

      1. 2 feet below the drainfield in design group C soils

      2. 3 feet below the drainfield in design group A and B soils

   iii. A minimum of 12 inches of suitable soils must be maintained between the sand filter and the normal high ground water level or a porous limiting layer.

5. When the native soils are design subgroup A-1 or coarser, the filter sand shall envelop the drainrock so that at least 1 foot of filter sand is between it and the native soils, as shown in Figure 4-25.

6. The seasonal or normal ground water must not come within 12 inches of the bottom of the sand filter.

Figure 4-28 shows two types scenarios for use of in-trench sand filters. Figure 4-29 provides an example of an enveloped in-trench sand filter installed in unsuitable coarse native soil. Figure 4-30 provides an example of an enveloped in-trench sand filter installed in suitable native soils with a reduced separation distance to ground water or a porous limiting layer.

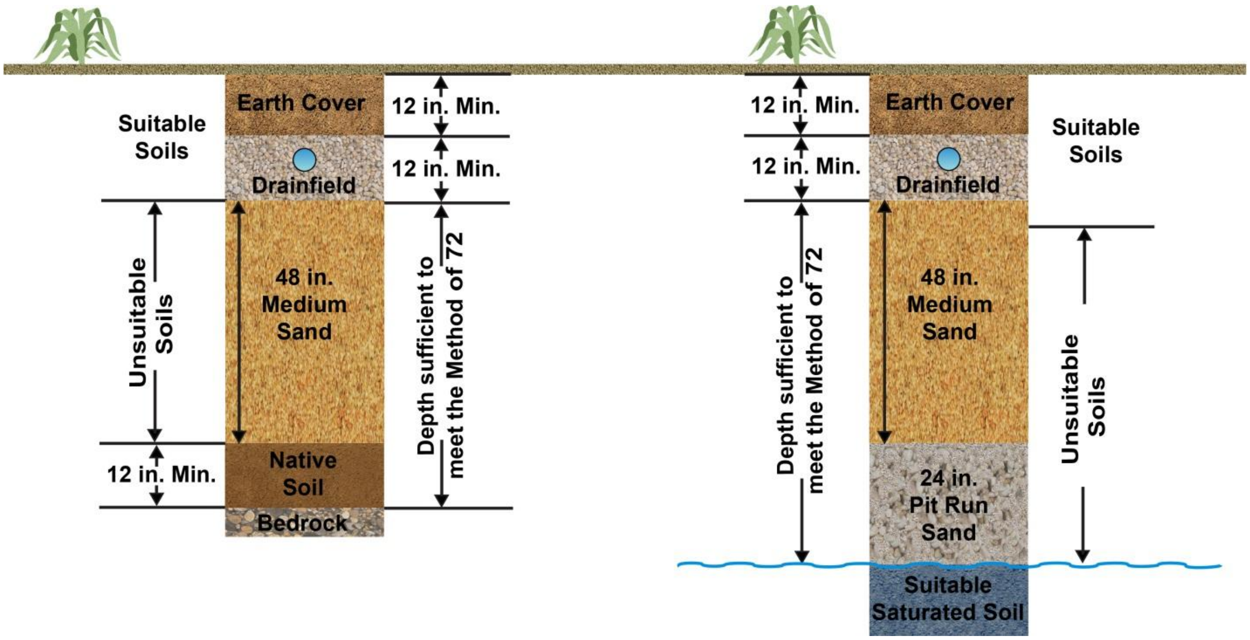


Figure Error! No text of specified style in document.**-28. In-trench sand filter accessing suitable soils through an unsuitable soil layer.**

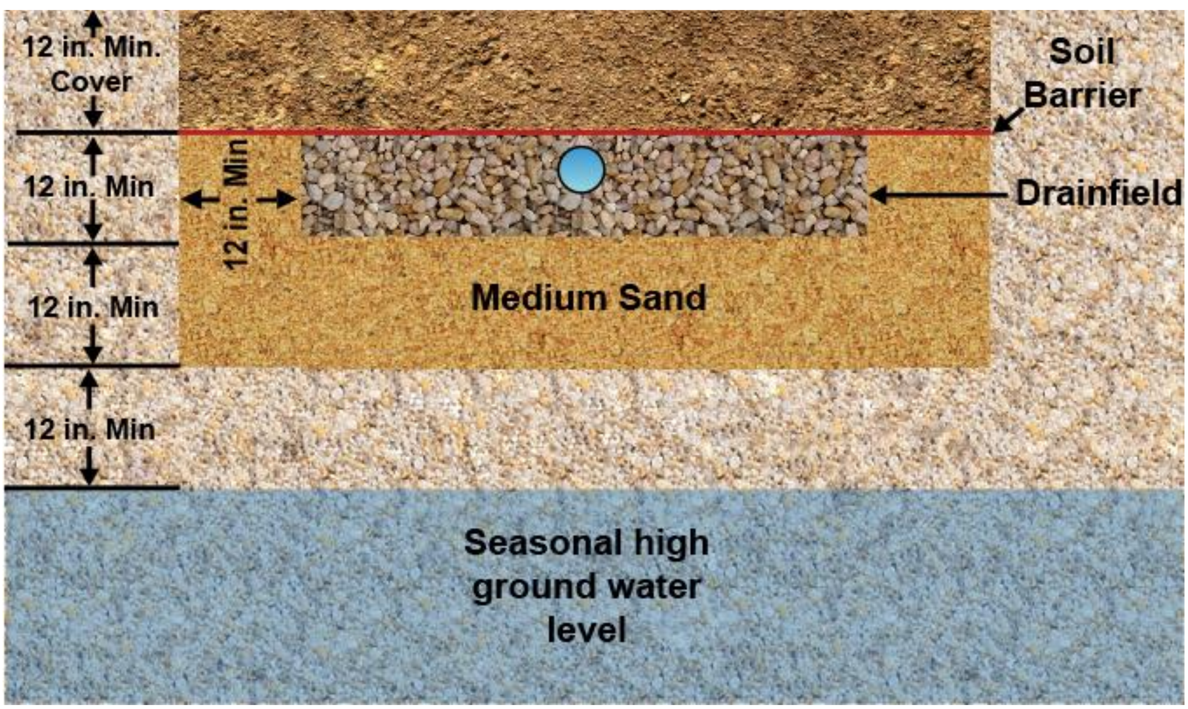


Figure Error! No text of specified style in document.**-29. Enveloped in-trench sand filter with alternative pretreatment for installation in coarse unsuitable native soils (i.e., ~~A-1~~coarse or very coarse~~r~~ sand).**

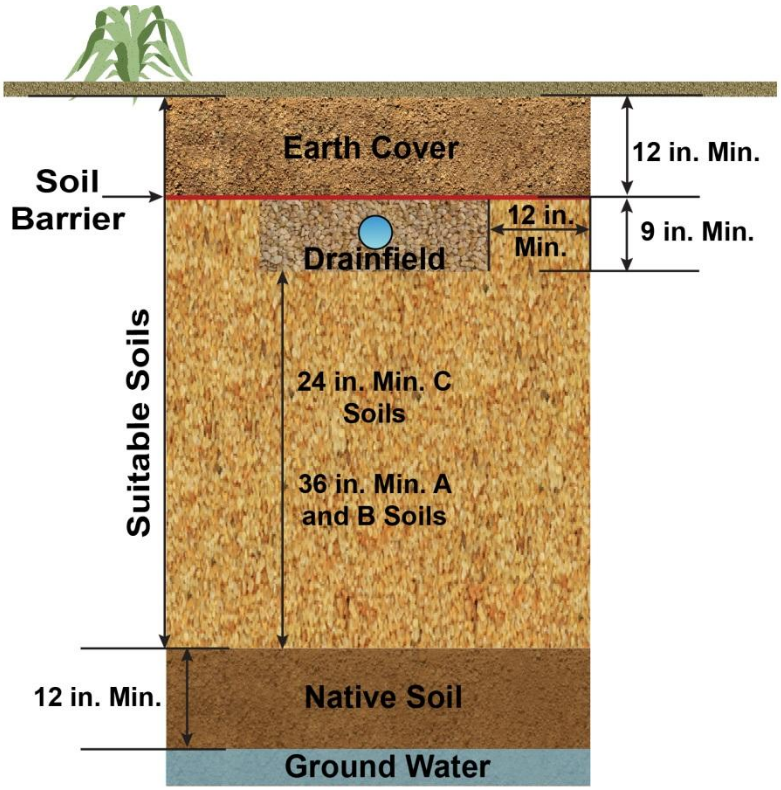


Figure Error! No text of specified style in document.**-30. Enveloped pressurized in-trench sand filter for installation in suitable soils for a reduction in separation to ground water or a porous limiting layer.**

Appendix C

4.4 Easement

Revision: ~~April 21~~February 6, 2014~~00~~

The Individual/Subsurface Sewage Disposal Rules provide that every owner of real property is responsible for storing, treating, and disposing of wastewater generated on that property. This responsibility includes obtaining necessary permits and approvals for installation of the individual or subsurface disposal system. Therefore, a property owner wishing to install an individual or subsurface disposal system must obtain a permit under these Rules, and any other necessary approval for the installation of a system, including any authorization needed to install the system on another property that does not contain the wastewater generating structure. This property may be owned by the same individual that owns the parcel with the wastewater generating structure or another individual. Consistent with this requirement, the Rules require an applicant for a permit to include in the application copies of legal documents relating to access to the system (IDAPA 58.01.03.005.04.l). This section provides guidance regarding the circumstances under which the health district should permit a system to be located on another property that does not contain the wastewater generating structure and the legal documents that must be included in or with an application for such a system.

A. The health district will consider allowing the installation of a ~~private, individual~~ subsurface sewage disposal system on ~~an adjoining~~ another property (e.g., lot, parcel, etc.) ~~owned by a second property owner~~. However, this option should be considered a last resort for use only when other practical solutions for subsurface sewage disposal are not available on the applicant's property. In addition, the entire site (i.e., the area for both the primary and replacement drainfield) on the other property must be reviewed by the health district and the site must meet all requirements of the "Individual/Subsurface Sewage Disposal Rules" (IDAPA 58.01.03).

B. The placement of an individual subsurface sewage disposal system on another property requires that an easement be in place prior to subsurface sewage disposal permit issuance. Easements are required anytime a subsurface sewage disposal system is proposed on another property regardless of property ownership. Easements will need to be obtained for each property, other than the wastewater generating parcel that the application is submitted for, that any portion of the subsurface sewage disposal system is proposed to be installed upon. ~~The following is guidance and guidelines~~provides guidance ~~for approval of an easement to construct an individual subsurface sewage disposal system:~~It is the applicant's responsibility to include an easement that:

1. Contains a sufficient description of the easement area, and of the property to be benefited by the easement (the property of the applicant).

2. Contains language that ensures that the other property can be used for the system, and that the applicant or a subsequent purchaser of the applicant's property has access to make repairs or perform routine maintenance, until the system is abandoned. The language must ensure such use and access even when the applicant's property or the other property is sold or otherwise transferred.

3. Contains language that restricts the use of the easement area in a manner that may have an adverse effect on the system functioning properly.

4. Is surveyed, including monumenting the corners of the entire easement area, to supply an accurate legal description of the easement area for both the primary and replacement drainfield areas and enable the health district to properly evaluate the site.

C. It is the responsibility of the applicant to ensure that a legally sufficient document is prepared to establish the necessary easement for the subsurface disposal system located on another property. This document must be submitted to the health district with the permit application. The health district must ensure that an easement document is included in the application. However, the health district does not have the expertise, nor is it the duty of the health district, to determine the legal adequacy of the easement document, and the issuance of a permit does not in any way represent or warrant that an easement has been properly created. In order to issue a permit that includes a system on another property, the health district must ensure that the easement document included with the application:

1. Has been prepared by an attorney.

2. Has been recorded in the county with jurisdiction. Evidence that the document has been recorded must be provided.

If the easement document meets the above two criteria, the health district may issue a permit. It is not the health district's responsibility to ensure the easement document meets the requirements in section B above. It is the responsibility of the applicant and the applicant's attorney to ensure the easement is legally sufficient and will meet the requirements in section B.

5. ~~The entire site (i.e., the area for both the primary and replacement drainfield) for the proposed easement area must be reviewed by the health district for approval prior to recording and surveying of the easement and issuance of the permit.~~

6. ~~Site must meet all requirements of the "Individual/Subsurface Sewage Disposal Rules" (IDAPA 58.01.03) (section 8.1), including but not limited to soils, setbacks,slope, and sufficient area for the original primaryand replacement drainfields, and slope~~.

7. ~~The easement is to be professionally prepared by an attorney and recorded in the county courthouse of local jurisdiction, or a written agreement prepared from the grantor granting an easement to the grantee, both of which will be surveyed and recorded after the system is installed. A copy of the easement is to be made available to the local health district and attached to the sewage disposal permit before final permit approval.~~

   a. ~~AThe easement shall include a survey, including monumenting the corners of the entire easement area, of the proposed easement site shall be made to supply an accurate legal description of the easement and enable the health district to properly evaluate the site.~~

   b. The entire easement area shall be monumented at all corners to identify the area of system placement prior to permit issuance and the monuments should be identified on the easement survey.

8. The easement shall be signed by all individuals or entities listed on the deed or title for each impacted property.

9. A copy of the easement is to be provided to the local health district prior to permit issuance.

8.10. A copy of the recorded easement and survey is to be provided to the local health district prior to final permit approval.

9. The attorney shall include in the written easement the following items:

   a. Easement shall be in perpetuity or until the system is abandoned by the grantee.

   b. Grantor is to be protected with enforceable provisions that will require the owner of the system to make repairs as needed.

   c. Grantee is to have access to the system to make repairs or perform routine maintenance.

   d. Grantee must have ability to restrict any use of the easement area that may have an adverse effect on the system functioning properly.

10.11. A survey, including monumenting the corners, of the proposed easement site shall be made to supply an accurate legal description of the easement and enable the health district to properly evaluate the site.

4.4.1 Easement Restrictions

1. Effluent transport pipes for separate properties should not occupy the same trench within an easement.

2. If easements for drainfields under separate ownership result in more than 2,500 gallons per day of effluent being disposed of on the same property then the drainfields must be designed as a Large Soil Absorption System and undergo a Nutrient-Pathogen Evaluation.

1.3. Easement boundaries that are not adjacent to the grantee's property line must meet the separation distance of 5 feet between the drainfield and/or septic tank and the easement boundary.

Appendix D

4.25 Sand Mound

Revision: ~~October 23, 2012~~February 6, 2014

4.25.1 Description

A sand mound is a soil absorption facility consisting of a septic tank, ~~pumping~~ dosing chamber ~~or dosing siphon and chamber~~, mound ~~fill~~ constructed of ~~selected~~ medium sand, ~~with~~ a pressurized small-diameter pipe distribution system, ~~cap,~~ and topsoil cap. ~~Figure 4-26~~ Figure 4-30 provides a diagram of a sand mound.

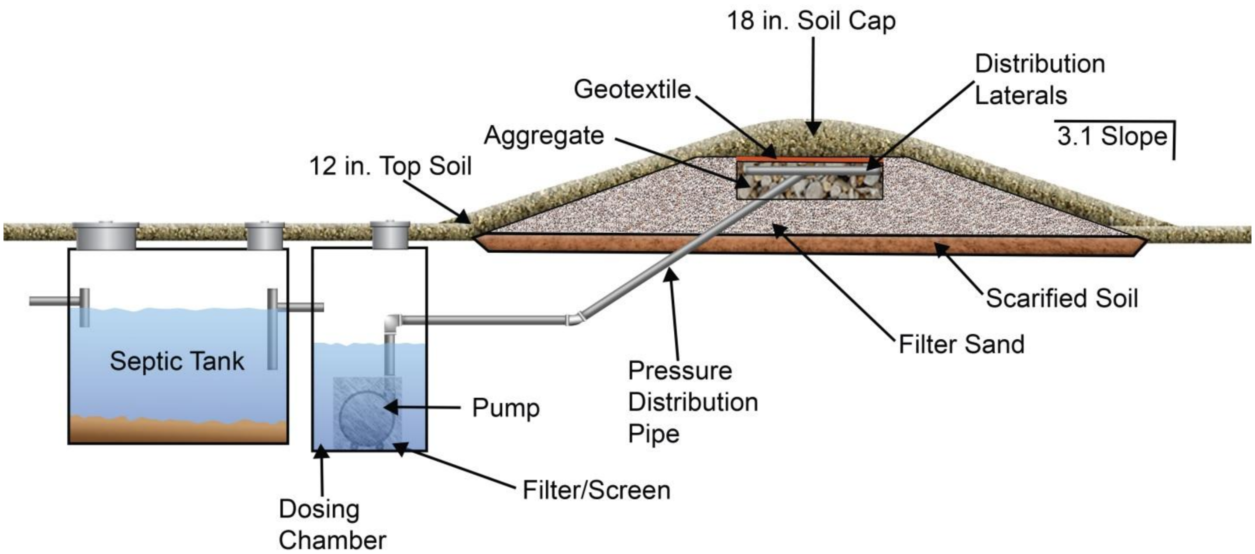


Figure 4-30. Cross sectional view of sand mound.

4.25.2 Approval Conditions

1. Effective soil depth to limiting layers may vary depending upon thickness of filter sand beneath the absorption bed:
   a. If 12 inches of filter sand is placed beneath the absorption bed, then Table 4-23 lists the minimum depth of natural soil to the limiting layer.
   b. If 24 inches of filter sand is placed beneath the absorption bed, and the dosing recommendations in section 4.25.4 are met, then Table 4-21 in Section 4.23 "Intermittent Sand Filter," identifies the effective soil depth to limiting layers.
2. The soil application rate used in the sand mound design is based on the most restrictive soil layer within the soil profile's effective soil depth as determined based on approval condition 1 except that the effective sizing depth shall not be less than 18 inches.
3. ~~For soil textural classifications of sandy clay, silty clay, clay, or coarser-textured soils with percolation rates from 60 to 120 minutes/inch, the minimum depth of natural soil to the limiting layer shall conform to soil design group C.~~

3. Table 4-24 shows the maximum slope of natural ground, listed by soil design group.
4. Sand mound must not be installed in flood ways, areas with large trees and boulders, in concave slopes, at slope bases, or in depressions.
5. Minimum pretreatment of sewage before disposal to the mound must be a septic tank sized according to IDAPA 58.01.03.007.07.
6. The maximum daily wastewater flow to any mound or absorption bed cell must be equal to or less than 1,500 GPD.
7. Multiple mounds, or absorption bed cells, may be used to satisfy design requirements for systems larger than 1,500 GPD.
    a. Appropriate valving should be used in the design to ensure that flows are evenly divided between all of the mounds or absorption bed cells.
    b. Valving should be accessible from grade and insulated from freezing.
8. Design flow must be 1.5 times the wastewater flow.
9. Pressure distribution system design shall conform to section 4.20 of this manual.
10. Proof of proper permits for any electrical or plumbing components of the system that are under the jurisdiction of the Idaho Division of Building Safety shall be provided as part of the permit application prior to subsurface sewage disposal permit issuance (IDAPA 58.01.03.005.04.m).

Table 4-23. Minimum depth of natural soil to limiting layer.

Soil Design Group	Extremely Impermeable Layer (feet)	Extremely Permeable Layer (feet)	Normal High Ground Water (feet)
A, B	3	3	3
C	3	2	2

Table 4-24. Maximum slope of natural ground.

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

4.25.3 Design

1. Absorption ~~Bed~~ bed design:

   a. Only absorption beds may be used. The maximum absorption bed disposal area should be 2,250 ft^2 (A x B). Beds ~~in commercial or large systems~~ should be a maximum of ~~15 feet wide (B ≤ 15 feet), and beds for individual dwellings a maximum of~~ 10 feet wide (B ≤ 10 feet). Beds should be as long and narrow as practical, particularly on sloped ground, to minimize basal loading. It is recommended that beds be less than 10 feet wide if site conditions will allow.

   b. If multiple absorption bed cells are used in a sand mound design a separation distance of 10 feet should be maintained between each cell (see Figure 4-31).

   c. Absorption bed cells should only be placed end to end in a single mound design.

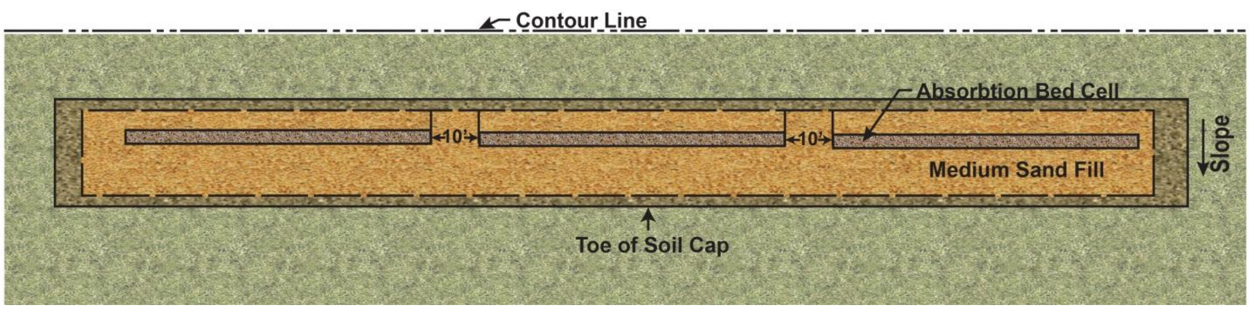


Figure 4-31. Multiple absorption bed cells installed in one sand mound.

   d. Application rate of effluent in the sand bed should be calculated at 1.0 gallon/ft^2 (sand HAR = 1.0 gallon/ft^2).

   ~~e. Absorption beds for commercial establishments that discharge other than normal strength domestic waste should be sized at 0.5 gallon/ft^2 or 40 pounds BOD/acre/day, whichever is greater.~~

   ~~f.~~ e. Absorption bed must be filled with 9 inches of clean drainrock, 6 inches of which must be below the pressurized distribution pipes.

   f. ~~Drainrock portion of the sand mound~~ The absorption bed drainrock must be covered with a geotextile after installation and testing of the pressure distribution system.

   g. Two observation ports should be installed extending from the drainrock/medium sand interface through the soil cap at approximately the ¼ and ¾ points along the absorption bed. The observation ports should contain perforations in the side of the pipe extending up 4 inches from the bottom of the port. Observation ports must be capped.

   h. Absorption bed disposal area or dimensions may not be reduced through the use of extra drainrock, pretreatment, or gravelless drainfield products.

i. Pressurized laterals within the absorption bed should not be further than 24 inches from the absorption bed sidewall and should not be spaced farther than 48 inches between each lateral within the absorption bed.

~~g.~~j. Orifice placement should be staggered between neighboring laterals.

2. Medium ~~Sand~~ sand fill design:

a. ~~Filter~~ Mound sand fill must conform to ~~ASTM C-33, with less than 2% passing the #200 sieve~~the medium sand definition provided in section 2.1.4 of this manual. ~~A manufactured sand is recommended.~~

b) Minimum depth of medium sand below the absorption bed shall be 1 foot.

c) Medium sand fill shall extend out a minimum of 24 inches level from the top edge of the absorption bed on all sides (medium sand fill absorption perimeter), and then uniformly slope as determined by the mound dimensions and the slope limitations as described in 4.25.3.2.f.

~~b)~~d) Flat sites: The effective area will be A x (C+B+D+2(H)).

~~c)~~e) Sloped sites: The effective area will be A x (B+D+H).

Equation 4-16 shows the calculation for the absorption bed area.

$$\frac{\text{Design Flow (GPD)}}{\text{Soil Application Rate }\left(\text{GPD}/\text{ft}^2\right)}$$

Equation 4-16. Effluent application area.

f) Slope of all sides must be 3 horizontal to 1 vertical (3:1) or flatter.

~~d)~~g) Sand fill area must be as long and narrow as practical, with plan view dimension G exceeding dimension F (Figure 4-31).

~~e)~~h) Slope correction factors as provided in Table 4-25 should be used to determine the downslope width of the medium sand fill for sloped sites.

i) Slope correction factors as provided in Table 4-26 should be used to determine the upslope width of the medium sand fill for sloped sites.

Table 4-25. Down slope correction factors (DCF) for sloped sites.

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

Table 4-26. Up slope correction factors (UCF) for sloped sites.

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	0.62

Figure 4-32 and Figure 4-33 can be used with Table 4-27 and Table 4-28 (sand mound design checklist) for flat and sloped sites.

3. Soil cap design:

   a) Sand mound must be covered with a minimum topsoil depth of 12 inches. The soil cap at the center of the mound must be crowned to 18 inches to promote runoff.

   f)b) Topsoil and soil cap must be a sandy loam, loamy sand, or silt loam. Soils meeting the soil design group classifications of A and C shall not be used for the topsoil and soil cap cover.

   c) Mound should be protected to prevent damage caused by vehicular, livestock, or excessive pedestrian traffic. The toe of the mound must be protected from compaction.

   g)d) Mounds on slopes should have design considerations taking surface runoff diversion into account.

   h)e) Sand fill area must be as long and narrow as practical, with plan view dimension G exceeding dimension F (Figure 4-27).

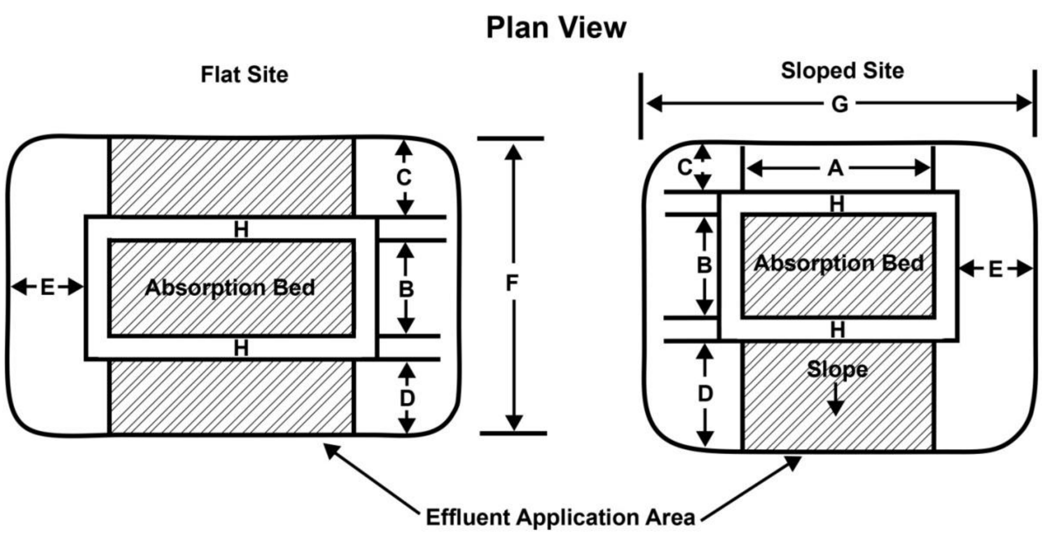


Figure 4-32. Design illustrations for sand mound installation on flat and sloped sites (use with sand mound design checklist).

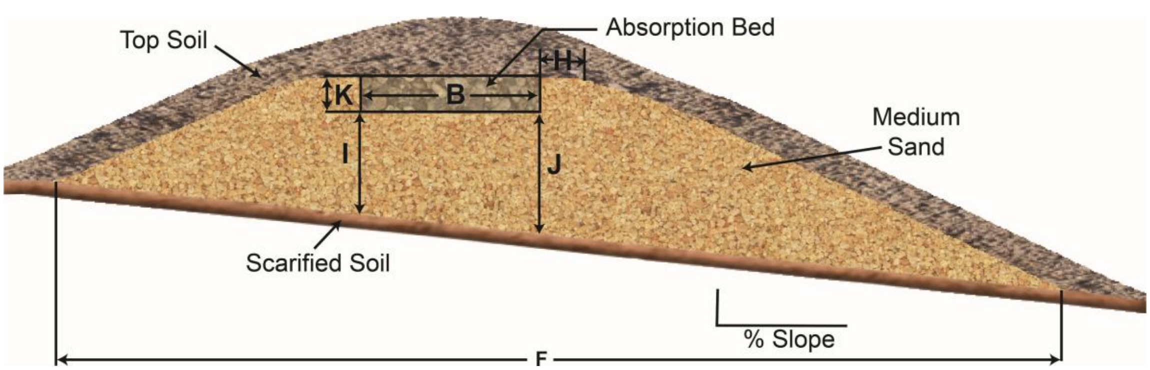


Figure 4-33. Design dimensions for use with the sand mound design checklist.

Table 4-27. ~~Sample~~ Example sand mound design checklist.

	Sand Mound Design Checklist **(Example for a three-bedroom house on soil design subgroup B-2 soils, flat site, 12 inch medium sand fill depth below absorption bed)**	
1	Determine soil application rate (AR) (Example: B-2 soil)	AR = GPD/ft^2 (Example: 0.45 GPD/ft^2)
2	Determine daily flow rate (DFR) (Example: 250 GPD x 1.5 safety factor)	DFR = GPD x 1.5 (Example: 375 GPD)
	Absorption Bed Design	
3	$Area = \dfrac{Daily\_Flow\_Rate\_GPD(\#2)}{Sand\_Application\_Rate\_{}^{GPD}/_{ft^2}\,(1.0\_{}^{GPD}/_{ft^2})}$	Area = ft^2 (Example: 375 ft²)
4	Width (B): $Width\_(B) = \sqrt{\dfrac{Area\_(\#3) \times Soil\_AR\_(\#1)}{Sand\_Application\_Rate\_(1.0\,{}^{GPD}/_{ft^2})}}$ Maximum bed width: ~~Commercial = 15 feet~~ ~~Residential =~~ 10 feet *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.* Example: $Width\_(B) = \sqrt{\dfrac{(\#3 \times \#1)}{1.0\,{}^{GPD}/_{ft^2}}} \approx 13\,ft$	Width (B) = feet (Example: 13 feet or 10 feet max) (Example: use 10 feet)
5	Length (A): $Length\_(A) = Area\_(\#3)/Width\_(\#4)$ (Example: 375 ft²/10 feet)	(A) feet (Example: 37.5 feet)
	Sand Mound Design	
6	Total area (TA): $TA = DFR\_(\#2)/soil\_AR\_(\#1)$ (Example: 375 gallon/0.45 gallon/ft^2)	TA = ft^2 (Example: 833 ft²)
~~7~~	~~Medium sand fill absorption bed perimeter area (SFAP):~~ ~~Flat Site: SFAP = 2 x [2 feet x length (#5)]~~ ~~Sloped Site: SFAP = 2 feet x length (#5)~~ ~~(Example: 2 x [2 feet x 37.5 feet])~~	~~SFAP = ft^2~~ ~~(Example: 150 ft^2)~~
~~8~~7	~~Effluent application area (EAA) = Total area (bed area + SFAP):~~ ~~EAA = TA (#6) – [Area (#3) + SFAP (#7)] = (Example: 833 ft^2 – [375 ft^2 + 150 ft^2] = 458 308 ft^2)~~	~~EAA = ft^2~~ ~~(Example: 458 308 ft²)~~

7~~8~~	Flat site perimeter (C,D): ~~0.5 x [EAA (#78)/length (#5)]~~ (I + K) x 3 *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 14.*	(C) = (D) = feet (5.25 feet minimum for 3:1 slope in 12 in. mound, 8.25 feet minimum for 3:1 slope in 24 in. mound)
	(Example: ~~0.5 x [458 308 ft²/37.5 feet] = 64.1 feet~~ (1 foot + 0.75 foot) x 3 = 5.25)	(Example: ~~64.1 feet, use default of~~ 5.25 feet~~to meet minimum slope~~)
8~~9~~	Sloped site: Downslope length (D) = ~~[EAA (#78)/length (#5)] x DCF~~ [(I) + ((B + H) x slope as a decimal) + (K)] x (3) x 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 14.* *Example based on 5% slope:* (Example: D = ~~[458 383 ft²/37.5 feet] x 1.0 = 1210.2 feet)~~ [(1 foot) + ((10 feet + 2 feet) x 0.05) + (0.75 feet)] x (3) x 1.18 = 8.32) → adjusted to 10.3 feet after step 14	(D) = feet (Example: ~~1210.2 feet~~8.32 feet → 10.3 after step 14 adjustments)
9~~0~~	Sloped site: Upslope (C) = [(~~Bed depth + max. sand depth~~[(I + K) x 3] x UCF *Downslope length must result in a maximum slope of 3:1.* Example based on 5% slope: (Example: C = [(~~0.75~~1.0 f~~oo~~t + ~~1.0~~0.75 feet) x 3] X 0.87 = ~~5.25~~4.6 feet)	(C) = feet (Example: ~~5.25~~4.6 feet)
10~~1~~	Flat site: End slope (E) = (~~Bed depth + max. sand depth~~ I + K) x 3 *End slope length must result in a maximum slope of 3:1.* (Example: [1.0 foot + 0.75 feet] x [3] = 5.25 feet)	(E) = feet (Example: 5.25 feet)
11	Sloped site: End slope (E) = (J + K) x 3 *End slope length must result in a maximum slope of 3:1.* Example based on 5% slope: (Example: [1.5 feet + 0.75 feet] x [3] = 6.75 feet)	(E) = feet (Example : 6.75 feet)
12~~2~~	Total width (F) = B + C + D + 2(H) (Flat site example: 10 feet + ~~6.1~~5.25 feet + ~~6.1~~5.25 feet + 4 feet = 2~~2~~4.~~2~~25 feet)	(F) = feet (Example: ~~22.2~~24.5 feet)
	(Sloped site example (5%): 10 feet + ~~5.25~~4.6 feet + ~~12.2~~8.32 feet + 4 feet = ~~27.45~~26.9 feet) → adjusted to 28.9 after step 16	(Example: ~~27.45~~26.9 feet → 28.9 after step 16 adjustments)

13~~3~~	Total length (G) = A+(2 x E) + 2(H) (G > F)	(G) = feet
	(Flat site example: [G] = 37.5 feet + [2 x 5.25 feet] + 4 feet = ~~48~~52 feet)	(Example: ~~48~~52 feet)
	(Sloped site example (5%): [G] = 37.5 feet + [2 x 6.75 feet] + 4 feet = 55 feet)	(Example : 55 feet)
	Total Area Verification	
14	Flat site: Design area (DA) = A x F [DA ≥ TA(#6)]	DA = ft^2
	(Example: [37.5 feet x 24.5 feet] = 918.75 ft^2; (918.75 ft^2 ≥ 833 ft^2)	Example: 919 ft^2
15	Sloped site: Design area (DA) = A x (B + D + H) [DA ≥ TA(#6)]	DA = ft^2
	(Example (5%): 37.5 feet x [10 feet + 8.32 feet + 2 feet] = 762 ft^2); (762 ft^2 ≤ 833 ft^2) → 71 ft^2 needed → expand D = 71 ft^2/37.5 feet = 1.9 feet → D = 8.32 feet + 1.9 feet = 10.22 → 10.3 feet (go back and adjust steps 8, 12, and 15)	Example: Adjust steps 8, 12, and 15 to meet minimum TA requirements
	Finished Mound Dimensions (Sand Mound + Soil Cap)	
1~~4~~6	Sand mound length + 6 feet min. (G + 6)	(G+6) = feet
	(Flat site example: ~~48~~52 feet + 6 feet = 5~~4~~8 feet)	(Example: 5~~4~~8 feet)
	(Sloped site example: 55 feet + 6 feet = 61 feet)	(Example: 61 feet)
1~~5~~7	Sand mound width + 6 feet min. (F + 6)	(F+6) = feet
	(Flat site example: ~~22.2~~24.5 feet + 6 feet = ~~28.2~~30.5 feet)	(Example: ~~28.2~~30.5 feet)
	(Sloped site example: ~~27.45~~28.9 feet + 6 feet = ~~33.45~~34.9 feet)	(Example: ~~33.45~~34.9 feet)

Note: gallons per day per square foot (GPD/ft^2), downslope correction factor (DCF), upslope correction factor (UCF), total area (TA), design area (DA), effluent application area (EAA), sand fill absorption perimeter (SFAP), daily flow rate (DFR), soil application rate (AR)

4.25.4 Construction

1. Pressure line from the dosing chamber should be installed first~~ and should be located upslope of the mound~~.
   a. The pressure line should slope down to the pump so that the pressure line will drain between discharges.
   b. If a downward slope from the mound to the pump chamber is not practical due to length of run, then the pressure line should be laid level below the anticipated frost line for that region.
   c. If the sand mound is located downslope of the pump chamber, consider using anti-seep collars on the trench. ~~If a pump is to be used, the pressure line should slope down to the pump so that the pressure line will drain between discharges.~~

2. Grass~~,~~ and shrubs~~, and trees~~ must be cut close to ground surface and removed from the mound site.

   a. If extremely heavy vegetation or organic mat exists, these materials should be removed before scarification and replaced with filter sand (typically 3 or 4 inches of filter sand is added~~.~~).

   b. Larger than two inch caliper trees and large boulders are not to be removed. Trees should be cut as close to ground level as possible and the stumps left in place. If stumps or boulders occupy a significant area in the mound placement area, additional area should be calculated into the total basal area of the mound to compensate for the lost infiltrative area.

~~2.~~3. When the soil is dry, and site vegetation has been cut or removed the ground in the basal placement area of the sand ~~fill~~ mound should ~~then~~ be scarified or ripped to a depth of 6–8 inches. Scarification/ripping is important to provide vertical windows in the soil. ~~Tree stumps are not to be removed. If stumps are numerous, additional area should be calculated into the total sand area to compensate for the lost area.~~

~~3.~~4. Sand fill will then be placed and shaped before it freezes or rains. No vehicles with pneumatic tires should be permitted on the sand or ~~plowed~~ scarified area to prevent the soils from being compacted. For sloped sites, all work ~~is~~ should be done from the upslope side of the mound placement area if possible.

5. Absorption bed will be shaped and filled with clean drainrock. The bottom of the absorption bed should be constructed level on all sites regardless of slope.

~~4.~~6. Two observation ports should then be installed extending from the drainrock/medium sand interface through the soil cap at approximately the ¼ and ¾ points along the absorption bed. The observation ports should contain perforations in the side of the pipe extending up 4 inches from the bottom of the port. Observation ports must be capped.

~~5.~~7. After leveling the drainrock, the low-pressure distribution system manifold and laterals will be installed. The system should be tested for uniformity of distribution.

~~6.~~8. Geotextile must be placed over the absorption bed and backfilled with 12 inches of soil on the sides and shoulders, and 18 inches of soil on the top center. Soil types must be sandy loam, loam~~y sand~~, or silt loam.

~~7.~~9. Typical lawn grasses ~~and~~ or other appropriate low-profile vegetation should be established on the mound cap as soon as possible, preferably before the system is put into operation. Do not plant trees or shrubs on the mound, or within the mature rooting radius of the tree or shrub. Trees with roots that aggressively seek water ~~must~~ should be planted at least 50 feet from the mound (~~e.g~~i.e., poplar, willow, cottonwood, maple, elm, etc.).

~~8.~~10. Mounds placed up and down slope from each other should maintain a mound-toe to mound-toe separation distance of 35 feet (Figure 4-34).

   a. The first 15 feet below the upslope mound should remain free of traffic and other activities resulting in soil compaction.

b. The 20 feet above the downslope mound should be maintained for construction of the downslope mound.

9.11. A separation distance of 15 feet should be maintained from the toe of each mound when multiple mounds are constructed on the same elevation contour.

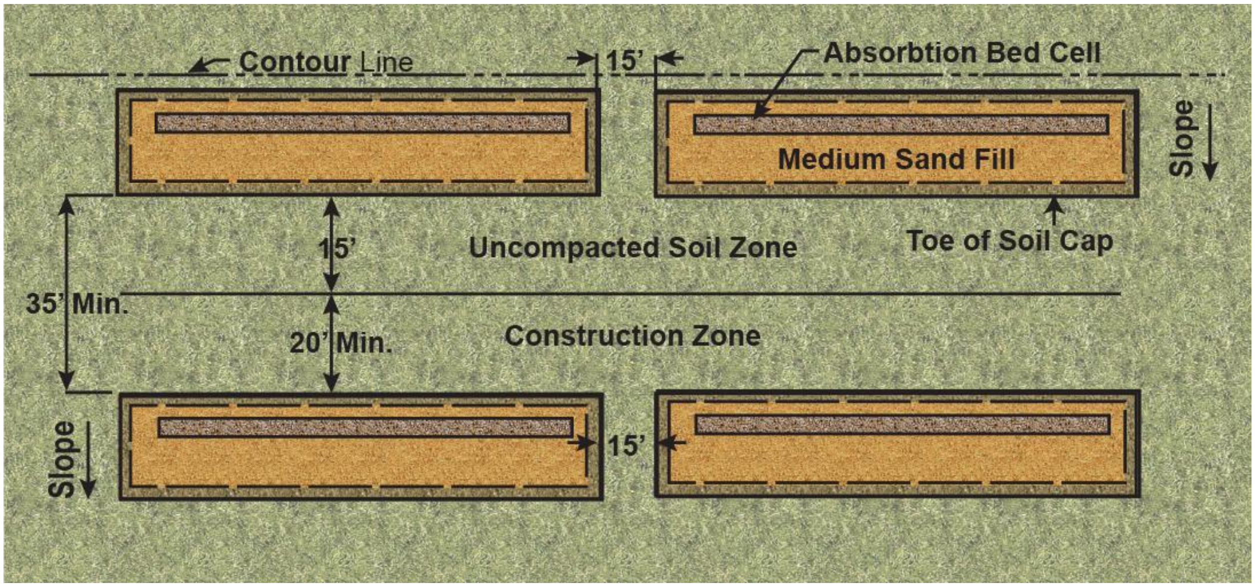


Figure 4-34. Mounds placed up- and downslope of one another.

10. A standpipe must be installed within the bed, down to the fill sand, so that ponding water can be measured periodically.

4.25.5 Inspections

1. Site inspections must be made by the Director before, during, and after constructionshall be conducted by the Director at the following minimum intervals (IDAPA 58.01.03.011.01):.
   a. Pre-construction
      i. Recommended that pre-construction conference be conducted with the Director, design engineer, complex installer, and property owner (if available) present.
   b. During construction as needed
      i. Scarification, pressure line installation, medium sand mound construction, absorption bed construction, pressure distribution piping.
   c. Final construction inspection
      i. Pump drawdown/alarm check, pressure test of distribution network, soil cap material and placement
2. The dDesigner engineer or owner must certify that the system has been installed according to the approved plans and provide as-built plans for the sand mound construction (IDAPA 58.01.03.005.15).

4.25.6 Operation and Maintenance

An operation and maintenance manual shall be developed by the system's design engineer that contains the following minimum requirements and shall be submitted as part of the permit application (IDAPA 58.01.03.005.14):

1. Operation and maintenance is the responsibility of the system owner.
2. Sludge depth in the septic tank should be checked annually and the tank should be pumped when the sludge exceeds 40% of the liquid depth.
3. All pump and pump chamber alarm floats and controls should be inspected on a regular schedule to ensure proper function.
4. Pump screens and effluent filters should be inspected regularly and cleaned. All cleaning byproducts should be discharged to the septic tank.
5. Sand mound observation port caps should be removed and the monitoring ports observed for ponding. Corrective action should be taken if ponding is present as specified by the system design engineer.
6. Observation ports for testing of residual head should be inspected regularly to ensure the residual head meets the system design minimum residual head.
7. Lateral flushing should occur annually to ensure any biomat buildup is removed from the distribution lateral.
8. Any valving for sand mounds containing multiple absorption bed cells should be inspected and verified to be functioning properly on a regular schedule.
9. Any other operation and maintenance as recommended by system component manufacturers and the system design engineer.

Table 4-27 is a sample sand mound design checklist, and Table 4-28 is a blank checklist for sand mound design.

Table 4-28. Sand mound design checklist.

	Sand Mound Design Checklist	
1	Determine soil application rate (AR)	AR = ________GPD/ft^2
2	Determine daily flow rate (DFR) *DFR = GPD x 1.5*	DFR = ________GPD
	Absorption Bed Design	
3	$Area = \frac{Daily\_Flow\_Rate\_GPD(\#2)}{Sand\_Application\_Rate\_{GPD}/_{ft^2}\left(1.0\_{GPD}/_{ft^2}\right)}$	Area = ________ft^2
4	Width (B): $Width\_(B) = \sqrt{\frac{Area\_(\#3) \times Soil\_AR\_(\#1)}{Sand\_Application\_Rate\_\left(1.0\,{GPD}/_{ft^2}\right)}}$ Maximum bed width: ~~Commercial = 15 feet~~ ~~Residential =~~ 10 feet	Width (B) = ________ft
5	Length (A): $Length\_(A) = Area\_(\#3)/Width\_(\#4)$	(A) ________ft

	Sand Mound Design	
6	Total area (TA): $EAA = DFR\_(\#2)/soil\_AR\_(\#1)$	TA = ________ft^2
~~7~~	~~Medium sand fill perimeter area (SFAP)~~ ~~Flat site: SFAP = 2 x [2 feet x length (#5)]~~ ~~Sloped site: SFAP = 2 feet x length (#5)~~	~~SFAP = ________ft^2~~
~~7~~8	~~Effluent application area (EAA) = Total area – (Bed area + SFAP): EAA = TA (#6) – [Area (#3) + SFAP (#7)]~~	~~EAA = ________ft^2~~
~~8~~7	Flat site perimeter (C,D): ~~0.5 x [EAA (#78)/length (#5)]~~ (I + K) x 3 (5.25 feet minimum for 12 in. mound, 8.25 feet minimum for 24 in. mound)	(C) = (D) = ________ft
~~9~~8	Sloped site: Downslope length (D) = ~~[EAA (#78)/length (#5)]~~ [((B + H) x (slope as a decimal) + (K)] x (3) x DCF	(D) = ________ft
~~10~~9	Sloped site: Upslope (C) = ~~[(Bed depth + max. sand depth)~~ [(I + K) x 3] x UCF	(C) = ________ft
~~11~~10	Flat site: End slope (E) = (~~Bed depth + max. sand depth~~ (I + K) x 3	(E) = ________ft
11	Sloped site: End slope (E) = (J + K) x 3	(E) = ________ft
~~12~~12	Total width (F) = B + C + D + 2(H)	(F) = ________ft
~~13~~13	Total length (G) = A+(2 x E) + 2(H) (G > F)	(G) = ________ft
	Total Area Verification	
14	Flat site: Design area (DA) = A x F [DA ≥ TA(#6)]	DA = ________ft^2 ≥ #6
15	Sloped site: Design area (DA) = A x (B + D + H) [DA ≥ TA(#6)]	DA = ________ft^2 ≥ #6
	Finished Mound Dimensions (Sand Mound + Soil Cap)	
~~14~~16	Sand mound length + 6 feet min. (G + 6)	(G+6) = ________ft
~~15~~17	Sand mound width + 6 feet min. (F + 6)	(F+6) = ________ft
Note: gallons per day per square foot (GPD/ft^2), downslope correction factor (DCF)		

Appendix E

2.2 Separation Guidelines

Revision: ~~October 31, 2013~~February 6, 2014

2.2.1 Separation Distance Hierarchy

Separation distances to features of concern or interest are required by IDAPA 58.01.03. Separation distances include vertical and horizontal separation distances, including effective soil depths, to features of concern, interest or limiting layers. Section 2.2 of this manual also provides guidance on the reduction of separation distances based on site specific conditions. The guidance on the reduction of separation distances is in place to help find permitting solutions for difficult sites that may not be able to meet the full separation distances required by IDAPA 58.01.03. These reductions should only be granted after it is documented that the site cannot meet the separation distances required by IDAPA 58.01.03. When performing a site evaluation for the issuance of a subsurface sewage disposal permit the following separation distance hierarchy should be followed:

1. IDAPA 58.01.03
2. Technical allowance (IDAPA 58.01.03.010.01)
3. TGM Guidance
4. Variance (IDAPA 58.01.03.010.02-.06)

This hierarchy does not apply to specific alternative system guidance for the reduction of effective soil depth to limiting layers. If the guidance from section 2.2 of this manual is utilized for any new or replacement subsurface sewage disposal permit, then complete justification must be included in the permit documentation explaining why this guidance was used over the requirements of IDAPA 58.01.03.

~~2.2.1~~2.2.2 Effective Soil Depth to Porous Layers or Ground Water

Table 2-6 provides guidance for determining effective soil depth from the bottom of absorption fields to very porous layers or to normal high ground water.

Table 2-6. Minimum effective soil depth (feet) by soil design subgroup to the limiting layer.

Limiting Layer	Soil Design Subgroup (feet)					
	A-1	A-2	B-1	B-2	C-1	C-2
Fractured bedrock or other porous layer	6	5	4	3	3	2.5
Normal high ground water	6	5	4	3	3	2.5
Seasonal high ground water	1	1	1	1	1	1

~~2.2.2~~2.2.3 Effective Soil Depths to Impermeable Layers

Table 2-7 may be used to determine the effective soil depth below absorption fields to impermeable layers, such as dense clays or caliche.

Table 2-7. Effective soil depth (feet) to impermeable layers on sloped terrain.

Slope (%)	Acres (feet)				
	1	2	3	4	5 or more
20	3.0	2.8	2.5	2.3	2.0
16	3.2	2.9	2.6	2.4	2.0
12	3.4	3.1	2.7	2.4	2.0
8	3.6	3.2	2.8	2.5	2.0
4	3.8	3.4	2.9	2.5	2.0
0	4.0	3.5	3.0	2.5	2.0

Approval Conditions:

1. Impermeable layer is that soil or geological feature less permeable than a subgroup C-2 soil. The layer must be contiguous and unbroken beneath the absorption field and its replacement area for at least 10 feet in any direction from these sites.
2. Adjacent lots are of equal size or larger.
3. This guidance is applicable to standard systems and capping fill trench alternatives.
4. Minimum distance to a property line on the downslope side of the absorption field and its replacement area must be at least 10 feet.
5. Lateral hydraulic conductivity of the effective soil should be able to transport the combined precipitation and wastewater flow through the soil without surfacing.

2.2.4 Effective Separation Distance to Surface Water

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 ~~and~~, 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 reduction allowances:

1. Separation distance to surface water shall not be less than 100 feet.
2. Alternative systems may be required as part of the reduction allowance.
3. No additional technical allowance may be granted to the reductions included in the sections below without following the~~a~~ 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.

2.2.4.1 Reduction in Separation Distance to Surface Water without a Variance

Table 2-8 shows the criteria for reducing separation distances to permanent or intermittent surface water based on soil design subgroups, vertical soil depth above surface water, and the vertical soil depth above any limiting layers.

Table 2-8. Criteria for reducing separation distances to permanent or intermittent surface water.

~~Setback~~ Separation Distance (feet)[a]	Soil ~~Class~~Design Subgroup	Soil Reduction (feet)	Vertical Soil Depth Above Water: > 25 feet; and Depth to Limiting Layer: > 10 feet	Maximum ~~Setback~~ Separation Reduction (feet)	Minimum Separation Distance to Surface Water (feet)
300	A-1	0	25	25	275
300	A-2	25	25	50	250
200	B-1	0	25	25	175
200	B-2	25	25	50	150
100	C-1	0	0	0	100
100	C-2	0	0	0	100

The distance to permanent surface water may also be reduced to not less than 100 feet for all soil types when it can be demonstrated that

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

~~Each site should be reviewed on its own merits. Additional criteria, such as population density and watershed characteristics, must be examined before an allowance is granted. Alternative systems may be required.~~

~~No additional technical allowance may be granted without a formal variance procedure.~~

2.2.4.2 Reduction in Separation Distance to Surface Water with a Variance

The separation distances to surface water are in place to protect the beneficial uses of the surface water. Septic tank effluent carries both nitrogen and phosphorous constituents that pose a threat to surface water. If a separation distance from a drainfield to surface water is to be reduced further than the reductions outlined in section 2.2.4.1 it must be done through a variance supported by models that evaluate the potential effects that the total nitrogen and phosphorus may have on the surface water body.

2.2.4.2.1 Supporting Variance Documentation for a Reduced Separation Distance to Surface Water

The minimum requirements for the supporting variance documentation are included below.

1. The variance must follow all requirements provided in IDAPA 58.01.03.010 and be filed with the health district along with a subsurface sewage disposal permit application.
2. The necessary site evaluation process must be followed to obtain the minimum information necessary to support a subsurface sewage disposal permit and the required effluent nutrient evaluations.
3. A Nutrient-Pathogen (NP) evaluation must be performed for the site and be acceptable based on the required minimum system designs, proposed system placement, and model outputs as outlined below.
4. A phosphorous evaluation must be performed as outlined in the DEQ guidance *Drainfield to Surface Water Setback Determination Guidance and Model* and be acceptable based on the required minimum system designs, proposed system placement, and model outputs as outlined below.

2.2.4.2.2 Drainfield Design Requirements for a Reduced Separation Distance to Surface Water

A drainfield proposed with a reduced separation distance to surface water as allowed under this variance procedure must meet the following minimum design requirements:

1. The drainfield shall be pressurized and designed based on section 4.20 of this manual.
2. The maximum installation depth of the drainfield in the native soil profile shall be 6 inches.
3. Two full sized drainfields shall be installed under the initial permit and alternative dosing between each drainfield shall be included in the system's pressurized design.
4. No separation distance to surface water shall be reduced to less than 100 feet.
5. An alternative pretreatment system shall be installed after the septic tank that is capable of reducing total nitrogen to at least 27 mg/L. A greater total nitrogen reduction level may be required dependent upon the outcome of the NP Evaluation.

2.2.4.2.3 Nutrient Evaluation Model Outputs for a Reduced Separation Distance to Surface Water

To support a variance for a reduced separation distance to surface water two nutrient evaluations must be performed based on the following specific effluent nutrient values and minimum model outputs:

2.2.4.2.3.1 Nutrient-Pathogen Evaluation

1. The maximum nitrogen output from the septic tank shall be 27 mg/L.
2. All other standard NP Evaluation criteria and output requirements apply.

2.2.4.2.3.2 Drainfield to Surface Water Setback Determination Guidance and Model

1. The average phosphorous output from the septic tank shall be 8.6 mg/L.
2. The minimum site life of each drainfield shall be 200 years.

3. All other standard Drainfield to Surface Water Setback Determination Model criteria and output requirements apply.

2.2.4.2.3.3 Restrictions on Drainfields Designs Necessary to Obtain Successful Outputs in Nutrient Evaluation Models

IDAPA 58.01.03 specifies the minimum drainfield area required to adequately handle the specified volume of wastewater generated in the structure being permitted. It is acceptable for a system design to be in excess of the drainfield area required by IDAPA 58.01.03. In order to reduce a drainfield's separation distance to permanent or intermittent surface water it may require that the drainfield area is in excess of the minimum requirements stipulated in IDAPA 58.01.03. This may be due to the surface area and volume of soil below the drainfield necessary to sequester phosphorous constituents in the wastewater and reduce the potential impacts on surface water. If it is necessary to expand the drainfield in order to obtain successful outputs for the models described in section 2.2.4.2.3, then the drainfield area in excess of the minimum requirements provided in IDAPA 58.01.03 is strictly limited to the original wastewater flows evaluated for the original permit application and cannot be used in the future for additional structures or existing structure expansion.

2.2.5 Method of 72 to Determine Effective Soil Depths to Porous Layers and Ground Water

Often, effective soil depths, as required by IDAPA 58.01.03.008.02.c, are not achievable due to various site conditions. In response to this issue, section ~~2.2.1~~2.2.2 provides guidance for reducing separation distances to limiting layers based upon soil design subgroups. In some situations, this guidance does not go far enough to address these site limitations, nor does it provide guidance on how to approach separation distances to limiting layers when the soil profile is variable and does not meet the minimum effective soil depths as described in IDAPA 58.01.03.008.02 or Table 2-6, or when the in-trench sand filter system design is used. To address these situations, use the method of 72.

The method of 72 assigns treatment units to soil design subgroups. Treatment units assigned to soil design subgroups are extrapolated from the effective soil depths required by IDAPA 58.01.03.008.02.c. Based on this rule, it can be determined that 72 treatment units are necessary from the drainfield-soil interface to the porous layer/ground water to ensure adequate treatment of effluent by the soil. Table 2-9 provides the treatment units assigned to each soil design subgroup.

Table 2-9. Treatment units assigned to each soil design subgroup per foot and per inch.

Soil Design Subgroup	A-1/ Medium Sand	A-2	B-1	B-2	C-1	C-2
Treatment units per 12 inches of soil	12	14.4	18	24	24	28.8
Treatment units per inch of soil	1	1.2	1.5	2	2	2.4

~~2.2.3.1~~2.2.5.1 *Native Soil Profiles and the Method of 72*

When the soil profile contains multiple suitable layers, but no layer is thick enough to meet the separation guidance provided in IDAPA 58.01.03.008.02.c or Table 2-6, use the method of 72 to determine the suitable separation distance for the proposed drainfield site. The following example is based on the soil profile identified in Figure 2-3.

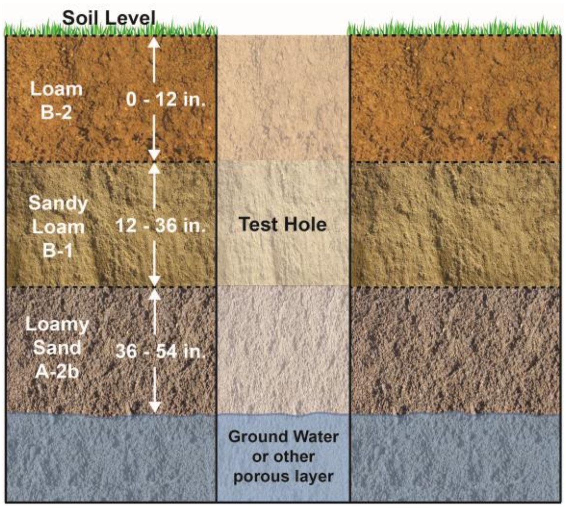


Figure 2-3. Test hole profile used in example 1.

Example 1:

Based upon the soil profile in Figure 2-3 and treatment units from Table 2-9, the following treatment unit equivalent would be ascribed:

Treatment units = 24 + 36 + 21.6 = 81.6

Since this is the treatment unit equivalent from grade to the porous layer or normal high ground water level, the installation depth must still be determined. In this example, the soil profile has 9.6 treatment units more than the minimum necessary to be considered suitable for a standard alternative drainfield. To determine installation depth, use the upper layer of the soil profile where the system will be installed and determine the treatment units per inch of soil. Once the treatment units per inch are known, the depth of allowable installation can be determined.

24 treatment units /12 inches of B-2 soil = 2 treatment units per inch
Installation depth = 9.6 excess treatment units /2 treatment units per inch
Installation depth = 4.8 inches

In this example, a standard basic alternative system can be permitted. The system design would be a capping fill trench with a maximum installation depth of 4.5 inches below grade.

~~2.2.3.2~~2.2.5.2 *In-Trench Sand Filters and the Method of 72*

The method of 72 may also be used in determining the necessary depth of medium sand required for installation between a drainfield and the native soils overlying a porous limiting layer or normal high ground water. Installation of medium sand may be necessary to access suitable soils below an unsuitable layer. The following example is based on the soil profile identified in Figure 2-4.

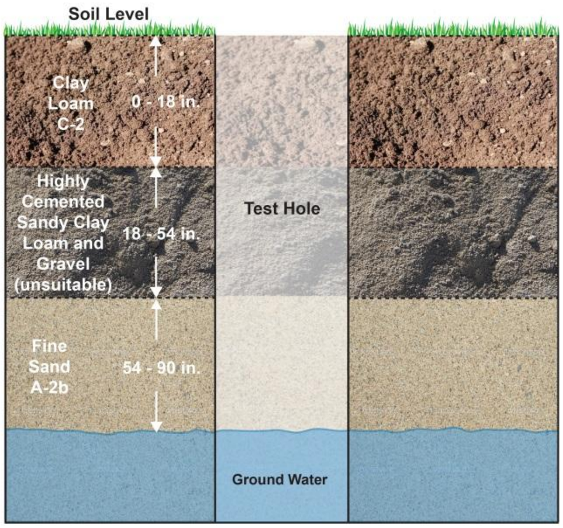


Figure 2-4. Test hole profile used in example 2.

Example 2*:*

In this example, the site soils must be excavated down to 54 inches to access suitable soils. This leaves 36 inches of A-2b soils, providing 43.2 treatment units. The amount of medium sand required to be backfilled prior to system installation would be determined as follows:

Remaining treatment units = 72 – 43.2 = 28.8

Depth of medium sand required = 28.8 treatment units remaining/1 treatment unit per inch

Depth of medium sand required = 29 inches

Thus the medium sand would be backfilled to a depth of 25 inches below grade. The drainfield would then be installed on top of the leveled medium sand.

Note: Regardless of the soil profile and treatment units needed, drainfields must be installed no deeper than 48 inches below grade per IDAPA 58.01.03.008.04. Drainfield depth restrictions only apply to the aggregate as defined in IDAPA 58.01.03.008.08 or the gravelless trench components approved in section 5.6. Medium sand may be installed to any depth necessary to reach suitable soils as long as the excavation and installation of the medium sand meet the requirements in section 4.24.

State of Idaho
Department Of Environmental Quality
Technical Guidance Committee

Appendix F

4.20 Pressure Distribution System

Revision: ~~April 19~~February 6, 2014~~2013~~

4.20.1 Description

A pressure distribution system is a low-pressure system of small-diameter perforated plastic pipe laterals, manifold, pressure transport line, dosing chamber, and a pump or siphon. The pressure distribution system is used when it is desirable to:

1. Maintain a uniform application of effluent across the drainfield.
2. Treat and dispose of effluent in the uppermost levels of the soil profile.
3. Aid in mitigating the potential contamination of ground water in areas of excessive permeability.
4. Improve the performance and increase the life span of a drainfield.

4.20.2 Approval Conditions

1. ~~a.~~ Pressure distribution ~~may~~ shall be used in drip distribution, grey water systems, sand mounds, intermittent sand filters, ~~sand-filled trenches,~~ recirculating gravel filters, ~~and standard trenches in aquifer-sensitive areas or~~ and in large drainfields.
2. Pressure distribution may be used in in-trench sand filters to obtain a reduced separation distance to permeable limiting layers, standard or basic alternative systems at the applicant's request, and in environmentally-sensitive areas.
3. Low-pressure distribution systems are required for systems that exceed 1,500 ft^2 in total trench bottom (IDAPA 58.01.03.008.4).
4. Geotextile filter fabrics are required to be used for cover over pressure distribution systems.
5. All design guidance related to dosing chambers, in-tank pumps, and pump to drop box systems contained herein shall be followed for any alternative system utilizing these components regardless of whether the drainfield is pressurized or not (IDAPA 58.01.03.004.10).

~~2.~~6. All electrical connections should be permitted and inspected by the Electrical Bureau. A copy of the electrical permit or inspection for the electrical connections and components related to a pressure distribution system shall be provided by the applicant to the Director as part of the permit application for this system or any of its related electrical components (IDAPA 58.01.03.005.04.m and .o).

~~3~~7. The~~se guidelines~~ design guidance provided herein for piping, pump, and dosage requirements is meant to be a simple design strategy ~~to assist the nonengineer. They~~and ~~are~~ is not intended to supplant or limit engineering design ~~or other low-pressure systems~~ for these components and systems.

8. The guidance contained herein relating to piping, pumps, and dosage should not be used where laterals are at different elevations (elevation differences greater than 6 inches) or for systems with daily wastewater flows over 2,500 gallons.

9. Plans for systems with designs different than those provided herein and where daily wastewater flows exceed 2,500 gallons shall be reviewed by DEQ.

10. The system must be designed by a PE licensed in Idaho.

11. The following guides ~~is~~ are recommended for use in pressure system design ~~outside of these guidelines~~:

    Otis, R.J. 1981. *Design of Pressure Distribution Networks for Septic-Tank Absorption Systems*. Madison, WI: University of Wisconsin. Small Scale Waste Management Project Publication No. 9.6. (www.soils.wisc.edu/sswmp/pubs/9.6.pdf)

    Converse, J.C. 2000. *Pressure Distribution Network Design.* Madison, WI: University of Wisconsin. Small Scale Waste Management Project Publication No. 9.14. (www.soils.wisc.edu/sswmp/pubs/9.14.pdf)

4.20.3 Design

Many considerations need to be made in the design of a pressure distribution system based on site and flow specific characteristics. These characteristics will affect several system components dependent upon each specific design scenario. Typical system design should occur based on the following design procedures:

1. Layout the distribution lateral network.
2. Select the orifice size and spacing.
3. Determine the lateral diameter compatible with the orifice size and spacing.
4. Determine the lateral discharge rate.
5. Determine the manifold diameter based on the number, spacing, and discharge rate of the laterals.
6. Determine the total internal volume of the manifold and lateral.
7. Determine the desired dose volume and rate.
8. Calculate the static and dynamic pressure requirements of the piping network and document this in a system performance curve.
9. Select multiple pumps based on the dose volume, discharge rate, friction losses, and total head of the system and the pump manufacturer's supplied performance curves.
    a. Plot these pump performance curves on the system performance curve. Where each pump curve crosses the system performance curve is where that pump will operate.
    b. The crossing point must exceed the specified minimum operating system pressure and should like near the center of the pump performance curve.
10. Select the correct size of dosing chamber based on the system design flow and pump selection.

11. Select the pump controls.

4.20.3.1 Piping

Pressure distribution system piping typically consists of several sections including transport piping, manifold, and laterals. Each of these piping sections have components and design factors that are unique to that particular section.

4.20.3.1.1 Laterals

Lateral piping is placed within the drainfield and is used to evenly distribute wastewater effluent to the drainfield's infiltrative surface. To distribute the effluent several small diameter orifices are drilled into each lateral. Recommendations for the design of lateral piping and the associated orifices are included below.

4.20.3.1.1.1 Distribution Laterals

1. Lateral length should be shorter than the trench length by at least 6- inches but not more than 12 inches.
2. Laterals in trenches should be placed equidistant from each trench sidewall.
3. Lateral spacing in beds is recommended to be equal to orifice spacing.
   a. The outside laterals should be placed at one-half the selected lateral spacing from the bed's edge.
   b. Laterals should not be placed further apart than 6 feet on center in bed designs and should not be placed further than 3 feet from the bed's edge regardless of orifice spacing (IDAPA 58.01.03.008.10.d).
4. Determine the lateral diameter based on distribution lateral network design.
   a. Lateral diameter typically ranges from 1-4 inches for most system applications.
   b. Lateral diameter for typical individual dwelling systems range from 1-2 inches.
5. Lateral length should be selected based on the lateral diameter, orifice spacing, and piping schedule/class.
   a. Lateral length is constrained by the minimum pressure at the distal end of the lateral which shall not drop below 90% of the manifold pressure. This uniform pressure assures relatively uniform effluent discharge down the length of the lateral.
6. Individual ball valves shall be installed on each lateral to balance residual head on terraced systems.
7. Sweeping cleanouts should be placed at the terminal end of each lateral and be accessible from grade.
   a. Cleanout sweeps should be the same diameter piping as the main lateral.
   b. A ball valve or threaded cap should be located on the end of the cleanout that allows the lateral to be flushed.

c. Prior to pressurization of the distribution laterals the system should be flushed with clean water while all of the terminal ball valves are open or caps are removed.

4.20.3.1.1.2 Orifices

1. Orifice sizing, spacing, and quantity, coupled with each lateral's pressure, establish the flow rate of the distribution network.
2. Orifice placement should occur:
   a. Along the same axis of the distribution lateral.
   b. In a staggered location between any two laterals so they are located half of the orifice spacing from one another along the drainfield length.
   c. Orifices should be placed to serve a circular area as best as possible with limited overlap (e.g., 6 foot wide trench with two laterals and orifice placement to serve an area 3 feet in diameter).
3. Orifice orientation:
   a. Is typically toward the bottom of the trench in aggregate filled drainfeilds to facilitate lateral drainage.
   b. If the orifices in the distribution laterals are oriented up the distribution lateral must slope back towards the manifold to aid in drainage. Sloping of the distribution lateral should be as minimal as possible.
   c. Regardless of orifice orientation throughout the distribution lateral the distal most orifice in each lateral shall point up.
      i. An observation port should be located over this orifice and be accessible from grade.
      ii. This observation port should be used to evaluate the operation of the dosing system and ponding in the drainfield during annual operation and maintenance checks.
4. Orifice diameter:
   a. Typical orifice diameter is ¼ inch, but may be smaller or larger depending upon system design requirements.
   b. Orifices smaller than ¼ inch may lead to clogging, which should be considered in system design.
   c. Typical discharge rates based on orifice size are provided in table 4-13.

Table 4-13. Orifice discharge rate in GPM based on pressure.

	Orifice Diameter (in.)				
Pressure (ft.)	**1/8**	**3/16**	**1/4**	**5/16**	**3/8**
2.5	0.29	0.66	1.17	1.82	2.62
3.0	0.32	0.72	1.28	1.00	2.87
3.5	0.34	0.78	1.38	2.15	3.10
4.0	0.37	0.83	1.47	2.3	3.32
4.5	0.39	0.88	1.56	2.44	3.52
5.0	0.41	0.93	1.65	2.57	3.71
5.5	0.43	0.97	1.73	2.7	3.89
6.0	0.45	1.02	1.8	2.82	4.06
6.5	0.47	1.06	1.88	2.94	4.23
7.0	0.4	1.1	1.95	3.05	4.39
7.5	0.5	1.14	2.02	3.15	4.54
8.0	0.52	1.17	2.08	3.26	4.69
8.5	0.54	1.21	2.15	3.36	4.83
9.0	0.55	1.24	2.21	3.45	4.97
9.5	0.57	1.28	2.27	3.55	5.11
10.0	0.58	1.31	2.33	3.64	5.24

Values were calculated as: $gpm = 11.79 \times d^2 \times h^{1/2}$; where d= orifice diameter in inches, h = head feet.

5. Orifice spacing should distribute effluent as uniformly as possible over the infiltrative surface.
   a. Typical orifice spacing is 30-36 inches but may be closer or further apart depending upon system design requirements, system flow rate, and soil type.
   b. For most installations, the spacing will be between 18–36 inches.
   c. Typical spacing should result in a disposal area of 6 ft^2 per orifice.
   d. The maximum disposal area per orifice for sand mounds, intermittent and in-trench sand filters, and recirculating gravel filters is 6 ft^2.
6. Orifices should be drilled with a sharp bit and any burs, chips or cuttings from the drilling process should be removed from the piping prior to assembly.
7. Orifice shields are recommended to be used.

4.20.3.1.1.3 Lateral Discharge Rate

Once the number of laterals, the lateral diameter, orifice spacing, and orifice diameter has been selected, the individual lateral discharge rate and total distribution system discharge rate can be calculated. Individual lateral discharge rate is calculated by:

GPM = (individual orifice discharge rate) x (number of orifices per lateral)

The total distribution system discharge rate is calculated by:

GPM = (individual lateral discharge rate) x (total number of laterals)

4.20.3.1.2 Manifold Piping

The manifold is typically a larger diameter pipe that provides a uniformly pressurized effluent to the distribution laterals. The manifold is at the terminal end of the transport piping. There are three common manifold designs: (1) an end manifold, (2) a central manifold, and (3) an offset manifold. End manifolds are located at one end of the distribution laterals. Central manifolds are located at the mid-point of the distribution laterals. Offset manifolds may be located at any point along the distribution laterals. Multiple manifolds may also be used in a system design as long as the pressures at each manifold are equal. The following design elements for manifolds are recommended to be followed:

1. The manifold pipe diameter must accommodate the number, spacing, and discharge rate of the distribution laterals.
2. It is recommended that the outlet to the laterals occur at the crown of the manifold to minimize leakage from the distribution laterals prior to their complete pressurization.
3. The manifold should drain to either the pump chamber or the distribution laterals when the pump shuts off.
4. If the manifold cannot drain it should be insulated to protect it from freezing.

4.20.3.1.3 Transport Piping

The transport piping, or line, is the piping that connects the pump in the pump chamber and the manifold. The length and diameter of this piping varies based upon pump selection, wastewater flows, transportation distance, and elevation difference between the pump and drainfield. There are several design recommendations that should be followed for this section of piping.

1. The transport pipe exiting the dosing chamber should have a minimum strength equivalent of ABS schedule 40 that spans past the excavation for the dosing chamber (IDAPA 58.01.03.007.21.a).
2. Transport piping should be sloped to drain back into the dosing chamber when the pump shuts off. A small drain hole (1/4 in.) may be drilled in the transport pipe inside the dosing chamber to aid the pipe in draining. This drain hole must be taken into account in pressure distribution design and pump selection.
3. If the transport pipe cannot be sloped back to the pump chamber the piping should be buried below the site specific frost line to prevent freezing.

4. Friction loss should be considered when selecting the diameter of the transport piping.
    a. The material and diameter of the transport pipe will influence the friction loss.
    b. The friction increases with increasing flow rates.
    c. These losses must be included in the system performance curve in order to properly select a suitable pump.

4.20.3.2 Pressurization Unit

Pressurization of the piping network occurs through a pressurization unit. This may be an electrically driven pump or a gravity charged siphon. Electrically driven pumps may be used in any pressurized design regardless of the site layout. Siphons are limited to pressurized designs where all of the piping components are located below the siphon discharge invert. A critical component of either pump selection or siphon design is the total head the pressurization unit must operate against. Total head can be calculated using equation 4-15.

Calculate the total head using Equation 4-15:

$$H_{total} = E + T + R$$

Equation 4-15. Total head.

where:
H_{total} = total head
E = elevation difference between the pump or siphon bell opening and manifold
T = ~~transport pressure line~~ piping network's friction head
R = residual head (~~2.~~5 feet)

4.20.3.2.1 Pumps

Pumps used in the pressure distribution design are either centrifugal effluent pumps or turbine effluent pumps. Centrifugal pumps are typically a high capacity/low-head pump with a relatively flat performance curve. Turbine pumps are typically a low capacity/high-head pump with a relatively steep performance curve. The type of pump that is selected should be based on where the pump's performance curve intersects the system's performance curve. A pump is suitable for a particular system if the middle of its performance curve intersects the system performance curve at an acceptable pressure and flow value. Specific pump selection factors are discussed below:

1. Using Use the pump head discharge rate curves supplied by the manufacturer to~~,~~ select a pump that will perform at the required head.
2. To help maximize pump efficiency, pump selection should also address maximum usable head.
    a. Select pumps where the operating point will be greater than 15% of the maximum pump rate (maximum gallons per minute rating).
    ~~a.~~b. For example, a pump with a maximum capacity of 80 GPM should only be used if the operational requirement is greater than 80 GPM x 0.15 or 12 GPM.
~~3~~4. Other pump considerations:
    a. Pump should be specified for effluent.

b. Pump should transfer solids as large as orifice diameter.

c. Pumps must be kept submerged.

ed. Pump should be serviceable from ground level without entering the pump chamber. PVC unions are available to assist in the easy removal of pumps.

de. Pumps and electrical connections shall conform to the requirements of the Idaho Division of Building Safety, Electrical Bureau. ~~Pumps must be kept submerged.~~

i. *For multiple residential and commercial installations* all electrical connections must be made outside the chamber in an explosion proof box.

ii. *For individual residential systems*, the electrical connections may be made in a weatherproof box.

~~i.~~iii. *Both systems require the use of a seal off.* See Figure 4-19, Figure 4-20, Figure 4-21, and accompanying text for details.

ef. Impellers shall be cast iron, bronze, or other corrosion-resistant material. Regardless of the material, the impeller may freeze if the pump remains inactive for several months.

fg. If a check valve is used, a bleeder hole should be installed so the volute is kept filled with effluent. Some pumps may run backwards if the impeller is in air.

h. Siphon (vacuum) breakers should be used in pressure distribution networks where the low water level in the dosing chamber is above the lateral inverts in the drainfield.

4.20.3.2.2 Siphons

Siphons operate by building up more head in the dosing chamber than the distribution piping network requires in order to operate correctly. The siphon flow rate must be greater than the discharge rate out of the distribution lateral orifices. Siphons only work in a demand dosing situation. Recommendations for siphon dosing systems are included below:

1. Frequent maintenance checks should be performed on siphons to ensure they are operating properly and are not distributing effluent under *trickling* conditions.
2. High water audio and visual alarms should be placed in siphon dosing chambers above the operating point of the siphon and below the siphon vent.
3. Siphons must discharge to a piping network that allows steady flow. Piping networks that have abrupt bends or Tees will create pressure oscillations that will disrupt the siphon flow, resulting in *trickling* flows.
4. Siphon trap diameter must be smaller than the piping network's transport pipe.
5. ~~1.~~5. The dosing chamber must provide an overflow Tee in case the siphon becomes plugged. This Tee also allows gas in the drainfield to escape into the dosing chamber as the effluent displaces it.

4.20.3.3 Dosing

Dosing consists of the type of dosing that is selected for the system design and dosing volume (dose). There are two types of dosing available for system pressurization. The first is demand dosing and the second is timed dosing. These dosing parameters are discussed below.

4.20.3.3.1 Demand Dosing

Demand dosing can be performed using both electrically driven pumps and gravity driven siphons. In demand dosing a specific volume of effluent is sent to the drainfield with each dose based on the specific system demand. This demand is triggered by the volume of effluent reaching a predetermined level within the dosing chamber. Once this level is reached the entire pre-determined volume of effluent is delivered to the drainfield. After a pumping cycle effluent will not be delivered to the drainfield until enough effluent has entered the dosing chamber to reach the predetermined pump-on level. This type of dosing leaves little control over how much effluent is delivered to the drainfield during high flow events.

4.20.3.3.2 Timed Dosing

Timed dosing can only be performed through the use of an electrically driven pump. Due to the more frequent start/stop cycling of the pump in timed dosing a pump with good longevity is recommended. Turbine pumps are typically a good fit for this design based on their longevity relative to start/stop cycles. Timed dosing utilizes a timer to deliver effluent to the drainfield on a regularly timed schedule. This is done by setting an amount of time the pump is off between cycles and the amount of time the pump is on during the cycle. Some of the advantages of this dosing method are listed below:

- Smaller and more frequent doses can be delivered to the drainfield.
- Peak and surge flows can be leveled out so the drainfield is not overloaded.
- A higher level of treatment is provided to the effluent at the infiltrative surface.
- Greater drainfield longevity.

With timed dosing surge capacity should be taken into account when sizing the dosing chamber. The chamber should be large enough to handle peak and surge flows. A high level override switch may be used below the high level alarm to override the pump timer when large flows enter the dosing chamber. Controls can also be put in place to ensure that only full doses will be delivered to the drainfield preventing pump cycles that will not result in effluent reaching the drainfield.

4.20.3.3.3 ~~Dosage~~Dose

The dose is the volume of effluent necessary to fill the entire pressurized piping network and the volume of effluent that is desired to be delivered to the infiltrative surface with each dose. This is based on the volume of the transport and distribution piping network and the frequency at which the drainfield is desired to be dosed throughout any given day. ~~Determine the dose~~ Dose volume is determined by the following sets of design criteria:

1. Determine the volume of all piping components including the transport piping, manifold, and distribution laterals. Only pipe volumes that drain between doses should be used in

dosage calculations. Table 4-14 can be used to calculate distribution line, manifold, and transport line volumes.

Table 4-1814. Gallons per foot of pipe length.

Diameter (inches)	Schedule 40	Class 200	Class 160	Class 125
1	0.045	0.058	0.058	—
1.25	0.078	0.092	0.096	0.098
1.5	0.105	0.120	0.125	0.130
2	0.175	0.189	0.196	0.204
3	0.385	0.417	0.417	0.435
4	0.667	0.667	0.714	0.714
6	1.429	1.429	1.429	1.667

2. Determine the dose volume delivered to the infiltrative surface by dividing the average daily flowsystem design flow, in gallons per minuteday, by the recommended dosing frequency shown in Table 4-1715.

Table 4-1715. Minimum dosing number of doses per day based on soil type.

Soil Texture at Drainrock Interface	Doses per Day
Medium and fine sand	4
Loamy sand, sandy loam	1–2
Loam and finer soils	1

a3. Daily The daily dose-volume ratio should be at least sevenfive to ten times the volume of the manifold and distribution lateral piping that drains between doses plus one time for the interior volume of the transport line

4. Each dose should not exceed 20% of the estimated average daily wastewater flow. If the total dose volume is too small, then the pipe network will not become fully pressurized or may not be pressurized for a significant portion of the total dosing cycle and may need to be adjusted.

4.20.3.4 Dosing Chamber

Dosing chambers are tanks that contain a pump or siphon and their associated equipment. The dosing chamber is either a separate tank located after the septic tank or may be the last compartment of a multi-compartment septic tank. If the dosing chamber is part of a multi-compartment septic tank it must be hydraulically isolated from the compartment(s) of the tank that comprise the septic tank portion of the tank. The construction of a dosing chamber shall meet the requirements of IDAPA 58.01.03.007 except as specified herein. Figure 4-19 provides a dosing chamber diagram.

1. Any system utilizing a pump located after the septic tank to deliver effluent to the drainfield (pressurized or non-pressurized) or a non-packaged alternative pretreatment component shall locate the pump in a dosing chamber meeting the minimum requirements herein.

2. Dosing chamber must be watertight, with all joints sealed. Precautions must be made in high ground water areas to prevent the tank from floating.

3. A screen must be placed around the pump with one-eighth inch holes or slits of noncorrosive material and have a minimum area of 12 ft^2.

   a. Screen placement must not interfere with the floats and should be easily removable for cleaning.

   b. ~~Effluent~~ An effluent filter placed on the outlet of the septic tank designed~~s~~ with ~~fitted with~~ a closing mechanism when the filter is removed ~~are~~ is a suitable alternative to screens around pumps.

4. The volume of the dosing chamber should be equal to at least ~~a 2-day flow~~two times the system design flow when a single pump is used.

   a. If duplex pumps are used the volume of the dosing chamber may be reduced to equal the system design flow.

   b. The volume of the dosing chamber must be sufficient enough to keep the pump covered with effluent, deliver an adequate dose based on the system design, and store one-day's design flow above the high level alarm.

   c. Additional dosing chamber capacity may be necessary if the pressurized system is designed to have surge capacity. Systems designed with surge capacity should be limited to facilities with varying daily wastewater flows over the period of one week (e.g., churches, golf courses, etc.).

5. The dosing chamber manhole located above the pump shall be brought to grade using a riser.

6. A high level audio and visual alarm shall be located within the dosing chamber 2-3 inches above the pump-on level to indicate when the level of effluent in the dosing chamber is higher than the height of the volume of one dose.

7. A low level off switch shall be connected to the pump and be set to a height that is 2-3 inches above the top of the pump.

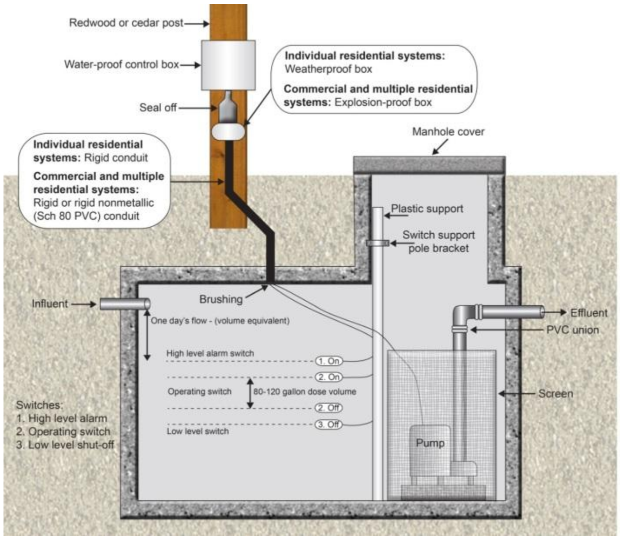


Figure 4-19. Dosing chamber.

8~~3~~. Electrical requirements (contact the Idaho Division of Building Safety, Electrical Bureau):

a. Visual ~~or~~ and audio alarms should be connected to~~on~~ a separate circuit from the pump ~~must be provided to indicate when the level of effluent in the pump or siphon chamber is higher than the height of the volume of one dose~~.

b. All electrical connections must be made outside of the chamber in either an approved weatherproof box or an explosion-proof junction box (Crouse-Hind Type EAB or equivalent).

c. The lines from the junction box to the control box must pass through a sealing fitting (seal-off) to prevent corrosive gases from entering the control panel.

d. All wires must be contained in solid conduit from the dosing chamber to the control box.

~~c. Minimum effluent level must be above the pump. This is the level that the low-level off switch is set and should be 2–3 inches above the pump.~~

e~~d~~. An acceptable circuit is shown in Figure 4-20.

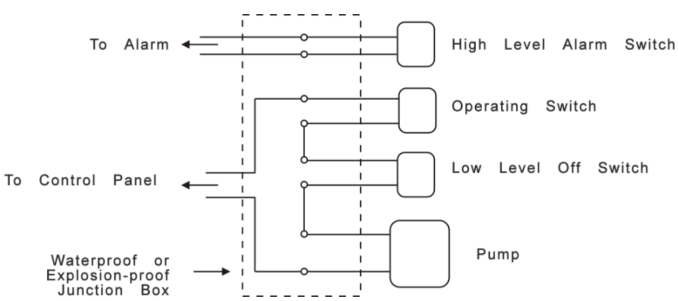


Figure 4-20. Example of float configuration.

~~e~~f. Plans and schematics for the electrical installation should be approved by the Idaho Division of Building Safety, Electrical Bureau before installation and at the same time the permit is issued.

~~f~~g. An alternative to placing the electrical connections on a pole is to place them in a dry well over the dosing chamber. The diagram in Figure 4-21 shows an arrangement acceptable to the Electrical Bureau.

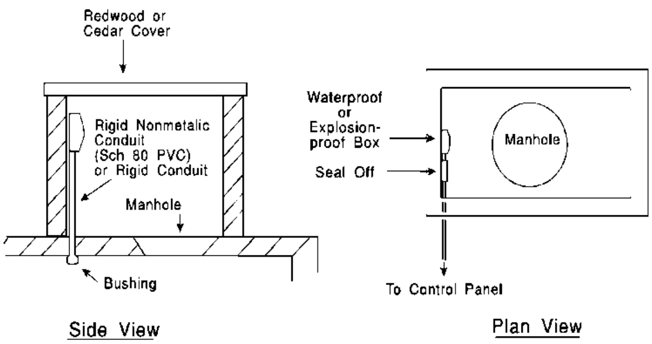


Figure 4-21. Dosing chamber drywell.

4.20.3.5 In-Tank Pumps

Placement of sewage effluent pumps in a septic tank is an acceptable practice under the following conditions:

1. The site is too small for the installation of a dosing chamber or a septic tank with a segregated dosing chamber compartment, or the flows are less than 100 GPD.
2. Sewage effluent pumps must be placed in an approved pump vault.
3. Effluent drawdown from the septic tank is limited to a maximum 120 gallons per dose with a maximum pump rate of 30 GPM.
4. Septic tanks must be sized to allow for 1-day flow above the high-water alarm, unless a duplex pump is used.
5. Pump vault inlets must be set at 50% of the liquid volume.
6. Pump vault placement inside the septic tank shall be in accordance with the manufacturer's recommendations.
7. Pump vault screens shall be one-eighth inch holes, or slits (or smaller); be constructed of noncorrosive material; and have a minimum area of 12 ft^2.
8. Pump vault and pump placement must not interfere with the floats or alarm, and the pump vault should be easy to remove for cleaning (Figure 4-22).

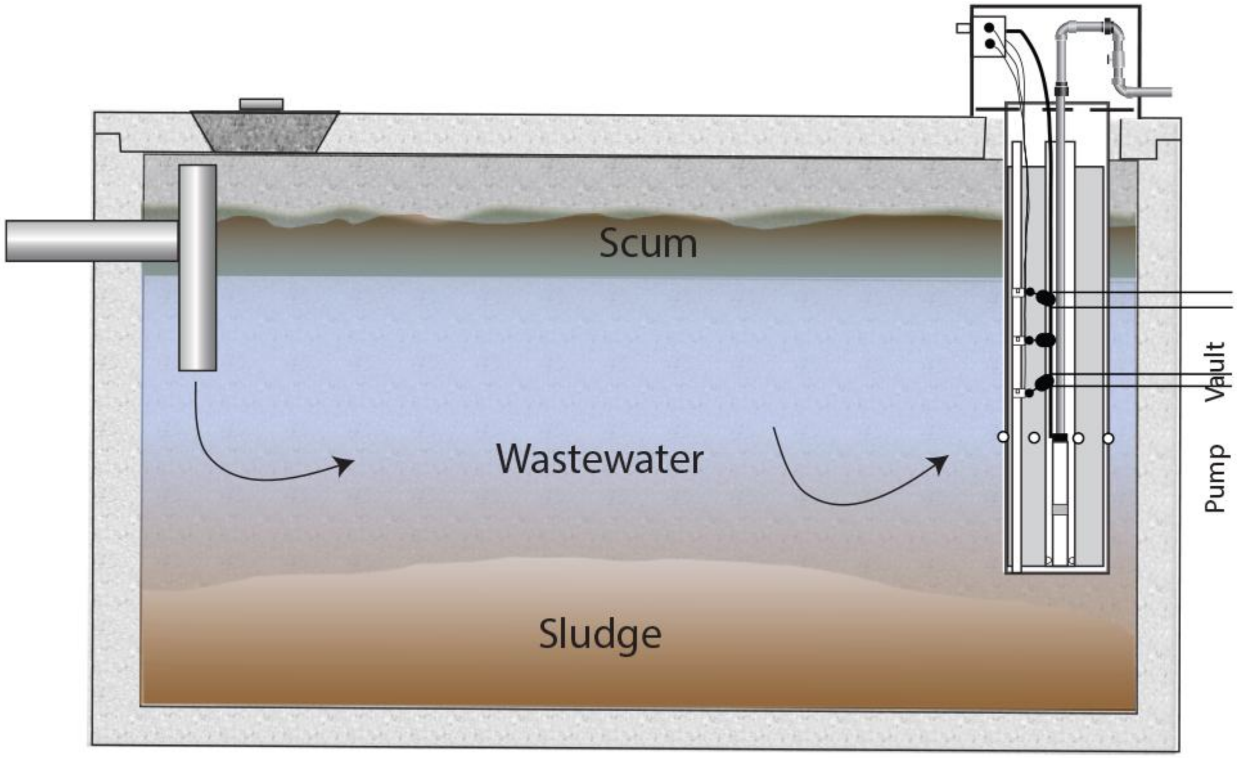


Figure 4-22. Example of effluent pump installed into single-compartment septic tank.

4.20.3.6 Pump to Drop Box

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 ft^2. 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 (Figure 4-23).

1. Pump selection, transport (pressure) line design, dosage, and dosing chamber or in-tank pump design shall follow the procedures in Section 4.20, "Pressure Distribution System."
2. A drop box should be installed that allows gravity distribution to all drainfield trenches.
3. 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.
4. A one-quarter inch hole may need to be drilled in the top of the angle connection to prevent a potential siphon.
5. A complex installer's permit shall be required for installation.
6. Pump and transport pipe design/selection may require engineering based upon the regulatory authority's judgment. Pump design/selection should be performed by an engineer licensed in Idaho when elevation gains of greater than 100 feet or lengths of 500 feet are exceeded in effluent transport.

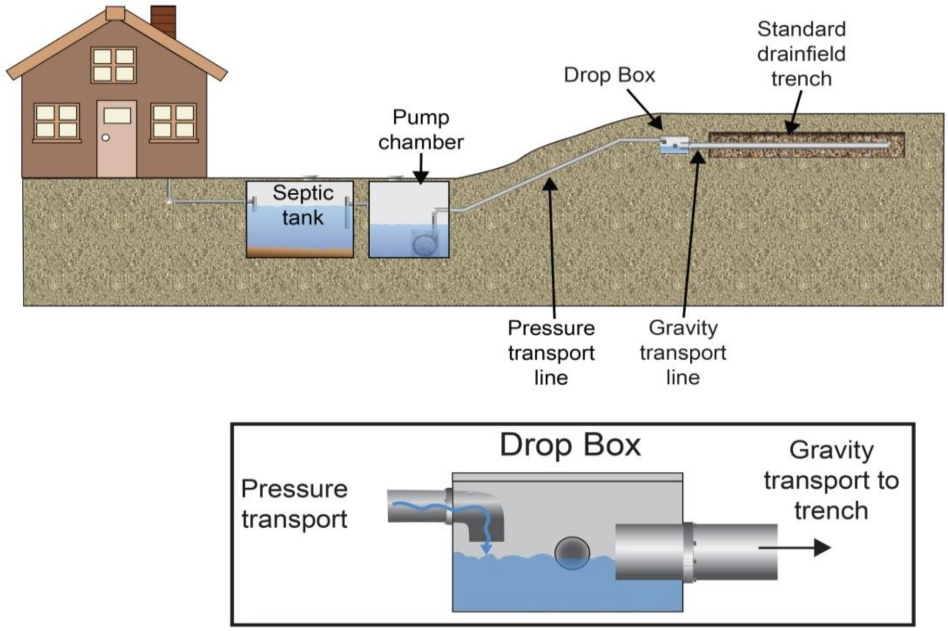


Figure 4-23. Example of pump to drop box installation.

Appendix G

4.5 Capping Fill Trench

Revision: ~~April 21, 2000~~February 6, 2014

4.5.1 Description

A capping fill trench is a ~~standard~~ drainfield trench constructed so that its bottom is at least 3 inches into the natural soil but less than 2 feet deep in the natural soil. A selected fill material caps the trench to provide cover. There are two subcategories of a capping fill trench. The standard capping fill trench and the extreme capping fill trench. Capping fill trenches may be installed by any installer with a basic installer's permit unless a complex component is used in conjunction with the capping fill trench design.

4.5.2 Standard Capping Fill Trench

A standard capping fill trench is constructed so that its bottom is less than 24 inches deep in the natural soil but deep enough in the natural soil to keep the invert of the drainfield pipe below the natural soil. The installation depth is deeper than 6 inches for a standard drainrock and perforated pipe drainfield. The bottom depth of the drainfield necessary to keep the invert of the drainfield pipe below the natural soil may be deeper for gravelless trench products or extra drainrock capping fill systems.

4.5.2.1 Standard Capping Fill Trench Approval Conditions

1. Capping ~~fill trench may be considered for a site if the effective depth below the trench bottom, as specified in section 2.2, Table 2-6 and Table 2-7, can be met.~~Effective soil depths below the drainfield bottom must be met as required by IDAPA 58.01.03 or as allowed in section 2.2 of this manual following the separation distance hierarchy.
2. Site may not exceed 12% slope if the ~~drainrock~~ drainfield extends above natural soil.
3. If the ~~drainrock~~ drainfield is at or below natural soil, the site may not exceed 20% slope.
4. ~~Bottom of a capping fill trench must be below the organic soil layer.~~

4.5.3 Extreme Capping Fill Trench

An extreme capping fill trench is constructed so that the invert of the drainfield pipe is above the natural soil. This is typically 6 inches deep or less for a standard drainrock and perforated pipe drainfield. The bottom depth of the drainfield that results in the invert of the drainfield pipe being above the natural soil may be deeper for gravelless trench products or extra drainrock capping fill systems.

4.5.3.1 Extreme Capping Fill Trench Approval Conditions

1. Effective soil depth below the drainfield bottom must be met as required by IDAPA 58.01.03 or as allowed in section 2.2 of this manual following the separation distance hierarchy.
2. Site may not exceed 12% slope.

3. The soil cap shall be constructed prior to trench excavation but after natural soil scarification.
4. The soil cap shall be compacted to 90% of the existing soils which shall be verified by a soil compaction test after cap construction.
5. The drainrock below the perforated pipe in an extra drainrock extreme capping fill trench shall not extend more than 3 inches above the natural soil.
6. The bottom of the drainfield shall be installed no shallower than 3 inches below the natural soil.

~~4.5.3~~4.5.4 Fill Material

The capping fill drainfield must meet the minimum (12 inches) and maximum (36 inches) cover requirements of IDAPA 58.01.03.008.04. Fill material must be imported or removed from a location greater than 6 feet away from the edge of the drainfield cap to meet the texture requirements of the cap. The material requirements for the cap are:

1. The upper layer of the natural site soil must be one of the approved effective soil design subgroups as described in Table 2-4.
2. The texture of the fill material used for the soil cap shall be the same as or one soil design subgroup finer than that of the ~~site material~~upper layer of the natural site soil, except that no fill material finer than clay loam may be used.
3. ~~1.~~ Fill material shall be free of debris, stones, frozen clods, or ice.

~~4.5.4~~4.5.5 Construction

1. ~~Fill~~ The entire cap area is plowed or scarified to disrupt the vegetative mat. Smearing of the soil during scarification shall be avoided.
2. Site soil should not be removed during the scarification process unless heavy vegetation (e.g., bushes) or a heavy vegetative mat is present. Any site soil that is removed should be replaced with medium sand prior to cap placement.
3. ~~4.~~ Construction related requirements in section 4.5.3.1 shall be followed.
4. ~~5.~~ Trenches shall be installed according to the specifications outlined on the permit, as if the top of the fill was the natural soil surface.

~~6. If the trenches are constructed entirely within the natural soil, the trenches will be constructed first. The site will then be scarified, and the cap installed after the trenches are in place.~~

~~2. When the invert of the pipe is at or above the original soil, the fill material should be compacted to 90% of the existing soils.~~

5. Edges of the finished cap fill should be at least 10 feet beyond the nearest trench sidewall.
6. Finished side slopes of the fill are to be evenly graded from the outer edges of the trenches to the natural soil surface with a slope of 3:1 or less (three horizontal to one vertical).

7. Compaction of the scarified area must be prevented. Use of equipment with pneumatic tires is prohibited on the fill or cover.
8. At least 12 inches of fill must be applied to cover the trenches.
9. Typical lawn grasses and other appropriate low-profile vegetation should be established on the fill soil cap after placement and final grading. Trees, shrubs, or other aggressive water seeking plants should not be planted on the soil cap.

4.5.6 Inspections

~~7.~~5. Site soil texture, fill soil texture, and the scarification or vegetative mat disruption process will be inspected by the Director.
~~8.~~6. Installed trenches will be inspected by the Director prior to cover.
~~9.~~7. Final inspection after covering may be conducted by the Director to ~~investigate the degree of incorporation of fill soil with the original soil~~ensure proper cap placement and slope.

Figure 4-1 shows a cross section of a capping fill trench.

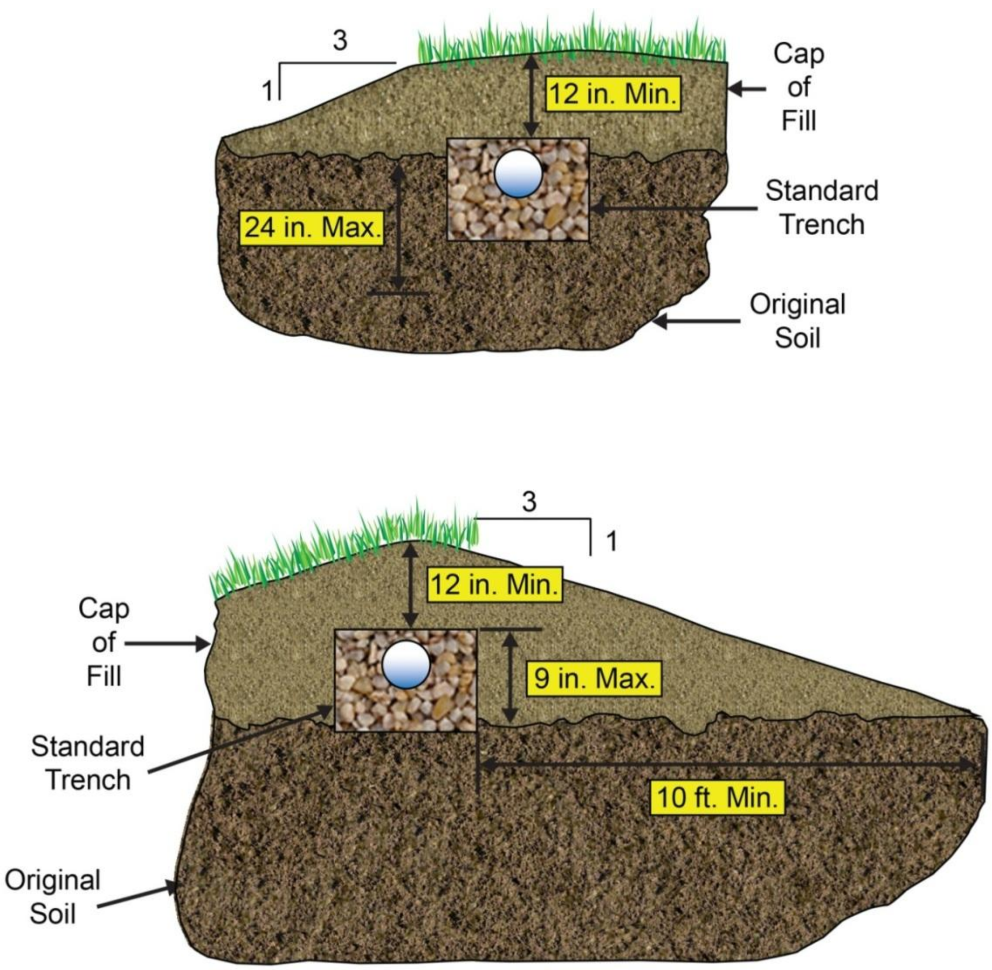


Figure 4-1. Cross-sectional view of a capping fill trench.

Appendix H

4.9 Experimental System

Revision: ~~April 21, 2000~~February 6, 2014

4.9.1 Description

An experimental system includes an individual or subsurface sewage disposal system or component that has not been previously used in Idaho or one that requires field review before approval as an alternative system or subsurface sewage disposal system component.

4.9.2 Approval Conditions

1. If produced by a manufacturer, the experimental system should remain in the ownership of that manufacturer until ~~the alternative status~~approval of the system or component has been ~~assigned~~provided as described by IDAPA 58.01.03.009 or section 1.4 of this manual.
2. ~~3.~~2. All information required by IDAPA 58.01.03.009.02-.03 regarding the system or component shall be provided to DEQ prior to subsurface sewage disposal permit issuance.
3. ~~4.~~3. The manufacturer and property owner must hold DEQ and the health district harmless from any liability arising from use of the system.
4. A variance ~~is required for use of an~~must be approved by DEQ as described in IDAPA 58.01.03.010 prior to permit issuance by the health district for the experimental system the petition for variance should be submitted to DEQ's On-Site Wastewater Coordinator.
    a. The variance hearing committee shall be composed of DEQ Wastewater Program and health district staff.
    b. ~~a.~~b. A subsurface sewage disposal permit application must be submitted to the health district that the experimental system is intended to be installed within prior to submission of the petition for variance to DEQ.
5. The site for system or component installation must otherwise be acceptable for a standard system or approved basic alternative system.
6. ~~5.~~6. The property owner must ~~also~~ agree to replace the experimental system with a standard system or approved basic alternative system that meets the requirements of IDAPA 58.01.03 should DEQ or the health district determine that the system is a failing system (IDAPA 58.01.03.004.05).
7. Conditions for use of the system should be contained in the permit, including, if necessary, operation and maintenance requirements and conditions for abandonment (IDAPA 58.01.03.005.13 and 58.01.03.005.14).
8. ~~6.~~8. Proof of proper permits for any electrical or plumbing components of the system falling under the jurisdiction of the Idaho Division of Building Safety shall be provided as part of the permit application prior to subsurface sewage disposal permit issuance (IDAPA 58.01.03.005.04.m).

~~7.~~9. It is recommended that the property owner or manufacturer secure a performance bond in the amount of the replacement system.

4.9.3 Design

1. The design of the system should be provided by a PE licensed in Idaho.
2. All components in contact with wastewater, effluent, or treated wastewater must be compatible with those waters. Such products should not decompose, dissolve, or otherwise contaminate processed waters at the point of discharge from the unit.
3. All components subject to wear or maintenance must be easily accessible and replaceable.

4.9.4 Construction

1. Installation instructions provided by the manufacturer should be used when installing the system.
2. Licensed public works contractors, plumbers, or electricians may be required to install respective components of experimental systems.

4.9.5 Operation and Maintenance

1. An operation and maintenance manual shall be provided by the system or component's design engineer to DEQ and the health district prior to permit issuance.
2. All operation and maintenance specified by the design engineer and DEQ or the health district shall be contained in the manual and provided as part of the permit application (IDAPA 58.01.03.005.14).

Appendix I

4.7 Drip Distribution System

Revision: ~~March 30, 2012~~February 6, 2014

4.7.1 Description

Drip distribution systems ~~may or may not be continuously flushed and~~ are comprised of a shallow network of thin-walled, small-diameter, flexible tubing with self-cleaning emitters to discharge filtered effluent into the root zone of the receiving soils. The drip system is flushed either continuously or noncontinuously depending upon the system design. ~~Typical~~Minimum system components include, but are not limited to, the following:

1. Septic tank
2. Pretreatment system (not required in grey water system designs):
   a. Intermittent sand filter
   b. Recirculating gravel filter
   c. ETPS
3. Filtering system: cartridge or disk filters (flushable filter cartridge)
4. Effluent dosing system: pump tank and dose pump
5. Process controller: programmable logic controller (PLC)
6. Flow meter
7. Drip tubing network and associated valving

4.7.2 Approval Conditions

1. Drip distribution systems shall only be installed at locations that meet the criteria in the site suitability subsection of IDAPA 58.01.03.008.02 and 58.01.03.013 (section 8.1).
2. The effective soil depths that are established for alternative pretreatment systems may be applied to drip distribution systems.
3. Proof of proper permits for any electrical or plumbing components of the system that are under the jurisdiction of the Idaho Division of Building Safety shall be provided as part of the permit application prior to subsurface sewage disposal permit issuance (IDAPA 58.01.03.005.04.m).
4. All pressurized distribution components and design elements of the drip distribution system that are not specified within section 4.7 shall follow the guidance provided in section 4.20.
5. Pretreatment system design, installation, operation, and maintenance will follow the specific pretreatment system guidance provided in this manual.
6. System must be designed by a PE licensed in Idaho.

4.7.3 Design

The following minimum design elements apply to both continuous and noncontinuous flush drip systems:

1. Application areas up to 2 square feet per foot (ft²/ft) of drip irrigation line may be used.
2. Drip ~~lines~~ tubes may be placed on a minimum of 2-foot centers.
3. Drip ~~lines~~ tubes are placed directly in native soil at a depth of 6–18 inches with a minimum final cover of 12 inches.
4. The design application rate is based on the most restrictive soil type encountered within 2 feet of the drip ~~lines~~tubes.

~~3.~~5. The effective soil depth to limiting layers below the drip tubes should meet the depths specified in Table 4-19.

~~4.~~6. Effluent is required to be filtered with a 100 micron or smaller disc or flushable filter cartridge before discharge into the drip tubing network.

~~In noncontinuous flush systems, drip laterals are flushed at least once every 2 weeks to prevent biofilm and solids buildup in the tubing network. Minimum flushing velocity is based on the tubing manufacturer's recommendations for the return ends of the distribution lines and in the drip irrigation tubing during field flush cycles. The minimum flushing duration is long enough to fill all lines and achieve several pipe volume changes in each lateral.~~

7. A minimum of two vacuum relief valves are required per zone.
   a. The valves are located at the highest points on both the distribution and return manifolds.
   ~~a.~~b. Vacuum relief valves are located in a valve box that is adequately drained and insulated to prevent freezing.
8. Pressure regulators and pressure compensating emitters should be used on sloped installations.

~~5.~~9. Pressure ~~is to~~should be between 25 and 40 psi unless pressure compensating emitters are used.

~~In noncontinuous flush systems, the return manifold is required to drain back to the septic tank.~~

~~6.~~10. Timed dosing is required in all drip distribution systems. ~~In noncontinuous flush systems, timed or event-counted backflushing of the filter is required.~~

~~7.~~11. ~~In noncontinuous flush systems, filters, flush valves, and a pressure gauge may be placed in a head works (between the dose pump and drip field).~~ Each valve, filter, pressure regulator, and any other non-drip tube component is required to be accessible from grade and insulated to prevent freezing.

~~8.~~12. ~~System must be designed by a PE licensed in Idaho.~~

4.7.3.1 Additional Design Elements for Noncontinuous Flush Drip Systems

The following additional minimum design elements apply only to noncontinuous flush drip systems:

1. In noncontinuous flush systems, drip laterals are flushed at least once every 2 weeks to prevent biofilm and solids buildup in the tubing network.
   a. Minimum flushing velocity is based on the tubing manufacturer's recommendations for the return ends of the distribution lines and in the drip irrigation tubing during field flush cycles.
   b. The minimum flushing duration is long enough to fill all lines and achieve several pipe volume changes in each lateral.
2. In noncontinuous flush systems, the return manifold is required to drain back to the septic tank.
3. In noncontinuous flush systems, timed or event-counted backflushing of the filter is required.
4. In noncontinuous flush systems, filters, flush valves, and a pressure gauge may be placed in a head works (between the dose pump and drip field).

4.7.3.2 Additional Design Elements for Continuous Flush Drip Systems

The following additional minimum design elements apply only to continuous flush drip systems:

1. Filter must be a flushing type.
   a. The filter is required to be backwashed according to the manufacturer's recommendations and the process must be automated unless the automated backwashing requirement has been waived.
   b. The automated backwashing requirement may be waived if the filter is configured with an alarm to indicate when velocity is reduced below the manufacturer's minimum recommended flow velocity.
2. Drip laterals are flushed during the dosing cycle.
   a. The continuous flush system must be designed to the manufacturer's minimum recommended flow velocity.
   b. The dose duration must be long enough to achieve several pipe volume changes in each drip tube lateral to adequately accomplish flushing the drip tubing lines.
3. ~~2.~~3. Filters and pressure gauges may be placed in a head works (between the dose tank and drip field), and supply and return pressure gauges are needed to ensure that the field pressurization is within the required range specified by the drip tube manufacturer.
4. In continuous flush systems, both supply and return manifolds are required to drain back to the dose tank.
5. Due to the nature of the continuous flush process, the filter shall be examined after initial start-up and cleaned if necessary to prevent incorrect rate of flow readings for the controller.

~~3.~~6. The drip distribution system will operate to the manufacturer's minimum recommended flow velocity for the duration of each cycle, and the total flow minus the emitter uptake flow would be the return and flushing flow.

4.7.4 Construction

1. No wet weather installation is allowed.
2. Excavation and grading must be completed before installing the subsurface drip distribution system.
~~1.~~3. Drip distribution systems may not be installed in unsettled fill material.
4. No construction activity or heavy equipment may be operated on the drainfield area other than the minimum to install the drip distribution system.
~~2.~~5. Do not park or store materials on the drainfield area.
~~3.~~6. For freezing conditions, the bottom drip tube line must be higher than the supply and return line elevation at the dosing tank.
7. All PVC pipe and fittings shall be PVC schedule 40 type 1 or higher rated for pressure applications**.**
~~4.~~8. All glued joints shall be cleaned and primed with purple (dyed) PVC primer before being glued.
9. All cutting of PVC pipe, flexible PVC, or drip tubing should be completed using pipe cutters~~, unless the following requirements for sawing are complied with~~.
~~5.~~10. Sawing PVC, flexible PVC, or drip tubing is allowed only if followed by cleaning of~~f~~ any residual burs and removing all shavings retained in the tubing or pipe.
11. All open PVC pipes, flexible PVC, or drip tubing in the work area shall have the ends covered during storage and construction to prevent construction debris and insects from entering the pipe.
~~6.~~12. Prior to gluing, all glue joints and tube or pipe interior shall be inspected and cleared of construction or foreign debris.
13. Dig the return ~~header~~ manifold ditch along a line marked on the ground and back to the ~~septic~~ dosing tank.
    a. ~~Start t~~The return ~~header~~ manifold ditch should start at the farthest end of the manifold from the dosing tank.
    ~~a.~~b. The return ~~line~~ manifold must slope back to the ~~treatment tank or septic~~ dosing tank.
~~8~~14. Prior to start-up of the drip distribution system, the air release valves shall be removed and each zone in the system shall be flushed as follows:
    a. System flushing is accomplished by the manufacturer or engineer using the control panel's manual override.
    b. Using an appropriate length of flexible PVC pipe with a male fitting and attach to the air release connection to direct the flushing away from the construction area.

c. Flush the zone with a volume of water (clean water to be provided by contractor) equal to at least 1.52 times the volume of the pipes from the central unit to the air release valve or the equivalent of 5 minutes of flushing.

d. Repeat this procedure for each zone.

Note: filters are not backflushed during start-up as any clogging could cause incorrect rate of flow readings for the controller.

15. If existing septic tanks are to be used, they shall be pumped out by a commercial permitted septic tank pumper, checked for leakage or otherstructural or component problems, and repaired or replaced if necessary.

a. After the tank is emptied, the tank shall be rinsed, pumped, and refilled with clean water, and leak tested.

b. Debris in the septic tank shall should be kept to a minimum because it could clog the filter during start-up.

Note: filters are not backflushed during start-up as any clogging could cause incorrect rate of flow readings for the controller.

1016. Once completed, cap drainfield areas for shallow installations (less than 12 inches) with 6–8 inches of clean soil and suitably vegetate.

a. Cap fill material shall be the same as or one soil group finer than that of the site material, except that no fill material finer than clay loam may be used.

b. Cap fill shall be free of debris, stones, frozen clods, or ice.

c. Suitable vegetation should consist of typical lawn grasses or other appropriate low-profile vegetation.

d. Trees, shrubs, and any other vegetation that aggressively seeks water should not be planted within 50 feet of the drip tubing network.

4.7.5 Inspection

1. A preconstruction meeting between the health district, design engineer, and installer should occur prior to commencing any construction activities.

2. The health district shall inspect all components and fill material used in the construction of the drip distribution system prior to backfilling or cap fill placement.

3. System must be inspected and approved by a PE licensed in Idaho.The design engineer should conduct as many inspections as necessary for verification of system and component compliance with the engineered plans.

1.4. The design engineer shall provide the health district a written statement that the system was constructed and functions in compliance with the approved plans and specifications. Additionally, the design engineer shall provide as-built plans to the health district if any construction deviations occur from the permitted construction plans. (IDAPA 58.01.03.005.15)

2. Turn on the pump and check pressure at the air vacuum breaker.

3. Check the system for leaks and record flow measurements and pressure readings at start-up.

4.7.6 Operation and Maintenance

1. The drip distribution system design engineer shall provide a copy of the system's operation, maintenance, and monitoring procedures to the health district as part of the permit application and prior to subsurface sewage disposal permit issuance (IDAPA 58.01.03.005.04.k).
2. Minimum operation, maintenance, and monitoring requirements should follow each system component manufacturer's recommendations.
3. Additional operation, maintenance, and monitoring may be required for the pretreatment component of the drip distribution system.
    a. The minimum operation, maintenance, and monitoring of the pretreatment component will be based off of the manufacturer's recommendations and the minimum requirements specified within this manual for the specific pretreatment system.
    b. Additional operation, maintenance, and monitoring may be based on specific site conditions or pretreatment component type.

4.7.64.7.7 Suggested Design Example

1. Determine square feet needed for the drip distribution system, as follows.
    a. Wastewater flow in GPD is divided by the soil application rate (based on the soil classification from an on-site evaluation).
    b. Result is the square feet (ft²) needed for the system.

Example conditions: three-bedroom home in subgroup C-2 soils.

Example calculation: (250 GPD)/(0.2 gallons/ft²) = 1,250 ft²

2. System design will use an application area of 2 ft^2/ft of drip linetube. Divide the required square feet by the drip line tube application area (2 ft²/ft). This will determine the total length of drip line tube needed for the system.

Example: (1,250 ft²)/(2 ft²/ft) = 625 feet of drip linetube

3. Determine the size of pump based on gallons per minute (GPM) (step 3 of suggested design example) and total head (step 4 of suggested design example) needed to deliver dose to system. Determine pumping rate by finding the total number of emitters and multiplying by the flow rate per emitter (1.32 gallons/hour/emitter at 20 psi). Adjust output to GPM and add 1.5 GPM per connection for flushing to achieve, for example, a 2 feet/second flushing velocity. *Note:* For continuous flush systems, the number of emitters will vary depending on the product selected.

Example: (625 feet)/(2 emitters/foot) = 312.5, use 313 emitters

(313 emitters) x (1.32 gallons/hour/emitter) = 413.2 gallons/hour

(413.2 gallons/hour)/(60 minutes/hour) = 6.89 GPM, or 7 GPM

10 connections at 1.5 GPM per connection = 15 GPM

Pumping rate: 7 GPM + 15 GPM = 22 GPM

4. Determine feet of head. Multiply the system design pressure (20 psi is standard, but values can ~~be between 10 and 60 psi~~vary depending on the drip ~~line~~ tube used) by 2.31 feet/psi to get head required to pump against.

Example: (20 psi) x (2.31 feet/psi) = 46.2 feet of head

Add in the frictional head loss from tubing

5. Select a pump. Determine the size of pump based on gallons per minute (GPM) (step 3 of suggested design example) and total head (step 4 of suggested design example) needed to deliver a dose to the system. ~~Pump~~ The pump selected for this example must achieve a minimum of 22 GPM plus the flush volume at 46.2 feet of head.

Figure 4-2 shows an overhead view of a typical drip distribution system. Figure 4-3 shows a potential layout of a filter, valve, and meter assembly, and Figure 4-4 illustrates a cross-sectional view of the filter, valve, and meter assembly. Figure 4-5 provides a view of the continuous flush system filter and meter assembly.

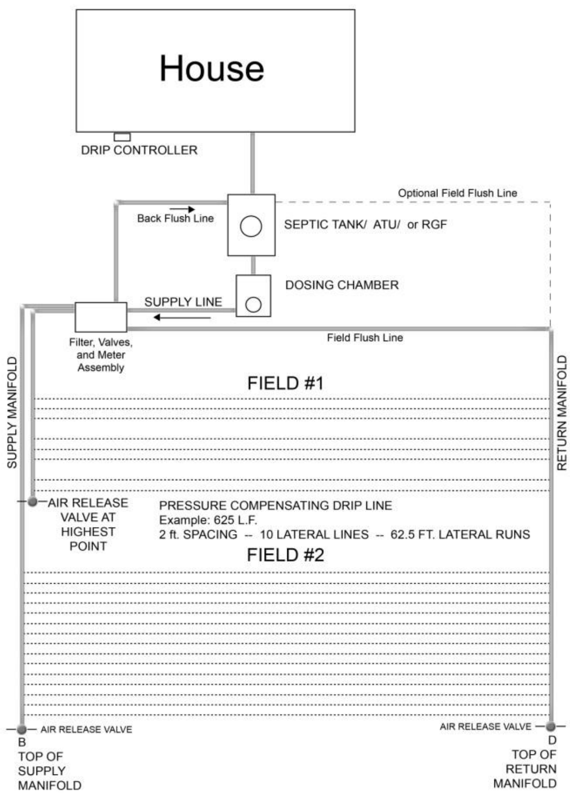


Figure 4-2. Overhead view of typical drip distribution system.

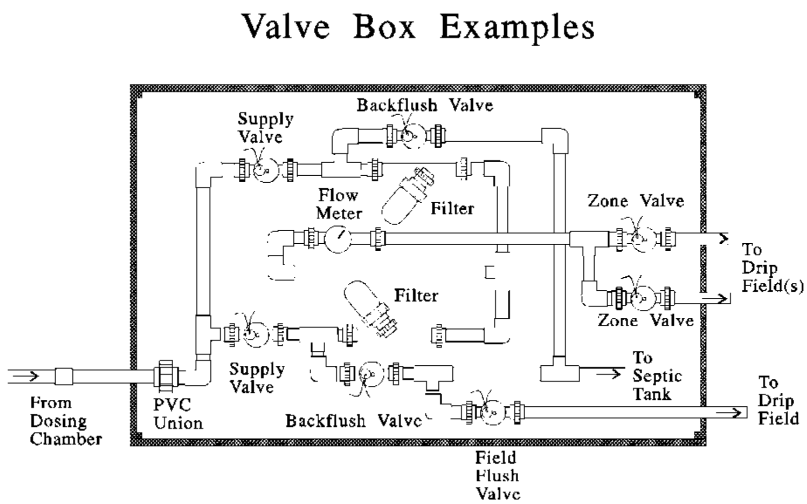


Figure 4-3. Overhead view of filter, valve, and meter assembly.

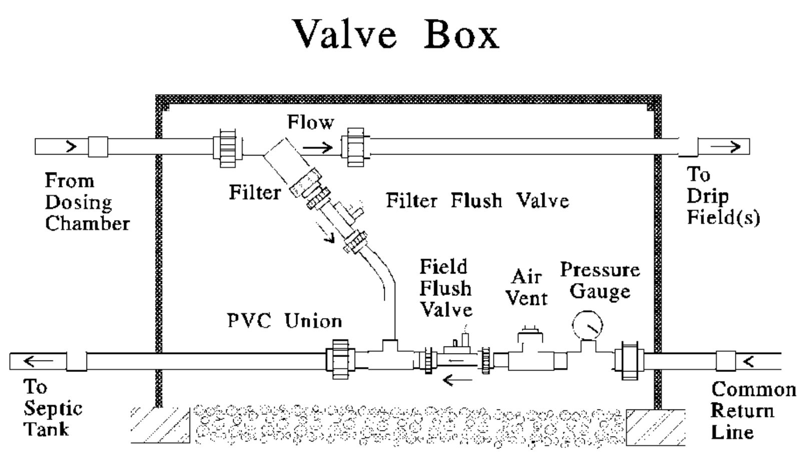


Figure 4-4. Cross-sectional view of typical filter, valve, and meter assembly.

~~4.7.7 Continuous Flush Systems~~

~~The requirements for continuous flush systems are different than for the rest of the drip distribution systems. All other requirements described in section 4.7 apply to continuous flush systems along with the following sections. Figure 4-5 provides a view of the continuous flush system filter and meter assembly.~~

~~*4.7.7.1 Filter Type*~~

~~Filter must be a flushing type.~~

~~*4.7.7.2 Filter Backwashing*~~

~~The filter is required to be backwashed according to the manufacturer's recommendations and the process must be automated unless the automated backwashing requirement has been waived. The automated backwashing requirement may be waived if the filter is configured with an alarm~~

~~to indicate when velocity is reduced below the manufacturer's minimum recommended flow velocity.~~

~~4.7.7.3 Flushing~~

~~Drip laterals are flushed during the dosing cycle. The continuous flush system must be designed to the manufacturer's minimum recommended flow velocity with a dose duration long enough to achieve several pipe volume changes in each lateral to adequately accomplish flushing the drip lines.~~

~~4.7.7.4 Filter and Gauge Locations~~

~~Filters and pressure gauges may be placed in a headworks (between the dose tank and drip field), and supply and return pressure gauges are needed to ensure that the field pressurization is within the required range specified by the drip tube manufacturer.~~

~~4.7.7.5 Manifold Drain Routing~~

~~In continuous flush systems, both supply and return manifolds are required to drain back to the dose tank.~~

~~4.7.7.6 Examination and Cleaning of Filter during Start-up~~

~~Due to the nature of the continuous flush process, the filter shall be examined after initial start-up and cleaned if necessary to prevent incorrect rate of flow readings for the controller.~~

~~4.7.7.7 Determining Required Pump Size and Total Head~~

~~The drip distribution system will operate to the manufacturer's minimum recommended flow velocity for the duration of each cycle, and the total flow minus the emitter uptake flow would be the return and flushing flow.~~

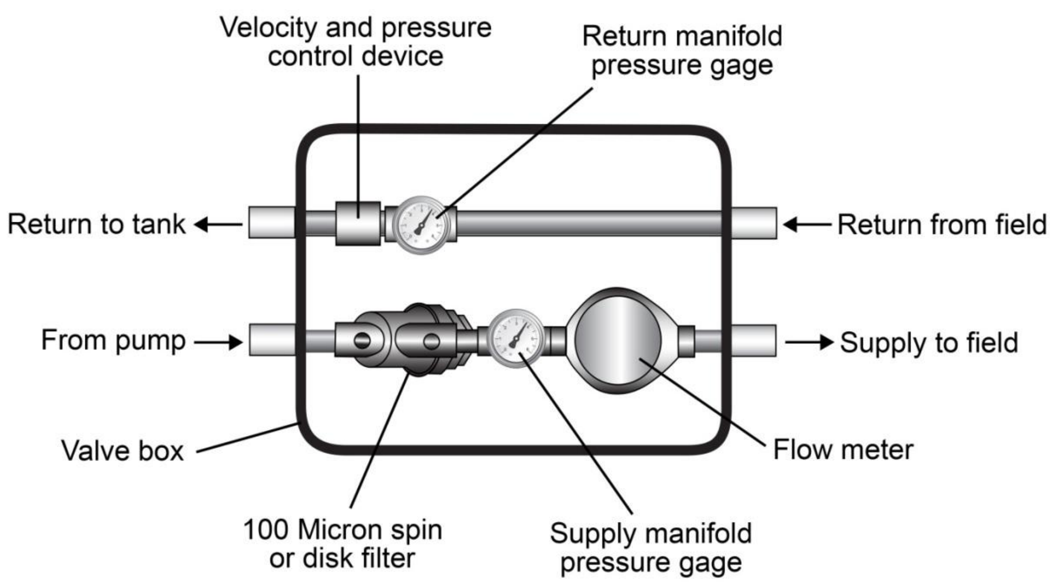


Figure 4-5. Overhead view of continuous flush system filter and meter assembly.

Appendix J

3.2.7 Drainfield Cover

Drainfield cover consists of two components. These are the soil barrier and the soil placed over the drainfield as final cover. There are several elements to consider for both components that are discussed below.

3.2.7.1 Soil Barrier

IDAPA 58.01.03.008.07 requires that drainfield aggregate must be covered throughout the drainfield by a soil barrier. For standard subsurface sewage disposal systems, standard absorption beds, and seepage pits the soil barrier may consist of untreated building paper, synthetic filter fabric (geotextile), or a 3 inch layer of straw or other acceptable permeable material. Other permeable materials proposed for use as a soil barrier will be considered on a case-by-case basis and must be approved by the health district prior to installation in the standard subsurface sewage disposal system. Although straw and untreated building paper may be used to cover ~~drainrock~~drainfield aggregate, geotextiles of greater than 1 ounce per square yard weight are recommended. These materials are particularly recommended in soils that may flow when wet, such as uniform fine sands or silts ~~and in pressure distribution systems~~.

Soil barriers used for all basic and complex alternative systems not listed within IDAPA 58.01.03.008 should use geotextile filter fabric to cover the entire drainfield. Additionally, all large soil absorption systems shall also utilize geotextile filter fabric as the soil barrier (IDAPA 58.01.03.013.04.i). Some approved gravelless trench components used for drainfield aggregate replacement may not need to be covered with a soil barrier. The soil barrier requirements for each gravelless trench component should be based on the product manufacturer's recommendations.

3.2.7.2 Soil Cover

Every drainfield must have a soil cover installed after the system's installation and subsequent final inspection by the health district. The minimum depth of soil that must be placed over the top of a drainfield is 12 inches (IDAPA 58.01.03.008.04). The maximum depth of soil that may be placed over the top of a drainfield is 36 inches (IDAPA 58.01.03.008.04). These depths are intended to keep effluent from reaching the ground surface through the drainfield, mitigate the rise of nuisance odors from the drainfield, and allow oxygen to reach the drainfield and its surrounding soils.

Soil used to cover the drainfield should be the same as or one soil group finer than that of the native site material around and above the drainfield. Cover soil should be consistent with one of the approved soil design groups provided in Table 2-4. No soil finer than clay loam should be used as cover over the drainfield. All soil used as cover shall be free of debris, stones, frozen clods, and ice or snow.

Care should be taken to account for settling of the cover soil. Extra cover may be necessary to achieve the desired fill depth after the cover soil settles. All cover placed over the drainfield should be placed in a manner that prevents the blockage and accumulation of surface runoff over the drainfield. Cover that is placed above grade should not exceed a 3:1 slope. Mechanical compaction of the drainfield cover is not allowed and shall not be covered by any impermeable surface barriers (IDAPA 58.01.03.008.09).

3.2.8 Drainfield Excavation Backfilling Materials and Alternative System Construction Media

Installation of a drainfield or construction of several alternative systems requires that the drainfield excavation or alternative system be constructed with some type of media or aggregate. For any media used in a basic or alternative system it is important that the media or aggregate meet certain size and cleanliness specifications to ensure the system's functionality and longevity. To ensure proper media or aggregate sizing and material cleanliness it is necessary for the health districts to verify and inspect the media or aggregate installed in subsurface sewage disposal systems. Media and aggregate inspection and approval processes are discussed further below.

Upon excavation, native site soils are considered the same as fill material. For subsurface sewage disposal systems, excavation is considered any disturbance of the native site soils that causes the soil to lose its original compaction. Native site soils excavated for any portion of a subsurface sewage disposal system shall not be left in place or backfilled below a drainfield unless the material has successfully completed the evaluation process outlined in section 2.4. Scarification of soils as described in certain alternative system guidance is the only excavated native soil that is approved to be left below a drainfield. Scarification should only occur for the approved alternative systems in this manual that it is specified for. Manual raking of a drainfield excavation to alleviate soil smearing is not considered scarification.

3.2.8.1 Drainfield Aggregate and Construction Media Approval Process

Drainfield aggregate is any crushed rock or gravel that is durable, inert, free of fines, and has an effective diameter of ½ to 2 ½ inches (IDAPA 58.01.03.008.08). Construction media is considered any earthen material specified for use in the construction of an alternative system. The following construction media is currently specified for use in alternative systems:

- Medium sand (also referred to as ASTM C-33 sand)
- Pea gravel
- Pit run material (consisting of clean sand and gravel)

Aggregate and construction media must come from an approved source before installation in any subsurface sewage disposal system. To become an approved source a supplier (typically a material pit or storage yard) shall submit an annual sieve analysis for each source of drainfield aggregate or construction media that they would like to obtain approval for the purpose of installation in a standard or alternative subsurface sewage disposal system. The sieve analysis verifies compliance with material sizing and cleanliness specifications as specified in IDAPA 58.01.03.008.08 or verifies compliance with the recommendations for an approved alternative system (IDAPA 58.01.03.004.10). The sieve analyses from each source shall be submitted to the local health district for review and aggregate or construction media approval. Each health district shall maintain an approved source and materials list for their district and will provide a copy of this list to DEQ.

Health district approval of an aggregate or construction media source only provides verification that the source is capable of producing these materials in conformance with the material specifications. The health district may still disapprove drainfield aggregate or construction media if it becomes contaminated during processing, loading, transport, storage, or installation either at the source location or at a subsurface sewage disposal installation site. It is the responsibility of those processing, providing, transporting, storing, or installing the aggregate or media to ensure the drainfield aggregate or construction media maintains its approved characteristics (i.e., size and cleanliness).

The size and cleanliness characteristics of drainfield aggregate and construction media shall be evaluated utilizing standard sieve analysis. The sieve sizing shall conform to the standards of the American Society for Testing and Materials (ASTM). The size and cleanliness characteristics for each material are provided below.

3.2.8.1.1 Drainfield Aggregate

Drainfield aggregate is commonly referred to as drainrock. The dimensions of this material are specified in IDAPA 58.01.03.008.08. The material is typically comprised of crushed rock or gravel and the rock or gravel is of a durable and inert type. Other materials meeting the size and cleanliness specifications may be considered for use as drainfield aggregate if it can be shown that the material is both durable and inert. Consideration of alternative drainfield aggregate sources will be made on a case by case basis. To determine if a drainfield aggregate is suitable it must be passed through a sieve to ensure that 100% passes a 2.5 inch sieve and that ≤ 2% passes through a 0.5 inch sieve for size and less than 2% passes a #200 sieve for cleanliness (Table 3-3).

Table 3-3. Drainfield aggregate allowable particle size percent composition.

Sieve Size	Passing (%)
2.5 inch	100
0.5 inch	≤ 2
200	< 2

3.2.8.1.2 Medium Sand (will replace section 2.1.4)

~~The following definition may be used t~~To determine if a ~~soil texture~~construction media is ~~a~~ medium sand~~:~~ the sand is passed through a sieve to ensure that it ~~Conforms~~ conforms to the gradation requirements of ~~American Society for Testing and Materials (~~ASTM~~)~~ C-33 for size and less than 2% passes a #200 sieve for cleanliness (Table ~~2-5~~3-4).

~~A sand with a mean particle size (D_{50}) of no more than 0.5 millimeter (mm) and a coefficient of uniformity (C_u) of 8 or greater has been shown to sustain a biological mat and will be acceptable in systems under continual use.~~

Table 2-53-4. Modified ASTM C-33 medium Medium sand (modified ASTM C-33) allowable particle size percent composition.

Sieve Size	Passing (%)
4	95-100
8	80-100
16	50-85
30	26-60
50	10-30
100	2-10
200	< 2

3.2.8.1.3 Pea Gravel

To determine if a construction media is pea gravel the media is passed through a sieve to ensure that it conforms to the gradation requirements of 100% passing the 1/8 inch sieve, less than 2% passing the #7 sieve, and that less than 1% passes the #50 sieve for size and cleanliness (Table 3-5). Additionally, the media must have a uniformity coefficient of less than 2.

Table 3-5. Pea gravel allowable particle size percent composition.

Sieve Size	Passing (%)
1/8 inch	100
7	< 2
50	< 1

3.2.8.1.4 Pit Run

Pit run construction media is composed of clean cobble, gravel, and sand. To determine if a construction media is suitable pit run it shall be passed through a sieve to ensure that it conforms to the gradation requirements of 100% passing a 10 inch sieve, 66-100% passing a #50 sieve and 2-10% passing a #100 sieve for size. Additionally, less than 2% shall pass a #200 sieve for cleanliness. See Table 3-6.

Table 3-6. Pit run allowable particle size percent composition.

Sieve Size	Passing (%)
10 inch	100
50	66-100
100	2-10
200	< 2

3.2.8.2 Substantiating Drainfield Aggregate and Construction Media Installation

After delivery of the drainfield aggregate or construction media to a subsurface sewage disposal system installation site the health district shall verify that the aggregate and/or media was obtained from an approved source as described in section 3.2.8.1. The permitted installer, property owner, or licensed public works contractor under the direction of a P.E. licensed in Idaho performing the subsurface sewage disposal system installation shall provide the drainfield aggregate or construction media receipts to the health district for verification of source and volume (IDAPA 58.01.03.011.04). The health district shall record the volume of drainfield aggregate or construction media on the final inspection form for the installation permit. The volume of drainfield aggregate and construction media may also be used to verify the excavation depth of drainfield trenches.

Example (verification of excavation depth of an in-trench sand filter drainfield trench):

The drainfield covers a disposal area of 420 ft^2 and was installed with two 6 foot wide trenches that are each 35 feet long. The excavation depth of the system was required to be 7 feet with a drainfield installation of 4 feet. To meet the excavation depth and install the drainfield no deeper than 4 feet approximately 47 cubic yards or medium sand must be installed below the drainfield aggregate. Another 15.6 cubic yards of drainfield aggregate should be installed to ensure that a minimum of 12 inches of aggregate is in place and that it is installed no deeper than 4 feet. This is determined by:

Medium Sand Volume

(420 ft^2 of disposal area) x (3 ft. of medium sand) = 1,260 ft^3 of medium sand.

(1,260 ft^3 of medium sand)/(27 ft^3/yd^3) = 46.67 yd^3 of medium sand

Drainfield Aggregate

(420 ft^2 of disposal area) x (1 ft. of drainfield aggregate) = 420 ft^3 of drainfield aggregate.

(420 ft^3 of drainfield aggregate)/(27 ft^3/yd^3) = 15.56 yd^3 of drainfield aggregate

Appendix K

4.28 Two-Cell Infiltrative System

Revision: ~~April 21, 2000~~February 6, 2014

4.28.1 Description

Domestic sewage is discharged into a two-cell infiltrative system (TCIS). The cells provide sewage storage during wet seasons. The second cell provides very slow infiltration into the surrounding soils. Evaporation and more rapid infiltration occur during dry seasons, reducing the liquid volume and replenishing the cell's storage capacity.

4.28.2 Approval Conditions

1. Cells may not be placed within 100 feet of the owner's property line and may not be placed within 300 feet from a neighboring dwelling.
~~6.~~2. Bottom of the finished cells must meet the effective soil depths for a design group C soil.
~~7.~~3. Soil design group must be C or *unsuitable clays*.
~~8.~~4. Site must be located in an area of maximum exposure to the sun and wind.
~~9.~~5. Slope must not be greater than 6%.
~~10.~~6. System cannot be placed on fill.
~~11.~~7. Source of make-up water with a backflow prevention system between the source and the TCIS must be readily available.
~~12.~~8. Lot size shall be at least 5 acres.
~~13.~~9. This design is for an individual residential dwelling with up to six bedrooms and is not to be used for commercial or industrial nondomestic wastewater.
10. In areas of Idaho where the precipitation exceeds evaporation by more than 6 inches, this design would be considered experimental.
11. A reserve area equal to the size of the second cell shall be required.
~~14.~~12. The system must be designed by a PE licensed in Idaho.

4.28.3 Design ~~Volume~~

1. The first cell is approximately 32,100 gallons at a liquid depth of 4 feet~~. The first cell~~ and should operate full or nearly full at all times.

2. If the water level of the first cell drops below 2 feet, make-up water is added to raise the ~~first cell~~ water level up to the 2-foot minimum pool.

3. The second cell is approximately 51,000 gallons at a liquid depth of 4 feet~~. This~~ which provides 182 days or about 6 months storage when this cell is dry.

4. Total minimum volume ~~=~~ of both cells combined is 83,100 gallons at a liquid depth of 4 feet.

4.28.4 Construction

1. Shallow permeable topsoils shall be removed before starting excavation and construction (topsoils may be saved and used to provide vegetative cover on the dike embankments).

2. Dike levees, embankments, and inlet piping trenches shall be compacted to 90% standard proctor density.

2.3. No vehicles with pneumatic tires shall be permitted on the basal area or inside slope of the second cell.

3.4. Sewage discharge inlet must be placed in the center of the basal area of boththe first cells.

4.5. Concrete splash pad must be constructed around the discharge inlets.

5.6. Water depth gauges clearly visible from the edge of the both cells shall be installed.

6.7. Cleanout must be placed on the gravity effluent lines at a point above the maximum liquid elevation.

7.8. If the sewage is pumped to the system, a check valve, and a shutoff valve must be placed between the pump and system so that repairs can be completed without draining the cells.

9. Excavation must provide the following dike and embankment details:. listed in Table 4-28.

a. Inner slope – 3:1

b. Outer slope – 2:1 or flatter

a.c. Embankment width – 4 feet minimum

Table 4-28. Dike and embankment slope minimums.

Dike and Embankment	Minimum Slopes
Inner slopes	3:1
Outer slopes	2:1
Embankment width (top)	4 feet minimum

8.10. System must be fenced to exclude children, pets, and livestock. A sign on the fence indicating *Danger—Human Sewage* shall be erected.

9.11. Diversion ditches or curtain drains must be installed on sloping terrain to prevent surface runoff from entering the system.

A reserve area equal to the size of the second cell shall be required.

10.12. Before operation of the system, the first cell shall be filled with 2 feet of make-up water.

11.13. Shallow permeable topsoils shall be removed before starting excavation and construction (topsoils may be saved and used to provide vegetative cover on the dike embankments).

Dike levees and embankments shall be adequately compacted. Inlet piping trenches shall be compacted to 90% standard proctor density.

No vehicles with pneumatic tires shall be permitted on the basal area or inside slope of the cells.

12.14. Top and outer embankment shall be seeded or adequately protected from erosion.

4.28.5 Inspection

Inspections may be required during construction and after completion. Inspections shall include slope verification, interior and exterior dimensions, splash pads, clean outs, signs, fencing, O&M manual, and embankment seeding.

1. A preconstruction conference should be held between the health district, design engineer, and installer.
2. The design engineer should conduct as many inspections as necessary for verification of system and component compliance with the engineered plans.
3. The design engineer shall provide the health district a written statement that the system was constructed and functions in compliance with the approved plans and specifications. Additionally, the design engineer shall provide as-built plans to the health district if any construction deviations occur from the permitted construction plans. (IDAPA 58.01.03.005.15)
4. Site must be inspected at the time the cells are excavated.
5. All required system components and design elements shall be inspected.
6. Inspections may beis required during embankment construction to ensure verify that all fill materialadequacy of fill compaction is compacted to 90% proctor density.
7. Prior to operation and before filling the first cell with make-up water, a final inspection shall be completed.

4.28.6 Operation and Maintenance

O&M procedures shall be followed as outlined in the approval conditions in section 4.28.2.

1. The two-cell infiltrative system design engineer shall provide a copy of the system's operation, maintenance, and monitoring procedures to the health district as part of the permit application and prior to subsurface sewage disposal permit issuance (IDAPA 58.01.03.005.04.k).
2. The first cell must be kept filled with at least 2 feet of liquid.
3. Annual maintenance and testing of the backflow prevention device installed on the makeup water supply line shall be performed at least annually and be done according to the manufacturer's recommendations.
4. Permanent vegetation should be maintained on the top and outer slopes of the embankment except where a foot or vehicle path is in use.
5. Woody vegetation should be removed from the embankments, grasses should be mowed, and other vegetation should be maintained regularly.
6. Weeds and other vegetation should not be allowed to grow in either of the cells.
7. Floating aquatic weeds must be physically removed on a regular basis.
8. The fence and all gates surrounding the system must be maintained to exclude animals, children, and other unwanted intrusion.

Figure 4-33 shows a cross-sectional view of a two-cell infiltrative system. Figure 4-34 provides an overhead view of a two-cell infiltrative system.

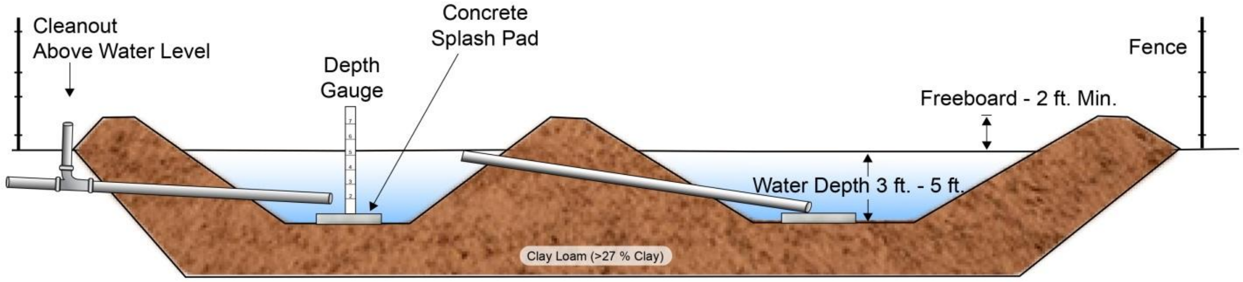


Figure 4-33. Cross-sectional view of a two-cell infiltrative system.

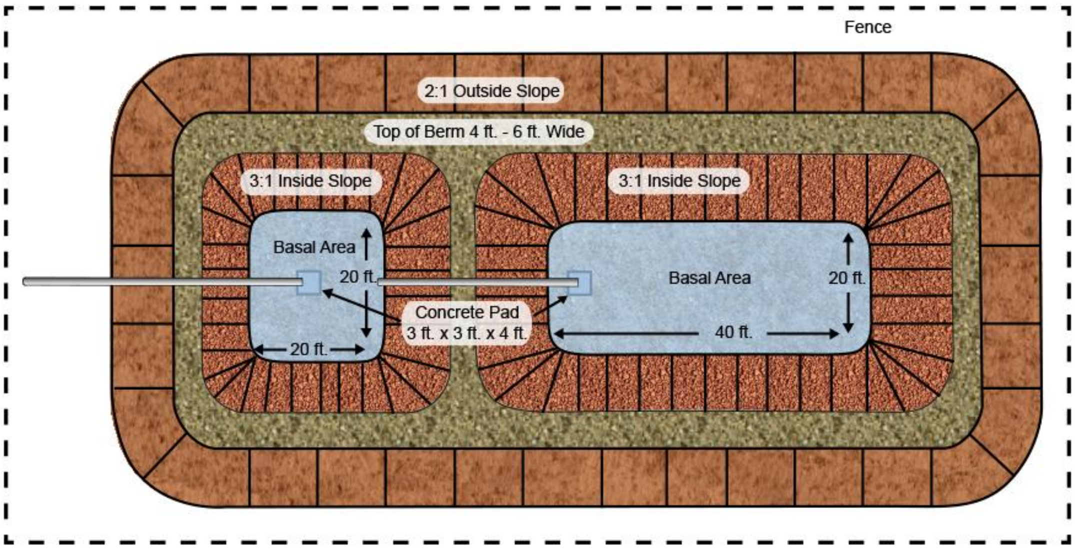


Figure 4-34. Overhead view of a two-cell infiltrative system.

Appendix L

4.22 Recirculating Gravel Filter

Revision: ~~October 13, 2004~~February 6, 2014

4.22.1 Description

A recirculating gravel filter is a bed of ~~coarse sand~~filter media in a container that filters and biologically treats septic tank effluent. The filter effluent is returned to the recirculation tank for blending with untreated septic tank effluent and recirculated back to the filter. The treated effluent is distributed to a disposal trench of reduced dimension. System components include a septic tank, recirculating tank with float valve and low-pressure distribution system, free access filters, and a drainfield.

4.22.2 Approval Conditions

1. Nondomestic wastewater with BOD or TSS exceeding normal domestic wastewater strengths (section 3.2.1, Table 3-1) is required to be pretreated to these levels before discharge into the recirculating gravel filter system.
2. The bottom of the filter must not come within 12 inches of seasonal high ground water.
3. All pressurized distribution components and design elements of the recirculating gravel filter system that are not specified within section 4.22 must be designed and installed according to the guidance for pressure distribution systems in section 4.20.
4. Proof of proper permits for any electrical or plumbing components of the system that are under the jurisdiction of the Idaho Division of Building Safety shall be provided as part of the permit application prior to subsurface sewage disposal permit issuance (IDAPA 58.01.03.005.04.m).
5. ~~2.~~System must be designed by a PE licensed in Idaho.

4.22.3 Design

Minimum design requirements for the recirculating gravel filter components are provided in the sections below.

4.22.3.1 Septic and Recirculating Tank

1. The septic tank shall be sized according to IDAPA 58.01.03.007.07.
2. Minimum recirculating chamber volume is ~~one-half~~1.5 times the ~~volume of the septic tank~~daily design flow of the structure.
3. The recirculating chamber may be a modified septic or dosing tank selected from section 5.2 or section 5.7.
   a. Alternatively, the recirculation chamber may be designed by the system's design engineer to meet the minimum necessary requirements of this section and IDAPA 58.01.03.007.
   b. Subsections .07, .08, .10, .11, and .13 are exempt from the recirculating chamber design requirements.

4. The recirculating chamber shall be accessible from grade and the by-pass valve, pump, pump screen, and pump components shall be accessible from this access point.
5. A ~~F~~float valves or equivalent bypass alternatives ~~are~~is required in the recirculation tank.
6. Discharge to the drainfield must occur after filtration.
7. The recirculating chamber shall meet all other minimum design requirements of section 4.20.3.4.

4.22.3.2 Recirculating Filter

1. The filter surface area is sized at 3-5 gallons/ft²/day forward flow (forward flow is equivalent to the daily design flow from the structure).
2. Filter construction media shall meet the specification in section 3.2.8.1.3.
3. Minimum filter construction media depth shall be 24-36 inches and result in the equivalent of a total daily recirculation flow of no more than 25 gallons/ft^3 of filter construction media.
4. 12 inches of drainrock shall be placed below the filter construction media.
5. An underdrain must be located within the drainrock to return filtered effluent to the recirculation tank and should be placed level throughout the filter.
6. Filter container shall be constructed of reinforced concrete or other materials where equivalent function, workmanship, watertightness and at least a 20-year service life can be documented. The following requirements must be met for flexible membrane liners:
   a. Have properties equivalent to or greater than 30-mil PVC.
   b. Have field repair instructions and materials provided to the purchaser of the liner.
   c. Have factory fabricated boots for waterproof field bonding of piping to the liner.
   d. Liner must be placed against smooth, regular surfaces free of sharp edges, nails, wire, splinters, or other objects that may puncture the liner. A 4-inch layer of clean sand should provide liner protection.
7. No soil cover is required over the recirculating filter though the following minimum requirements must be met:~~.~~
   a. Media and pipe shall be covered to prevent accidental contact and to provide access to the filter surface for filter maintenance.
   b. Extreme climates may require insulation of the recirculating sand filter lid or cover to prevent freezing of the media.

4.22.3.3 Recirculating Filter Dosing

1. The recirculation ratio of the filter is ~~4~~5:1 (the daily flow moves through the filter 5 times prior to discharge to the drainfield).
2. Timed dosing is required and the filter dosing cycle should meet the following minimum recommendations:

a. Pumps are set by timer to dose approximately 5–10 minutes per 30 minutes2 times per hour.

b. Dose volume for each cycle should be 9.6% of the daily flow from the structure (forward flow).

3. Orifices are recommended to be oriented up with an orifice shield used to minimize orifice blockage from the filter construction media.

Longer dosing cycles may be desirable for larger installations, e.g., 20 minutes every 2–3 hours. Hydraulic loading is 5 gallons/ft²/day (forward flow).

Filter media is very fine washed gravel (pea gravel), with 100% passing the three-eighths inch sieve, an effective size of 3–5 mm, a uniformity coefficient (C_u) < 2, and < 1% passing a #50 sieve.

3.4. Minimum recirculating chamber size is one-half the volume of the septic tank.

4.5. Gravel filter container, piping, gravel, and gravel cover should meet the minimum requirements as shown herein. No soil cover is required.

5. Filter container shall be constructed of reinforced concrete or other materials where equivalent function, workmanship, watertightness and at least a 20-year service life can be documented. The following requirements must be met for flexible membrane liners:

a. Have properties equivalent to or greater than 30-mil PVC.

b. Have field repair instructions and materials provided to the purchaser of the liner.

c. Have factory fabricated *boots* for waterproof field bonding of piping to the liner.

d. Liner must be placed against smooth, regular surfaces free of sharp edges, nails, wire, splinters, or other objects that may puncture the liner. A 4-inch layer of clean sand should provide liner protection.

6. Float valves or equivalent bypass alternatives are required in the recirculation tank. Discharge to the drainfield must occur after filtration.

7. Media and pipe shall be covered to prevent accidental contact and to provide access to the filter surface for filter maintenance.

8. Extreme climates may require insulation of the recirculating sand filter lid or cover to prevent freezing of the media.

4.22.4 Filter Construction

1. All materials must be structurally sound, durable, and capable of withstanding normal installation and operation stresses.

5.2. Components that may be subject to excessive wear must be readily accessible for repair or replacement.

6.3. All filter containers must be placed over a stable level base.

7.4. Pressure system must be designed and installed according to the guidance given for pressure distribution systems in section 4.20. Geotextile filter fabric shall not only be used in the recirculating gravel filterplaced over the top of the filter and must not be used in-between the filter construction media and drainrock.

~~8.~~5. Access to the filter surface must be provided to facilitate maintenance.

4.22.5 ~~Gravity Disposal~~Drainfield Trenches

1. Except as noted herein, the final disposal trenches must meet the requirements of a standard trench system.
2. Distances shown in Table 4-19 must be maintained between the trench bottom and limiting layer.
3. Capping fill may be used to obtain adequate separation from limiting layers but must be designed and constructed according to the guidance for capping fill trenches in section 4.5.
4. Pressure distribution may be used with the following design considerations:

a. The pressure distribution system related to the drainfield is designed in accordance with section 4.20.

~~a.~~b. The recirculation chamber may not be used as the dosing chamber for the drainfield.

5. The minimum area, in square feet of bottom trench surface, shall be calculated from the maximum daily flow of effluent divided by the hydraulic application rate for the applicable soil design subgroup listed in Table 4-20.

Table 4-19. Recirculating gravel filter vertical setback to limiting layers (feet).

Limiting Layer	Flow <2,500 GPD	Flow ≥2,500 GPD
	All Soil Types	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

Note: gallons per day (GPD)

Table 4-20. Secondary biological treatment system hydraulic application rates.

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

4.22.6 Inspection

1. A preconstruction meeting between the health district, design engineer, and installer should occur prior to commencing any construction activities.
2. The health district should inspect all system components prior to backfilling and perform inspections of the filter container construction prior to filling with drainrock and filter construction media.
3. The design engineer should conduct as many inspections as necessary for verification of system and component compliance with the engineered plans.
4. The design engineer shall provide the health district a written statement that the system was constructed and functions in compliance with the approved plans and specifications. Additionally, the design engineer shall provide as-built plans to the health district if any construction deviations occur from the permitted construction plans. (IDAPA 58.01.03.005.15)

4.22.6 Operation and Maintenance

1. The recirculating gravel filter design engineer shall provide a copy of the system's operation, maintenance, and monitoring procedures to the health district as part of the permit application and prior to subsurface sewage disposal permit issuance (IDAPA 58.01.03.005.04.k).
2. Minimum operation, maintenance, and monitoring requirements should follow each system component manufacturer's recommendations.
3. Operation and maintenance directions should be included regarding the replacement of the filter construction media and the direction to the system owner that a permit must be obtained from the health district for this activity.
4. Maintenance of the septic tank should be included in the O&M manual.

Figure 4-24 shows two examples of recirculating flow splitters. Figure 4-25 is a diagram of a recirculating/dose tank. Figure 4-26 shows a cross section of a recirculating gravel filter system.

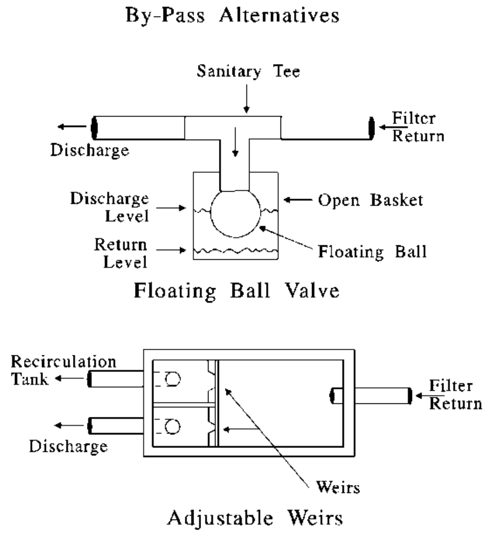


Figure 4-24. Two examples of recirculating flow splitters.

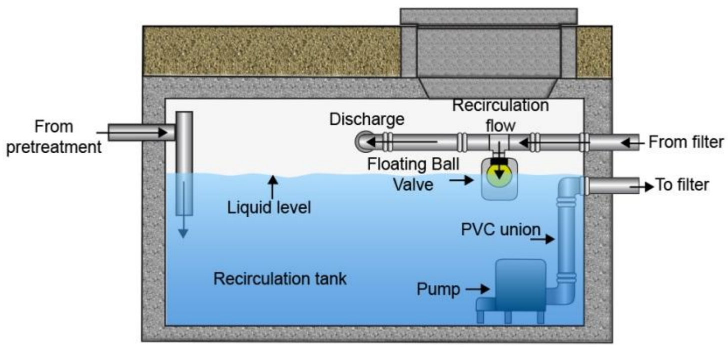


Figure 4-25. Recirculating/dose tank.

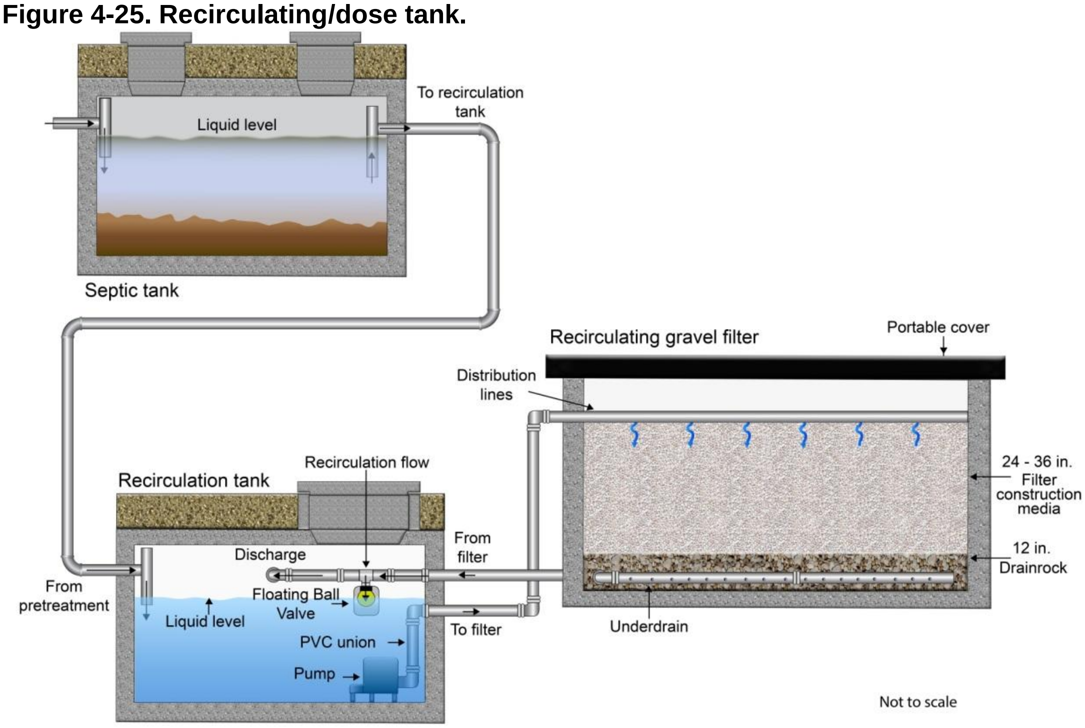


Figure 4-26. Cross section of recirculating gravel filter system.

Appendix M

4.10.3 Operation, Maintenance, and Monitoring

Procedures relating to operation, maintenance, and monitoring are required by IDAPA 58.01.03 (section 8.1) or may be required as a condition of issuing a permit, per IDAPA 58.01.03.005.14 (section 8.1) to ensure protection of public health and the environment.

1. Operation and maintenance
   a. Annual maintenance shall be performed on the ETPS unit as described in the ETPS manufacturer's O&M manual for the ETPS model as submitted under section 4.2.
   b. Additional maintenance not specified in the O&M manual may be required to ensure the ETPS functions properly.
   c. Records of each maintenance visit shall be kept and should include the following information for the primary maintenance visit:
      1) Date and time.
      2) Observations for objectionable odors.
      3) Observation for surfacing of effluent from the treatment unit or drainfield.
      4) Notation as to whether the system was pumped since the last maintenance visit including the portions of the system pumped, pumping date, and volume.
      5) Sludge depth and scum layer thickness in the primary septic tank and treatment unit.
      6) If responding to an alarm event, provide the cause of the alarm and any maintenance necessary to address the alarm situation.
      7) Field testing results for any system effluent quality indicators included in the approved sampling plan as submitted under section 4.2.4 or as recommended in item 2(b) below.
      8) Record of any cleaning and lubrication.
      9) Notation of any adjustments to control settings or equipment.
      10) Test results for pumpers, switches, alarms, and blowers.
      11) Notation of any equipment or component failures.
      12) Equipment or component replacement including the reason for replacement.
      13) Recommendations for future service or maintenance and the reason for the recommendations.
      14) Any maintenance occurring after the primary annual maintenance visit should only record and address the reason for the visit and the associated activities that occur.

2. Monitoring

a. Annual effluent monitoring will be required for all ETPS units that discharge to a reduced size drainfield, to a drainfield with a reduced separation distance to limiting layers, and/or to a drainfield located in an environmentally sensitive area (area of concern).

   Annual monitoring included in the annual report must occur within the reporting period (Figure 4-8).

b. DEQ recommends prior to collecting effluent samples from the treatment unit for laboratory analysis that effluent quality indicators be field tested as described in the approved sampling plan for the O&M entity. Recommendations included in this section are recommendations only and should be verified with the treatment technology manufacturer as acceptable with their field sampling plan and as suitable effluent quality indicators. Field testing is recommended to include, but may not be limited to the following:

   1) Visual examination for wastewater color, odor, and effluent solids

   2) Constituents shown in Table 4-5:

Table 4-5. Recommended field testing constituents for effluent quality indication.

Constituent	Acceptable Range
pH	6 to 9
Dissolved oxygen	≥ 2 mg/L
Turbidity	≤ 40 NTU

Notes: milligram per liter (mg/L); nephelometric turbidity unit (NTU)

c. Monitoring samples provided to a laboratory will analytically quantify that the units are operating in compliance if samples do not exceed 40 mg/L (40 ppm) for $CBOD_5$ and 45 mg/L (45 ppm) for TSS.

   Results for $CBOD_5$ and TSS that exceed these levels indicate the ETPS unit is not achieving the required reduction levels.

d. For those systems installed in areas of concern, including nitrogen sensitive areas, or are used to fulfill NP evaluation results and requirements, the following additional constituents may be monitored as stipulated on the permit:

   1) Total Kjeldahl nitrogen (TKN)

   2) Nitrate-nitrite nitrogen (NO3+NO2-N)

   3) Results for total nitrogen (TN = TKN + [NO3+NO2-N]) that exceed the levels stipulated on the installation permit, in the subdivision approval for sanitary restrictions release, or the approved NP evaluation, indicate that the device is failing to achieve the required reductions

e. Samples will be collected, stored, transported, and analyzed according to the latest version of *Standard Methods for the Examination of Water and Wastewater* (Rice et al. 2012) and other acceptable procedures.

1) Each sample will have a chain-of-custody form, identifying, at a minimum, the sample's source (street address or installation permit number), date and time of collection, and the person who extracted the sample.

2) Chain-of-custody form should also specify the laboratory analyses to be performed on the sample.

3) Sample storage and transport will take place in appropriate containers under appropriate temperature control.

f. Sample analysis will be performed by a laboratory capable of analyzing wastewater according to the acceptable standards identified in Table 4-6, and the monitoring results will be submitted as part of the annual report to the local health district.

1) ETPS effluent analysis shall be performed using the standards in Table 4-6 from the *Standard Methods for the Examination of Water and Wastewater* (Rice et al. 2012). NSF uses the same standards in their Standard 40 and 245 evaluations.

2) Annual reports submitted with laboratory analysis results differing from these standard methods will be rejected.

Table 4-6. Standard methods required for the analysis of ETPS effluent in annual testing.

Analysis	Standard Method Number
Total suspended solids (TSS)	SM 2540 D
Carbonaceous biological oxygen demand ($CBOD_5$)[a]	SM 5210 B
Total Kjeldahl nitrogen (TKN)	SM 4500-NH_3 C
Nitrate-nitrite nitrogen (NO_3 + NO_2-N)	SM 4500-NO_3^- F

a. Person requesting the analysis from the laboratory must specify the $CBOD_5$ on the chain-of-custody form.

g. Samples failing to achieve the required effluent constituent levels shall require the following:

1) Additional operation and maintenance within 15 days of the failed sample results as determined by the date provided on the laboratory form.

If additional operation and maintenance or component replacement is necessary as determined from this service the reason, maintenance necessary, and dates must be provided as part of the service record.

2) Additional sampling to demonstrate the operation and maintenance performed successfully restored the treatment system to proper operation.

3) Sample extraction and analysis ~~should~~ needs to occur within 30 days after servicing the system (as determined in item 1 above).

   The 30 day timeframe for sample extraction will begin based on the last documented operation and maintenance visit required under item 1 above.

4) A maximum of three sampling events, within 90 days (as determined from the last documented operation and maintenance visit from item 1 above), will be allowed to return the system to proper operation. Failure to correct the system within this time frame will result in the system being classified as a *failing system* (Figure 4-9).

5) If an annual report as described in section 4.10.4 for a system identifies that an effluent sample fails to meet the limits provided in item 2.c and .d above and the required resampling of the system did not occur, the regulatory authority will issue the Failure to Resample letter provided in the DEQ program directive, "Extended Treatment Package System Education and Enforcement Letters."

   i) If resampling as described in this section does not occur by the date provided in the Failure to Resample letter the actions will be considered a refusal of service as described in section 4.10.6 and the enforcement procedures provided in section 4.10.6 shall be followed by the regulatory authority.

Appendix N

4.10.8 Construction

Procedures relating to construction are required by IDAPA 58.01.03 (section 8.1) or may be required as permit conditions, as appropriate, to ensure the protection of public health and the environment.

1. Installation
    a. A licensed complex system installer shall be required to install an ETPS unit and all other portions of the septic system connected to the ETPS unit or that the ETPS unit discharges to (IDAPA 58.01.03.006.01.b).
    b. A public works contractor may install an ETPS unit if they are under the direct supervision of a PE licensed in Idaho.
    c. Licensed plumbers and electricians will be required to install specific devices and components for proper system operation. If the device requires any on-site fabrication or component assembly, a public works contractor should be used.
    d. A sample port will be installed in the effluent line after the aerobic treatment unit. Figure 4-11 shows the placement of a sampling port after the ETPS unit, and Figure 4-12 shows the sample port and drainfield after the septic and treatment tank.

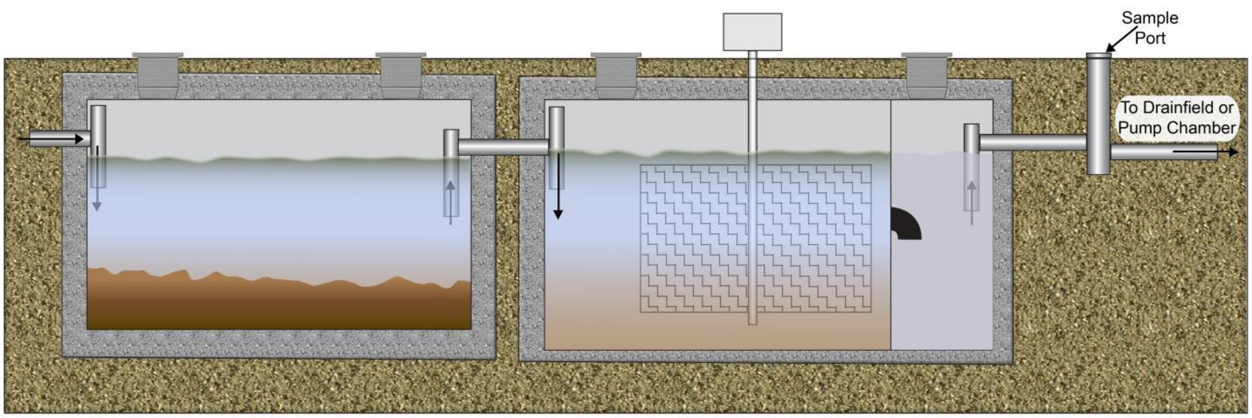
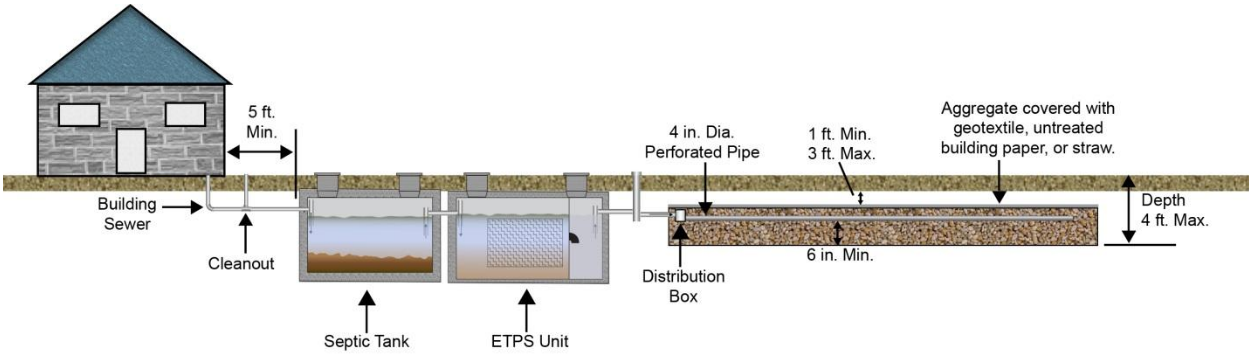


Figure 4-11. Sampling port example.



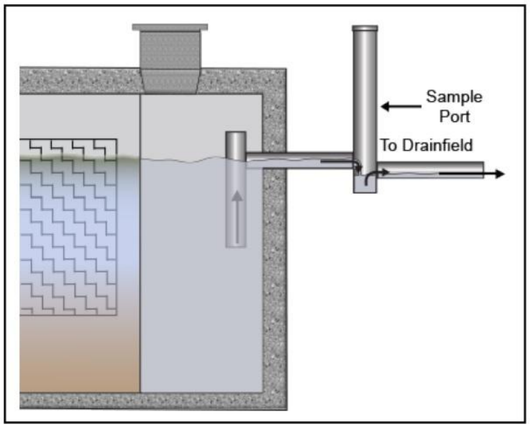


Figure 4-12. Sampling port and drainfield.

2. Within 30 days of completing the installation, the property owner shall provide certification to the regulatory authority, from their O&M entity, that the system has been installed and is operating in accordance with the manufacturer's recommendations (IDAPA 58.01.03.005.15).
    a. A statement requiring the submission of the installation verification form described above shall be written on the face of the subsurface sewage disposal permit.
    b. The regulatory authority shall not finalize the subsurface sewage disposal permit until the certification of proper installation and operation is received.
3. Upon ETPS unit installation the health district shall record the installed unit's manufacturer, product, and model number on the final inspection form.

State of Idaho
Department Of Environmental Quality
Technical Guidance Committee

Appendix O

January 21, 2014 [Certified Mail No.]

[Name]
[Address]
[City, State]

Re: Failure to Perform Operation, Maintenance, and Resampling of Your Extended Treatment Package System

Dear [Name],

[Insert O&M Entity] (O&M Entity) has provided [insert health district] with the annual report for your extended treatment package system (ETPS). This annual report indicates that your ETPS failed to meet the required effluent limits for [insert failed constituents]. The effluent limits for [these/this] constituent [is/are] [insert effluent limits in mg/L]. When an ETPS unit fails to meet the effluent limits required of your subsurface sewage disposal permit the ETPS unit must be serviced by your O&M Entity and resampled in accordance with the specified operation, maintenance, and monitoring procedures for your subsurface sewage disposal permit (IDAPA 58.01.03.005.14). The specified operation, maintenance, and monitoring procedures are described in section 4.10.3 of the Technical Guidance Manual (enclosed).

Please contact your O&M Entity to schedule the necessary follow-up maintenance and monitoring for your ETPS. The contact information for your O&M Entity is:

[Contact Name]
[Entity Business Name]
[Entity Address]
[Phone Number]

Failure to perform the required follow-up maintenance and monitoring will be considered a refusal of maintenance and testing requirements as described in section 4.10.6 of the Technical Guidance Manual (enclosed). It is highly recommended that you consult with your O&M Entity regarding the use and function of your ETPS. Certain water use habits, household products, medications, and appliances can reduce the performance of your ETPS unit and result in unacceptable wastewater effluent limits. Please see the enclosed brochure on household practices that can improve the function of your septic system.

Failure to perform the follow-up maintenance by [insert date that is 45 days from letter issuance] may result in your ETPS being placed in the refusal of service classification. This classification can lead to enforcement actions against you as the property owner.

Sincerely,

enclosure
cc:[insert O&M Entity]

State of Idaho
Department Of Environmental Quality
Technical Guidance Committee

Appendix P

January 21, 2014 [Certified Mail No.]

[Name]
[Address]
[City, State]

Re: Failure to Submit Annual Operation and Maintenance Report for Your Extended Treatment Package System

Dear [Name],

[insert health district] has not received the annual report for your extended treatment package system (ETPS). This annual report is required to be submitted to [insert health district] by July 31st every year. The annual report needs to contain all records for the reporting period including maintenance records, certified laboratory records for effluent sampling, and the chain-of-custody form associated with each effluent sample. The reporting period extends from July 1st of the preceding year through June 30th of this year.

The records required to fulfill your annual reporting requirements should be available through your Operation and Maintenance (O&M) Entity. Please contact your O&M Entity to have them submit the necessary records to [insert health district] or provide you a copy of the records so you can submit them to [insert health district]. The contact information for your O&M Entity is:

[Contact Name]
[Entity Business Name]
[Entity Address]
[Phone Number]

You are being provided a secondary deadline to submit your annual report to [insert health district]. The annual report must be submitted to [insert health district] by August 31, [insert year]. Failure to submit the annual report by this date may result in [insert health district] forwarding a notice of nonreport to the Idaho Department of Environmental Quality (DEQ) as DEQ has required [insert health district] to do. Once your records have been forwarded to DEQ, DEQ may seek any remedy available under IDAPA 58.01.03, "Individual/Subsurface Sewage Disposal Rules" to obtain the required annual report records. This may include requiring you as the property owner to replace your ETPS unit with another system.

Please contact us at [insert phone number] with any questions or updates regarding the annual report for your ETPS.

Sincerely,

cc:[insert O&M Entity]