Technical Guidance Committee Meeting

Minutes

Wednesday, May 18, 2016

Conference Room B
Department of Environmental Quality
1410 North Hilton
Boise, Idaho

TGC ATTENDEES:

Tyler Fortunati, REHS, On-Site Wastewater Coordinator, DEQ
Joe Canning, PE, B&A Engineers
Bob Erickson, REHS, Senior Environmental Health Specialist, SCPHD
Dale Peck, PE, Environmental & Health Protection Division Administrator, PHD
Michael Reno, REHS, Environmental Health Supervisor, CDHD

GUESTS:

Larry Waters, PE, Lead Wastewater Program Engineer, DEQ
Janelle Larson, Administrative Assistant, DEQ
Ryan Spiers, Alternative Wastewater Systems, LLC
Dick Bachelder, Infiltrator Systems, Inc.
Allen Worst, R.C. Worst & Company, Inc.
PaRee Godsill, Everlasting Extended Treatment
Rob Howarth, Environmental Health Director, CDHD
Sheryl Ervin, Bio-Microbics, Inc. (via telephone)
Bill Evans, Presby Environmental, Inc. (via telephone)
Kevin Sherman, Presby Environmental, Inc. (via telephone)
Don Prince, Presby Environmental, Inc. (via telephone)
Christina Connor-Cerezo, Presby Environmental, Inc. (via telephone)
Dennis Fogg, Presby Environmental, Inc. (via telephone)
Lee Rashkin, Presby Environmental, Inc. (via telephone)
Fred Vengrouskie, Presby Plastics, Inc. (via telephone)
Stefan Johansson, EcoJohn (via telephone)

CALL TO ORDER/ROLL CALL:

Meeting called to order at 8:34 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:

February 4, 2016 Draft TGC Meeting Minutes: Review, Amend, or Approve

No public comment was received on the draft minutes. The minutes were reviewed by the committee.

Motion: Dale Peck moved to approve the minutes as presented.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously.

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

OLD BUSINESS/FINAL REVIEW

4.19.3.1 Piping

No public comment was received on this section. The committee had no questions or comments.

Motion: Bob Erickson moved that the TGC recommend final approval of Section 4.19.3.1 Piping to DEQ as presented.

Second: Mike Reno.

Voice Vote: Motion carried unanimously.

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

2.3 Standard Percolation Test

No public comment was received on this section. The committee had no questions or comments.

Motion: Mike Reno moved that the TGC recommend final approval to DEQ for Section 2.3 Standard Percolation Test as presented.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously.

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

2.1 Soils Texture and Group Determinations

No public comment was received on this section. The committee had no questions or comments.

Motion: Joe Canning moved that the TGC recommend final approval to DEQ for Section 2.1 Soils Texture and Group Determinations as presented.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously.

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

2.2.4.2 Reduction in Separation Distance to Surface Water with a Variance

Tyler Fortunati presented written public comment received from Austin Hopkins on behalf of the Idaho Conservation League. Mr. Hopkins referenced a stricken portion of the guidance that read "…a variance supported by models…" from section 2.2.4.2 and was proposed to be replaced with terms such as "assessment" and "evaluation". Mr. Hopkins expressed concern that these terms could be interpreted subjectively and lead applicants to not understand the full extent of work necessary to receive a reduced separation distance variance. Mr. Hopkins requested that the last sentence of section 2.2.4.2 include the term "…and supported by model outputs…". Mr. Hopkins also requested that a fourth bullet point be added to section 2.2.4.2.2 that stipulates reservation of a full-size replacement area is required.

Tyler Fortunati explained to the committee that DEQ had addressed Mr. Hopkins' requests in the draft version of the document presented to them today and included in the meeting agenda.

Dale Peck expressed concern regarding the criteria that the health district must evaluate to approve or disapprove a variance request and interpretation of the associated models. Mr. Peck stated that any challenge to the variance approval/disapproval would be filed with the health districts and he wasn't comfortable with defending model interpretations. Tyler Fortunati clarified that the intent is for DEQ to perform the review of the nutrient pathogen evaluations and phosphorous models, not the health districts. Mr. Peck requested that clarification be added to the guidance that DEQ would issue a recommendation to approved/disapprove based on model outcomes. Clarification was included in the guidance that DEQ would issue a written recommendation for approval if model outputs are acceptable.

Motion: Mike Reno moved that the TGC recommend final approval to DEQ for Section 2.2.4.2 Reduction in Separation Distance to Surface Water with a Variance as amended.

Second: Joe Canning.

Voice Vote: Motion carried unanimously.

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

4.21 Recirculating Gravel Filter

No public comment was received on this section.

The committee had discussions on monitoring gravel filters. Mike Reno stated that gravel filters weren't intended to undergo monitoring since they do not get reductions <27 mg/L of total nitrogen. Tyler Fortunati amended the guidance to reflect this intent and verify that only operation and maintenance is required for these systems moving forward.

Motion: Joe Canning moved that the TGC recommend final approval to DEQ for Section 4.21 Recirculating Gravel Filter as amended.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously.

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

NEW BUSINESS/DRAFT REVIEW

4.23.1 In-Trench Sand Filter Description

The committee discussed the fact that the additions are to provide clarification on permitting allowances for in-trench sand filters. Joe Canning requested the addition be its own paragraph.

Motion: Dale Peck moved that the TGC recommend preliminary approval to DEQ for Section 4.23.1 In-Trench Sand Filter Description as amended.

Second: Mike Reno.

Voice Vote: Motion carried unanimously, section will be posted for public comment.

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

4.5 Drip Distribution

Tyler Fortunati read public comment received from Allen Worst regarding various portions of the drip distribution guidance. Mr. Worst questioned the need for a maximum lateral length. The committee amended the guidance to recommend that equal discharge volumes be achieved across lateral emitters. Mr. Worst also had several concerns regarding the requirement for filters and flushing. The committee made disposable filters acceptable and clarified that flushing of filters is recommended for flushing type filters. Mr. Worst questioned the removal of non-pressure compensating emitters. The committee feels the use of non-pressure compensating emitters should be restricted to ensure a more reliable system operation and discharge with variable pressures throughout a drip distribution system. Mr. Worst requested that basket screens not be required in a dosing chamber for flush return purposes. The committee agreed and removed this requirement. Mr. Worst also had concerns that the emitter rate limit of 1.0 gallon per hour would eliminate certain manufacturer's products from use. The committee increased the rate to 1.1 gallon per hour to ensure more products are available for use. Mr. Worst felt it would be beneficial to add a pressure gauge on the return manifold for use with pressure compensating emitters and that flexible PVC piping should be recommended for use in connecting drip laterals to supply and return manifolds. The committee agreed and made these revisions.

The committee requested the Tyler Fortunati have a pressure gauge added to the portion of Figure 4-9 labeled "to drip field".

9:52 a.m. Break

10:02 a.m. Meeting Resumed

Motion: Joe Canning moved that the TGC recommend preliminary approval to DEQ for Section 4.5 Drip Distribution as amended.

Second: Dale Peck.

Voice Vote: Motion carried unanimously, section will be posted for public comment.

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

4.8 Extended Treatment Package System

Tyler Fortunati provided the committee an update on the negotiated rulemaking status for service provider certifications being added to IDAPA 58.01.03. Mr. Fortunati informed the committee that DEQ's Board did vote to adopt the rule with a minor revision related that allows manufacturers to train a reasonable number of service providers for their product. Mr. Fortunati informed the committee that the reasonable number would be determined by DEQ on a case-by-case basis. Mr. Fortunati told the committee the next step is for the rule to be presented to the 2017 legislature for their approval.

The committee questioned the need to move the operation and maintenance requirements out of the extended treatment package system guidance at this time. Mr. Fortunati stated that he is setting up the guidance for the upcoming changes related to extended treatment package system product approval tiers, the potential service provider changes, and the inclusion of recirculating gravel filters into the managed operation and maintenance program. Mr. Fortunati stated that he felt it would be best to begin those changes now.

Motion: Joe Canning moved that the TGC recommend preliminary approval to DEQ for section 4.8 Extended Treatment Package System as presented.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously, section will be posted for public comment.

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

1.9 Managed Operation, Maintenance, and Monitoring

The committee requested that the document be edited to show the text that was moved from section 4.8 Extended Treatment Package System to this proposed section in green and new additions in red for easier review. Tyler Fortunati stated that he would provide this format in the meeting minutes and for public comment.

Dale Peck stated that for applicability to the recirculating gravel filters the term service provider needed to be added after operation and maintenance entity throughout the section. Mr. Peck also stated that upon approval of the service provider rules then the committee only has to remove the operation and maintenance term in the future. Tyler Fortunati stated that this would be included in the meeting minutes and for public comment.

Motion: Mike Reno moved that the TGC recommend preliminary approval to DEQ for section 1.9 Managed Operation, Maintenance, and Monitoring as proposed to be amended.

Second: Joe Canning.

Voice Vote: Motion carried unanimously, section will be posted for public comment.

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

4.24.2 Sand Mound Approval Conditions

Joe Canning requested that the words daily and design be changed for one-another in the edited design item.

Motion: Joe Canning moved that the TGC recommend preliminary approval to DEQ for section 4.24.2 Sand Mound Approval Conditions as amended.

Second: Dale Peck.

Voice Vote: Motion carried unanimously, section will be posted for public comment.

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

3.3.1 Letter of Intended Use and 3.3.2 Empirical Wastewater Flow Data

The committee reviewed the proposed amendments and had no comments or revisions.

Motion: Joe Canning moved that the TGC recommend preliminary approval to DEQ for section 3.3.1 Letter of Intended Use and 3.3.2 Empirical Wastewater Flow Data as proposed.

Second: Dale Peck.

Voice Vote: Motion carried unanimously, section will be posted for public comment.

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

4.15 Incinerator Toilets

The committee held general discussion on the proposed changes to this guidance. The committee discussed that the water source would be restricted to storage tanks that are not automatically filled by use demand within the dwelling. The owner would have to physically refill the tank using a hose or other mechanism. The committee also discussed holding tank requirements for the incinerator. There were no revisions made by the committee.

Motion: Bob Erickson moved that the TGC recommend preliminary approval to DEQ for section 4.15 Incinerator Toilets as proposed.

Second: Mike Reno.

Voice Vote: Motion carried unanimously, section will be posted for public comment.

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

11:30 a.m. Lunch

1:00 p.m. Meeting Resumed

Presby Environmental, Inc. Advanced Enviro-Septic Treatment System

Tyler Fortunati informed the committee that written public comment was received from Dick Bachelder of Infiltrator Systems, Inc. Tyler Fortunati informed the committee that Mr. Bachelder would like to speak to the committee in-person in lieu of Mr. Fortunati reading his letter into the public comment record on the Presby product submittal and that after Mr. Bachelder's public comment the committee may ask him questions and then the Presby representatives would have a chance to respond (see **Appendix N** for Mr. Bachelder's written comments).

Mr. Bachelder stated that he was speaking to the committee on behalf of Infiltrator Systems, Inc., Bio-Microbics, Inc., and Orenco Systems, Inc. (companies). Mr. Bachelder stated that the companies would like to caution the committee in their review and approval of new technologies. The companies would like the committee to not only consider treatment performance of new technologies but also the long term hydraulic acceptance of those technologies. Mr. Bachelder informed the committee that Infiltrator Systems, Inc. makes a similar pre-treatment product as Presby that is also certified to NSF/ANSI Standard 40. Mr. Bachelder cautioned the committee on their use of NSF/ANSI Standard 40 when considering the hydraulic dispersal of the product. Mr. Bachelder stated that when their ATL product was tested with 6 inches of sand beneath the piping and loaded at 2.1 gallons per linear foot the product exceeded NSF 40 performance standards but that Mr. Bachelder could not verify how long their ATL product would perform at that loading rate. Mr. Bachelder referenced a research paper that was included in his written letter to DEQ titled *Lateral Movement of Water in the Capillary Fringe Under Drainfields* by Amoozegar, Niewoehner, and Lindbo. Mr.

Bachelder also stated that the companies were concerned with the proposed minimum piping lengths of 30 lineal feet per bedroom that have been recommended by Presby Environmental, Inc. Mr. Bachelder encouraged the committee to look for field performance evaluation at that piping length. Mr. Bachelder would like to see the Advanced Enviro-Septic piping required across the entire infiltrative surface to ensure that there is distribution across the infiltrative surface. Mr. Bachelder provided the committee a description of pipe spacing and effluent movement as currently proposed with six foot on center separation and questioned how long that design will last in the field. The committee had no questions for Mr. Bachelder.

Lee Rashkin from Presby Environmental, Inc. responded to Mr. Bachelder's comments and stated that he feels the majority of the companies' concerns and questions had been addressed in the most recent submittal of the Presby design manual. Mr. Rashkin stated that Presby is willing to install their product at 50 lineal feet per bedroom and stated as much in a letter provided to Idaho DEQ. Mr. Rashkin stated to the committee that Mr. Bachelder represents their competitors and they are trying to keep their product out of the Idaho market and the comments provided are disingenuous. Mr. Rashkin stated that the Presby products have been on the market for 20 years and have a good track record of performance and experience to know how the product will function.

Mr. Bachelder commented to the committee that his presentation would be disingenuous if Infiltrator Systems, Inc. was asking the committee to approve their similar product at 3 gallons per linear foot of piping.

Mr. Rashkin stated that the Presby Environmental, Inc. product is different than the Infiltrator Systems, Inc. products and that the Presby product had been tested at 3 gallons per linear foot.

Mike Reno stated that the minimum sizing for gravelless system components in Idaho is based on the size of the reduced trench. Mr. Reno stated that he felt the committee needed to be consistent with other products.

Lee Rashkin stated that the loading rate of 3 gallons per linear foot was for the treatment component of their system and that Idaho's secondary application rate is used to determine the dispersal system of their product.

Mike Reno stated that a 1,000 square foot drainfield may end up with one pipe throughout it regardless of the minimum piping requirement proposed by Presby.

Tyler Fortunati stated that between the last meeting and the current meeting he had reviewed Presby's current design and installation manual and provided the company a letter outlining his concerns regarding minimum pipe sizing for effluent treatment and maximum spacing between pipes based on effluent dispersal concerns and effluent storage concerns. Mr. Fortunati stated that while the Presby product contains similarities to other product categories in Idaho that their submittal didn't need to fit neatly into the gravelless system design or intermittent sand filter design since this is a proprietary product. Mr. Fortunati stated that the product should have to meet some minimum requirements compared to other standard and alternative systems though and that he felt one of those requirements were effluent storage comparable to a standard rock and pipe system. Mr. Fortunati stated that his recommendation of a maximum pipe spacing of three foot on-center provided effluent storage that exceeds the storage capacity of a similar sized gravel and pipe trench and was comparable to gravelless chamber and piping product storage capacities that have been previously approved by the committee. Mr. Fortunati also stated that he recommended a minimum piping length of 50 feet per bedroom to be comparable to the other sizing requirements across the nation. Mr. Fortunati stated that regardless he felt the minimum disposal area and maximum pipe spacing would more often than not required the minimum pipe length to be exceeded. Mr. Fortunati also stated that the pipe is required to be installed from the front to back of the bed so distribution occurred along the entire length of the distribution area.

Mr. Reno stated that he would like to keep things simple and consistent when it comes to system design with pipe across the entire system side to side and front to back.

Lee Rashkin stated that when the committee considers other packaged treatment system technologies that they don't dictate the media or membrane sizing within that package and he felt Presby's product should be treated similarly.

Mr. Fortunati stated that while he didn't feel the Presby product needed to meet all of the minimum requirements of other alternative treatment system design requirements he felt the product did need to be evaluated for protection of public health and the environment as well as long-term performance for the consumer. Mr. Fortunati also stated that this product is different than other package treatment plants where the treatment system is also providing the effluent dispersal across the infiltrative surface. Based on this fact Mr. Fortunati felt that it is important for the committee to consider pipe sizing and dispersal layout.

Dale Peck stated that he felt the system design parameters had been answered and he would like to discuss the field testing information. Presby Environmental, Inc. representatives provided a summary of treatment system performance under the BNQ testing protocols in Canada and that they exceeded the treatment standards for NSF/ANSI Standard 40. Mr. Peck inquired how much sand was used in the BNQ testing. Presby Environmental, Inc. representatives stated there was 12 inches of sand used in the class II certification tests and 24 inches in the class III certification tests. Mr. Fortunati asked Presby to clarify that the sand depths in the BNQ testing was used to address total coliforms. Presby representatives verified the BNQ testing requires minimum coliform levels be met and that TSS and BOD are adequately addressed by the 6 inches of sand used in the NSF/ANSI testing.

The committee discussed their concern with only utilizing 6 inches of sand under the treatment/dispersal pipe. The committee came to a consensus that they were more comfortable utilizing 12 inches of sand under the entire system for long-term performance.

Tyler Fortunati provided the committee a summary of the system design elements they would like to see met which included:

- 50 lineal feet of Advanced Enviro-Septic piping per bedroom on residential installations or 2 gallons per linear foot for commercial installations. Pipe must be installed along entire length of distribution area for each pipe row.
- Pipe spacing minimum of 1.5 feet on-center and a maximum of 3 feet on-center.
- Sand installation depths of 12 inches below the piping and between outside piping and excavation sidewall, 6-24 inches between piping dependent upon pipe spacing, and 3 inches above the piping.
- Separation distances of 12 inches ground water and other fractured or porous limiting layers and 24 inches to impermeable limiting layers from the sand-soil interface.
- Minimum dispersal area requirements based on secondary treatment application rates.
- No required field testing or managed maintenance.

Motion: Dale Peck moved that the TGC recommend approval to DEQ for the Presby Environmental, Inc. Advanced Enviro-Septic Product upon DEQ receipt of a revised design and installation manual meeting the minimum requirements outlined by Tyler Fortunati.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously.

Tyler Fortunati will provide Presby Environmental, Inc. a letter outlining the revisions that must be made to the design and installation manual prior to approval from DEQ.

2:22 p.m. Break

2:27 p.m. Meeting Resumed

ECOJOHN Waste Combustion System

Tyler Fortunati stated that the committee had reviewed the submitted ECOJOHN Waste Combustion product materials that were submitted prior to the meeting. The committee had also already reviewed and provided preliminary approval to revisions on the Incinerator Toilet guidance to allow this type of product to be approved. Mr. Fortunati outlined the restrictions for water supply to structures with this type of system installed and associated minimum holding tank sizes.

Dale Peck asked Stefan Johansson of ECOJOHN to describe a typical installation to the committee. Mr. Johansson provided a basic description of how the system can be installed and associated combustion capabilities of each unit.

Based on Mr. Johansson's description of incineration rates the committee opted to remove the sizing requirement for bedrooms and allow the property owner to select a unit based on incineration rates that met their needs. The incineration rate does not need to meet or exceed the standard daily design flow of the structure, but adequate storage capacity must be available to account for daily flows in excess of the maximum incineration rate.

Motion: Mike Reno moved that the TGC recommend approval to DEQ for the ECOJOHN Waste Combustion Series product as amended.

Second: Joe Canning.

Voice Vote: Motion carried unanimously.

See **Appendix O**. Tyler Fortunati will provide ECOJOHN an approval letter outlining the products design and installation allowances.

NEXT MEETING:

The next committee meeting is scheduled to be on August 18, 2016 at the Idaho Department of Environmental Quality's state office.

Motion: Mike Reno moved to adjourn the meeting.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously.

The meeting adjourned at 3:02 p.m.

TGC Parking Lot.
This is a running list of issues requested to be prepared and presented at a future TGC meeting.

- Add individual section and title callouts into TGM header on each page.

List of Appendices from the February 4, 2016 Meeting

Appendix A:
February 4, 2016 TGC Meeting Minutes
Status: Final

Appendix B:
4.19.3.1
Status: Final

Appendix C:
2.3 Standard Percolation Test
Status: Final

Appendix D:
2.1 Soil Texture and Group Determinations
Status: Final

Appendix E:
2.2.4.2 Reduction in Separation Distance to Surface Water with a Variance
Status: Final

Appendix F:
4.21 Recirculating Gravel Filter
Status: Final

Appendix G:
4.23.1 In-Trench Sand Filter Description
Status: Preliminary, out for public comment

Appendix H:
4.5 Drip Distribution
Status: Preliminary, out for public comment

Appendix I:
4.8 Extended Treatment Package System
Status: Preliminary, out for public comment

Appendix J:
1.9 Managed Operation, Maintenance, and Monitoring
Status: Preliminary, out for public comment

Appendix K:
4.24.2 Sand Mound Approval Conditions
Status: Preliminary, out for public comment

Appendix L:
3.3.1 Letter of Intended Use and 3.3.2 Empirical Wastewater Flow Data
Status: Preliminary, out for public comment

Appendix M:
4.15 Incinerator Toilets
Status: Preliminary, out for public comment

Appendix N:
Written Public Comments from Infiltrator Systems, Inc, Bio-Microbics, Inc., and Orenco Systems, Inc. Regarding the Presby Environmental, Inc. Advanced Enviro-Septic Product Submittal

Appendix O:
5.6 Individual Wastewater Incinerator

Appendix A

Technical Guidance Committee Meeting Minutes

Thursday, February 4, 2016

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

TGC ATTENDEES:

Tyler Fortunati, REHS, On-Site Wastewater Coordinator, DEQ
Joe Canning, PE, B&A Engineers
Bob Erickson, REHS, Senior Environmental Health Specialist, SCPHD
Dale Peck, PE, Environmental & Health Protection Division Administrator, PHD
Michael Reno, REHS, Environmental Health Supervisor, CDHD

GUESTS:

Chas Ariss, PE, Wastewater Program Engineering Manager, DEQ
Janelle Larson, Administrative Assistant, DEQ
Ryan Spiers, Alternative Wastewater Systems, LLC
Matt Gibbs, Infiltrator Systems, Inc.
Sheryl Ervin, Bio-Microbics, Inc. (via telephone)
Allen Worst, R.C. Worst & Company, Inc. (via telephone)
Scott Jessick, R.C. Worst & Company, Inc. (via telephone)
Don Prince, Presby Environmental, Inc. (via telephone)
Christina Connor-Cerezo, Presby Environmental, Inc. (via telephone)
Dennis Fogg, Presby Environmental, Inc. (via telephone)
Lee Rashkin, Presby Environmental, Inc. (via telephone)

CALL TO ORDER/ROLL CALL:

Meeting called to order at 8:31 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:

November 5, 2015 Draft TGC Meeting Minutes: Review, Amend, or Approve

No public comment was received on the draft minutes. The minutes were reviewed by the committee. Joe Canning provided a minor grammatical edit.

Motion: Joe Canning moved to approve the minutes as amended.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously.

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

OLD BUSINESS/FINAL REVIEW

1.8 Easement

No public comment was received on this section. The committee clarified that the proposed changes were reviewed by DEQ's Attorney General. Tyler Fortunati stated that the proposed changes were drafted by one of DEQ's Deputy AGs and had been reviewed.

Motion: Bob Erickson moved that the TGC recommend final approval of Section 1.8 Easement to DEQ.

Second: Joe Canning.

Voice Vote: Motion carried unanimously.

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

4.22.3.2 Intermittent Filter Dosing

No public comment was received on this section. The committee had no questions or comments.

Motion: Joe Canning moved that the TGC recommend final approval to DEQ for Section 4.22.3.2 Intermittent Filter Dosing.

Second: Dale Peck.

Voice Vote: Motion carried unanimously.

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

4.27 Subsurface Flow Constructed Wetland

Tyler Fortunati read public comment received from Allen Worst of R.C. Worst Co. Mr. Worst provided a recap from the November 5, 2015 draft TGC meeting minutes describing information provided by Bob Erickson. The TGC minutes covered Mr. Erickson showing the committee pictures of wetlands that have been installed in Blaine County and stating that the initial plan was that DEQ would provide money to test the effluent from the systems to determine their treatment capability. Mr. Erickson told the committee that this plan fell apart when the economy turned and the DEQ money was no longer available. Mr. Worst then asked the committee to consider two points that included:

1. Idaho's trend is to approve technology that has a proven track record in the State. There is no information on the systems installed in Blaine County due to funding issues. Mr. Worst feels it would be inconsistent and irresponsible for the committee to approve increased loading rates and decreased separation distances for systems that do not have a proven track record in Idaho. For consistency Mr. Worst recommended that the committee condition an approval with the requirement that 30 systems must be installed for 3 years with testing to maintain performance validation methods currently required of other technologies.
2. Mr. Worst also stated that based on the May 21, 2015 meeting minutes some committee members expressed desire to implement required O&M on currently approved systems designed to treat or improve the quality of wastewater discharged from them. This includes systems constructed on site. Mr. Worst stated that DEQ has not been supportive of the committee's request. Based on this Mr. Worst asked the committee to refrain from approving additional technologies until the issues with O&M on complex systems have been addressed by DEQ.

Dale Peck stated that this system would not be considered proprietary or manufactured and is equivalent to a recirculating gravel filter or intermittent sand filter (i.e., individually engineered and constructed on site). Mr. Peck stated that these types of systems are not subject to the same approval policies of proprietary systems or extended treatment package systems and asked Tyler Fortunati to verify this. Tyler Fortunati agreed and stated that the treatment performance of systems that have design guidance and are individually engineered and constructed on site have been based on the extensive research available on them through various universities.

Joe Canning asked for verification that this system would be required to be engineered. Tyler Fortunati stated that they would. Tyler Fortunati also asked the committee if they would be ok with him placing the installer permit and engineering requirements for each alternative system below the alternative system title in section 4 of the TGM. The committee agreed that this is fine to do without their review.

Bob Erickson had questions regarding the placement of geotextile fabric over the top of the wetland system. Mr. Erickson feels that this will inhibit the plants from growing, spreading, and reseeding. This requirement was removed from the system guidance and the committee asked that figure 4-47 be amended accordingly.

Bob Erickson stated that he doesn't feel this is a proprietary system. Mr. Erickson also added that the systems with design guidance, are individually engineered, and are constructed on site have never been treated them the same as proprietary or manufactured wastewater treatment systems.

Mike Reno asked Allen Worst if he is requesting that an O&M provider be required when the system guidance is approved. Allen Worst stated he did not and that he felt more systems that necessitated O&M shouldn't be approved. Mr. Worst feels this is just adding to the O&M problem and that all the treatment systems should be required to undergo O&M. Bob Erickson asked Tyler Fortunati to address the comment by Allen Worst. Tyler Fortunati stated that there is not support from the DEQ administration to add additional systems to a managed O&M program. Tyler Fortunati stated that he didn't see it as adding to the problem due to the fact that these systems would be installed in a location where another type of treatment system like a sand mound, intermittent sand filter, recirculating gravel filter, or extended treatment package system would be required. Either way one system or another that needs O&M according to Mr. Worst would have to be permitted and installed. The committee agreed that managed O&M and testing shouldn't be required on these systems at this time.

Motion: Dale Peck moved that the TGC recommend final approval to DEQ for Section 4.27 Subsurface Flow Constructed Wetland as amended.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously.

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

NEW BUSINESS/DRAFT REVIEW

2.2.5.2 In-Trench Sand Filters and the Method of 72

Tyler Fortunati provided the committee information that he had received several inquiries into the figure and example provided in this section and its conflict with suitable soils being at the sidewall of the drainfield in conformance with IDAPA 58.01.03.008.02.b. Mr. Fortunati drafted this proposal in response to those inquiries for TGC discussion.

Mike Reno informed the committee that if this change is approved it will cause a large number of systems located in Ada County to be non-conforming due to the issues they have with hardpan and cemented soils in the county. Mr. Reno stated that it is common practice in District 4 to permit systems where they excavate through thick soil layers that would be considered unsuitable to reach suitable soils and backfill with medium sand. Mr. Reno stated that in many cases there is not enough suitable soils in the upper soil profile to get the drainfield sidewalls within suitable soils.

Dale Peck agreed with Mr. Reno and stated that District 1 would have the same issue over the aquifer area due to coarse soils. Tyler Fortunati stated that the in-trench sand filter section of the TGM specifically has an allowance to replace the coarse sands with medium sand so the drainfield is surrounded by suitable soils. Mr. Fortunati stated that the section did not address scenarios described by Mr. Reno and likely needed to.

Tyler Fortunati proposed an amendment to the in-trench sand filter section of the TGM that specifically allows the installation of the drainfield at depths that place the sidewalls in unsuitable soils like cemented soils or hardpan. This would allow section 2.2.5.2 to remain in its current format and document the alternative system allowance as described by Mr. Reno.

Motion: Bob Erickson moved that the TGC table section 2.2.5.2 In-Trench Sand Filters and the Method of 72 and that Tyler Fortunati bring back an amendment to section 4.23 In-Trench Sand Filter allowing installations described by Mike Reno.

Second: Mike Reno.

Voice Vote: Motion carried unanimously.

Action Item: Draft amendment to section 4.23 In-Trench Sand Filter for committee review.

Section will be tabled and new guidance will be drafted. See **Appendix E.**

2.2.4.2 Reduction in Separation Distance to Surface Water with a Variance

Tyler Fortunati informed the committee that DEQ had the first party attempt to complete the On-Site System Surface Water Separation Distance Determination Guidance and Model to reduce the separation from a drainfield to surface water. Mr. Fortunati stated that the model did not work out for the applicant based on the inability to meet the required site life. Mr. Fortunati also stated that DEQ had further developed the model requirements and evaluation based on this experience. Mr. Fortunati stated that DEQ is proposing to lower the acceptable site life from 100 years to 50 years per drainfield (150 year total site life). This is due to DEQ's belief that 100 years will be near impossible to attain and that 50 years was adequately protective and still a hard site life to meet. Mr. Fortunati also explained the new direction of requiring an equivalency evaluation is a site can meet the 50 year site life requirement and the associated water body is TMDL limited for phosphorous.

The committee held general discussion on the model.

Dale Peck asked for the evaluation process to be explained. Tyler Fortunati stated that it is done through a variance with the permitting health district and that prior to applying for the variance the applicant would need to successfully complete:

- A site evaluation with the health district
- A nutrient-pathogen evaluation with a maximum TN level of 27 mg/L
- The On-Site System Surface Water Separation Distance Model with a phosphorous discharge of 8.6 mg/L and meet a site life of 50 years and if the water body is TMDL limited for phosphorous the equivalency determination portion of the model comparing the proposed system to a system that would be permitted in the same soils at the rule required separation distance

Mr. Fortunati also stated that if successful the applicant would have to design the system as a pressurized system with a maximum installation depth of 6 inches, have TN treatment to at least 27 mg/L, and have two drainfields installed with reserve area for a third. Tyler Fortunati stated that this will utilize the complete model that was originally developed and meet DEQ's proposed response to public comment on the model and associated guidance.

Motion: Joe Canning moved that the TGC recommend preliminary approval to DEQ for Section 2.2.4.2 Reduction in Separation Distance to Surface Water with a Variance as proposed.

Second: Mike Reno.

Voice Vote: Motion carried unanimously.

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

4.19.3.1 Piping

Tyler Fortunati described the proposed changes to the committee. Mr. Fortunati explained that based on input from Joe Canning the minimum disposal area per orifice in sand and gravel filter systems should be calculated on a circular footprint instead of a square footprint to prevent distribution area overlap. Tyler Fortunati agreed with Mr. Canning and thought that a specific distance should be specified to ensure the intent is met. Mr. Fortunati used 2.25 lateral and orifice spacing for this purpose to achieve a circular distribution area of 4 square feet that doesn't overlap the adjacent orifice disposal areas. The committee asked what Tyler Fortunati was seeing across the state in his permit reviews. Mr. Fortunati stated that there were designs that were all over the place in regards to disposal area per orifice with the largest pushing 16 square feet per orifice within the last year.

Joe Canning asked for clarification as to whether Mr. Fortunati was seeing access risers to sweeping cleanouts extend through the entire mound. Mr. Fortunati stated that he had seen this issue and that he had also seen designs with bleeder holes in the transport piping that allowed the distribution manifold and laterals to drain at the sand-soil interface of the sand mound.

Motion: Bob Erickson moved that the TGC recommend preliminary approval to DEQ for section 4.19.3.1 Piping as proposed.

Second: Joe Canning.

Voice Vote: Motion carried unanimously.

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

9:38 a.m. Break

9:55 a.m. Meeting Resumed

2.1 Soils Texture and Group Determinations

Tyler Fortunati explained to the committee that he was informed by an NRCS soil scientist that DEQ's guidance on soil textural classification descriptions was not consistent with the NRCS descriptions. Mr. Fortunati had DEQ's soil scientist Mike

Cook work with his contacts at the NRCS to revise DEQ's soil texture and group determination guidance to be in conformance with the NRCS standards. Mr. Cook provided the draft amendments that the committee is reviewing today.

The committee recommended a couple revisions to table contents for consistency.

Motion: Joe Canning moved that the TGC recommend preliminary approval to DEQ for section 2.1 Soils Texture and Group Determinations as amended.

Second: Mike Reno.

Voice Vote: Motion carried unanimously.

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

2.3 Standard Percolation Test

Tyler Fortunati informed the committee that DEQ is proposing to remove the guidance on percolation tests since this is not a standard method to determine soil texture or group determinations in Idaho any longer. Mr. Fortunati stated that it is no longer used in appeals or second opinions throughout the state either. Mr. Fortunati stated that the soil application rates from this section had been moved into the revised table 2-4.

Motion: Mike Reno moved that the TGC recommend preliminary approval to DEQ for section 2.3 Standard Percolation Test as proposed.

Second: Joe Canning.

Voice Vote: Motion carried unanimously.

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

Presby Environmental, Inc. Advanced Enviro-Septic Treatment System and 5.14 Proprietary Wastewater Treatment Products

Tyler Fortunati informed the committee that he had been contacted via email by Christin Connor-Cerezo from Presby Environmental, Inc. (PEI) to inform DEQ that PEI is now only seeking approval for the Advanced Enviro-Septic Treatment System product. PEI is no longer seeking approval of the Enviro-Septic or Simple Septic products. Tyler Fortunati also stated that he received public comment regarding the PEI product submittal for the committee's consideration and would now read that comment into the meeting record.

The first public comment read was received from Allen Worst of R.C Worst Co. Mr. Worst stated he had concerns regarding the proposed PEI product approval under the Proprietary Product Policy. Those concerns include:

1. Mr. Worst believes that PEI and the committee may be attempting to sidestep the normally required provisional approval, maintenance requirements, and effluent

testing requirements of Idaho's ETPS program by placing the PEI product under the Proprietary Product Approval section of the TGM.

2. Mr. Worst outlined a statement made by Tyler Fortunati as documented in the August 20, 2015 meeting minutes stating *The TGC is capable of requiring a manufactured product submitted for review under the proprietary product policy to undergo the two-level approval process that extended treatment package system would have to go through*. Mr. Worst believes that before the PEI products are approved as a Proprietary Product that they should be subjected to the 30 systems and 3 year testing protocol as is required of other technologies and as discussed in the August TGC meeting.
3. Mr. Worst also highlighted a portion of the May 21, 2015 TGC meeting minutes that read *The committee discussed their collective concern that all mechanical treatment systems should necessitate managed maintenance, not just the extended treatment package systems*. Mr. Worst believes that the committee is going backwards on this.
4. Mr. Worst also wrote that after extensive research and discussion with industry professionals he would like the committee to consider his opinion that the PEI products are basically an elaborate drainfield trench product with sand placed around the exterior and under the chamber device. Although approved under NSF Standard 40 Mr. Worst strongly feels that the same approval could be granted to other trench products if sampling occurred below the trench and beneath enough soil to provide the required reductions. Mr. Worst asked the committee to recognize the deficiencies of NSF 40 for system performance evaluation. Mr. Worst stated that the PEI product should be afforded the same loading rates and separation requirements as any other Idaho approved trench or bed drainfield system.

The second public comment received was from Nicholas Noble of Orenco Systems, Inc. (OSI) Mr. Noble wrote on behalf of Orenco Systems, Inc. with several concerns they identified with the current PEI proposal.

1. Mr. Noble expressed concern that after the wastewater passes through the PEI product there is no understanding of what the wastewater strength is when it is applied to the system sand due to a lack of data on this subject. Mr. Noble stated that due to the unknown waste strength an unknown efficacy of the pipe product it is appropriate to apply sand filter loading rates to the PEI product. Mr. Noble also outlined that there is a second infiltrative surface which should be subject to loading rates established in Idaho regulations (Table 4-21 from the TGM). Mr. Noble outlined that the two infiltrative surfaces that should be regulated on par with other systems that use sand or media as the primary treatment mechanism. Mr. Noble stated that he had provided sections of Washington and Colorado regulations or guidance that supported his assertions and that he also attached a research paper from Dr. Tyler regarding wastewater application rates to soils. Mr. Noble believes that the initial infiltrative surface should be calculated utilizing locally accepted loading rates for septic tank effluent to coarse sand. Mr. Noble also stated that the PEI system is a single-pass sand filter with no way to adjust, service, or inspect the system.

2. Mr. Noble stated that it is DEQ's role to protect environmental health which is in part accomplished by setting effluent quality limits for wastewater treatment systems. Mr. Noble questions how DEQ intends to ensure that the PEI systems are meeting effluent limits. Mr. Noble also questions that if a pan sampler is used how will DEQ know that the effluent in the pan is not subject to dilution from rain, snowmelt, or groundwater.
3. Mr. Noble states that anyone with some experience in the wastewater treatment industry understands that systems in the real world are subject to peak flows, high strength waste, leaking toilets, and significant FOG. This isn't experienced in NSF bench tests. Mr. Noble states that these conditions will have deleterious effects on system performance. Mr. Noble states that the difference between most systems that experience these conditions and the PEI products is that nearly all the other systems can be adjusted, monitored, and accessed to correct potential problems. Mr. Noble states that with the PEI system no one would know if a problem was occurring until it was too late, after which little could be done and may result in the premature failure of the soil.
4. Mr. Noble also states that it is disturbing that with the approval of the PEI system that DEQ intends to allow the property owner to do their own O&M. Mr. Noble takes this allowance seriously and believes that all NSF 40 systems need to be held to the same standards in the field. Mr. Noble believes that is DEQ is going to allow property owners to do their own maintenance that they would consider this a restriction of trade by creating unfair market conditions. Mr. Noble states that OSI requests that all NSF 40 systems be held to the same standards.

Mike Reno asked if there was treatment documentation of effluent from the PEI pipe and not after the sand. Dennis Fogg stated that the PEI system had not been tested with less than 6 inches of sand below and around the piping.

Dale Peck asked what the proposed separation distance is for the PEI system. Tyler Fortunati stated that it is proposed to be the same as the recirculating gravel filter, intermittent sand filter, or an extended treatment package system. Don Prince stated that the minimum size for the PEI system is 2 bedrooms.

Mike Reno stated that the PEI system is a lot like an intermittent sand filter but it has less sand. The PEI system is proposed with 6 inches of sand where the intermittent sand filter has 24 inches of sand. Mike Reno stated there is no historical data on the PEI system though. Don Prince stated that the PEI system is tested in Canada in the field. Don Prince stated that PEI preferred the NSF 40 results be used through as this standard had been tested on all three of their products spanning a period of 3 years.

Joe Canning asked how the PEI system was tested in the field. Don Prince stated that they install a large tray that captures effluent below the system and directs the effluent to a sump. Joe Canning asked if the sump was continually full. Don Prince stated that is was but directed effluent back to the treatment system after a certain volume was reached.

Mike Reno stated that he believes the system needs to be tested on par with the TGM protocols. Mr. Reno does not see how the treatment could not be occurring in the sand portion of the system. Don Prince stated that PEI would take issue with the view that treatment was only occurring in the sand portion of the system. Mr. Prince stated that you cannot separate the pipe and the sand independently as they are all part of the system. Separation would be on par with separating treatment of each membrane in a multiple membrane system which isn't done within the industry. Mike Reno stated that he had an issue with blanket acceptance of NSF 40 data and stated that past acceptance has created issues for the State in other treatment system programs.

Dale Peck asked if there were other states with historical testing data over some period of duration. Don Prince stated that there was data in Canada but not in any states. Mr. Prince stated that Canada requires testing as a condition of the PEI approval up there. Mr. Prince stated that the PEI system had also undergone the secondary and tertiary BNQ testing in Canada as well. Mr. Prince asked for an explanation of testing for other systems. Tyler Fortunati described how NSF 40 testing is used in Idaho's ETPS program and the continual testing of ETPSs that has been performed in the state. Tyler Fortunati stated that DEQ and the TGC would like to review the field testing data from Canada and the BNQ results. Mr. Fortunati stated that the committee would consider this outside data on a case-by-case basis but could not guarantee it would be sufficient. The PEI representatives agreed to provide the BNQ secondary and tertiary testing information along with annual field results to DEQ.

Joe Canning asked how the testing pan worked. PEI representatives stated that the pan was placed under the first few feet of the system. They stated during NSF testing that it was found that over half of the system wasn't utilized due to the wastewater distribution throughout the system. PEI didn't feel it was necessary to install the pan further down the piping. The committee held a general discussion on biomat buildup and breakdown within the system to ensure that effluent was able to be collected.

Tyler Fortunati asked the committee if they felt they had covered Mr. Worst's public comment concerns. The committee responded that they did not feel that the system is mechanical in nature and don't feel that managed maintenance is necessary based on the design. Tyler Fortunati and the committee agreed that testing of the PEI system can be discussed further after the BNQ and Canada field testing data are submitted for review.

Tyler Fortunati asked if the committee felt they had covered Mr. Noble's public comment concerns. The committee stated that they felt the PEI system only needed to be considered as one interface based on the system design. The interface used will be the sand-native soil interface. The committee felt this is sufficient based on PEI's design and often will require more PEI piping than what would be required under the standard PEI design. The committee agreed that the monitoring and testing concerns will be discussed further once they can review the BNQ and Canada field testing data from PEI.

Mike Reno asked PEI for clarification as to the depth of system sand used in the BNQ testing. PEI representatives stated that they used 12 and 24 inches in the BNQ testing.

The committee moved on to discuss the draft design manual provided by PEI. Tyler Fortunati stated that there were only a few items that he saw warranted committee discussion including the pipe length requirements and storage capacity. Mr. Fortunati outlined that the proposal submitted by PEI includes two different sizing requirements, one for residential (30 ft/bedroom), and one for non-residential (3 GPD/ft). Mr. Fortunati stated that based on this proposal the residential sizing would be short in one- and two-bedroom scenarios and would then be oversized starting at three-bedrooms in comparison to PEI's standard sizing of 3 GPD/ft. PEI representatives stated that the minimum sizing requirement for their system should be two-bedrooms and that they do not install systems sized for one-bedroom. The committee accepted this approach and requested that the draft manual include the written requirement that the minimum system size for residential structures be two-bedrooms and a minimum non-residential sizing of 200 GPD.

Tyler Fortunati asked the committee if they were concerned about the PEI product's storage capacity. Mr. Fortunati stated that the product has a capacity of 5.8 gallons/ft and that a standard drainrock system holds 3.9 gallons/foot when excavated 3 feet wide. The committee was not concerned with the storage capacity based on the maximum pipe spacing of 6 feet.

The committee asked the PEI representatives to address the requests made during today's discussion and come back to the next meeting with the information. Tyler Fortunati stated that he would follow-up with PEI and provide a breakdown of the committee and DEQ's requests. PEI agreed to do so.

Motion: Dale Peck moved that the TGC table section 5.14 Proprietary Wastewater Treatment Products.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously.

Section will be tabled for further discussion and review. See **Appendix J**.

4.21 Recirculating Gravel Filter

Tyler Fortunati presented a revision to the recirculating gravel filter system design that met the requests from the committee at the November meeting addressing nitrogen reducing designs and non-nitrogen reducing designs.

The committee requested changes to the nitrogen reduction being at 27 mg/L instead of less than 27 mg/L and that the monitoring portion of the mandatory maintenance statement be removed.

Dale Peck requested that additional information be added to the guidance that outlines what occurs when a system isn't operated or maintained correctly and that activity isn't documented and submitted by a service provider. Tyler Fortunati stated that he envisioned making the amendment to coincide with changes to the ETPS program as well. Mr. Fortunati stated that he would address this issue for review at the next meeting.

Action Item: Add additional guidance regarding actions or process to follow when the system is not operated, maintained, or reported on by a service provider for review at the next meeting.

Motion: Dale Peck moved that the TGC recommend preliminary approval to DEQ for section 4.21 Recirculating Gravel Filter as amended.

Second: Joe Canning.

Voice Vote: Motion carried unanimously.

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

4.5 Drip Distribution

Tyler Fortunati stated that at the last meeting the committee requested that he provide a research summary on the use of primary septic tank effluent in a drip distribution system. Tyler Fortunati stated that he had summarized several studies on the subject which was included in appendix J of the meeting agenda. Mr. Fortunati stated that he would not be reading the summary at this meeting but it was available for everyone's review in the agenda. Mr. Fortunati stated that based on the studies and design guidance he reviewed, and based on discussions with industry professionals and review of drip manufacturer literature he saw no reason not to allow the use of primary septic tank effluent in drip distribution systems. Mr. Fortunati stated that the draft amendments before the committee today were based on his research and review of studies and various design guidance for this allowance. Mr. Fortunati also stated that he had received written public comment on this guidance which he would read for the committee.

The first written comment received was from Ryan Spiers of Alternative Wastewater, Inc. Mr. Spiers outlined a few issues that he saw with the existing drip guidance and would like built into the guidance:

1. The construction notes read as if all the piping is supposed to drain back to the tanks. Mr. Spiers believes that the only line recommended to drain back to the tanks is the backflush line from the hydraulic unit between the zone solenoids and check valves. Mr. Spiers states that mains and uprights sit below frost line and everything else drains back into the tubing. When pressure is cut to the system emitters open allowing everything to drain from the air release valves back to the tank.
2. Mr. Spiers states that there are a couple different ways to build manifolds. On sloped sites Mr. Spiers uses top feed manifolds that are above and parallel to tubing so they can evenly drain into the tubing without overloading lower tubes. On flat sites Mr. Spiers uses side feed manifolds that are perpendicular to laterals and slightly elevated that drain back into tubes.

The second public comment was received from Tom Ashton with American Manufacturing Company, Inc. Mr. Ashton's comments were limited to section 4.5.3.2 of the proposed drip guidance and include the following:

1. The filter size should range from 100-115 microns.

2. Item 3 allows for application areas up to 1 square foot per linear foot of drip distribution line and a line spacing of 1 foot may be used. Mr. Ashton states that drip systems are typically sized on a footprint basis with the minimum tubing required being the total area divided by two. This infers a two-foot center separation between tubing runs.
3. Mr. Ashton states that more tubing is always more desirable but believes that designers should have the flexibility to design with more tubing within the area to accommodate a simpler field network configuration. Mr. Ashton feels that it is important that designers consider a site's soil texture and structure and the topographic installability of an individual site. Mr. Ashton does not believe that drip tubing can be installed closer than 1.5 feet on center with a vibratory plow or trencher regardless of the site.
4. Mr. Ashton feels that sites with very high loading rates often require close tubing spacing to provide an adequate amount of tubing to keep pump run time and daily instantaneous loadings down. Typically this is done in very sandy soils or certain at grade/mound applications.
5. Tubing separations greater than 2 feet on center may be indicated in several situations. On steep slopes this is necessary for the machine to traverse the site. The important part is ensuring the minimum amount of tubing is installed.
6. Mr. Ashton states that the recommendation should be to install more tubing in an area when the soils are clayey.
7. Mr. Ashton believes that the 2 foot emitter spacing and 2 foot separation on contour is a good standard but designers should be able to design the drip network with a higher orifice density as soil and site conditions allow.
8. Mr. Ashton stated that at a minimum two independently back washed disk filters need to be required to be automatically flushed at each dosing cycle and the tubing network needs to be flushed every 20-50 dosing cycles or roughly once every one or two weeks with a minimum fluid velocity of 2 feet per second designed at the distal end of the lateral connection. All filter and tubing flushing should be returned to the head of the treatment train.

Allen Worst of R.C. Worst Co. provided the committee with verbal comments on the drip distribution proposal including:

1. 4.5.1(3) – Recommend only requiring a filter on systems without secondary treatment. Filters are showing little accumulation in the field.
2. 4.5.1(7) – Pressure regulators for non-pressure compensating emitters only, not required on systems using pressure compensating emitters.
3. 4.5.3.1(1) – This is extra hydraulic loading on the septic tank and is a bad idea. They have always run return flow from secondary and primary effluent systems with no ill effects (1,000 gallon tanks typical).
4. 4.5.3.1(3) – Completely draining drip tubing from the emitters is a physical impossibility due to emitter orientation and typical tubing installation grade line variability. Spot freezing and plugging can occur in cold weather. Drip systems designed to properly drain back in cold climates are recommended to slightly slope to the manifolds.

5. 4.5.3.1(3a) – Requiring two zones defeats the purpose of continual flush systems. Consistent coverage is ensured through hydraulic modeling and pressure compensating emitters. Zone valves are problematic and prone to freezing. We have invented and patented a method of drip distribution to avoid the hassles of multiple zone systems.
6. 4.5.3.1(3b) – Lateral lengths do not need to be equal if hydraulic modeling insures minimum flushing velocity.
7. 4.5.3.1(3c) – Zones do not need to be equal in size to achieve efficient and consistent application of wastewater as long as this is taken into consideration during design and dosing settings are appropriate there is no reason zones can't be of different size.
8. 4.5.3.1(3d) – The point of continuous flush systems is to provide consistent coverage and assure rapid drain back to the dose tank eliminating bottom loading issues. These recommendations create potential freeze issues.
9. 4.5.3.1(5) – This requirement should only apply to standard septic tank effluent. This is not necessary after secondary systems.
10. 4.5.3.1(7) – Recommend that the requirement is for pressure regulators or pressure compensating emitters.
11. 4.5.3.1(9) – Pressure compensating emitters balance emitter flow rates in variable pressure systems.
12. 4.5.3.3 – According to the provided research and our own field observations there is no need for this filter in secondary treated systems.
13. 4.5.3.5(1) – Filter should only be required for septic tank effluent. Using non-flushing disk filters with an alarm in place we have experienced zero alarms and inspections indicated little to no accumulation. Annual cleaning is sufficient.
14. 4.5.3.5(4 & 5) – There shouldn't be a requirement to drain effluent from the system back to the septic tank. The only time this would make sense is for septic tank effluent systems. This may limit the system's ability to drain back effectively.

Allen Worst stated that the info provided by Tyler Fortunati recommends operation and maintenance be performed on the system two times per year. Mr. Worst stated that he personally supports requiring maintenance on the system.

Dale Peck stated that they need operation and maintenance on the standard septic tank effluent system for it to operate correctly and it is something that should be required.

The committee asked Tyler Fortunati to change the drip tube spacing on the septic tank effluent system but to retain the same sizing requirements for the system. The committee also requested that the filter requirement be removed from secondary effluent. The committee requested that Tyler Fortunati address the items presented in public comment and from the committee. A new draft of this guidance was requested to be completed for preliminary review at the next meeting.

Action Item: Address public comment and committee provided revisions.

Motion: Joe Canning moved that the TGC table section 4.5 Drip Distribution System.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously.

Section will be tabled for further revision and review. See **Appendix L**.

NEXT MEETING:

The next committee meeting is scheduled to be on May 18, 2016 at the Idaho Department of Environmental Quality's state office.

Motion: Bob Erickson moved to adjourn the meeting.

Second: Joe Canning.

Voice Vote: Motion carried unanimously.

The meeting adjourned at 1:05 p.m.

Appendix B

4.19.3.1 Piping

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

Lateral Piping

Lateral piping is placed within the drainfield and is used to evenly distribute wastewater effluent to the drainfield 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.

Distribution Laterals

1. Lateral length should be shorter than the trench length by at least 6 inches but not more than 36 inches.
2. Laterals in trenches should be placed equidistant from each trench sidewall and from each other.
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 farther apart than 3 feet on center in bed designs and should not be placed farther than 1.5 feet from the bed's edge regardless of orifice spacing.
    c. The maximum lateral spacing in sand mounds, intermittent and in-trench sand filters, and recirculating gravel filters is 2.25 ft.
4. Determine the lateral diameter based on distribution lateral network design.
    a. Lateral diameter typically ranges from 0.75 to 4 inches for most system applications.
    b. Lateral diameter for typical individual dwelling systems range from 0.75 to 2 inches.
5. Lateral length should be selected based on the lateral diameter, orifice spacing, and piping schedule/class.

    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 ensures relatively uniform effluent discharge down the length of the lateral.
6. Individual ball or gate 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 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.

d. Cleanout access risers shall not extend past the installation depth of the drainfield (i.e. drainrock or gravelless system component) and native soil or medium sand interface.

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 adjoining 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 drainfields to facilitate lateral drainage and towards the top of the trench in gravelless trench component drainfields.
   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. All manifold and distribution lateral drainage not drained to the drainfield shall drain back to the dosing chamber if not retained in the transport piping below frost levels.
4. Orifice diameter
   a. Typical orifice diameter is 0.25 inch but may be smaller or larger depending upon system design requirements.
   b. Orifices smaller than 0.25 inch may lead to clogging, which should be considered in system design.
   c. Typical discharge rates based on orifice size are provided in Table 4-18.
5. Orifice spacing should distribute effluent as evenly and uniformly as possible over the infiltrative surface.
   a. Typical orifice spacing is 30–36 inches but may be closer or farther 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. The maximum ~~disposal area per~~ orifice spacing for sand mounds, intermittent and in-trench sand filters, and recirculating gravel filters is ~~4 ft^2~~2.25 ft.
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 when orifices are oriented up.

Appendix C

2.3 Standard Percolation Test

Revision: September 3, 2009

A percolation test checks on-site surveys and soil analysis data *only*. It is not to be used as the sole qualifier of a proposed disposal site's infiltrative capability. The most recent version of the following ASTM standards should be applied when evaluating a site's infiltrative capability:

- ASTM D3385, Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer
- ASTM D5093, Standard Test Method for Field Measurement of Infiltration Rate Using a Double-Ring Infiltrometer with a Sealed-Inner Ring

Percolation and application rates by soil type are shown in Table 2-9.

Table 2-9. Percolation and application rates by soil type.

Soil Design Subgroup	Soil Type	Percolation Rate (minutes/inch)[a]	Application Rate (GPD/ft^2)[b]
NS[c]	Gravel, coarse sand[d]	<1	NS
A-1	Medium sand	1–3	1.20
A-2a	Medium sand, poorly graded	4–5	1.0
A-2b	Fine sand, loamy sand	6–15	0.75
B-1	Sandy loam	16–30	0.60
B-2	Loam, silt loam	31–60	0.45
C-1	Sandy or silty clay loam[e]	45–60	0.30
C-2	Clay loam[e]	61–120	0.20
NS	Clays, organic muck, duripan, hardpan, claypan	>120	NS

a. Estimates only; actual percolation rates as determined using ASTM D5093 or ASTM D3385 may differ.

b. Application rates are for domestic wastes. A safety factor of 1.5 or more should be used for wastes of significantly different characteristics. Gallons per day per square foot (GPD/ft^2).

c. Not suitable (NS) for installation of a subsurface sewage disposal system.

d. See medium sand definition for a material that may be acceptable for use.

e. Soils without expandable clays.

Appendix D

2.1 Soil~~s~~ Texture and Group Determinations

Revision: ~~January 30, 2013~~May 18, 2016

2.1.1 Determining Soil Textural Classifications

Soil texture is determined by the proportion of three separates: sand, silt, and clay. It is one of the most important characteristics of soil for water movement because of its relationship to ~~pore size,~~ pore size distribution~~,~~ and pore continuity. Permeability, aeration, and drainage are all related to the soils' ability to filter and adsorb or otherwise retain, pollutants for treatment. Sizes of the major separates are shown in Table 2-1.

Table Error! No text of specified style in document.**-1. Sizes of mineral, soil, and rock fragments.**

Material	Equivalent Diameter[a]	Passes Sieve #
Clay	<0.002 mm[b]	425
Silt	0.002–0.05 mm	270
Very fine sand	0.05–0.10 mm	140
Fine sand	0.10–0.25 mm	100
Medium sand	0.25–0.50 mm	50
Coarse sand	0.50–1.00 mm	16
Very coarse sand	1.00–2.00 mm	10
Gravel	2.00 mm–7~~.~~5 ~~cm~~mm	3 in.[b]
Cobbles	7~~.~~5–250~~.4~~ ~~cm~~mm	10 in.
Stones	250~~.4~~ –600~~1~~ ~~cm~~mm	24 in.
Boulders	>600~~1~~ ~~cm~~mm	—

a. NRCS National Soil Survey Handbook (NSSH) Part 618 (Subpart A), 618.46 (D) and 618.31(K) 3ii
b. ~~*Notes:*~~ millimeter (mm); ~~centimeter (cm);~~ inches (in)

The Soil Textural Classification used by Idaho was adopted from the United States Department of Agriculture (USDA). Soil textures of proposed soil absorption sites are determined according to these guidelines. Once the textures have been determined, then the soil design groups may be specified for the absorption system design. Characteristics of each soil texture are shown in Table 2-2. To determine the texture classification of soils, refer to Table 2-~~3~~2, Table 2-3, and Figure 2-1 for summaries of the soil particle distributions and percentages in each of the textures. Refer to Figure 2-2 for a flowchart of the steps for determining soil classification.

Table 2-2. Soil textural characteristics[a].

Soil Texture	Visual Detection of Particle Size and General Appearance of Soil	Squeezed by Hand and Pressure Released When Air-Dry	Squeezed by Hand and Pressure Released When Moist	Ribbon Between Thumb and Finger
Sand	Soil has a granular appearance, loose, gritty grains visible to the eye. Free flowing when dry.	Will not form a cast. Falls apart easily.	Forms cast that crumbles at least touch.	Cannot ribbon
Sandy loam	Somewhat cohesive soil; aggregates easily crushed. Sand dominates but slight velvety feel.	Cast crumbles easily when touched.	Cast will bear careful handling.	Cannot ribbon
Loam	Uniform mixture of silt, clay, and sand. Aggregates crushed under moderate pressure. Velvety feel that becomes gritty with continued rubbing.	Cast will bear careful handling.	Cast can be handled freely.	Cannot ribbon
Silt loam	Quite cloddy when dry. Can be pulverized easily to a fine powder. Over 50% silt.	Cast can be freely handled. Flour-like feel when rubbed.	Cast can be freely handled. When wet, flows into puddle.	Will not ribbon but has slight plastic look.
Silt	Over 80% silt with little fine sand and clay. Cloddy when dry pulverizes readily to a flour-like powder.	Cast can be freely handled.	Cast can be freely handled. Puddles readily. “Slick” feeling.	Ribbons with a broken appearance.
Silty clay loam	Hard lumps when dry, resembling clay. Takes strong pressure to break the lumps.	Cast can be freely handled.	Cast can be freely handled. Can be worked into a dense mass.	Forms thin ribbon that breaks easily.
Clay	Very fine-textured soil breaks into very hard lumps that take extreme pressure to break.	Cast can be freely handled.	Cast can be freely handled. “Sticky” feeling.	Forms long, thin ribbons.

Soil Texture	USDA Soil Textural Classification	Dry Soil Description (0-25% available moisture percent[b])	Moist Soil Description (75-100% available moisture percent)	
			Ball[c] Formation	Ribbon[d] Between Thumb and Finger
Coarse	Fine sand Loamy fine sand Sand Coarse sand Loamy coarse sand Loamy sand Very fine sand	Dry, loose, will hold together if not disturbed, loose sand grains on fingers with applied pressure	Wet, forms a weak ball[1], loose and aggregated sand grains remain on fingers, darkened color, heavy water staining on fingers	Will not ribbon
Moderately Coarse	Sandy loam Fine sandy loam Very fine sandy loam Coarse sandy loam Loamy very fine sand	Dry, forms a very weak ball, aggregated soil grains break away easily from ball	Wet, forms a ball with wet outline left on hand, light to medium water staining on fingers	Makes a weak ribbon between thumb and forefinger
Medium	Sandy clay loam Loam Silt loam Silt	Dry, soil aggregations break easily, no moisture staining on fingers, clods crumble with applied pressure	Wet, forms a ball with well-defined finger marks, light to heavy soil/water coating on fingers	Ribbons between thumb and forefinger
Fine	Clay Clay loam Silty clay loam Sandy clay Silty clay	Dry, soil aggregations easily separate, clods are hard to crumble with applied pressure	Wet, forms a ball, uneven medium to heavy soil/water coating on fingers	Ribbons easily between thumb and forefinger

a. Adapted from USDA Natural Resource Conservation Service (NRCS). April 1998, Reprinted June 2005. Estimating Soil Moisture by Feel and Appearance. Program Aid Number 1619.
b. Available moisture percent is that percent of the available water-holding capacity of the soil occupied by water.
c. Ball is formed by squeezing a hand full of soil very firmly with one hand.
d. Ribbon is formed when soil is squeezed out of hand between thumb and forefinger.

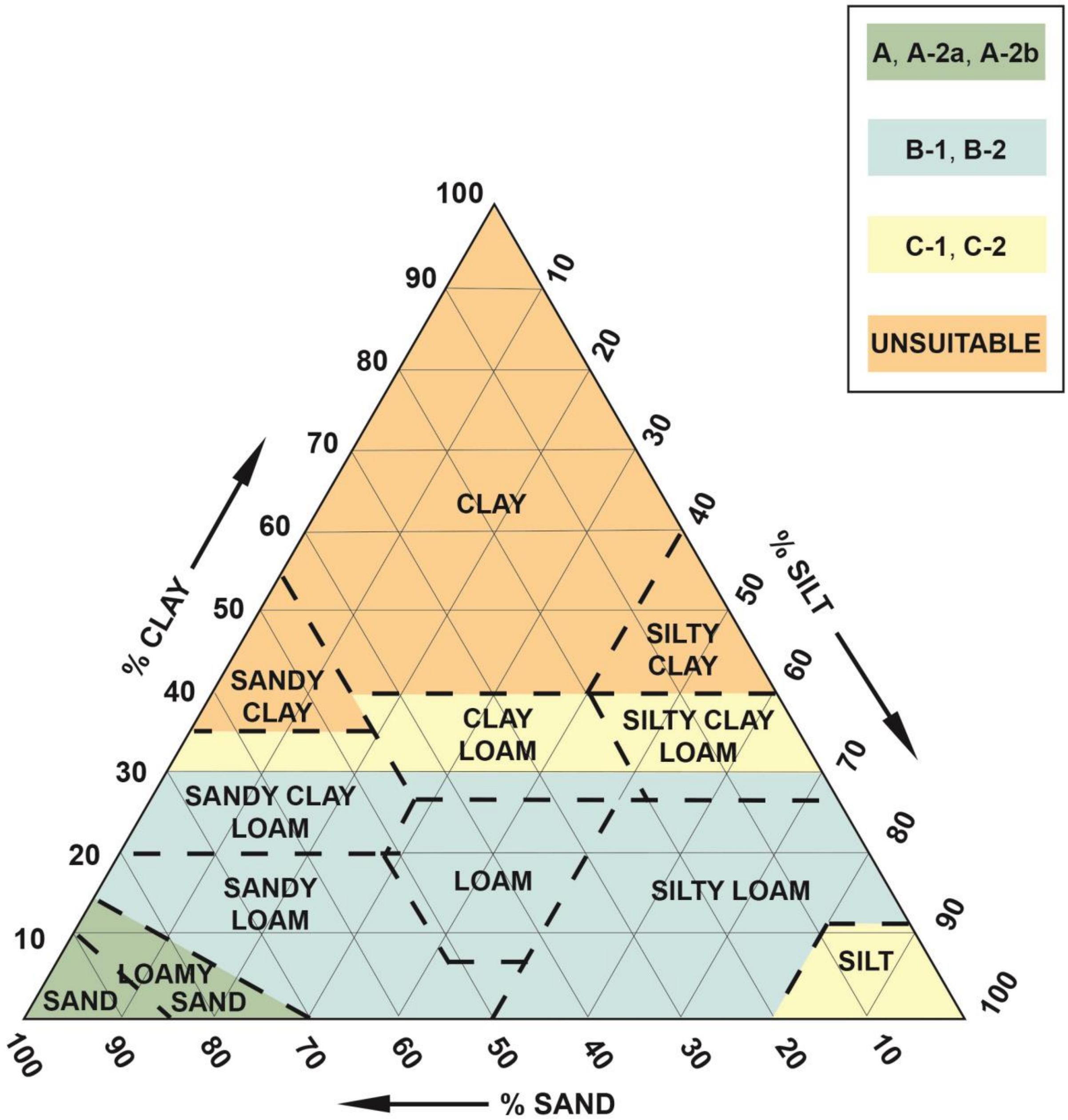
Table 2-3. Soil textural proportions.

USDA Soil Textur~~e~~al Classifications	Sand (%)	Silt (%)	Clay (%)
Sand	>85	<15	<10
Loamy sand	70–90	<30	~~1~~0-15
Sandy loam	43–85	<50	<20
Loam	23–52	28-~~<~~50	7–27
Silty loam	<50	50–88	<27
Silt	<20	>80	<12
Sandy clay loam	45–80	<28	20–35
Clay loam	20–45	15–53	27–40
Silty clay loam	<20	~~6~~40–73	27–40
Sandy clay	45–65	<20	35–55
Silty clay	<20	40–60	40–60
Clay	<45	<40	>40

Basic textural names may be modified if the soil mass contains 15%–95% of stones, cobble, or gravel by adding the name of the dominant rock fragment:

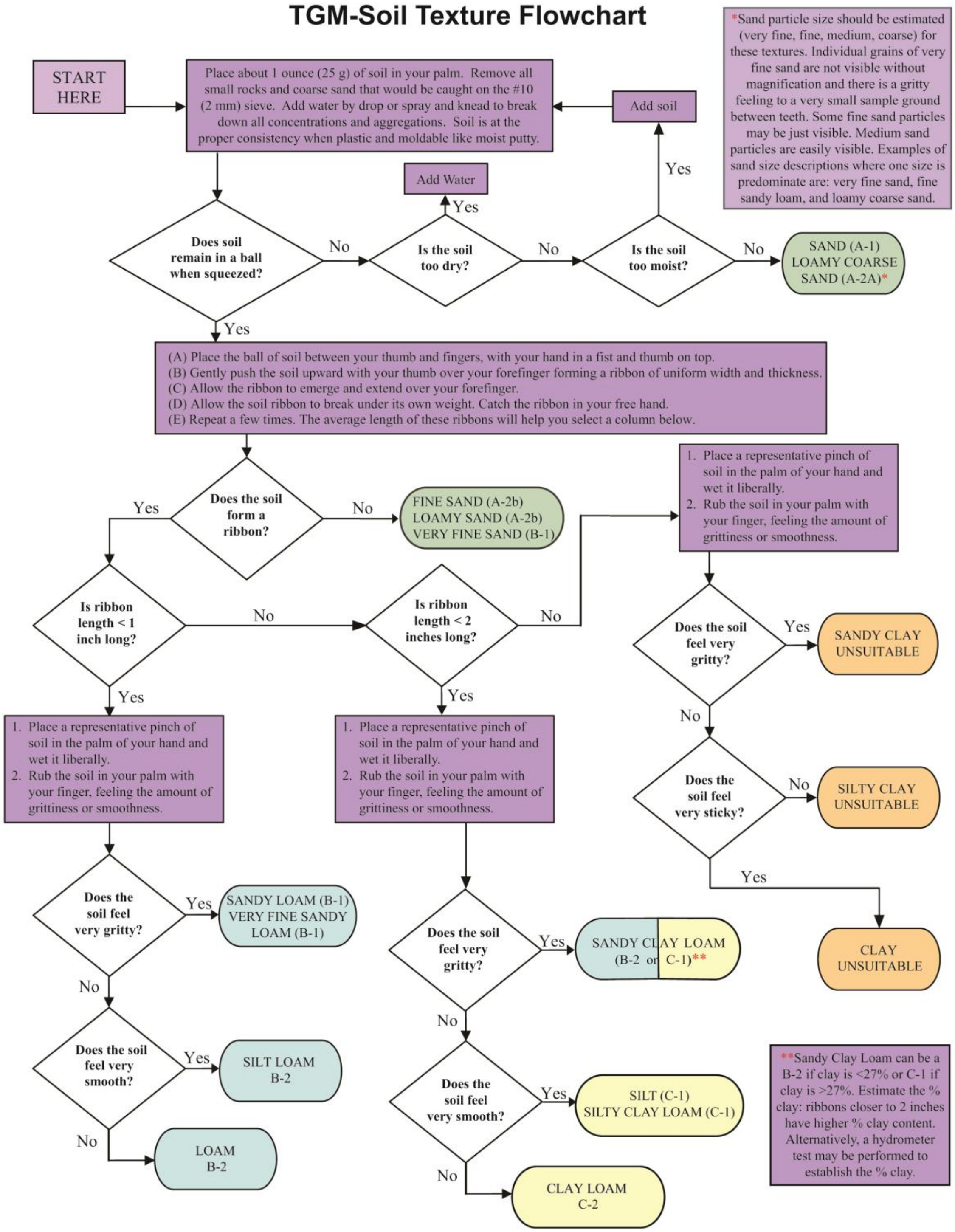
- Gravelly or stony = 15%–35% of the soils volume is rock fragments.
- Very gravelly or very stony = 35%–60% of the soils volume is rock fragments.
- Extremely gravelly or extremely stony = 60%–95% of the soils volume is rock fragments.
- 95% or more should take the name of the geological type, such as granite, gneiss, limestone, or gravel.

TGM-Soil Texture Flowchart Triangle



A black and white version is provided in Appendix B.

Figure 2-1. United States Department of Agriculture soil textural triangle.



A black and white version is provided in Appendix B.

Figure 2-2. Soil texture determination flowchart.

2.1.2 Soil Design Groups and Subgroups

This section is provided as a guide to field environmental health personnel in making technical allowances for standard systems and for health districts to use in selecting alternative systems. The required absorption area of a subsurface sewage disposal system depends on the texture of the soils in the proposed disposal system location. In a similar manner, required separation distances between the disposal area and features of concern, such as wells, surface water, and ground water, depend on soil texture. Soils surrounding the disposal system and those below it may not be the same.

The soil design group or subgroup (Table 2-4) used to determine the minimum effective soil depth, and applicable separation distances, describes the finest-textured soils adjacent to the drainfield trenches and beneath the drainfield for the effective soil depth.

All other soil textures and some soil features (i.e., gravel, coarse sand, all clays, organic muck, claypan, hardpan, and duripan) are unsuitable for installing a standard drainfield system.

Table 2-4. Soil textural classification design groups.

Soil Design Group	Soil Design Subgroup	Soil Textural Classification	Application Rate[a] (GPD/ft²)[b]
NS[c]	NS	Gravel Coarse sand	NS
A	A-1	~~Medium s~~Sand[d]	1.2
	A-2a	~~Medium~~ Loamy coarse sand	1.0
	A-2b	Fine sand Loamy sand	0.75
B	B-1	Very fine sand Sandy loam Very fine sandy loam	0.6
	B-2	Loam Silt loam Sandy clay loam (≤27% clay)	0.45
C	C-1	Silt Sandy clay loam[e] Silty clay loam[e]	0.3
	C-2	Clay loam[e]	0.2
NS	NS	Sandy Clay Silty Clay Clay Organic muck Duripan Hardpan Claypan	NS

a. Application rates are for domestic strength wastewater. A safety factor of 1.5 or more should be used for wastes of significantly different characteristics.
b. Gallons per day per square foot (GPD/ft^2).
c. Not suitable (NS) for installation of a subsurface sewage disposal system.
d. See medium sand definition (section 3.2.8.1.2) for a manufactured material that may be acceptable for use.
e. Soils without expandable clays.

2.1.3 Soil Design Subgroup Corrections

A soil design subgroup may be lowered as indicated in this section. **(Subgroup correction is used to determine the application rate only; it will not change surface water or ground water separation requirements.)**

1. Soil with moderate or strong platy structure should be lowered one subgroup for design purposes.
2. Soil should be lowered one subgroup if 35%–60% of its volume is rock fragments (very gravelly, very stony).
3. Soil should be lowered by two subgroups if 60%–95% of its volume is rock fragments (extremely gravelly, extremely stony).
4. Soil with 95% or greater rock fragments is unsuitable as an effective soil for subsurface sewage disposal.
5. Uniform fine and very fine sand (e.g., blow sands) should be lowered two subgroups for design purposes. Soils that qualify for this modification have a coefficient of uniformity less than three ($C_u < 3.0$).

Example:

A soil evaluation results in the designation of loamy sand with rock fragments volumes estimated at 70% of the total soil volume below within the effective soil depth of below the drainfield installation. The loamy sand would be assigned a soil design subgroup of A-2b consistent with Table 2-4. Due to the estimated volume of rock fragments, the soil design subgroup would then be lowered by two subgroups resulting in an assigned soil design subgroup of B-2. Based on these determinations, the drainfield would be sized consistent with the B-2 soil application rate (0.45 GPD/ft^2; section 2.3, Table 2-94) to increase the available soil surface available for effluent treatment due to the soil surface being reduced by large fraction rock. However, both the required vertical (effective soil depth, IDAPA 58.01.03.008.02.c) and the horizontal separation distances (IDAPA 58.01.03.008.02.d) shall meet the requirements for soil design group A soils.

Appendix E

2.2.4.2 Reduction in Separation Distance to Surface Water with a Variance

~~The s~~Separation distances to surface water are in place to protect water quality, ecological health and current and future ~~the~~ beneficial uses of the ~~surface water~~resource. Septic tank effluent ~~carries~~contains both nitrogen and phosphorous which are ~~constituents~~nutrients that pose a eutrophication threat to surface water. If ~~a~~the separation distance from a drainfield to surface water is proposed to be ~~reduced~~decreased ~~further~~more than the ~~reductions~~limits outlined in section 2.2.4.1, ~~it~~an assessment must be done ~~through a variance supported by models that~~to evaluate the potential adverse effects that ~~the total~~ nitrogen and phosphorous loading may have on ~~the~~receiving surface waters ~~body~~. If the evaluation is favorable (i.e., no adverse impact is determined), supported by model outputs, and written recommendation for approval from DEQ is received then a variance may be issued for a reduced separation distance.

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

~~The m~~Minimum documentation requirements ~~for the~~to support~~ing~~ a variance ~~documentation~~ request are: ~~included below.~~

1. The variance must follow all requirements ~~provided~~specified 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~~, nutrient-pathogen (NP) evaluation, and phosphorous evaluation.
3. An ~~nutrient-pathogen (~~NP~~)~~ evaluation must be performed ~~for the~~to demonstrate site suitability ~~and be acceptable~~ based on ~~the required~~ minimum system design~~s~~ requirements, proposed system placement, and model outputs as outlined in section 2.2.4.2.3 prior to performing a phosphorous evaluation as described in the on-site system surface water separation distance determination guidance and model.
4. The phosphorous evaluation must be performed to demonstrate site suitability based on minimum system design requirements, proposed system placement, and model outputs as outlined in section 2.2.4.2.3.

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 4.19 of this manual.
2. The maximum installation depth of the drainfield in the native soil profile shall be 6 inches and the proposed drainfield sites must meet the above-grade capping fill system criteria (section 4.3) or drip distribution system criteria (section 4.5).

3. Two full-size drainfields shall be installed under the initial permit, and alternating dosing between each drainfield shall be included in the system's ~~pressurized~~operational design.
4. Replacement area for a third full-size drainfield must be reserved on the property.
5. No separation distance to surface water shall be reduced to less than 100 feet.
6. 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 depending on the outcome of the NP evaluation.

Restrictions on Drainfield 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. To reduce the 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 adverse impacts ~~on~~to surface water. If it is necessary to expand the drainfield to obtain successful outputs for the models described in section 2.2.4.2.3, 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.

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

To support a variance request 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:

Nutrient-Pathogen Evaluation

1. The maximum total nitrogen concentration of the effluent discharged to the drainfield shall be 27 mg/L.
2. All other standard NP evaluation criteria and output requirements apply.

On-Site System Surface Water Separation Distance Determination Guidance and Model

1. The average phosphorous output from the septic tank shall be 8.6 mg/L.
2. The minimum phosphorous site life of receiving soils shall be ~~100~~50 years for each drainfield.
3. If the minimum phosphorous site life can be met, then the surface water body must be evaluated to determine if it has a Total Maximum Daily Load (TMDL) limit for phosphorous based on the following:
   a. If the water body is not TMDL limited for phosphorous, the subsurface sewage disposal permit may be issued.

b. If the water body is TMDL limited for phosphorous, its' impact on the surface water body must be evaluated through an equivalency comparison between what may be permitted by rule (standard separation distances) and the reduced separation distance proposed.

   i. If the modeled impact of the system at the reduced separation distance is equivalent to, or less than, the impact of what could be permitted by rule then the subsurface sewage disposal permit may be issued.

   ii. If the modeled impact of the proposed system at the reduced separation distance is greater than the impact of what could be permitted by rule then the subsurface sewage disposal permit may not be issued.

34. All other standard On-Site System Surface Water Separation Distance Determination Model criteria and output requirements apply as described in DEQ's guidance *On-Site System Surface Water Separation Distance Determination Guidance.*

Restrictions on Drainfield 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. To reduce the 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 to obtain successful outputs for the models described in section 2.2.4.2.3, 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.

Appendix F

4.21 Recirculating Gravel Filter

Revision: ~~May 21~~May 18, ~~2015~~2016

4.21.1 Description

A recirculating gravel filter is a bed of 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. The effluent returned from the filter may either return to the recirculating tank or a combination of the equalization tank and recirculating tank depending on effluent treatment requirements. Minimum ~~S~~system components include, but are not limited to, the following:

1. ~~a s~~Septic tank~~,~~
2. Equalization tank (if nitrogen reduction is required)
3. ~~r~~Recirculati~~o~~ng~~g~~ tank~~,~~
4. ~~l~~Low-pressure distribution system~~,~~
5. ~~f~~Free-access filter~~s, dosing chamber, mechanical~~
6. ~~f~~Flow splitter~~, and~~
7. Dosing chamber (if drainfield is pressurized)
8. ~~d~~Drainfield.

4.21.2 Approval Conditions

1. Nondomestic wastewater ~~with biological oxygen demand (BOD) or TSS exceeding~~ must be pretreated to normal domestic wastewater strengths (section 3.2.1, Table 3-1) ~~is required to be pretreated to these levels~~ before discharge ~~in~~to 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 4.21 must be designed and installed according to the guidance for pressure distribution systems in section 4.19.
4. ~~The~~All tanks and the recirculating gravel filter container shall meet the same separation distance requirements as a septic tank.
5. Recirculating gravel filters required to reduce total nitrogen shall meet the additional design requirements in section 4.21.3.2.3.
5. System must be designed by a PE licensed in Idaho.
6. Recirculating gravel filters that are required to reduce total nitrogen to 27 mg/L shall follow the operation and maintenance requirements ~~for extended treatment package systems (section 4.8.3)~~as outlined in sections 1.9.1 and 1.9.3 effective July 1, 2017.
    a. Operation and maintenance must be performed, as described in section 1.9.1, by a permitted complex installer that maintains a current service provider endorsement.

b. All subsurface sewage disposal permits issued for recirculating gravel filters meeting the above requirements shall contain the following statement beginning July 1, 2017: *Annual treatment system equipment servicing and reporting is required per IDAPA 58.01.03.005.14. Operation and maintenance must be conducted by a complex installer maintaining a current service provider endorsement.*

c. See sections 1.9.1 and 1.9.3 for compliance related information for recirculating gravel filter operation, maintenance, and reporting.

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

4.21.2.1 Recirculating Tank

1. Minimum recirculating tank volume shall be capable of maintaining two times the daily design flow of the system (Figure 4-27).
2. The recirculating tank may be a modified septic tank or dosing chamber selected from section 5.2 or section 5.3.
   a. Alternatively, the recirculation tank may be designed by the system's design engineer to meet the minimum requirements of this section and IDAPA 58.01.03.007.
   b. Recirculating tank design is exempt from subsections .07, .08, .10, and .11~~, and .13~~ of IDAPA 58.01.03.007.
3. The recirculating tank shall be accessible from grade and the return line, pump, pump screen, and pump components shall be accessible from these access points.
4. The recirculating filter effluent return point shall be located before the recirculation tank and shall enter at the inlet of the recirculating tank, unless a gravity float valve is used in which case the return point shall be located near the inlet.
5. The recirculating tank shall meet all other minimum design and equipment requirements of section 4.19.3.4.

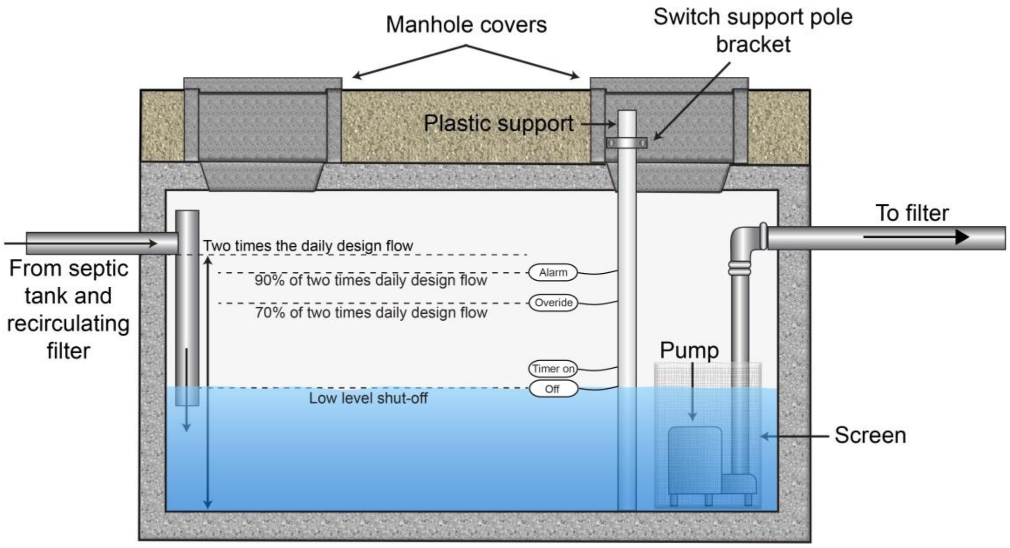


Figure 4-27. Recirculating tank.

4.21.2.2 Recirculating Filter

1. The 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.
2. The following requirements must be met for flexible membrane liners when used in place of concrete:
    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.

~~2~~3. The filter surface area is sized at a maximum of 5 gallons/ft^2/day forward flow (forward flow is equivalent to the daily design flow from the structure).

~~3~~4. Filter construction media shall meet the specifications in section 3.2.8.1.3 for pea gravel and section 3.2.8.1.1 for drainrock.

~~4~~5. Minimum filter construction specifications (i.e., media depth, geotextile fabric placement, cover slopes, filter container height, and piping placement) shall meet the dimensions and locations depicted in Figure 4-28.

~~5~~6. The bottom of the filter may be sloped at least 1% to the underdrain pipe.

~~6~~7. An underdrain must be located at the bottom of the filter to return filtered effluent to the dosing chamber meeting the following requirements:
    a. May be placed directly on the bottom of the filter.
    b. Placed level throughout the bottom of the filter.
    c. Constructed of slotted drain pipe with 0.25-inch slots, 2.5 inches deep and spaced 4 inches apart located vertically on the pipe, or perforated sewer pipe with holes located at 5 and 7 o'clock.
    d. One underdrain should be installed for each filter cell zone.
    e. The distal end is vented to the atmosphere, protected with a screen, and located within the filter to allow entry of air flow into the bottom of the filter and access for cleaning and ponding observation.
    f. Connected to solid pipe that meets the construction requirements of IDAPA 58.01.03.007.21, extends through the filter, and is sealed so the joint between the filter wall and pipe is watertight.

~~7~~8. Two observation tubes should be placed in the recirculating filter to monitor for ponding and clogging formation.
    a. The monitoring tubes must be secured and perforated near the bottom.
    b. The monitoring tubes must extend through the recirculating filter cover and have a removable cap.

~~8~~9. The surface of the recirculating filter must be left open to facilitate oxygenation of the filter. No soil cover shall be placed above the upper layer of drainrock in the recirculating gravel filter. However, the filter must be designed to prevent accidental contact with effluent from the surface. The following minimum requirements must be followed:

a. Chain-link fence or another acceptable protective barrier (Figure 4-28) shall be placed at the top of the filter container and cover the entire surface of the filter to prevent access, unless fencing is placed around the entire system to prevent access.
b. Geotextile fabric shall be placed over the access barrier.
c. Fencing around the recirculating gravel filter is recommended for all central systems.

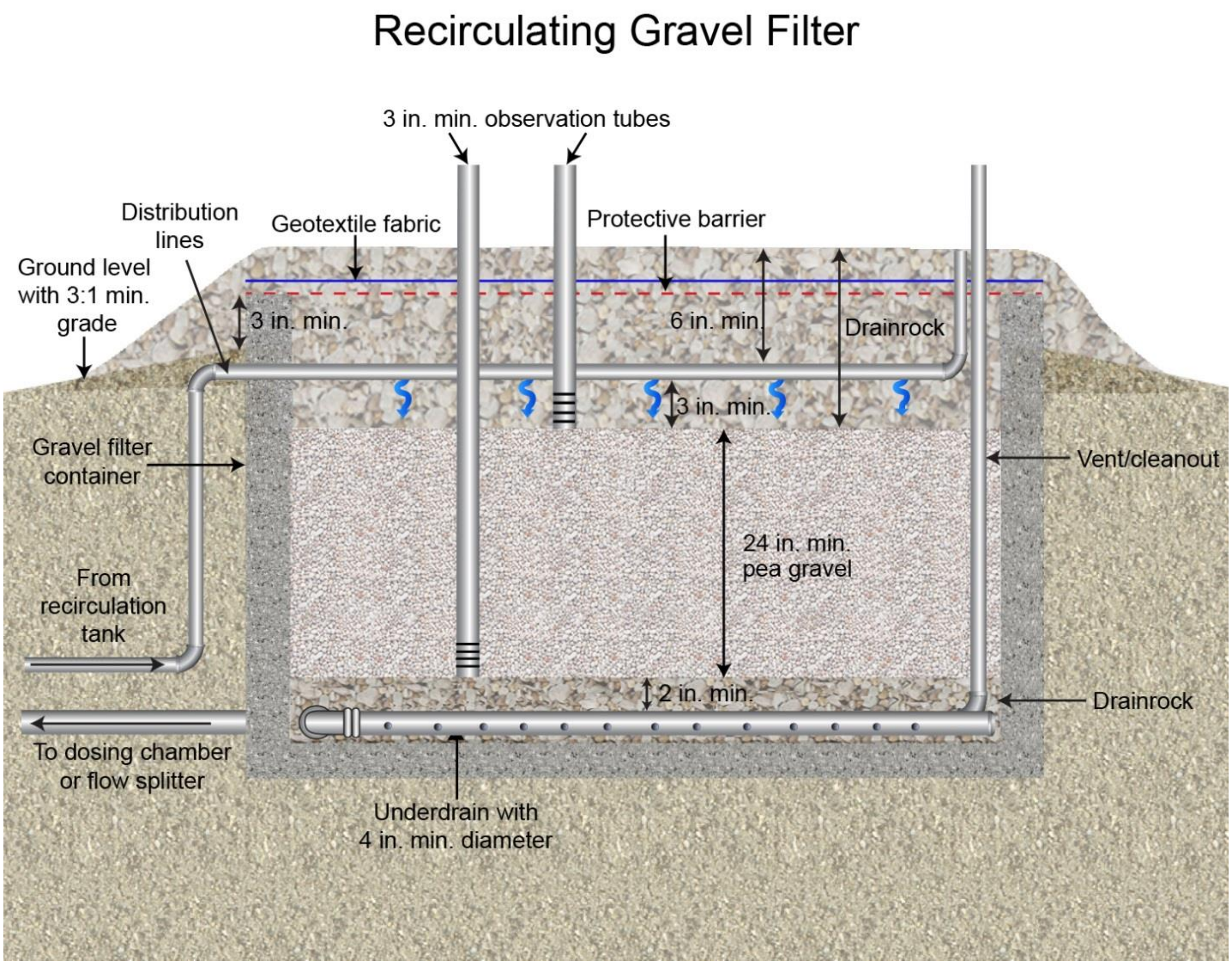


Figure 4-28. Recirculating gravel filter.

4.21.2.2.1 Recirculating Filter Cells

Depending on the volume of effluent and type of structure using a recirculating gravel filter, the recirculating filter may need to be split into cells that contain dosing zones (Figure 4-29). A filter cell is the total filter area that can be served by a single dosing pump or set of pumps. A filter zone is the area of a cell that can be dosed by a single dosing pump at any one time. Zone sizing depends upon pump size, lateral length, perforation size, and perforation spacing. The minimum filter design requirements for cells, zones, and pumps include the following:

1. Single-family homes: one cell, one zone, and one pump. If more than one cell or zone is used for a single-family home, duplex pumps are not required.
2. Central systems or systems connected to anything other than a single-family home (flows up to 2,500 GPD): one cell, two zones, and one pump per zone.
3. Large soil absorption systems (flows of 2,500 to 5,000 GPD): one cell, three zones, and one pump per zone.
4. Large soil absorption systems (flows over 5,000 GPD): two cells, two zones per cell, and one pump per zone.
5. An alternative to installing one pump per zone is to install duplex pumps connected to sequencing valves that alternate zones for each pressurization cycle. For systems with multiple cells, each cell must have a dedicated set of duplex pumps. Pumps should alternate between each cycle.
6. Filter cells are recommended to be hydraulically isolated from one another and shall be constructed according to the minimum requirements in section 4.21.3.2.
7. Each cell shall be equivalent in surface area and volume and have the same number of zones.
8. Each zone shall have the same number of laterals and perforations.

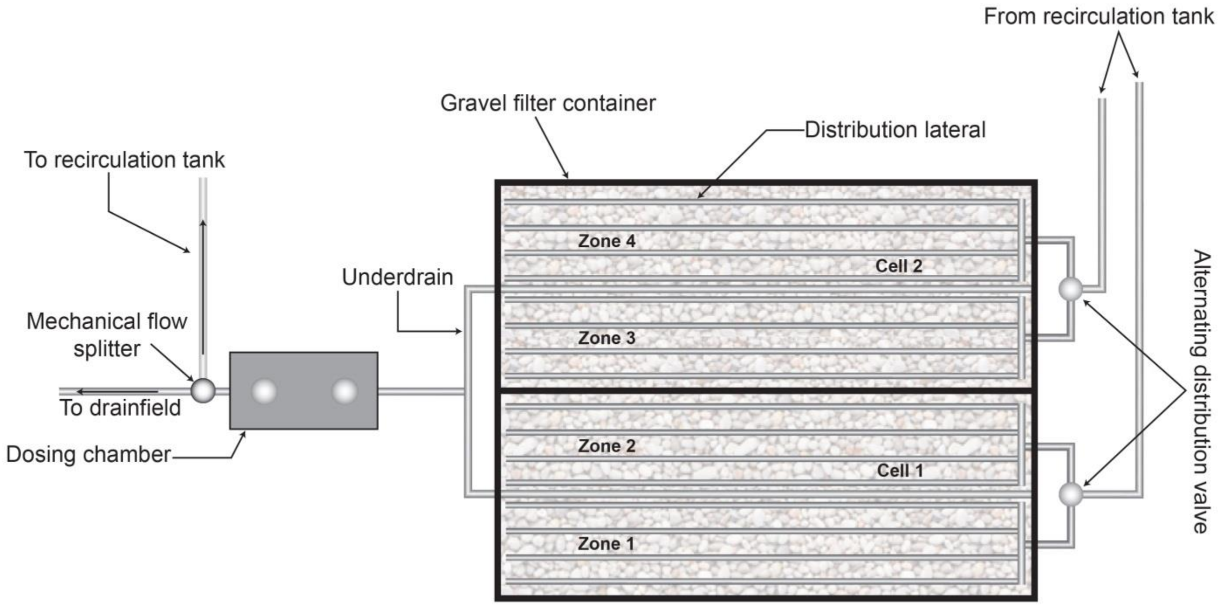


Figure 4-29. Overhead view of a recirculating gravel filter with multiple cells and dosing zones discharging to a dosing chamber utilizing mechanical flow splitting.

4.21.2.2.2 Recirculating Filter Dosing

1. The minimum recirculation ratio of the filter is 5:1, and the maximum recirculation ratio is 7:1 (the daily flow moves through the filter a minimum of five times or a maximum of seven times before discharge to the drainfield).
2. Timed dosing is required, and the filter dosing cycle should meet the following minimum recommendations:
   a. Pumps are set to dose each zone approximately two times per hour.

b. Dose volume delivered to the filter surface for each cycle should be 10.4% of the daily flow from the structure (forward flow).

c. A pump-on override float should be set at a point that equates to 70% of the recirculating tank's volume.

d. A low-level off float should be placed to ensure that the pump remains fully submerged at all times.

3. The pump controls should meet the following:

   a. Be capable of monitoring low- and high-level events so that timer settings can be adjusted accordingly.

   b. Have event counters and run-time meters to monitor daily flows.

4.21.2.3 ~~Dosing Chamber~~Effluent Return

1. Effluent must be returned from the filter to the recirculation tank which may occur by gravity or under pressure.
2. Gravity return must occur utilizing a float valve (Figure 4-30) within the recirculating tank, float valve must:
   a. Be located on the inlet side of the recirculating tank.
   b. Allow for continual splitting of filtered effluent when the buoy is fully seated and discharging to the drainfield.
   c. Be capable of returning 83% of the filtered effluent to the recirculation tank when the buoy is fully seated.
3. Other types of gravity flow splitters shall not be used to split recirculation flows.
4. Pressurized return must be done utilizing a dosing chamber meeting the minimum requirements of section 4.19.3.4, the dosing chamber must:
   a. Be located after the recirculating filter.
   b. Utilize a mechanical flow splitter (Figure 4-31 and Figure 4-32) that is capable of simultaneously returning effluent to the recirculating tank and discharging effluent to the drainfield.
5. Mechanical flow splitters shall:
   a. Be located outside of the dosing chamber and prior to the recirculation tank.

~~2. A dosing chamber meeting the minimum requirements of section 4.19.3.4 shall be installed after the recirculating filter, and all effluent passing through the recirculating filter shall be returned to the dosing chamber.~~

~~2. A mechanical flow splitter (Figure 4-3031 and Figure 4-3132) capable of simultaneously returning effluent to the recirculating tank and discharging effluent to the drainfield shall be located outside of the dosing chamber and before the recirculation tank. The flow splitter shall meet the following minimum requirements:~~

   ~~a~~b. ~~The flow splitter must b~~Be capable of returning effluent to the recirculating tank and discharging to the drainfield in a volume ratio equivalent to the designed recirculation ratio (e.g., if a recirculation ratio of 5:1 is used, ~~80~~83% of the filtered effluent by volume shall be returned to the recirculating tank, and ~~20~~17% shall be discharged to the drainfield).

b. ~~Float valves that do not allow for continual splitting of filtered effluent before discharge to the drainfield and nonmechanical weirs and flutes shall not be used to split flows.~~

~~3. Dosing of effluent from the dosing chamber may be either timed or on-demand.~~

~~4~~6. Discharge of effluent to the drainfield must occur after filtration and flow splitting.

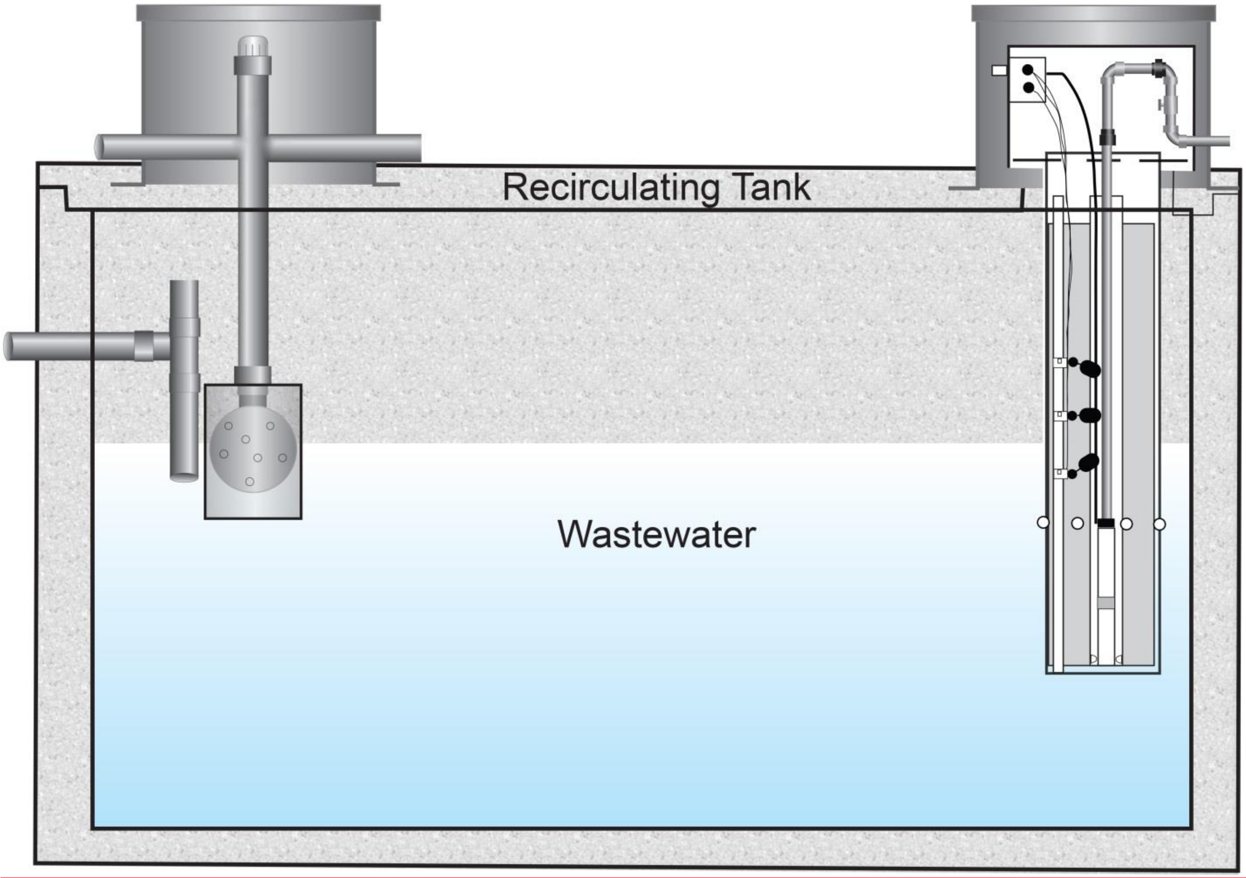


Figure 4-30. Gravity float valve return location within the recirculating tank.

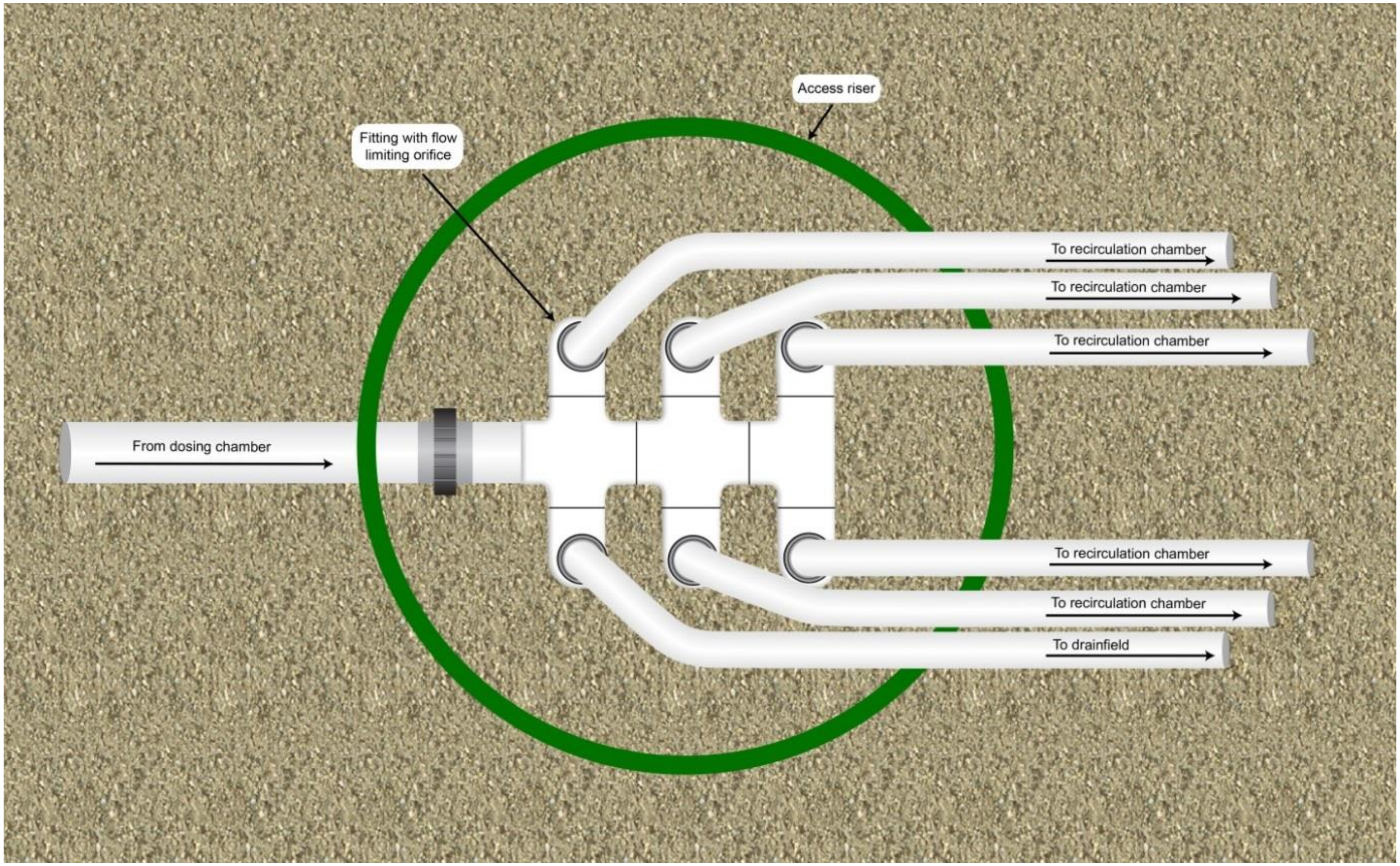


Figure 4-~~30~~31. Bottom view of a mechanical flow splitter for gravity distribution that delivers wastewater to all transport pipes with each dose.

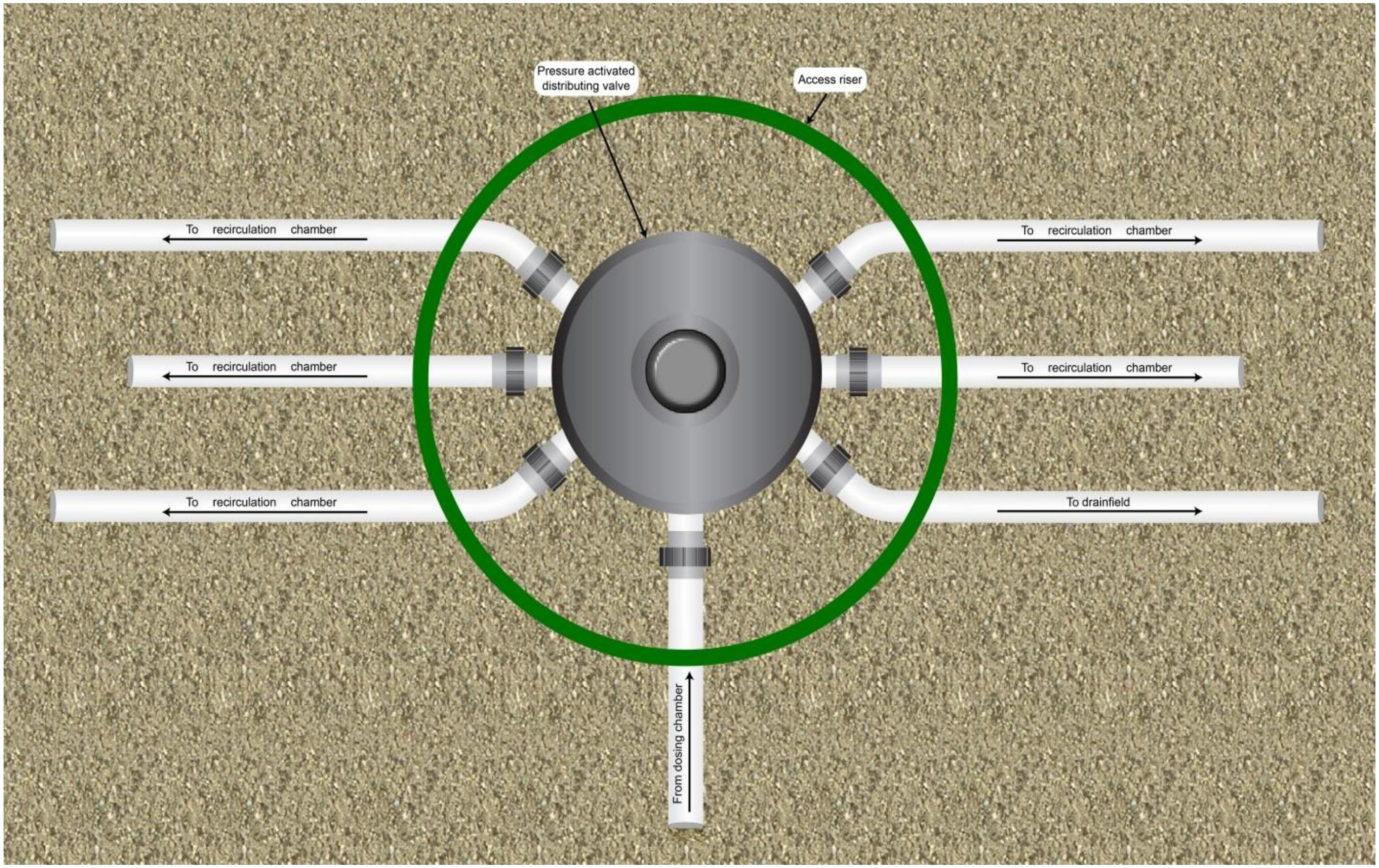


Figure 4-~~31~~32. Overhead view of a mechanical flow splitter for pressure distribution that only delivers wastewater to one transport pipe with each dose.

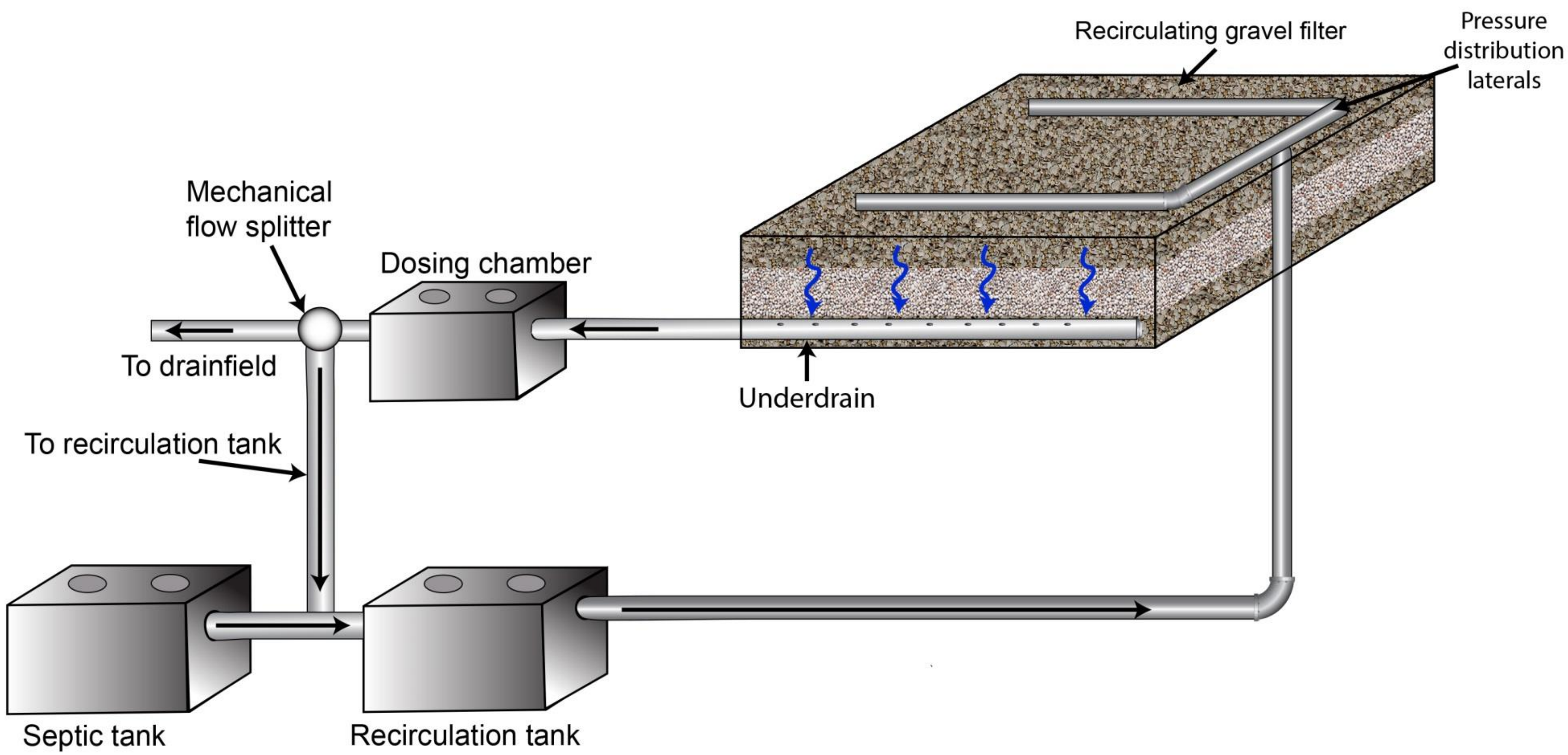


Figure 4-33. Cross section of a recirculating gravel filter system with pressure transport to, and/or within, the drainfield.

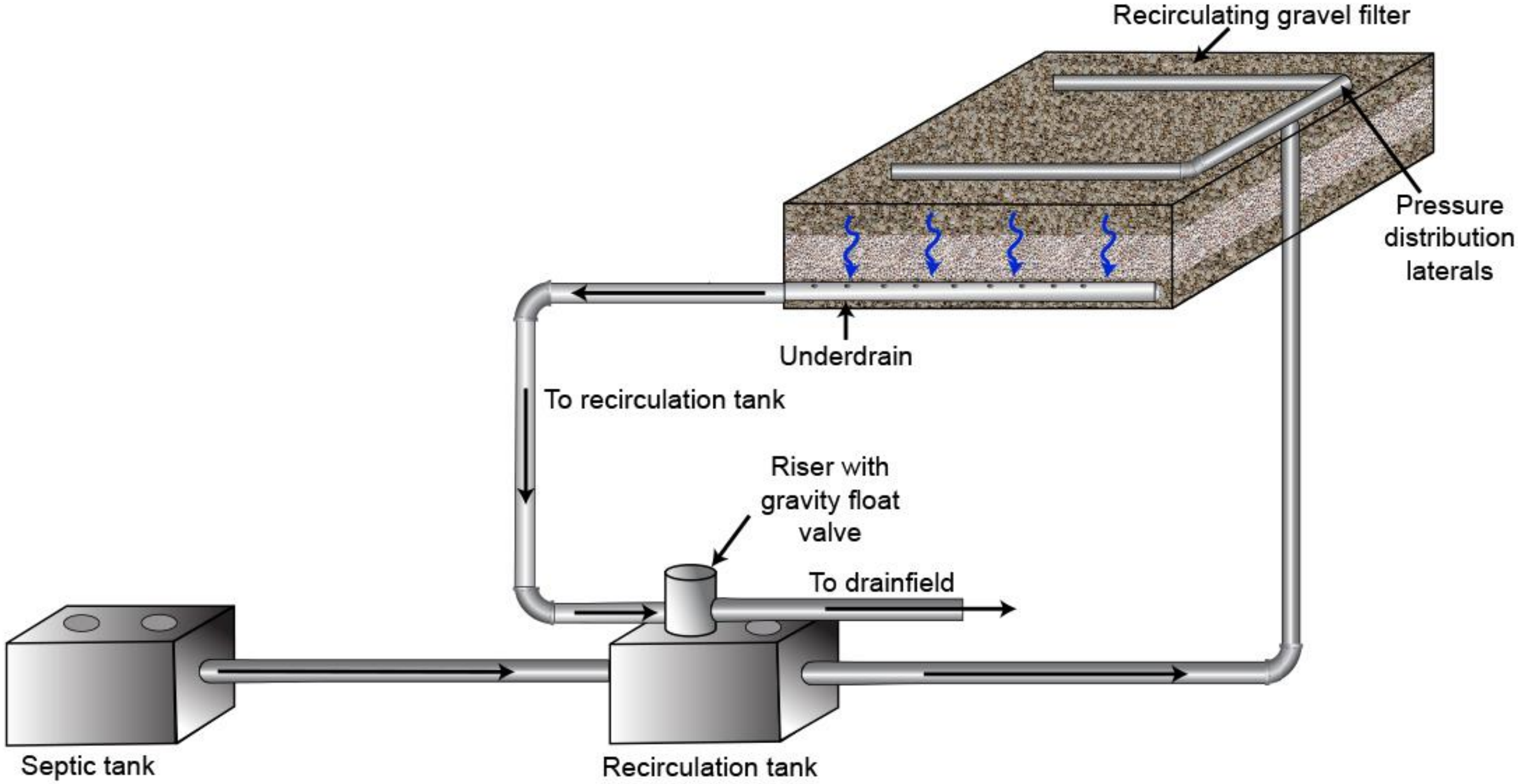


Figure 4-34. Cross section of a recirculating gravel filter system with gravity transport to the drainfield.

4.21.3.4 Additional Design Elements for Recirculating Gravel Filter Systems Required to Reduce Total Nitrogen

4.21.3.4.1 Equalization Tank

1. An equalization tank is required for all recirculating gravel filters treating effluent for total nitrogen.
2. A septic tank sized according to IDAPA 58.01.03.007.07 shall precede the equalization tank.
3. Minimum equalization tank volume shall be capable of maintaining two times the sum of the daily design flow of the system and recirculation volume returned to the equalization tank.
4. The equalization tank may be a modified septic tank or dosing chamber selected from section 5.2 or section 5.3.
    a. Alternatively, the equalization tank may be designed by the system's design engineer to meet the minimum requirements of this section and IDAPA 58.01.03.007.
    b. Equalization tank design is exempt from subsections .07 and .08 of IDAPA 58.01.03.007.
5. The recirculating filter effluent return point shall be located before the equalization tank and shall enter at the inlet of the equalization tank.

4.21.3.4.2 Effluent Return

1. Effluent shall be returned from the recirculating gravel filter in a ratio of 20% to the equalization tank and 80% to the recirculation tank (Figure 4-35).
2. Effluent return from the filter to the equalization tank and recirculation tank may be done by gravity or under pressure.
3. The design engineer must specify how the return ratio will be met with the system design and document the return flow in the system design calculations.

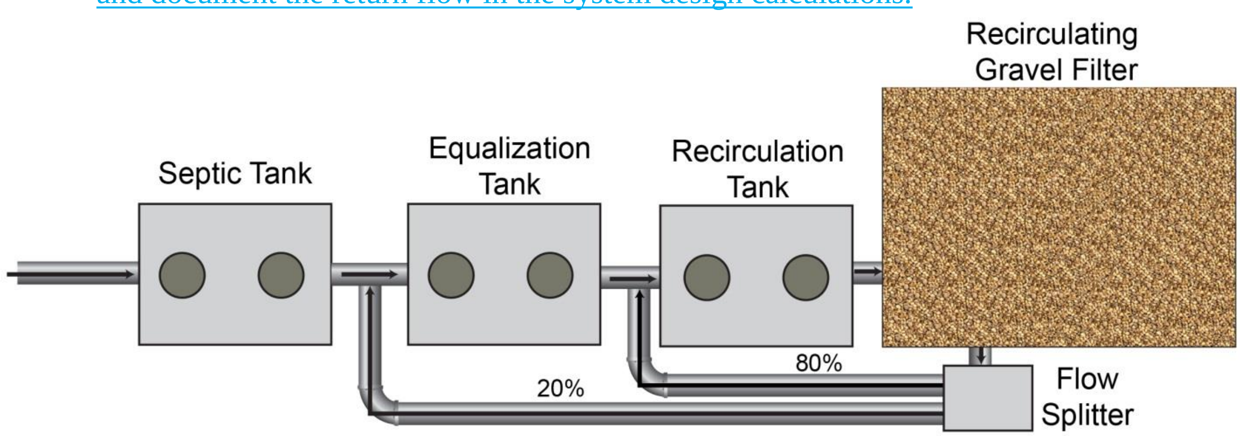


Figure 4-35. Effluent return locations and ratios from the recirculating gravel filter and flow splitter for systems treating total nitrogen.

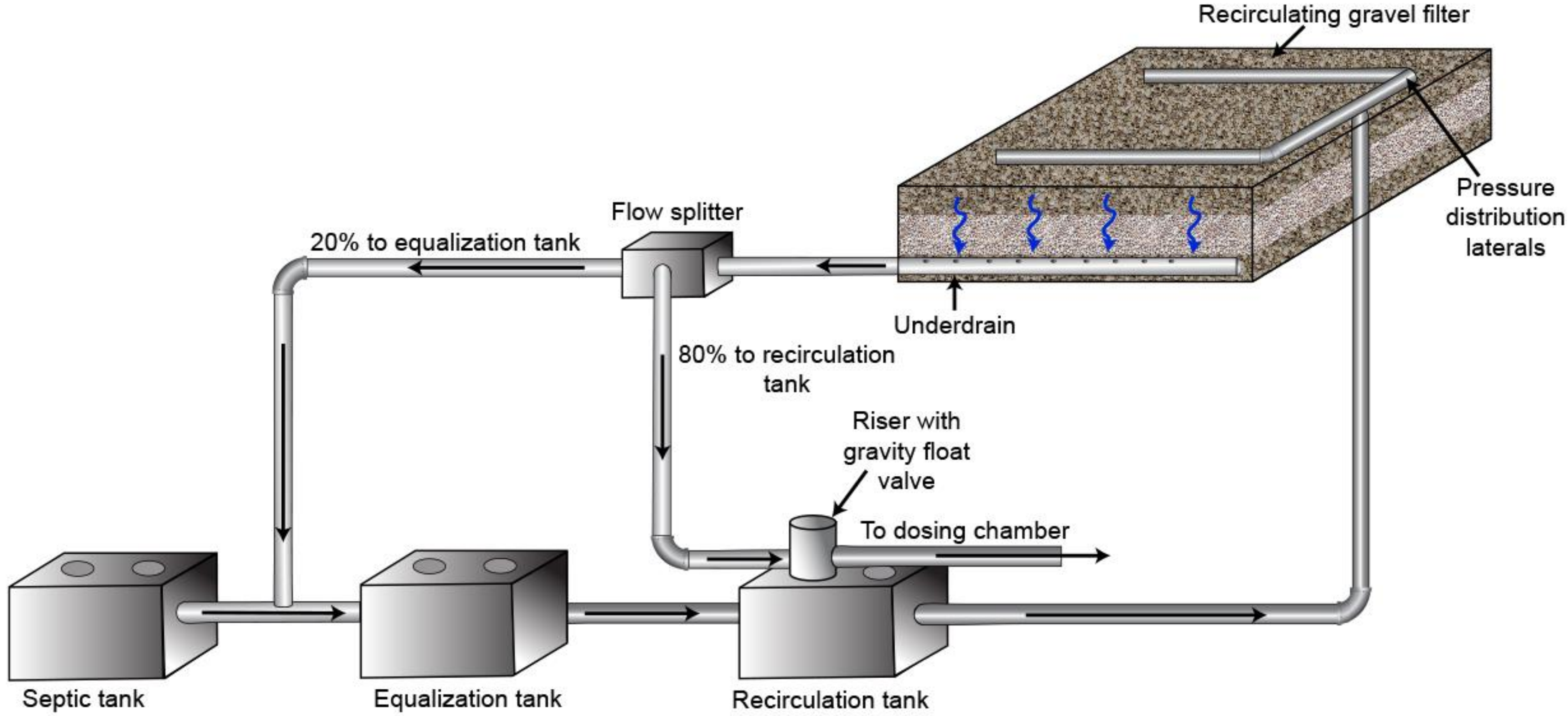


Figure 4-~~32~~36. Cross section of a nitrogen-reducing recirculating gravel filter system with pressure transport to, and/or within, the drainfield.

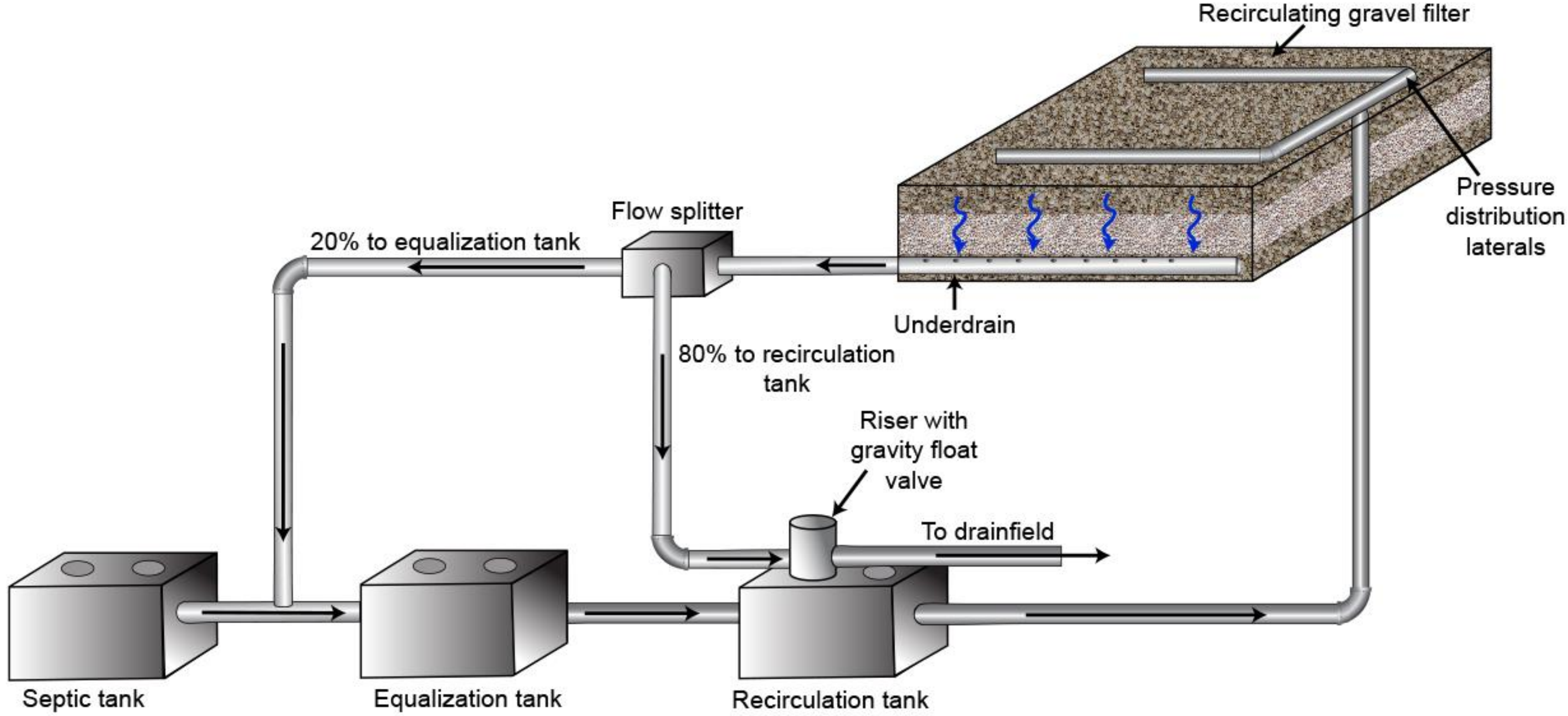


Figure 4-37. Cross section of a nitrogen-reducing recirculating gravel filter system with gravity transport to the drainfield.

4.21.3 Filter Construction

1. All materials must be structurally sound, durable, and capable of withstanding normal installation and operation stresses ~~(Figure 4-32)~~.
2. Components that may be subject to excessive wear must be readily accessible for repair or replacement.
3. All filter containers must be placed over a stable level base.
4. Geotextile filter fabric shall be placed only over the top of the filter and must not be used in-between the filter construction media and underdrain aggregate.
5. Access to the filter surface must be provided to facilitate maintenance.

4.21.4 Drainfield Trenches

1. Distances shown in Table 4-20 must be maintained between the trench bottom and limiting layer.
2. Pressure distribution, when used, shall meet the following design considerations:
    a. If a pressure distribution system is designed within the drainfield, it must be designed according to section 4.19.
    b. If the pressurized line from the mechanical flow splitter breaks to gravity before the drainfield, it must be done according to section 4.19.3.6.
    c. The recirculation tank and recirculating filter may not be used as the dosing chamber for the drainfield or for flow-splitting purposes.
3. 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 4-21.

Table 4-20. Recirculating gravel filter vertical separation 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 4-21. Secondary biological treatment system hydraulic application rates.

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

4.21.4 Inspection

1. A preconstruction meeting between the health district, responsible charge engineer, and installer should occur before commencing any construction activities.
2. The health district should inspect all system components before backfilling and inspect the filter container construction before filling with drainrock and filter construction media.
3. The responsible charge engineer shall conduct as many inspections as needed to verify system and component compliance with the engineered plans.
4. The responsible charge engineer shall provide the health district with a written statement that the system was constructed and functions in compliance with the approved plans and specifications. Additionally, the responsible charge 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).

4.21.5 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 before 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. Instructions on how to trouble shoot the pump control panel should be included to allow adjustment to pump cycle timing if the low-level off or high-level alarm switch is frequently tripped in order to maintain the minimum 5:1 recirculation ratio.
4. Operation and maintenance directions should be included describing replacement of the filter construction media and informing the system owner that a permit must be obtained from the health district for this activity.

5. Maintenance of the septic tank should be included in the O&M manual.
6. All pressure distribution system components should be maintained as described in section 4.19.5.
7. Check for ponding at the filter construction media/underdrain aggregate interface through the observation tube in the recirculating filter.
8. Clean the surface of the filter regularly to remove leaves and other organic matter that may accumulate in the aggregate or rock cover.
9. Regularly check the recirculating gravel filter for surface odors. Odors should not be present and indicate that something is wrong. Odors are likely evidence that the dissolved oxygen in the filter is being depleted and that BOD and ammonia removal are being impacted.

Appendix G

4.23.1 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 3.2.8.1.2. There are two classifications of an in-trench sand filter:

- Standard in-trench sand filter
- Enveloped in-trench sand filter

The standard design is typically used to excavate through impermeable or unsuitable soil layers down to suitable permeable soils. The standard design may also have clean pit run sand and gravel placed between the medium sand and the suitable permeable soils or ground water as long as minimum medium sand depths are used. 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.

Standard in-trench sand filter drainfields may be installed at depths where the sidewalls of the drainfield are located in impermeable or unsuitable soil to address sites that cannot meet the requirements of IDAPA 58.01.03.008.02.b. Unsuitable soils must have application rates <0.2 GPD/ft^2 (Table 2-4). Unsuitable soils with application rates >1.2 GPD/ft^2 (Table 2-4) must utilize an enveloped in-trench sand filter design.

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 drainfield and are used for sites with native soils consisting of coarse to very coarse sand or gravel. The enveloped in-trench sand filter has three subcategories based on effluent distribution and treatment (section 4.23.3.2).

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 5.7 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 4.3.

Appendix H

4.5 Drip Distribution System

Revision: ~~September 18, 2014~~May 18, 2016

4.5.1 Description

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

1. Septic tank
2. Pretreatment system (not required in grey water system designs or septic tank effluent drip distribution designs):
    a. Intermittent sand filter
    b. Recirculating gravel filter
    c. Extended treatment package system
3. Filtering system (septic tank effluent systems only): spin filter (screen filter), cartridge or disk filters (flushable filter cartridge), and filter flush return line
4. Effluent dosing system: dosing chamber~~pump tank,~~ ~~and dose~~ pump, and timed dosing control
5. Process controller: programmable logic controller (PLC)
6. Flow meter
7. Drip tubing network, ~~and~~ associated valving, supply line and manifold, pressure regulators (non-pressure compensating emitters only), return manifold and line, and air/vacuum relief valves

4.5.2 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).~~ Site slope may not exceed 45%.
2. ~~The effective soil depths that are established for the alternative pretreatment systems listed in section 4.5.1(2) may be applied to drip distribution systems when they are used in the system design.~~ All components that are in contact with wastewater must be rated by the manufacturer for wastewater applications.
3. All pressurized distribution components and design elements of the drip distribution system that do not have design criteria specified within section 4.5 shall follow the design guidance provided in section 4.19.

4. Pretreatment system design, installation, operation, and maintenance will follow the specific pretreatment system guidance provided in this manual.

54. System must be designed by a PE licensed in Idaho.

5. The design engineer shall provide an O&M manual for the system to the health district prior to permit issuance.

4.5.3 Design Requirements

Many considerations need to be made in the design of a drip distribution system based on site-, flow-, and effluent-specific characteristics. These characteristics will affect several system components depending on each specific design scenario. The design of a drip distribution system should be approached as an integrated system rather than individual components. System design should account for, but is not be limited to:

1. Tubing material and emitter type
2. Brand of drip tubing to be used and associated proprietary components
3. Level and type of pretreatment to be provided
4. System configuration based on site conditions and constraints
5. Extent of automation, monitoring, and timing of critical operation processes and procedures.

Design requirements vary dependent upon the allowable effluent quality and system flushing. Requirements based on these system parameters are included in the subsequent sections.

4.5.3.1 Basic Design Requirements

The following minimum design elements apply to both septic tank and pretreated effluent systems and continuous and noncontinuous flush drip distribution systems:

1. Application areas up to 2 square feet per foot (ft^2/ft) of drip irrigation line may be used.
2. Drip tubes may be placed on a minimum of 2-foot centers.
31. Drip distribution tubes are placed directly in native soil at a depth of 6–18 inches with a minimum final cover of 12 inches.
2. Drip distribution tubes should be placed on contour and slightly slope towards the manifold for proper drainage.
    a. Installations on slopes must account for depressurization flow and be designed to prevent movement of the wastewater to the bottom of the drip distribution zone during this time.
    b. Manifold design must allow for all the associated drip tubing to drain back to the manifold and prevent wastewater from drip tubing at higher elevations from draining into drip tubing at the lowest elevations.
3. A minimum of two zones are recommended, but not required, regardless of system size and zones should be kept as small as is reasonable.
    a. Individual lateral lengths should be designed to provide equal discharge volumes across the lateral emitters (lateral length is calculated from the connection point on the supply line to the connection point on the return line).

   b. Lateral lengths may differ within a zone as long as the minimum flushing velocity can be maintained at the terminal end of each lateral.
   c. Zones within a system should be close to equal in size to achieve efficient and consistent application of wastewater.
   d. In lower permeability soils (i.e. clayey soils) it is recommended that drip tubing and emitter spacing be reduced while maintaining the minimum square footage to increase the emission points and maintaining the dosing volume to decrease wastewater travel distance through the soil.

4. The design application rate is based on the most restrictive soil type encountered within ~~2 feet of the drip tubes~~ the minimum effective depth of soil below the drip distribution tubing required to meet the necessary separation distance to limiting layers.

~~5. The effective soil depth to limiting layers below the drip tubes should meet the depths specified in section 4.21.5, Table 4-20.~~

~~6~~5. Septic tank effluent drip distribution systems ~~is~~ are required to be adequately filtered with a 100-115 micron or smaller ~~disc or flushable filter cartridge~~ spin/screen filters or disk filters that are flushable or nonflushable ~~before~~ prior to discharge into the drip distribution tubing network. Filters are not required for pretreated effluent drip distribution systems, but are recommended.

6. When installed, effluent filters are required to:
   a. Be automatically backflushed to flush the solids off the filter surface and return them to the inlet pipe of the septic tank, or
   b. Be inspected periodically and hand cleaned if necessary.

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.
   b. Vacuum relief valves are located in a valve box that is adequately drained and insulated to prevent freezing.

8. ~~Pressure regulators and p~~Pressure compensating emitters ~~should~~shall be used ~~on~~in ~~sloped~~all drip distribution installations.

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

9. The hydraulic design of the drip distribution system should achieve discharge rates and volumes that vary no more than ±10% between all the emitters within a zone during a complete dosing event.
   a. Consideration should be given to the unequal distribution during flow pressurizing and depressurizing periods.
   b. The designer must be able to mathematically support the design for equal distribution.

10. ~~Timed dosing is required~~Dosing requirements in all drip distribution systems~~.~~ include:
   a. Timed dosing is required.
   b. Dosing will only occur when there is sufficient volume in the dosing chamber to deliver a full design dose to the drip distribution system.
   c. Sufficient rest time shall be programmed to provide time for effluent to distribute away from the drip lines.

d. Shall include a flow meter or run time/event counter.
e. The capability to monitor flow rates both during dosing and flushing events.
f. Small, frequent doses should be avoided and dose volumes should be several times the total supply and return manifold and drip tubing volumes within the dosing zone.

11. Dosing chambers shall provide sufficient storage for equalization of peak flows and meet the requirement of section 4.19.3.3.2 and 4.19.3.4.

~~11~~12. Each valve, filter, pressure regulator, and any other nondrip tube or piping component is required to be accessible from grade and should be insulated to prevent freezing.

4.5.3.2 Additional Design Requirements for Septic Tank Effluent Drip Distribution Systems

Septic tank effluent drip distribution systems are systems that discharge filtered effluent that has only passed through an appropriately sized septic tank, dosing chamber, and 100-115 micron filters prior to entering the drip distribution tubing. The following additional minimum design elements apply only to septic tank effluent drip distribution systems:

1. Effective soil depth to limiting layers below the drip tubes shall meet the minimum depths specified in IDAPA 58.01.03.008.02.c (Section 8.1) for daily design flows < 2,500 gallons per day (GPD) or IDAPA 58.01.03.013.04.c (Section 8.1) for daily design flows ≥ 2,500 GPD.
2. Total drip distribution area shall be determined by dividing the daily design flow by the soil application rates in Table 2-4.
3. Minimum drip tubing length that must be installed shall be determined by dividing the total drip distribution area by 2.
   a. The minimum tubing length and drip tube spacing must create a system layout that equals or exceeds the total drip distribution area calculated in 2.
   b. It is recommended that extra tubing be included in the system design for systems being placed in soil design group C soils.
4. Drip distribution tubes may be placed on a minimum of 2-foot centers.
5. Emitter spacing may be a maximum of 12 inches.
6. Emitter flow rate shall be ≤ 0.6 gallons per hour (GPH).
7. Filters shall be back flushed at the start of each dosing cycle and zones should be flushed every 20-50 dosing cycles with a minimum fluid velocity of 2 feet per second designed at the distal end of the lateral connection.

4.5.3.3 Additional Design Requirements for Pretreated Effluent Drip Distribution Systems

Pretreated effluent drip distribution systems are systems that discharge effluent that has passed through an appropriately sized septic tank, pretreatment system, and dosing chamber prior to entering the drip tubing. The following additional minimum design elements apply only to pretreated effluent drip distribution systems:

1. Effective soil depth to limiting layers below the drip tubes shall meet the minimum depths specified in section 4.21.5, Table 4-20.
2. Total drip distribution area shall be determined by dividing the daily design flow by the soil application rates in Table 4-21.
3. Minimum drip tubing length that must be installed shall be determined by dividing the total drip distribution area by 2.
   a. The minimum tubing length and drip tube spacing must equal or exceed the total drip distribution area calculated in 2.
   b. It is recommended that extra tubing be included in the system design for systems being placed in soil design group C soils.
4. Drip distribution tubes may be placed on a minimum of 2-foot centers.
5. Emitter spacing may be a maximum of 24 inches.
6. Emitter flow rate shall be ≤ 1.1 GPH.
7. If filters are flushed it is recommended that frequency be once per week.
8. Drip distribution zones should be flushed every two weeks.

4.5.3.4 Additional Design ~~Elements~~Requirements for Noncontinuous Flush Drip Distribution Systems

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

1. In noncontinuous flush systems, drip distribution laterals are flushed ~~at least once every 2 weeks~~ at regular intervals 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~~ distribution tubing during field flush cycles, must be high enough to scour the drip distribution tubing, and is recommended to exceed the manufacturer's recommended velocity.
   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~~dosing chamber.
3. In noncontinuous flush systems, timed or event-counted backflushing of the filters is required when filters are installed.
4. In noncontinuous flush systems, filters (when installed), flush valves, and a pressure gauge ~~may~~shall be placed in a head works (between the dose pump and drip field) and on the return manifold.

4.5.3.5 Additional Design ~~Elements~~Requirements for Continuous Flush Drip Distribution Systems

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

1. If flushing filters ~~must be a flushing type. a. The filteris~~ are installed, then they shall ~~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 distribution laterals are flushed during the dosing cycle.
   a. The continuous flush system must be designed to the manufacturer's minimum recommended flow velocity, must be high enough to scour the drip distribution tubing, and is recommended to exceed the manufacturer's recommended velocity.
   b. The dose duration must be long enough to achieve several pipe volume changes in each drip tubing e lateral to adequately accomplish flushing the drip tubing lines.
3. Filters (when utilized) and pressure gauges may be placed in a head works (between the dose tank and drip distribution tubing~~field~~).
4. Supply and return pressure gauges are needed to ensure that the field pressurization is within the required range specified by the drip tube manufacturer.
5. In continuous flush systems, both supply and return manifolds are required to drain back to the ~~dose tank~~dosing chamber.
6. 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 low readings for the controller.
7. 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.

4.5.4 Construction

1. No wet weather installation is allowed.
2. Excavation and grading must be completed before installing the subsurface drip distribution system.
3. Drip distribution tubing may be installed using a trencher, static plow, or vibratory plow.
   a. Care must be taken when using a trencher to ensure the tubing is in contact with the trench bottom and does not have many high and low points in the line.
   b. Trenchers may limit the potential for smearing in clay soils.
   c. When using a static or vibratory plow care must be taken to ensure the drip distribution tubing does not snag and stretch when unrolling.

d. Use of a gage wheel with a static plow will assist in installing tubing to grade on level sites.

e. Vibratory plows allow for minimal site disturbance and may be best for cutting through roots in the soil.

4. Drip distribution systems may not be installed in unsettled fill material.

~~4~~5. No construction activity or heavy equipment may be operated on the ~~drainfield~~ drip distribution area other than the minimum to install the drip distribution system.

~~5~~6. Do not park or store materials on the ~~drainfield~~ drip distribution area.

~~6~~7. For freezing conditions, the bottom drip ~~tube~~ distribution line must be higher than the supply and return line elevation at the dosing ~~tank~~ chamber.

~~7~~8. All PVC pipe and fittings shall be PVC schedule 40 type 1 or higher rated for pressure applications.

9. Flexible PVC pipe should be used for connecting individual drip lines together when making turns in laterals and may be used for connecting drip laterals to supply and return manifolds.

~~8~~10. All glued joints shall be cleaned and primed with purple (dyed) PVC primer before being glued.

~~9~~11. All cutting of PVC pipe, flexible PVC, or drip tubing should be completed using pipe cutters.

~~10~~12. Sawing PVC, flexible PVC, or drip distribution tubing is allowed only if followed by cleaning off any residual burs from the tubing or pipe and removing all shavings retained in the tubing or pipe.

~~11~~13. All open PVC pipes, flexible PVC, or drip distribution tubing in the work area shall have the ends covered during storage and construction to prevent construction debris and insects from entering the tubing or pipe.

~~12~~14. Prior to gluing, all glue joints and tube or pipe interior shall be inspected and cleared of construction or foreign debris.

~~13~~15. Dig the return manifold ~~ditch~~ trench along a line marked on the ground and back to the dosing ~~tank~~ chamber.

a. The return manifold ~~ditch~~ trench should start at the farthest end of the manifold from the dosing ~~tank~~ chamber.

b. The return manifold must slope back to the dosing ~~tank~~ chamber.

~~14~~16. 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. Use ~~ing~~ an appropriate length of flexible PVC pipe with a male fitting and attach it to the air release connection to direct the flush~~ing~~ water away from the construction and drip distribution system area.

c. Flush ~~the~~ each zone with a volume of clean water ~~(clean water to be provided by contractor) equal to~~ at least two times the volume of ~~the~~ all piping ~~es~~ and tubing from the ~~central unit~~ dosing chamber to the air release valve within the zone being flushed ~~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~~17. If existing septic tanks or dosing chambers are to be used, they shall be pumped out by a permitted septic tank pumper, checked for structural or component problems, and repaired or replaced if necessary.

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

b. Debris in ~~the septic~~ any tank should be kept to a minimum because it ~~could~~ may clog the filters during start-up.

~~16~~18. Once completed, cap ~~drainfield~~ the drip distribution 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. The cap should be crowned to promote drainage of rainfall or runoff away from the drip distribution area~~field~~.

~~c~~d. Suitable vegetation should consist of typical lawn grasses or other appropriate low-profile vegetation that will provide thermal insulation in cold climates.

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

19. Development of a diversion berm around the drip distribution ~~field site~~area will aid in the diversion of runoff around the system.

4.5.5 Inspection

1. A preconstruction meeting between the health district, responsible charge engineer, and installer should occur prior to commencing any construction activities.
2. The health district shall inspect all components and fill material used in constructing the drip distribution system prior to backfilling or cap fill placement.
3. The responsible charge engineer should conduct as many inspections as necessary to verify system and component compliance with the engineered plans.
4. The responsible charge engineer shall provide the health district with a written statement that the system was constructed and functions in compliance with the approved plans and specifications. Additionally, the responsible charge 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)

4.5.6 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.
   a. Monitoring should be based on the most limiting process in the system design.
   b. Regular monitoring of flow rates and pressures should be specified to diagnose possible overuse.
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 on 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.

4.5.7 Suggested Design Example

1. Determine square feet needed for the septic tank effluent 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 (ft^2) needed for the system.

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

   Example calculation: (250 GPD)/(0.2 gallons/ft^2) = 1,250 ft^2
2. System design will use an application area of 2 ft^2/ft of drip distribution tube. Divide the required square feet by the drip distribution tube application area (2 ft^2/ft). This will determine the minimum length of drip distribution tube needed for the system.

   Example: (1,250 ft^2)/(2 ft^2/ft) = 625 feet of drip tube
3. Determine pumping rate by finding the total number of emitters and multiplying by the flow rate per emitter (~~1.32~~ 0.9 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 feet/emitter) = 312.5, use 313 emitters

   (313 emitters) x (~~1.32~~ 0.9 gallons/hour/emitter) = ~~413.2~~ 281.7 gallons/hour

   (~~413.2~~ 281.7 gallons/hour)/(60 minutes/hour) = ~~6.89~~ 4.695 GPM, or ~~7~~ 5 GPM

   10 connections at 1.5 GPM per connection = 15 GPM

   Pumping rate: ~~7~~ 5 GPM + 15 GPM = 2~~2~~0 GPM

4. Determine feet of head. Multiply the system design pressure (20 psi for this example is standard, but values can vary depending on the drip distribution tube used) by 2.31 feet/psi to get the 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 the drip distribution tubing and piping.

5. Select a pump. Determine the size of the pump based on gallons per minute (step 3 of suggested design example) and total head (step 4 of suggested design example) needed to deliver a dose to the system. The pump selected for this example must achieve a minimum of 2220 GPM plus the flush volume at 46.2 feet of head.

Figure 4-7 shows an overhead view of a typical drip distribution system. Figure 4-8 shows a potential layout of a filter, valve, and meter assembly, and Figure 4-9 illustrates a cross-sectional view of the filter, valve, and meter assembly. Figure 4-10 provides a view of the continuous flush system filter and meter assembly.

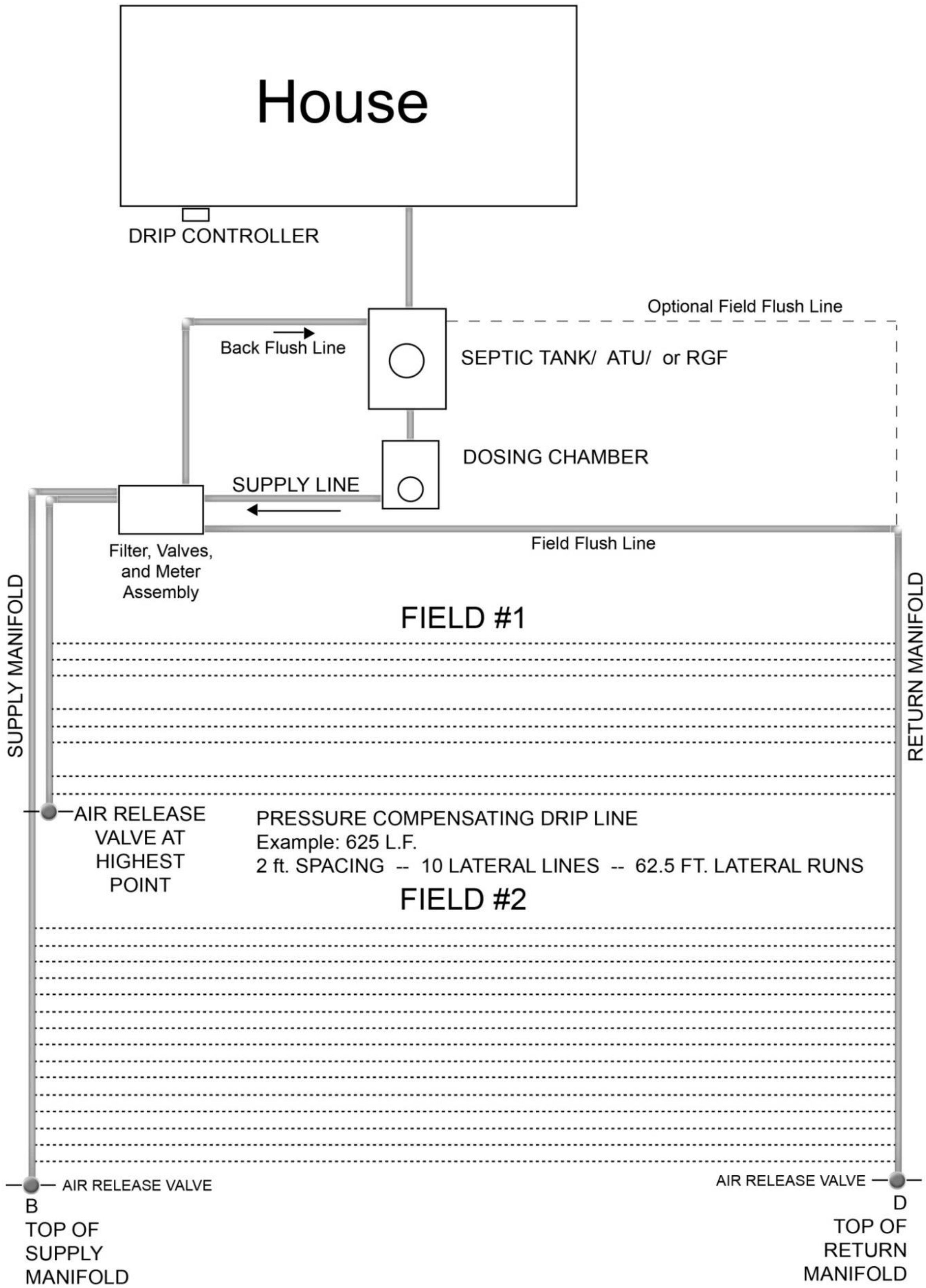


Figure 4-7. Overhead view of typical drip distribution system.

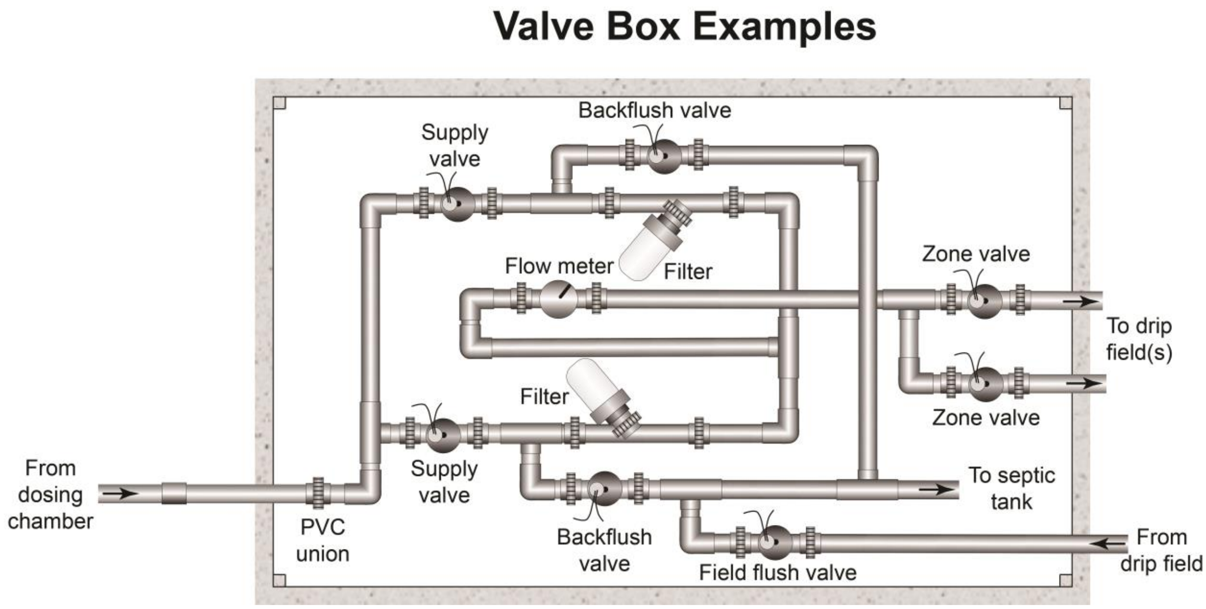


Figure 4-8. Overhead view of filter, valve, and meter assembly <u>for a noncontinuous flush system</u>.

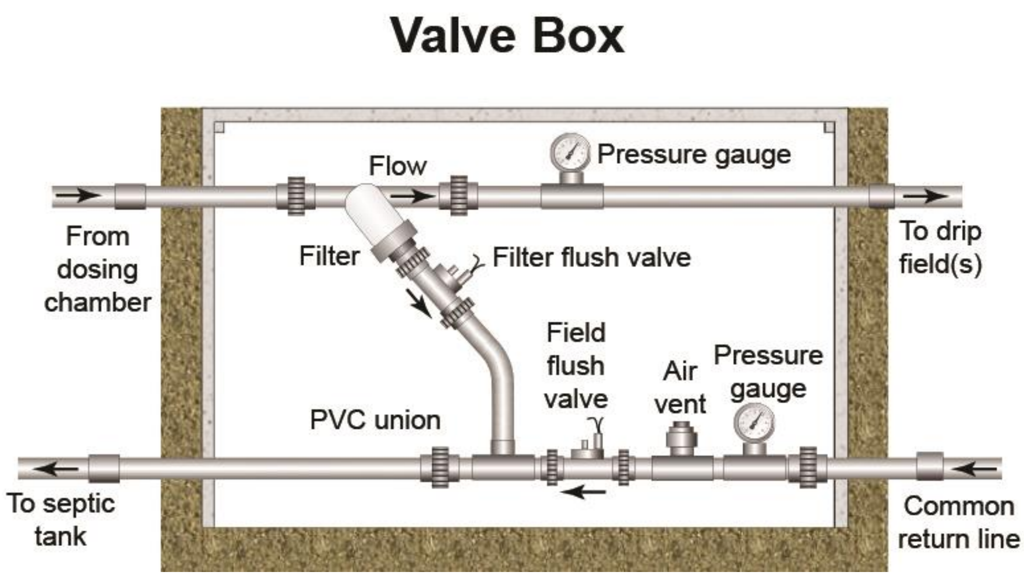


Figure 4-9. Cross-sectional view of typical filter, valve, and meter assembly <u>for a noncontinuous flush system</u>.

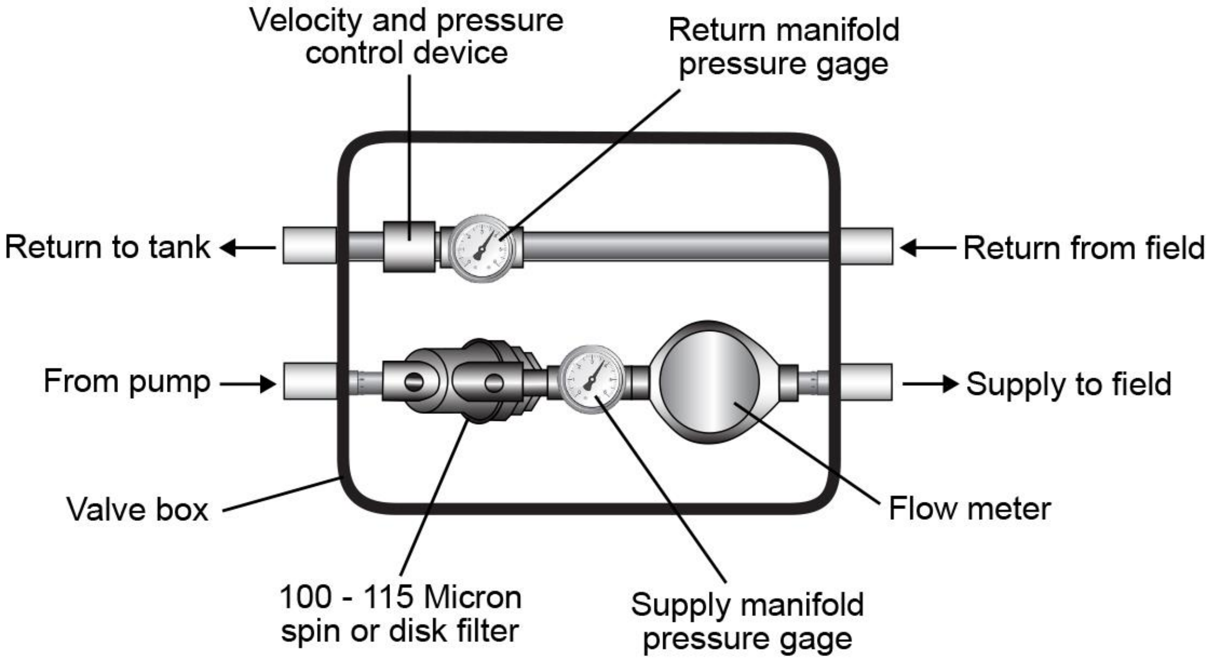


Figure 4-10. Overhead view of continuous flush system filter and meter assembly.

Appendix I

4.8 Extended Treatment Package System

Revision: ~~December 10, 2014~~May 18, 2016
Installer registration permit: Complex
Licensed professional engineer required: No

4.8.1 Description

Manufactured and *packaged* mechanical treatment devices that provide additional biological treatment to septic tank effluent. Such units may use extended aeration, contact stabilization, rotating biological contact, trickling filters, or other approved methods to achieve enhanced treatment after primary clarification occurs in an appropriately sized septic tank. These systems provide secondary wastewater treatment capable of yielding high-quality effluent suitable for discharge in environmentally sensitive areas.

~~ETPS are required to have annual maintenance and effluent quality testing performed and reported to the Director as described in section 4.8 (IDAPA 58.01.03.005.14). This maintenance is to be performed by an approved O&M entity (IDAPA 58.01.03.009.03).~~ Property owners that install an ETPS unit must choose an operation and maintenance (O&M) entity capable of meeting their operation, maintenance, and monitoring (OMM)~~effluent testing needs~~ requirements. Verification of the chosen O&M entity shall be submitted with the subsurface sewage disposal permit application ensuring that the OMM~~operation, maintenance, and monitoring (effluent quality testing)~~ will occur (IDAPA 58.01.03.005.04.k). Property owners that do not want to meet the~~se operation and maintenance~~ OMM requirements must meet the requirements of section 4.8.2(2) or choose another alternative system that will meet the conditions required for subsurface sewage disposal permit issuance.

4.8.2 Approval Conditions

1. A maintenance entity will be available to provide ~~continued~~ managed system~~device~~ OMM as described in section 1.9.1 and 1.9.2 (IDAPA 58.01.03.005.14). The OMM is to be performed by an approved O&M entity (IDAPA 58.01.03.009.03). Approval of the O&M entity will be made by the Director prior to permit issuance. Approvable entities may include, but are not limited to, the following:
   a. Municipal wastewater treatment departments
   b. Water or sewer districts
   c. Nonprofit corporations (section 1.6)

   An O&M entity membership agreement and an accompanying general access easement should be entered into between the property owner and the O&M entity, as a necessary condition for issuing an installation permit (IDAPA 58.01.03.005.04.k). This agreement and the easement will be recorded with the county as a condition for issuing an installation permit.
2. ETPSs may be used for properties without an approved O&M entity **only under all of the following conditions**:

a. The site is acceptable for a standard system. All separation distances from ground water, surface water, and limiting layers shall be met.

b. Enough land is available, and suitable, for two full-size drainfields. One complete full-size drainfield shall be installed.

3. Final effluent disposal through subsurface discharge will meet the following criteria:

   a. If an 85% reduction or better in $CBOD_5$ and TSS can be achieved, the effluent may be discharged to a drainfield satisfying Section 4.21.5 "Drainfield Trenches" application rate criteria and vertical setback requirements.

      1) Otherwise, the effluent must be discharged to a standard drainfield, sized as directed in IDAPA 58.01.03.008 (section 8.1), and meet the required effective soil depth for standard drainfields as directed in IDAPA 58.01.03.008.02.

      2) Additional drainfield-sizing reduction granted for use of gravelless trench products is not allowed.

   b. The 85% reduction will be accepted as being met if the effluent exhibits a quantitative value obtained from laboratory analysis not to exceed 40 milligrams per liter (mg/L) (40 parts per million [ppm]) $CBOD_5$ and 45 mg/L (45 ppm) TSS.

   c. TN reduction may be required for ETPS units located in an area of concern as determined through a NP evaluation. Permit-specific TN reduction levels will be determined through the NP evaluation. Results for TN are determined through the addition of TKN and nitrate-nitrite nitrogen (TN = TKN + [NO_3+NO_2-N]). TN reduction will be accepted as being met if the effluent exhibits a quantitative value obtained from laboratory analysis not to exceed the TN level stipulated on the subsurface sewage disposal permit.

4. Annual effluent monitoring and reporting is 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). Monitoring shall meet the requirements of section 1.9.2. Reporting shall meet the requirements of section 1.9.3.

5. The ~~system's aerobic treatment section~~ETPS will be preceded by an appropriately sized septic tank.

   a. The septic tank may be either a separate septic tank, a volume integral with the system's package, or a combination of internal clarifier volume coupled with an external tank.

   b. The septic tank shall provide the minimum tank capacity for residential facilities as specified in IDAPA 58.01.03.007.07.a, or for nonresidential facilities, a minimum of 2 days of hydraulic residence time (HRT) as stipulated in IDAPA 58.01.03.007.07.b.

   c. Timed dosing from the clarifier to the aerobic treatment unit is preferred and highly recommended to maintain a constant source of nutrients for the system's aerobic microbes.

4.8.3 ~~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 1.6.~~
   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 1.6.4 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 4-13).~~

b. Effluent monitoring may be done for a group of ETPS units from a common dosing chamber resulting in the sample from the common dosing chamber being applied to all of the associated ETPS units if

1) Annual operation and maintenance is performed as described in item 1 above for each individual ETPS unit, and operation and maintenance records are submitted for each individual unit as described in section 4.8.4.

2) All of the ETPS units connected to the common dosing chamber are from the same manufacturer. If there are multiple manufacturers' ETPS units connected to the common dosing chamber, each ETPS unit must be monitored individually. Additionally, if there are multiple common dosing chambers discharging to a single drainfield, each common dosing chamber must be monitored, and if there are any individual ETPS units discharging to the same system independently of the common dosing chamber, those individual units must also be monitored.

3) If the effluent sample from the common dosing chamber does not meet any one of the required effluent constituent levels for the system, then each individual ETPS unit connected to the common dosing chamber must be sampled independently for the failing constituent to determine what individual units do not meet the effluent monitoring requirements.

a) Individual units that do not meet the effluent constituent levels upon individual sampling must follow the operation, maintenance, and retesting requirements described in item 2.h below.

b) Individual units that do meet the effluent constituent levels upon individual sampling do not need to continue with the operation, maintenance, and retesting requirements.

c. 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 4-9:

Table 4-9. 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)

d. 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.~~

e. ~~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~~

f. ~~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.~~

g. ~~Sample analysis will be performed by a laboratory capable of analyzing wastewater according to the acceptable standards identified in Table 4-10, 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 4-10 from the *Standard Methods for the Examination of Water and Wastewater* (Rice et al. 2012) or the equivalent standards from EPA. 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 4-10. Standard methods required for the analysis of ETPS effluent in annual testing.~~

~~Analysis~~	~~Standard Method Number~~	~~EPA Method Equivalent to Standard Method~~
~~Total suspended solids (TSS)~~	~~SM 2540 D~~	~~—~~
~~Carbonaceous biological oxygen demand ($CBOD_5$)[a]~~	~~SM 5210 B~~	~~—~~
~~Total Kjeldahl nitrogen (TKN)~~	~~SM 4500-N_{org}-B~~	~~351.2~~
~~Nitrate-nitrite nitrogen (NO_3 + NO_2-N)~~	~~SM 4500-NO_3^- F~~	~~353.2~~

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

h. ~~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.~~

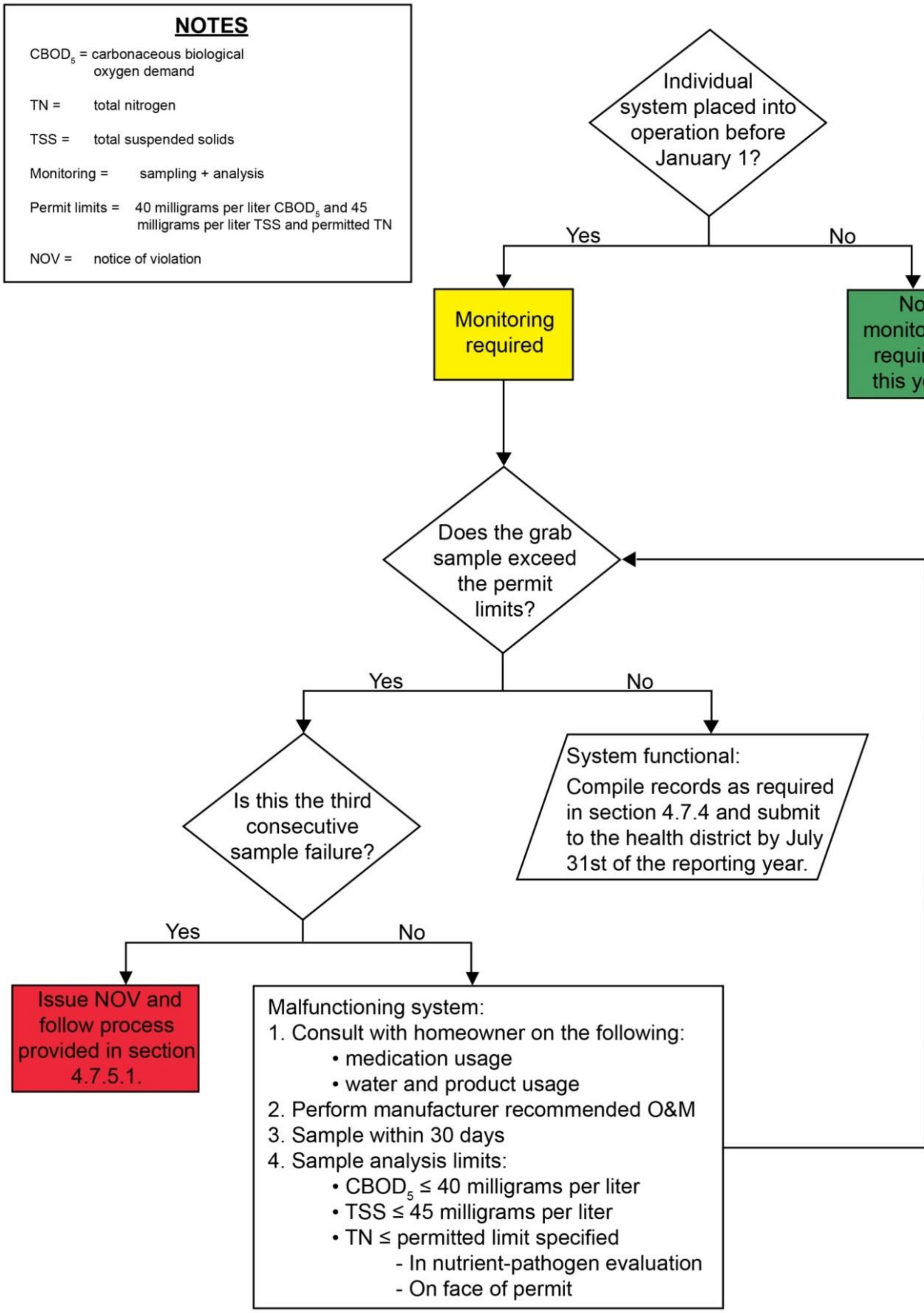
3) ~~Sample extraction and analysis needs to occur within 30 days after servicing the system (as determined in item 1 above).~~

   ~~The 30-day time frame 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* (section 4.8.5.1, Figure 4-14).~~

5) ~~If an annual report, as described in section 4.8.4, 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."~~

   ~~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 4.8.6, and the enforcement procedures provided in section 4.8.6 shall be followed by the regulatory authority.~~



~~**Figure 4-13. ETPS unit individual sampling process.**~~

4.8.4 ~~Annual Report~~

~~The reporting period is from July 1 of the preceding year through June 30 of the reporting year. Annual reporting is the responsibility of the property owner (member), and DEQ recommends that the property owner have their O&M entity compile and submit their annual report. The property owner responsible for the ETPS unit under IDAPA 58.01.03 shall ensure the following annual reporting requirements are met:~~

1. ~~Annual report for each property owner shall include these items:~~
    a. ~~A copy of all maintenance records for the reporting period as required under section 4.8.3(1)~~
    b. ~~A copy of all certified laboratory records for effluent sampling~~
    c. ~~A copy of each chain-of-custody form associated with each effluent sample~~
2. ~~If the O&M entity is fulfilling annual reporting requirements for their members, DEQ recommends that the following additional information be included within the annual report:~~
    a. ~~A current list of all O&M entity members within the health district to which the annual report was submitted.~~
    b. ~~The member list should clearly identify which members the O&M entity is contracted with for annual reporting requirements and the status of each member in regards to completing the annual reporting requirements.~~
    c. ~~If annual reporting requirements are not complete for any member who the O&M entity is responsible for providing the annual report, an explanation should be included with that member's records within the annual report.~~
3. ~~Annual report exemptions~~
    a. ~~A member may be exempt from effluent testing based upon extreme medical conditions.~~

        ~~Annual service and maintenance on the member's ETPS unit shall not be exempt due to medical conditions, and record of annual service and maintenance shall still be submitted with the member's annual report.~~

    b. ~~An O&M entity contracted by a member to fulfill annual reporting requirements may be exempt from reporting annual service and testing results for individual members if that member's activities fall within the guidelines in section 4.8.6.~~

        ~~The O&M entity should still report the activities described in section 4.8.6 for each member exempt from annual reporting based on the guidelines in section 4.8.6.~~

4. ~~Annual reporting process~~
    a. ~~The annual report shall be submitted to the local health district through mail by the property owner or the O&M entity on behalf of the member no later than July 31 of each year for the preceding 12-month period.~~

        ~~The annual report shall be submitted to the local health district that issued the subsurface sewage disposal permit for, and has jurisdiction over, the ETPS unit.~~

b. The local health district shall provide the O&M entity a written response within 45 days of receipt of the annual report detailing compliance or noncompliance with septic permit requirements.

1) The O&M entity should inform individual members of their compliance status.

2) All correspondence from the health district regarding a noncompliant annual report shall be copied to DEQ.

5. Delinquent annual reports

a. If the property owner or O&M entity contracted to submit the member's annual report does not submit the annual report by July 31 of the reporting year, the local health district shall send the property owner, or O&M entity contracted to submit the member's annual report, a reminder letter providing a secondary deadline of August 31 of the reporting year for the annual report submission. The reminder letter shall detail the report requirements and that failure to submit the annual report by the secondary deadline will result in the health district forwarding a notice of nonreport to DEQ. DEQ may seek any remedy available under IDAPA 58.01.03 including, without limitation, requiring the property owner to replace the ETPS unit with another system, as outlined in section 4.8.5.

b. All correspondence from the health district regarding delinquent annual reports shall be copied to DEQ.

4.8.5 ETPS System Failure, Disapproval, and Reinstatement

Commercially manufactured wastewater treatment components must be approved by DEQ (IDAPA 58.01.03.009.01). Manufactured ETPS units are subject to this approval. In addition, the installation of an ETPS unit requires a subsurface sewage disposal permit pursuant to IDAPA 58.01.03.005. ETPS units are alternative systems that must be approved by the Director pursuant to IDAPA 58.01.03.004.10. As part of the alternative system approval for ETPS units, DEQ defines the specific circumstances under which the ETPS units may be installed, used, operated, and maintained within section 4.8 (IDAPA 58.01.03.009.03 and 58.01.03.005.14).

If an ETPS product is not shown to be installed, used, operated, or maintained as described in section 4.8, DEQ may pursue enforcement against a property owner and seek those remedies available under IDAPA 58.01.03. Enforcement and remedies against the property owner may include a determination that the ETPS system has failed and the requirement that the property owner replace the ETPS unit with a different system authorized by DEQ. Replacement may include installing another ETPS unit approved by DEQ, or engineering and installing another alternative system that is capable of meeting the requirements of the property owner's subsurface sewage disposal permit. If an ETPS product is not shown to comply or consistently function in compliance with IDAPA 58.01.03 and operation and maintenance requirements outlined in section 4.8, DEQ may disapprove the ETPS unit. Reasons for DEQ enforcement, which may include seeking remedies against a property owner or disapproval of an ETPS manufacturer's technology as outlined herein, include, but are not limited to, the following:

1. Failure to submit an annual report by the secondary deadline of August 31.
2. Annual reports for a particular ETPS technology identify a malfunctioning system rate of 10% or more.

~~Malfunctioning systems are defined as any system that fails to receive annual maintenance or exceeds the effluent reduction levels for any constituent required as part of the septic permit (i.e., TSS, $CBOD_5$, or TN).~~

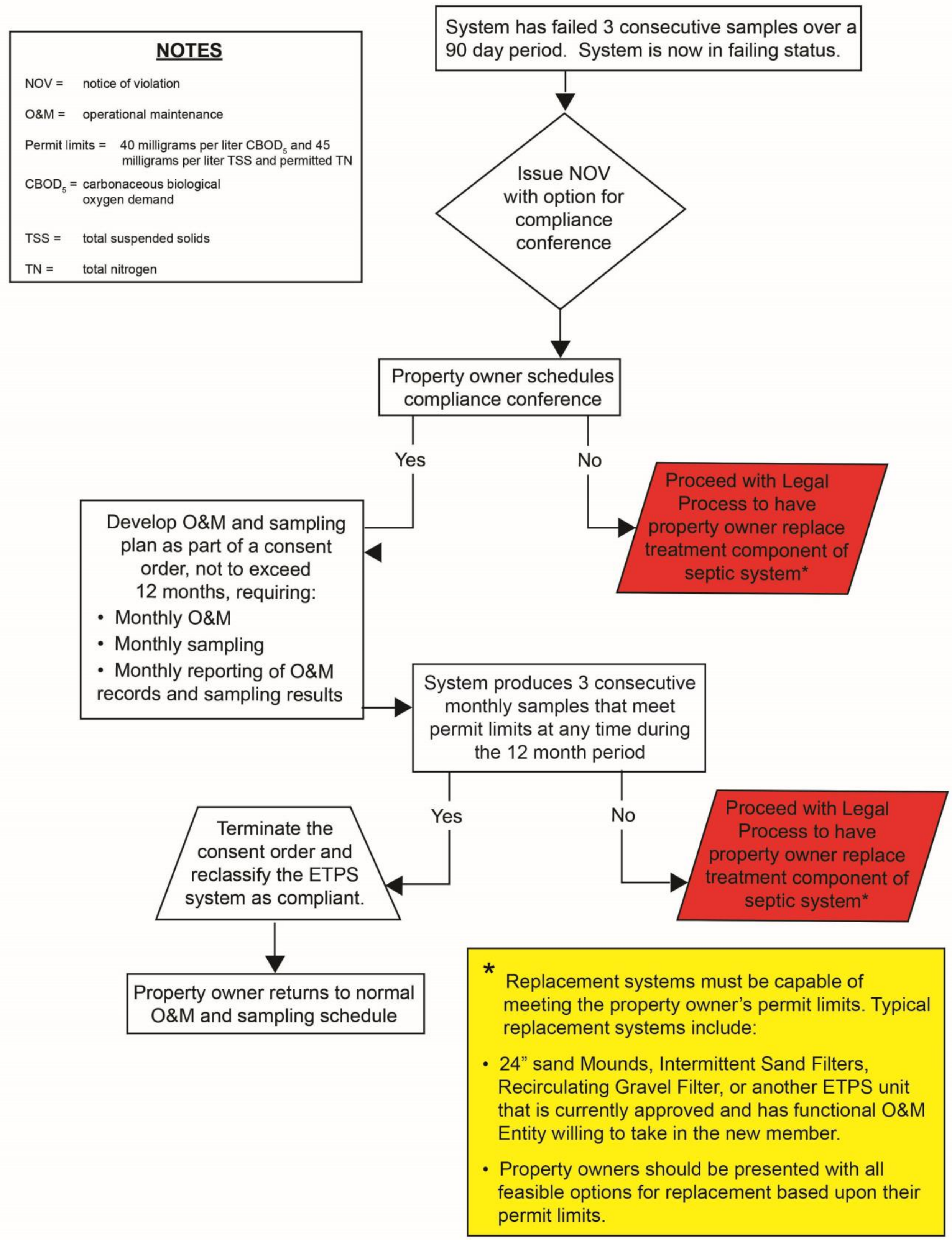
3. ~~Property owner's ETPS unit has been determined to be a failing system. Failing ETPS units are defined in section 4.8.3(2)(h).~~

~~4.8.5.1 Failing System Enforcements~~

~~The regulatory authority shall follow the procedures below upon determination that an ETPS unit is a failing system (Figure 4-14):~~

1. ~~When the regulatory authority is notified that a system is failing, a notice of violation (NOV) shall be issued to the property owner. The property owner shall have the opportunity to hold a compliance conference with the regulatory authority to enter into a consent order.~~
2. ~~Consent orders should allow a property owner a 12-month period to return the system to proper operation or replace the failing system.~~
   a. ~~Over this 12-month period, the property owner should have their O&M entity service the ETPS unit at least monthly.~~
   b. ~~Monthly effluent samples should be taken by the O&M entity until the ETPS unit passes 3 consecutive monthly samples.~~

      ~~Three consecutive passing monthly samples taken 1 month apart would be cause for the regulatory authority to terminate the consent order and NOV, and reclassify the system as compliant.~~
   c. ~~Operation and maintenance records as described in section 4.8.3(1), certified laboratory records, and chain-of-custody forms for each sample should be submitted to the regulatory authority on a monthly basis as part of the consent order.~~
   d. ~~If the ETPS unit cannot produce 3 consecutive monthly samples over the 12-month period, the system shall be replaced with another alternative system that meets the effluent quality requirements based upon applicable site conditions.~~
   e. ~~Replacement systems must meet the treatment requirements of the original septic permit. Appropriate replacement systems may include a sand mound with 24 inches of sand beneath the absorption bed, intermittent sand filter, recirculating gravel filter, or a different ETPS unit that is approved and has an active O&M entity.~~



~~**Figure 4-14. ETPS failing system enforcement flowchart.**~~

4.8.5.2 ETPS Product Disapproval

In addition to determining a particular system is a failing system as set forth in section 4.8.5.1, if DEQ determines that an ETPS unit cannot consistently function in compliance with IDAPA 58.01.03, DEQ may disapprove the product (IDAPA 58.01.03.009.04). A written notice of DEQ's intent to disapprove the product will be provided following Idaho Code §67-52 and sent to the ETPS product manufacturer, O&M entity, and health districts. The ETPS manufacturer will be allowed an opportunity to respond prior to product disapproval. Upon disapproval of a manufacturer's ETPS product line, the health districts shall not issue septic permits on new applications for ETPSs from the disapproved product manufacturer. Monitoring, reporting, and servicing requirements of existing ETPS unit installations will not be affected by the product disapproval (Figure 4-15).

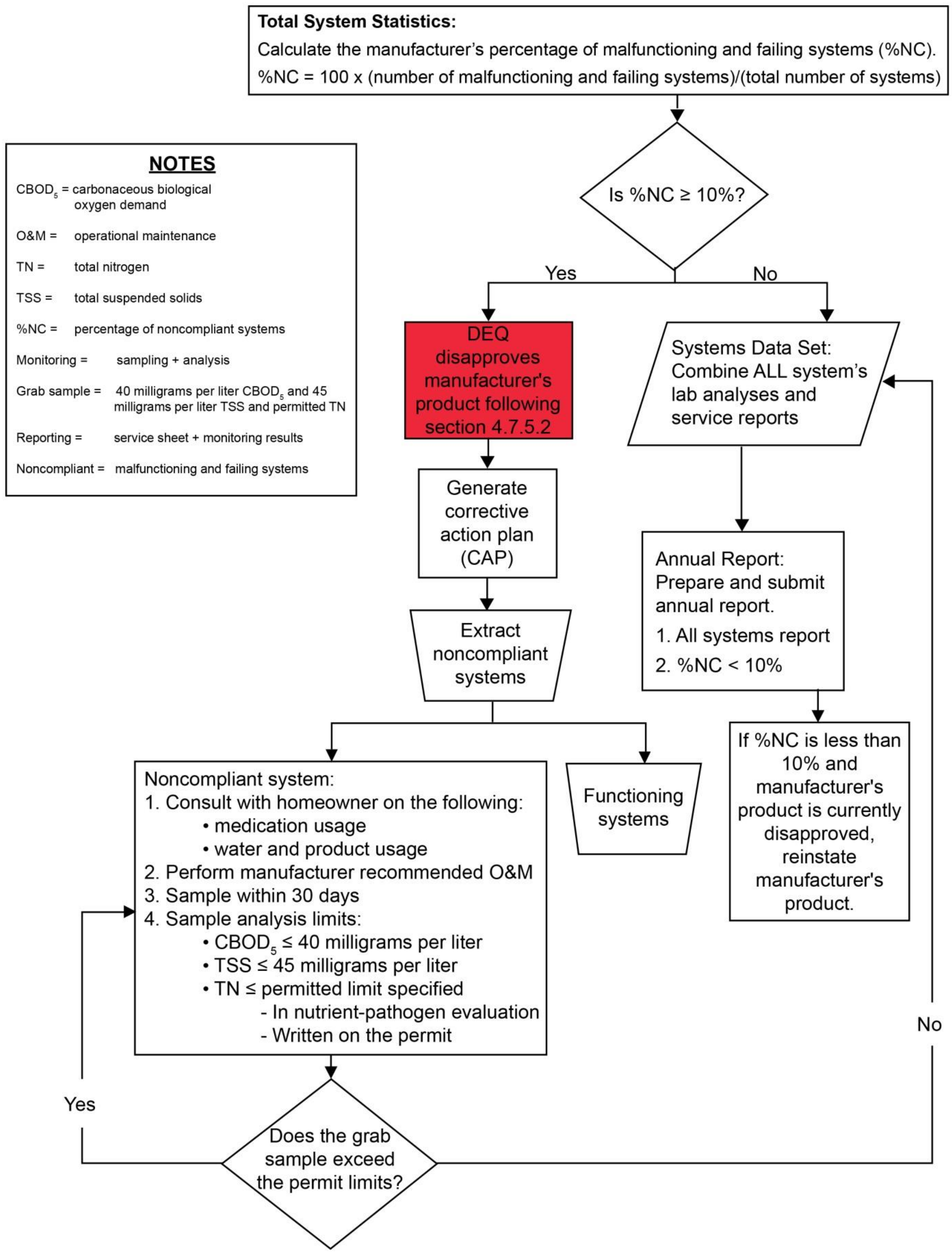
ETPS Product Reinstatement

Upon ETPS product disapproval, DEQ will provide the ETPS product manufacturer the opportunity to enter into a corrective action plan (CAP) for product reinstatement. The CAP should establish the time frame to return the noncomplying or failing systems to proper operation. The product disapproval will remain in effect until the malfunctioning and failing system rate for the ETPS manufacturer's technology is below 10%.

4.8.6 Member Refusal of Maintenance or Testing Requirements

The individual nonprofit O&M entity members (property owners) are responsible for ensuring the O&M entity can perform the annual maintenance and effluent testing required for their ETPS unit. Failure of an individual member to permit the O&M entity from carrying out the required services is considered a violation of IDAPA 58.01.03.012.01. Activities engaged in by a property owner toward the O&M entity that may be considered a refusal of service action by a member, include, but are not limited to, the following:

1. Refusal to allow annual maintenance or effluent quality testing (e.g., refusal to pay annual dues preventing the financial capability of service or denial of property access).
2. Refusal to maintain the ETPS unit in operating condition (e.g., refusal to replace broken components or refusal to provide electricity to the unit).
3. If the refusal of service continues through the annual reporting period, the nonprofit O&M entity should substitute and submit the following documents in the annual report for members refusing service that the O&M entity is contracted with:
    a. Copies of all correspondence and associated certified mail receipts documenting the property owner's receipt of the correspondence regarding the refusal of service. Refusal of service by a member through nonpayment should include documentation of a lien being placed on the member's property.
    b. If the documentation is not included within the annual report, there will be insufficient documentation of the property owner's refusal to allow maintenance and monitoring, and therefore, the lack of maintenance and monitoring may count against the malfunctioning rate for the ETPS technology.



~~Figure 4-15. ETPS product disapproval process based upon annual reports.~~

~~Refusal of Service Enforcement Procedures~~

~~Upon receipt of an annual report showing that individual O&M entity members have refused to allow maintenance and monitoring as described in section 4.8.6, the following guidelines apply:~~

1. ~~The regulatory authority shall issue Letter 1 with the associated enclosure provided in the DEQ program directive, "Extended Treatment Package System Education and Enforcement Letters."~~
   a. ~~Letter 1 shall be sent to the property owner by certified mail and copied to the associated O&M entity.~~
   b. ~~The property owner is responsible for working with the regulatory authority and the O&M entity to address their delinquent responsibilities. The O&M entity should contact the regulatory authority and associated property owner 30 days after receiving Letter 1 to inform the regulatory authority of the property owner's voluntary compliance status.~~
2. ~~If the property owner fails to voluntarily comply within the 30-day time frame, the regulatory authority shall issue Letter 2 provided in the DEQ program directive, "Extended Treatment Package System Education and Enforcement Letters."~~
   a. ~~Letter 2 shall be sent to the property owner by certified mail and copied to the associated O&M entity.~~
   b. ~~The property owner is responsible for working with the regulatory authority and their O&M entity to address their delinquent responsibilities. The O&M entity should contact the regulatory authority and associated property owner by the voluntary compliance date provided in Letter 2 to inform the regulatory authority of the property owner's voluntary compliance status.~~
3. ~~If the property owner fails to voluntarily comply by the date provided in Letter 2, the regulatory authority may issue a NOV to the property owner to ensure compliance with the property owner's subsurface sewage disposal permit requirements for the ETPS unit.~~

4.8.3 ETPS Unit Design

Procedures relating to design are required by IDAPA 53.01.03 (section 8.1) or may be required as permit conditions, as appropriate, to ensure protection of public health and the environment.

1. All materials will be durable, corrosion resistant, and designed for the intended use.
2. All electrical connections completed on site shall comply with the National Fire Protection Association (NFPA) Standard NFPA 70, National Electrical Code, as required by the Idaho Division of Building Safety, Electrical Division.
3. Design for each specific application should be provided by a PE licensed in Idaho.
4. ~~The system's aerobic treatment section will be preceded by an appropriately sized septic tank. The septic tank may be either a separate septic tank, a volume integral with the system's package, or a combination of internal clarifier volume coupled with an external tank. The septic tank shall provide the minimum tank capacity for residential facilities as specified in IDAPA 58.01.03.007.07.a, or for nonresidential facilities, a minimum of 2 days of hydraulic residence time (HRT) as stipulated in IDAPA 58.01.03.007.07.b. Timed dosing from the clarifier to the aerobic treatment unit is preferred and highly~~

~~recommended to maintain a constant source of nutrients for the system's aerobic microbes.~~

5. Manufactured and *packaged* mechanical treatment devices will be required to prove that the specified equipment model meets the ETPS product approval policy outlined in section 1.4.2.2.

4.8.7 4.8.4 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 4-16 shows the placement of a sampling port after the ETPS unit, and Figure 4-17 shows the sample port and drainfield after the septic and treatment tank.

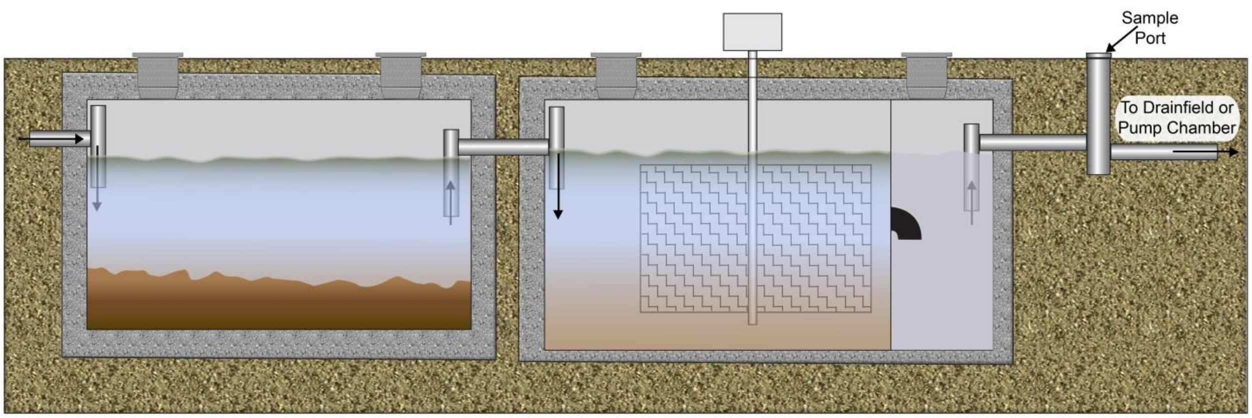
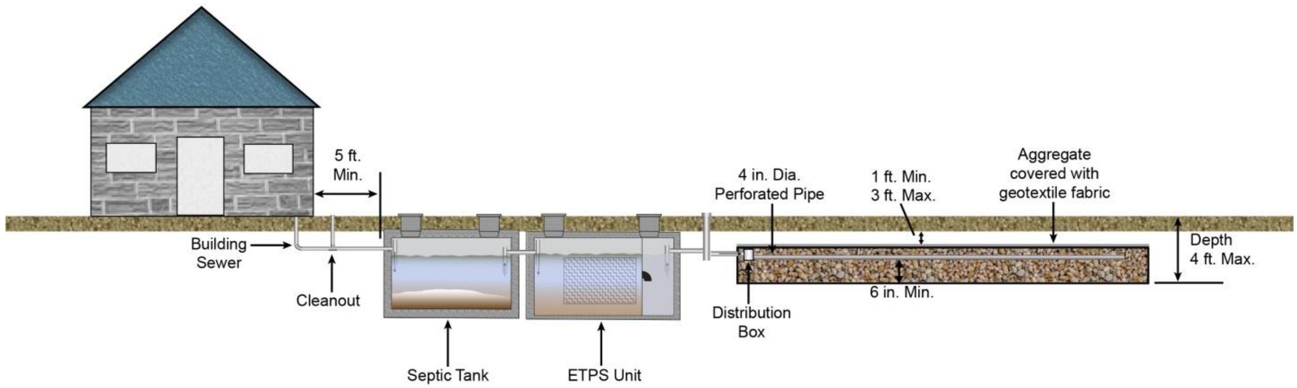


Figure 4-16. Sampling port example.



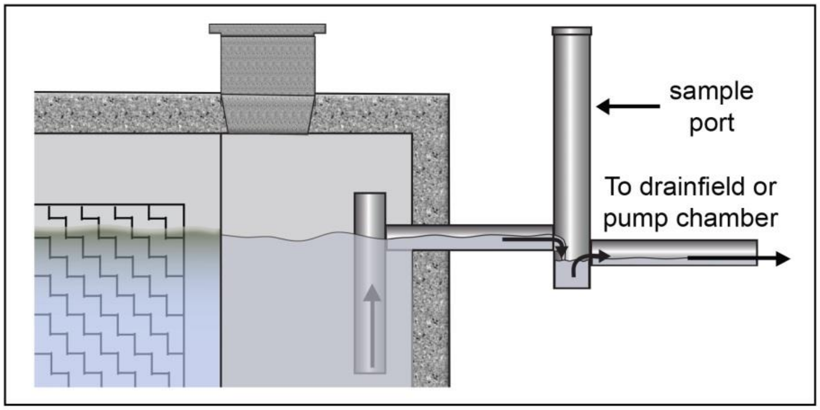


Figure 4-17. Sampling port and drainfield.

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 and includes information on the manufacturer, product, model number, and serial number of the ETPS unit installed.

Appendix J

1.9 Managed Operation, Maintenance, and Monitoring

Revision: May 18, 2016

Operation, maintenance, and monitoring (OMM) may be required for any system specified by the Director. The Director may specify OMM as a condition of a product's design approval (IDAPA 58.01.03.009.03) or as a condition of issuing a subsurface sewage disposal permit (IDAPA 58.01.03.005.14). This section lists out the Director specified OMM requirements. Managed OMM is performed by an Operation and Maintenance Entity (section 1.6) or a certified service provider.

1.9.1 Managed Operation and Maintenance

Operation and maintenance (O&M) refers to the direct access to a subsurface sewage disposal system to provide planned or reactive activities that are necessary to ensure efficiency, effectiveness, and sustainability of the system. Managed O&M is required for systems the Director has determined necessitate professional oversight to ensure the systems operate according to the rules (IDAPA 58.01.03) and system specific recommendations provided by the Technical Guidance Committee (IDAPA 58.01.03.004.10). When managed O&M is specified for a system the following requirements shall be met (IDAPA 58.01.03.005.14 and 58.01.03.009.03):

1. Annual maintenance shall be performed on the system as described in the manufacturer's O&M manual submitted under section 1.4 or 1.6.
    a. Systems that are incorporated into an engineered design shall also follow the minimum O&M requirements set by the design engineer.
    b. Additional maintenance not specified in an O&M manual may be required to ensure the system functions properly.
2. Records for each O&M visit shall be kept and should include the following information for the primary maintenance visit:
    a. Date and time.
    b. Observation for objectionable odors.
    c. Observation for surfacing of effluent from the system or drainfield.
    d. Notation as to whether the system was pumped since the last O&M visit including the portions of the system pumped, pumping date, and volume.
    e. Sludge depth and scum layer thickness in the system's tanks and/or treatment unit.
    f. If responding to an alarm event, provide the cause of the alarm and any maintenance necessary to address the alarm situation.
    g. Field testing results for any system effluent quality indicators included in the system's approved sampling plan (if required) or as recommended in section 1.9.2(2).
    h. Record of any cleaning and lubrication.
    i. Notation of any adjustments to control settings or equipment.
    j. Test results for pumps, switches, alarms, and blowers.

k. Notation of any equipment or component failures.
l. Equipment or component replacement including the reason for replacement.
m. Recommendations for future service or maintenance and the reason for the recommendations.

3. Any maintenance occurring after the primary maintenance visit should only record and address the reason for the visit and the associated activities that occur.

1.9.2 Managed Monitoring

Monitoring refers to the requirement for effluent sampling and analysis of wastewater discharged from a treatment system prior to the effluent entering the drainfield. Managed monitoring is required for systems that the Director has determined necessitate field verification of the system's performance to ensure effluent quality limits are being met. When managed monitoring is specified for a system the following requirements shall be met (IDAPA 58.01.03.005.14 and 58.01.03.009.03):

1. Effluent quality shall be monitored annually for all systems specified by the Director.
2. Annual monitoring included in the annual report must occur within the reporting period (Figure 1-1).
3. Effluent monitoring may be done for a group of treatment systems from a common dosing chamber resulting in the sample from the common dosing chamber being applied to all of the associated systems if:
   a. Annual O&M is performed and documented as described in section 1.9.1 for each individual treatment system, and O&M records are submitted for each individual treatment system as described in section 1.9.3.
   b. All of the treatment systems connected to the common dosing chamber are from the same manufacturer or are the same engineered alternative treatment system design.
      i. If there are multiple manufacturers' units or multiple engineered alternative treatment system designs connected to the common dosing chamber, then each system must be monitored individually.
      ii. If there are multiple common dosing chambers discharging to a single drainfield, then each common dosing chamber must be monitored.
      iii. If there are any individual manufacturers' units or engineered alternative treatment system designs discharging to the same system independently of a common dosing chamber, then those individual units must also be monitored.
   c. If the effluent sample from the common dosing chamber does not meet any one of the required effluent constituent levels for the system, then each individual treatment system connected to the common dosing chamber must be sampled independently for the failing constituent to determine what individual systems do not meet the effluent monitoring requirements.
      i. Individual systems that do not meet the effluent constituent levels upon individual sampling must follow the O&M and retesting requirements described in item 11 below.
      ii. Individual systems that do meet the effluent constituent levels upon individual sampling do not need to continue with the O&M and retesting requirements.

4. DEQ recommends that prior to collecting effluent samples from a treatment system for laboratory analysis that effluent quality indicators be field tested as described in the system's approved sampling plan. Recommendations included in this section are recommendations only and should be verified with the treatment technology manufacturer or design engineer 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:
   a. Visual examination for wastewater color, odor, and effluent solids.
   b. Constituents shown in Table 1-1.

Table 1-1. 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)

5. Monitoring samples provided to a laboratory will analytically quantify that the treatment system is operating in compliance if samples do not exceed:
   a. 40 mg/L (40 ppm) for $CBOD_5$
   b. 45 mg/L (45 ppm) for TSS
   c. Permit specific levels stipulated on the installation permit for nitrogen as described in item 6.
   d. Permit specific levels stipulated on the installation permit for other constituents of concern that may be determined on a case-by-case basis
6. For those systems installed in areas of concern, including nitrogen sensitive areas, or are used to fulfill NP evaluation results and requirements, the following total nitrogen related constituents may be monitored to determine total nitrogen concentration:
   a. Total Kjeldahl nitrogen (TKN)
   b. Nitrate-nitrite nitrogen (NO3+NO2-N)
   c. Results for total nitrogen (TN = TKN + [NO3+NO2-N])
7. Results for monitoring samples that exceed the stipulated levels on the installation permit indicate the treatment system is not achieving the required reduction levels.
8. Effluent specific constituents that must be monitored for a treatment system will be specified in the treatment system specific guidance in section 4.
9. Monitoring 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:
   a. 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.
   b. Chain-of-custody form should also specify the laboratory analyses to be performed on the sample.

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

10. Sample analysis will be performed by a laboratory capable of analyzing wastewater according to the acceptable standards identified in Table 1-2, and the monitoring results will be submitted as part of the annual report to the local health district.

a. Effluent analysis shall be performed using the standards in Table 1-2 from the *Standard Methods for the Examination of Water and Wastewater* (Rice et al. 2012) or the equivalent standards from EPA.

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

Table 1-2. Standard methods required for the analysis of ETPS effluent in annual testing.

Analysis	Standard Method Number	EPA Method Equivalent to Standard Method
Total suspended solids (TSS)	SM 2540 D	—
Carbonaceous biological oxygen demand ($CBOD_5$)[a]	SM 5210 B	—
Total Kjeldahl nitrogen (TKN)	SM 4500-N_{org} B	351.2
Nitrate-nitrite nitrogen (NO_3 + NO_2-N)	SM 4500-NO_3^- F	353.2

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

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

a. Additional O&M within 15 days of the failed sample results as determined by the date provided on the laboratory form.

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

b. Additional sampling to demonstrate the O&M performed successfully restored the treatment system to proper operation.

c. Sample extraction and analysis needs to occur within 30 days after servicing the system (as determined in item 11.a above).

The 30-day time frame for sample extraction will begin based on the last documented O&M visit required under item 11.a above.

d. A maximum of three sampling events, within 90 days (as determined from the last documented O&M visit from item 11.a 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 (section 1.9.4.1, Figure 1-2).

e. If an annual report, as described in section 1.9.3, for a system identifies that an effluent sample fails to meet the limits stipulated on the installation permit, and the required resampling of the system did not occur, then the regulatory authority will issue the "Failure to Resample" letter provided in the DEQ program instruction "Extended Treatment Package System Program Letters."

If resampling as described in this section does not occur by the date provided in the Failure to Resample letter, then the actions will be considered a refusal of service as described in section 1.9.5, and the enforcement procedures provided in section 1.9.5 shall be followed by the regulatory authority.

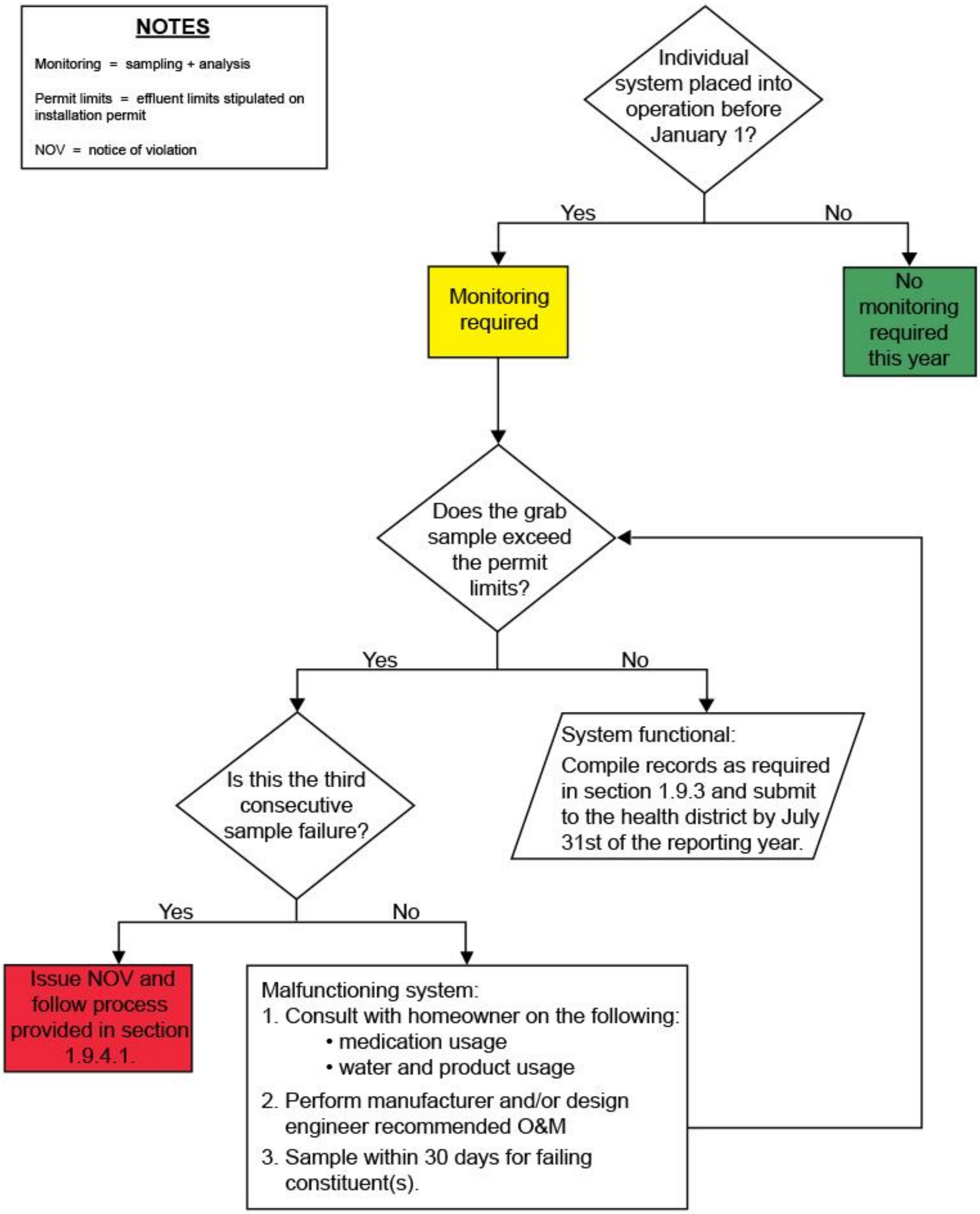


Figure 1-1. Individual treatment system sampling process.

1.9.3 Annual Reporting of Managed Operation, Maintenance, and Monitoring

The annual reporting period is from July 1 of the preceding year through June 30 of the reporting year. Annual reporting is the responsibility of the property owner, and DEQ recommends that the property owner have their O&M entity or service provider compile and submit their annual report. The property owner responsible for the treatment system under IDAPA 58.01.03 shall ensure the following annual reporting requirements are met:

1. Annual report for each property owner shall include these items:
   a. A copy of the maintenance records for the reporting period as required under section 1.9.1.
   b. A copy of all laboratory records for effluent sampling as described in section 1.9.2 (if required).
   c. A copy of each chain-of-custody form associated with each effluent sample as described in section 1.9.2 (if required).
2. If an O&M entity or service provider is fulfilling annual reporting requirements for their property owners, then DEQ recommends that the following additional information be included within the annual report:
   a. A current list of all O&M entity or service provider contracted property owners within the health district to which the annual report was submitted.
   b. The property owner list should clearly identify which property owners the O&M entity or service provider is contracted with for annual reporting requirements and the status of each property owner in regards to completing the annual reporting requirements.
   c. If annual reporting requirements are not complete for any property owner who the O&M entity or service provider is responsible for providing the annual report, then an explanation should be included with that property owner's records within the annual report.
3. Annual report exemptions
   a. A property owner may be exempt from effluent testing based upon extreme medical conditions.

      Annual O&M on the property owner's treatment system shall not be exempt due to medical conditions, and record of annual O&M shall still be submitted with the member's annual report.
   b. An O&M entity or service provider contracted by a property owner to fulfill annual reporting requirements may be exempt from reporting annual OMM for an individual property owner if that owner's activities fall within the guidelines of section 1.9.5.

      The O&M entity or service provider should still report the activities described in section 1.9.5 for each property owner exempt from annual reporting based on the guidelines in section 1.9.5.
4. Annual reporting process
   a. The annual report shall be submitted to the local health district by the property owner, O&M entity, or service provider on behalf of the property owner no later than July 31 of each year for the preceding 12-month period.

The annual report shall be submitted to the local health district that issued the subsurface sewage disposal permit.

b. The local health district shall provide the O&M entity or service provider a written response within 45 days of receipt of the annual report detailing compliance or noncompliance with septic permit requirements.

    i. The O&M entity or service provider should inform individual property owners of their compliance status.

    ii. All correspondence from the health district regarding a noncompliant annual report shall be copied to DEQ.

5. Delinquent annual reports

    a. If the property owner, O&M entity, or service provider contracted to submit the property owner's annual report does not submit the annual report by July 31 of the reporting year, then the local health district shall send the property owner, O&M entity, or service provider contracted to submit the property owner's annual report, a reminder letter providing a secondary deadline of August 31 of the reporting year for the annual report submission. The reminder letter shall detail the report requirements and that failure to submit the annual report by the secondary deadline will result in the health district forwarding a notice of nonreport to DEQ. DEQ may seek any remedy available under IDAPA 58.01.03 including, without limitation, requiring the property owner to replace the treatment system with another system, as outlined in section 1.9.4.

    b. All correspondence from the health district regarding delinquent annual reports shall be copied to DEQ.

1.9.4 Treatment System Failure, Disapproval, and Reinstatement

Commercially manufactured wastewater treatment systems must be approved by DEQ (IDAPA 58.01.03.009.01). Installation of a commercially manufactured wastewater treatment system requires a subsurface sewage disposal permit pursuant to IDAPA 58.01.03.005. In addition, commercially manufactured wastewater treatment systems are alternative systems that must be approved by the director pursuant to IDAPA 58.01.03.004.10. As part of the alternative system approvals for commercially manufactured wastewater treatment systems, DEQ defines the specific circumstances under which the treatment systems may be installed, used, operated, and maintained within alternative treatment system guidance (IDAPA 58.01.03.009.03 and 58.01.03.005.14).

If a commercially manufactured wastewater treatment product is not shown to be installed, used, operated, or maintained in accordance with DEQ requirements, then DEQ may pursue enforcement against a property owner and seek those remedies available under IDAPA 58.01.03. Enforcement and remedies against the property owner may include a determination that the treatment system has failed and the requirement that the property owner replace the treatment system with a different system authorized by DEQ. Replacement may include installing another commercially manufactured wastewater treatment system approved by DEQ, or engineering and installing another alternative system that is capable of meeting the requirements of the property owner's subsurface sewage disposal permit. If a commercially manufactured wastewater treatment system is not shown to comply or consistently function in compliance with IDAPA

58.01.03 and specified OMM requirements, DEQ may disapprove the commercially manufactured wastewater treatment product. Reasons for DEQ enforcement, which may include seeking remedies against a property owner or disapproval of a commercially manufactured wastewater treatment product as outlined herein, include, but are not limited to, the following:

1. Failure to submit an annual report by the secondary deadline of August 31.
2. Annual reports for a particular commercially manufactured wastewater treatment product identify a malfunctioning system rate of 10% or more.

   Malfunctioning systems are defined as any system that fails to receive annual O&M or exceeds the effluent reduction levels for any constituent specified in the subsurface sewage disposal permit (i.e., TSS, $CBOD_5$, or TN).
3. Property owner's commercially manufactured wastewater treatment product has been determined to be a failing system. Failing commercially manufactured wastewater treatment systems are defined in section 1.9.2.

1.9.4.1 Failing System Enforcements

The regulatory authority shall follow the procedures below upon determination that a wastewater treatment system has been determined to be a failing system (Figure 1-2):

1. When the regulatory authority is notified that a system is failing, a notice of violation (NOV) shall be issued to the property owner. The property owner shall have the opportunity to hold a compliance conference with the regulatory authority to enter into a consent order.
2. Consent orders should allow a property owner a 12-month period to return the system to proper operation or replace the failing system.
   a. Over this 12-month period, the property owner should have their O&M entity or service provider service the wastewater treatment system at least monthly.
   b. Monthly effluent samples should be taken by the O&M entity or service provider until the wastewater treatment system passes 3 consecutive monthly samples.

      Three consecutive passing monthly samples taken 1 month apart would be cause for the regulatory authority to terminate the consent order and NOV, and reclassify the system as compliant.
   c. OMM records as described in section 1.9.1 and 1.9.2 should be submitted to the regulatory authority on a monthly basis as part of the consent order.
   d. If the commercially manufactured wastewater treatment system cannot produce 3 consecutive monthly samples over the 12-month period, then the system may be replaced with another alternative system that meets the effluent quality requirements based upon applicable site conditions.
   e. Replacement systems must meet the treatment requirements of the original septic permit. Appropriate replacement systems will be determined on a case-by-case basis.

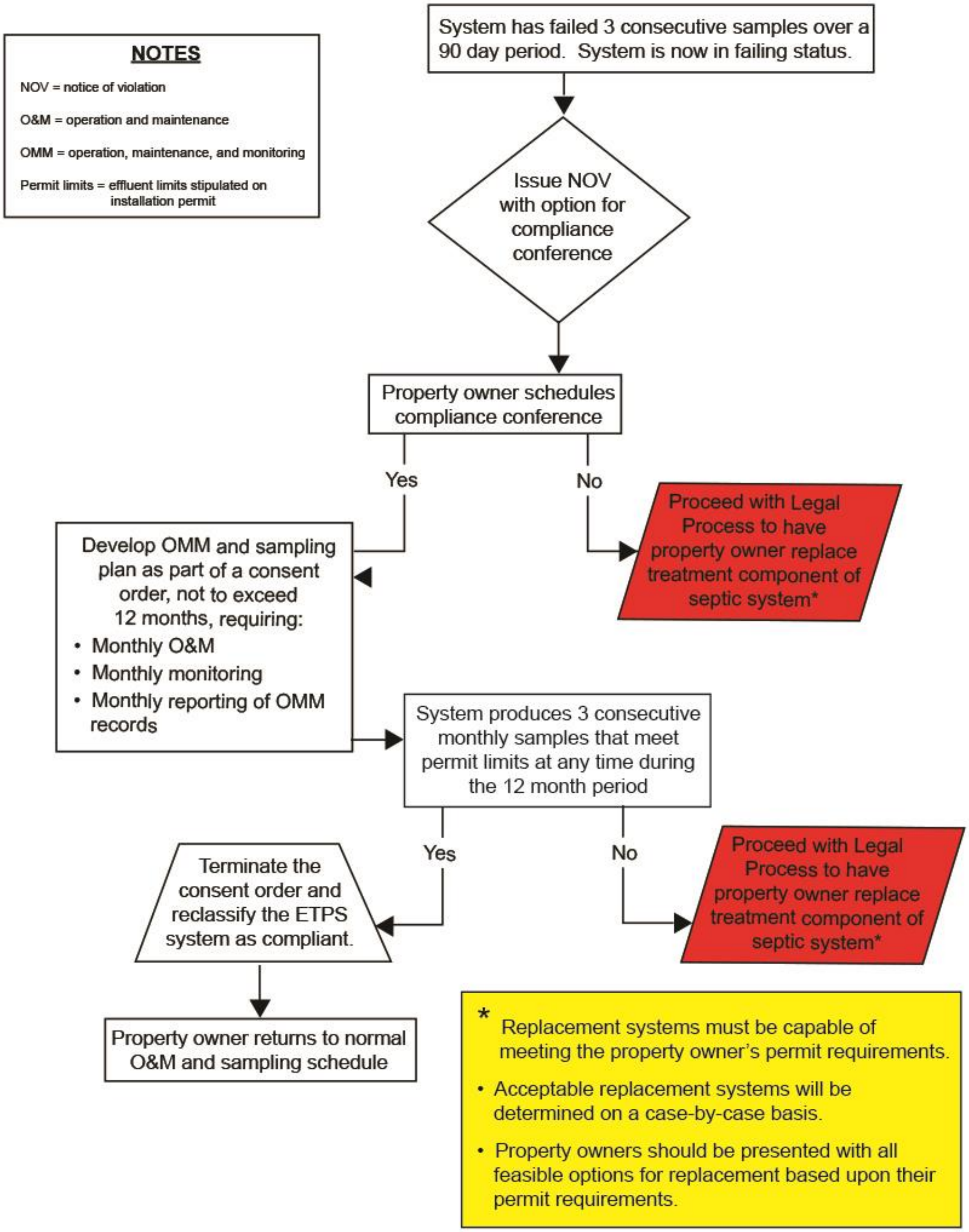


Figure 1-2. Failing wastewater treatment system enforcement flowchart.

1.9.4.2 Commercially Manufactured Wastewater Treatment System Disapproval

In addition to determining a particular system is a failing system as set forth in section 1.9.4.1, if DEQ determines that a commercially manufactured wastewater treatment system cannot consistently function in compliance with IDAPA 58.01.03, then DEQ may disapprove the product (IDAPA 58.01.03.009.04). A written notice of DEQ's intent to disapprove the commercially manufactured wastewater treatment system will be provided following Idaho Code §67-52 and sent to the wastewater treatment system manufacturer, O&M entity or service provider, and health districts. The commercially manufactured wastewater treatment system manufacturer will be allowed an opportunity to respond prior to product disapproval. Upon disapproval of a manufacturer's wastewater treatment system product line, the health districts shall not issue septic permit on new application for the commercially manufactured wastewater treatment system product line from the disapproved manufacturer. OMM requirements for existing installations of the commercially manufactured wastewater treatment system product line will not be affected by the product disapproval (Figure 1-3).

1.9.4.3 Commercially Manufactured Wastewater Treatment System Reinstatement

Upon commercially manufactured wastewater treatment system product disapproval, DEQ will provide the manufacturer the opportunity to enter into a corrective action plan (CAP) for product reinstatement. The CAP should establish the time frame to return the noncomplying or failing systems to proper operation. The product disapproval will remain in effect until the malfunctioning and failing system rate for the manufacturer's technology is below 10%.

1.9.5 Property Owner Refusal of Operation, Maintenance, or Monitoring Requirements

Individual property owners are responsible for ensuring their O&M entity or service provider can meet the annual OMM requirements for their wastewater treatment system. Failure of an individual property owner to permit the O&M entity or service provider from carrying out the required OMM services is considered a violation of IDAPA 58.01.03.012.01. Actions engaged in by a property owner toward the O&M entity or service provider that may be considered a refusal of service action by a property owner, include, but are not limited to, the following:

1. Refusal to allow annual operation, maintenance, or monitoring (e.g., refusal to pay annual dues preventing the financial capability of service or denial of property access).
2. Refusal to maintain the wastewater treatment system in operating condition (e.g., refusal to replace broken components or refusal to provide electricity to the unit).
3. If the refusal of service continues through the annual reporting period, then the O&M entity or service provider should substitute and submit the following documents in the annual report for property owners refusing service that the O&M is contracted with:
    a. Copies of all correspondence and associated certified mail receipts documenting the property owner's receipt of the correspondence regarding the refusal of service. Refusal of service by a property owner through nonpayment should include documentation of a lien being placed on the individual's property.

b. If the documentation is not included within the annual report, there will be insufficient documentation of the property owner's refusal to allow OMM, and therefore, the lack of OMM may count against the malfunctioning rate for the wastewater treatment system product.

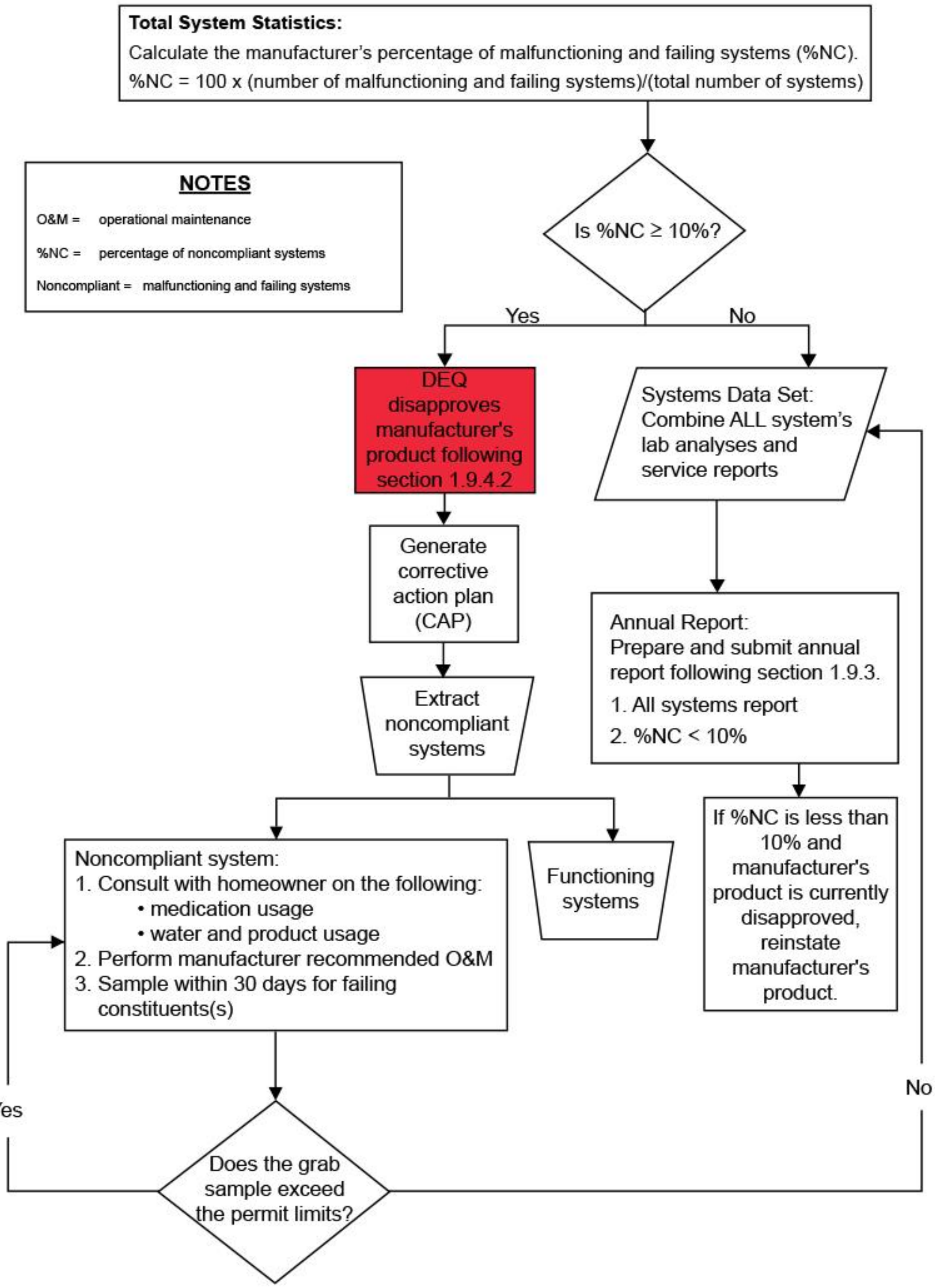


Figure 1-3. ETPS product disapproval process based upon annual reports.

Refusal of Service Enforcement Procedures

Upon receipt of an annual report showing that individual property owners have refused to allow maintenance and monitoring as described in section 1.9.5, the following guidelines apply:

1. The regulatory authority shall issue Letter 1 with the associated enclosure provided in the DEQ program instruction, "Extended Treatment Package System Education and Enforcement Letters."
    a. Letter 1 shall be sent to the property owner by certified mail and copied to the associated O&M entity or service provider.
    b. The property owner is responsible for working with the regulatory authority and the O&M entity or service provider to address their delinquent responsibilities. The O&M entity or service provider should contact the regulatory authority and associated property owner 30 days after receiving Letter 1 to inform the regulatory authority of the property owner's voluntary compliance status.
2. If the property owner fails to voluntarily comply with the 30-day time frame, then the regulatory authority shall issue Letter 2 provided in the DEQ program directive, "Extended Treatment Package System Education and Enforcement Letters."
    a. Letter 2 shall be sent to the property owner by certified mail and copied to the associated O&M entity or service provider.
    b. The property owner is responsible for working with the regulatory authority and their O&M entity or service provider to address their delinquent responsibilities. The O&M entity or service provider should contact the regulatory authority and associated property owner by the voluntary compliance date provided in Letter 2 to inform the regulatory authority of the property owner's voluntary compliance status.
3. If the property owner fails to voluntarily comply by the date provided in Letter 2, then the regulatory authority may issue a NOV to the property owner to ensure compliance with the property owner's subsurface sewage disposal permit requirements for the ETPS unit.

Appendix K

4.24.2 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 4-24 lists the minimum depth of natural soil to the limiting layer.
   b. If 24 inches of filter sand is placed beneath the absorption bed, then Table 4-22 in Section 4.22 "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 by approval condition 1 except that the effective sizing depth shall not be less than 18 inches.
3. Table 4-25 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 rate for the sand mound must be 1.5 times the wastewater daily flow required by IDAPA 58.01.03.007.08 or as determined in accordance with section 3.3 of this manual and is only used in designing the absorption bed cell and medium sand fill.
9. Pressure distribution system and associated component design shall conform to section 4.19 of this manual.

Appendix L

3.3.1 Letter of Intended Use

As part of the permit application, the applicant must provide information regarding the type of establishment served (IDAPA 58.01.03.005.04.c), nature and quantity of wastewater the system will receive (IDAPA 58.01.03.005.04.j), and documentation that substantiates that the proposed system will comply with IDAPA 58.01.03 (IDAPA 58.01.03.005.04.o). This information should be included in a Letter of Intended Use that contains the following minimum elements:

- Description of the commercial/industrial processes that are occurring within the facility.
  - Type of business that will be discharging to the subsurface sewage disposal system and the processes involved in its operations.
  - Maximum number of employees and customers within the facility at any given time now or in the future if expansion is to occur later.
  - Estimated daily wastewater flow that may be produced by the domestic, commercial, and industrial uses occurring within the facility. Estimated daily wastewater flow projections must either be supported by IDAPA 58.01.03.007.08 or follow the guidance regarding empirical wastewater flow data as provided in section 3.3.2.
- Completed copy of the ~~nondomestic wastewater application checklist~~subsurface sewage disposal permit application supplement for nondomestic wastewater. Characteristics of the nondomestic wastewater should be supported with adequate documentation.

3.3.2 Empirical Wastewater Flow Data

Empirical wastewater flow data is collected from facilities similar to the one proposed in the subsurface sewage disposal permit application. Wastewater flow data is typically collected from facilities connected to a public water system or other water source that can provide water meter data for daily, weekly, or monthly water use by the facility. The daily wastewater flow is estimated based upon the potable water used by the facility as determined by water meter data. The data obtained often needs to be converted into GPD as most utilities and public water systems do not meter water by the gallon. The volume of water provided in a water usage history should be verified for the correct meter units.

Evaluated facilities should be located within Idaho if possible and may be from any region within the state. Unique facilities that may not be found elsewhere in the state may use similar facilities from other states. Facilities should be able to be compared to the proposed facility and capable of assigning a daily wastewater flow estimate on a per unit basis. Units may include employees, meals, visitors, or any other quantifiable unit applicable to the proposed facility. If the proposed facility will produce nondomestic wastewater (i.e., wastewater from sources other than hand sinks, toilets, showers/bathtubs, noncommercial kitchens, and washing machines), the wastewater data must also include characterization of the proposed commercial or industrial wastewater to be discharged to the subsurface sewage disposal system in addition to the daily wastewater flow data.

The time of year that water usage data is collected and evaluated should represent the proposed facility's peak usage time frame. If possible, DEQ recommends that water consumption data devoid of irrigation flows be provided. To accomplish this, locate facilities that do not have landscaping to irrigate or eliminate the irrigation season from the evaluation. Eliminating the irrigation season from the water data evaluation should only be used for facilities that do not have peak facility use occur over this time frame. Water usage data that does not include the irrigation season typically occurs from November through February.

Adequate documentation of daily wastewater flows may vary on a case-by-case basis. The following list of water usage data will be considered adequate for most circumstances:

- Water usage data from a minimum of three facilities of similar operation should be provided for review.
  - Facilities should be connected to a public or private water system for which monthly water use records are kept that can be readily converted to average GPD flows. Water usage data should be provided in writing by the water system operator.
  - Statistics should be provided on each facility's operation that are pertinent to the wastewater flow estimation (e.g., number of employees, number of children attending a childcare, number of meals served per day for restaurants, and occupancy per day of a hotel or RV park). Statistical data for each facility should be provided in writing by the facility providing the data.
- Water usage data should occur over an adequate time frame to provide data that is applicable to the design flows for subsurface sewage disposal permit issuance.
- Wastewater characterization for nondomestic wastewater sources (including the ~~nondomestic wastewater application checklist~~subsurface sewage disposal permit application supplement for nondomestic wastewater found on DEQ's website).
- Other facility specific data the Director feels is reasonable and necessary for daily wastewater flow estimation evaluation.

The Director shall evaluate the data provided to determine an acceptable flow. If the Director determines that any data provided is inadequate for assessment, the facility that the data applies to will not be included in the evaluation process. The provision of empirical wastewater flow data in lieu of using the wastewater flows provided in IDAPA 58.01.03.007.08 does not guarantee that the daily wastewater flow projection will be less than what is provided by IDAPA 58.01.03.007.08.

Appendix M

4.15 Individual Wastewater Incinerator ~~Toilets~~

Revision: ~~December 10, 2014~~May 18, 2016
Installer registration permit: Property owner or standard and basic
Licensed professional engineer required: No

4.15.1 Description

Housed within a dwelling or other structure, individual wastewater incinerators ~~toilets~~ store and incinerate ~~nonwater-carried human urine and feces~~wastewater and/or blackwaste. Incineration is facilitated by petroleum fuels or electricity.

4.15.2 Approval Conditions

1. Water under pressure shall not serve the dwelling unless:
   a. A public sewer connection is ~~available~~provided to the dwelling, or
   b. A full-size subsurface sewage disposal system is installed, or~~.~~
   c. An incinerator capable of combusting the daily design flow for the dwelling's sewage blackwater and grey water is installed.
      i. Water under pressure for dwellings served by an incinerator is limited to storage tanks that are not continuously or automatically filled by natural sources (e.g., springs) or mechanical sources (e.g., pumped wells, surface water).
      ii. Daily design flow shall be per IDAPA 58.01.03.007.08, and
      iii. Low flow water fixtures shall be installed throughout the dwelling, and
      iv. The installation permit shall include a statement that: *"Incinerator must be maintained and operable at all times the dwelling is occupied until such time that the dwelling is connected to an approved wastewater disposal system. The wastewater holding tank is only approved for temporary storage of wastewater prior to discharge to the incinerator and shall not be used as a permanent pump-and-haul holding tank."*
2. Non-water carried ~~I~~incinerator ~~toilets~~:
   a. May be located in structures other than a dwelling if the structure is constructed to meet the requirements of a pit privy building (section 4.17.4).
   b. Units are restricted to disposal of human feces and urine and shall be installed and operated according to the manufacturer's recommendations.
3. Water carried incinerator:
   a. Wastewater holding tanks shall have a volume two times the capacity of the water supply tank and shall not be less than two times the maximum incineration volume of the installed unit.
   b. Wastewater holding tank shall not be used as a permanent holding tank that necessitates pumping and hauling of the wastewater by a pumper truck.
4. Individual wastewater ~~I~~incinerator ~~toilet~~ models must be approved by DEQ before installation (section 5.6).

5. Incinerators shall be installed according to the manufacturer's specifications.
56. Proper electrical, plumbing, and gas line permits must be obtained through the Idaho Division of Building Safety or any other applicable regulatory agency for the area the ~~toilet~~ incinerator is installed within.

4.15.3 Design Requirements

1. All materials used in construction of an incinerator toilet must be durable and easily cleaned. Styrene rubber, PVC, and fiberglass are examples of acceptable materials for toilet components.
2. The combustion area and flue must be constructed of heat-resistant, noncorrosive metals.
3. The design must demonstrate adequate resistance to internal and external stresses.
4. All mechanical and electrical components should be designed to operate safely and be capable of providing continuous service under reasonably foreseen conditions such as extremes in temperature and humidity.
5. For standard dwellings, the incinerator or toilet unit must be capable of accommodating full-time use based on two people in the first bedroom and one person in every other bedroom. Full-time use for other structures or dwellings will be determined on actual capacity and projected visitors per day.
6. Continuous positive ventilation of the storage or treatment chamber must be provided to the outside.
   a. Ventilation components should be independent of the other structure ventilation systems.
   b. Venting connections must not be made to room vents or to chimneys.
   c. All vents must be designed to prevent flies and other insects from entering the treatment chamber.

Note: Toilets, as plumbing fixtures, are under the regulation of the Idaho Division of Building Safety, Plumbing Program. Current plumbing code prohibits using incinerator toilets without the permission of the health district. Proof of permission will be provided through a permit issued by the health district. Some incinerators may require significant volumes of fuel and long operation times to operate at peak capacity.

4.15.4 Operation and Maintenance

1. The toilet~~s~~ and/or incinerator should be inspected regularly to check the quantity of incinerated waste for removal needs.
2. The toilet and/or incinerator components should be inspected and maintained according to the manufacturer's recommendations.

Appendix N

See subsequent pages.

April 19, 2016

Mr. Tyler Fortunati, R.E.H.S.
DEQ State Office
Water Quality Division
1410 N. Hilton
Boise, ID 83706

Re: Comments on Presby Environmental, Inc. Request for Approval for Use Simple-Septic, Enviro-Septic, and Advanced Enviro-Septic Treatment Systems

Dear Tyler,

Bio-Microbics, Inc., Orenco Systems, Inc., and Infiltrator Water Technologies, LLC (the Companies) are manufacturers of subsurface sewage treatment and disposal products and systems presently approved for use in Idaho. These three companies have been following Presby Environmental, Inc.'s request for approval for use of its Simple-Septic, Enviro-Septic, and Advanced Enviro-Septic Treatment Systems in Idaho. We come together to comment on this application.

We have reviewed the most recent draft of the *Idaho Design and Installation Manual for Advanced Enviro-Septic Wastewater Treatment Systems* (Presby Manual), dated January 2016, which was obtained through a Public Records Law request in March 2016. Our comments are based upon our review of this document, as well as the minutes from the Technical Guidance Committee (TGC) meetings on November 5, 2015 and February 4, 2016.

We wish to comment on two specific elements of system design which are included in the application: total disposal area requirements and minimum pipe length requirements.

Total Disposal Area Requirements

The Companies fully support the TGC's position on this issue, as articulated in the November meeting minutes. Specifically:

> *The committee agreed that the sand footprint of the Presby system would need to meet the total disposal area required based on the design flow and increased application rates allowed for the intermittent sand filter and recirculating gravel filter.*

We have serious concerns with respect to the long term hydraulic performance capability of all sand-based, combined treatment and dispersal systems when the disposal area at the system sand/native soil (or fill) interface is determined by utilizing applications rates greater than those allowed in the State of Idaho for NSF/ANSI 40 Class 1 effluent.[1]

Minimum Pipe Length Requirements

The Presby Manual includes a minimum pipe length requirement for Advanced Enviro-Septic of 30 feet per bedroom and 3 gallons per day per linear foot (GPD/ft) for commercial applications. The Companies respectfully submit that the manufacturer's recommendation/requirement with respect to minimum pipe lengths is irrelevant, as this specification is predetermined by the Technical Guidance Manual (TGM).

After an extensive and extended process on the part of DEQ, the TGC, and all interested parties including representatives of the Companies, the TGM was revised to include specific application ratings for individual gravelless products. Section 4.11, titled Gravelless Trench System (p. 4-75), specifically includes "large diameter nylon fabric wrapped piping of varying dimensions", which clearly applies to the pipe component in the Advanced Enviro-Septic System. Subsection 3(1) of section 4.11 details the process to be used to calculate the "Length of gravelless trench product needed". Finally, Table 5.7 (p. 5-12) applies a "Rating (ft^2/ft)" to each approved gravelless trench component. All 12-inch diameter products, including large diameter pipe manufactured by ADS, Inc. and Prinsco, Inc., as well as 12-inch diameter bundled expanded polystyrene beads (EPS) manufactured by Infiltrator, are approved for use at a rating of 1.33 ft^2/ft.

We submit that the minimum pipe length in the application under consideration, as well as for the conduit in any similar sand lined combination treatment and dispersal system, should be determined in accordance with the TGM. The product rating will be at 1.33 ft^2/ft, and the application rate will be either 1.0 GPD/ft^2 or 1.2 GPD/ft^2, with the TGC making a determination that the manufacturer's system sand material as specified meets the specifications of soil design subgroup A-1 or A-2 (from Table 3-2).

The Companies anticipate that the applicant will assert that the ratings applied to gravelless products as detailed in the TGM should not apply to its unique system. We submit that this is entirely contrary to the intent of the parties who worked together to create these revised ratings. The intent included a universal desire to limit gravelless product length reductions to 25% or less, regardless of configuration. For design purposes, 30 linear feet of 12-inch diameter product should provide no more than 40 ft^2 (1.33 ft^2/ft) of disposal area.

Additional Considerations

We would appreciate your consideration of the following concerns as well.

<u>Other Gravelless Product Ratings</u>

We believe it is noteworthy that the 36-inch-wide Eljen product is included in Table 5.7 of the TGM at a rating of 4 ft^2/ft. Eljen is another sand-lined combination treatment and dispersal

[1] In fact, Infiltrator Water Technologies, LLC (Infiltrator) manufactures and markets a product called the ATL System which competes with other sand-lined, combined treatment and dispersal systems, including the GEO-Flow System and Advanced Enviro-Septic System. The ATL System is similar to both of these systems in that it is comprised of a nominally 12-inch diameter conduit encased in specified system sand, and all are NSF/ANSI 40 certified and listed for the production of Class 1 effluent. Infiltrator universally recommends infiltration loading rates for the ATL System as detailed in the widely-accepted Tyler Table for <30 mg/L TSS and <30 mg/L BOD effluent. The ATL System is presently approved for use in 6 states and one province.

system. It is designed for use with specified sand as backfill below, adjacent to, and above a proprietary product (which in this case are rectangular "modules" as opposed to circular pipe or conduit). The system is NSF/ANSI 40 certified and listed as producing Class 1 effluent. But for the difference in the proprietary media, we submit that from a process perspective the Eljen system is no different than the GEO-flow, Advanced Enviro-Septic, or ATL Systems. This rating is appropriate and in concert with the TGM. We submit that other sand lined combination treatment and dispersal systems should be sized similarly.

Please consider the following: Let us assume that a chamber manufacturer undertakes to install its 34-inch wide product in a bed configuration with sand below, between and beside the chamber rows. The system is then tested for six months in accordance with all aspects of the NSF/ANSI 40 protocol, the effluent meets Class 1 effluent standards, and the system is ultimately certified and listed. Would the manufacturer be justified in requesting a rating of 9 ft^2/ft for its 34-inch-wide chamber in Idaho? We believe not.

<u>System Sand Saturation</u>

As stated above, the Companies believe that providing adequate total disposal area is critical to long term hydraulic performance. Additionally, we submit that long term treatment performance will be directly related to providing adequate dispersal capability. With these sand-lined combined treatment and dispersal systems, treatment to NSF/ANSI 40 Class 1 standards requires unsaturated sand below and beside the proprietary gravelless components. This is particularly critical in instances where the manufacturer cites "proven" treatment capability in order to gain favorable conditions of use in the approval (increased loading rates, decreased vertical separation distance, etc.).

When the TGM was revised to allow for a maximum reduction (sizing factor) of 25%, the following language was also included:

> *The measured width of the installed product should be at least 90% of the excavated trench width.*

It is our understanding that this was included in part to ensure that the gravelless product would "substantially cover" the infiltrative surface. For a sand-lined, combination treatment and dispersal system to uniformly apply wastewater to the sand bed area, as is inferred in the language included in the updated TGM (above), the gravelless media needs to be installed across the entire sand bed. Without distribution media across the entire sand bed width and length, the only mechanism for uniform distribution of wastewater is for the system sand to become saturated, which violates stipulations published in the manufacturer's literature[2] and reduces the effective thickness of this treatment media due to the absence of oxygen in the water-filed pore space of the sand.

Please reference Section 6.0 of the Presby Manual (p. 5). Note #2 states the following:

> 2. *Minimum spacing is 1.5 ft. Larger spacing is allowed at the discretion of the designer but cannot exceed 6 ft in accordance with the bed configurations referenced in IDAPA 58.01.03.008.10.*

If approved as drafted the Presby Manual will allow for designs with up to 5 feet of system sand between the pipe rows. With a distance of only 6 inches of system sand between the bottom of

[2] See Attachment 1. This is a document circulated by Presby in the State of Indiana in December 2009. We have added the highlight for ease of review.

the pipe and the infiltrative surface, the Companies have grave concerns with respect to how the effluent will reach the system sand/native soil interfaces located between adjacent rows spaced up to 5 feet apart.

Section 8 of the Presby Manual (pp. 10-11) is informative to this point as well. Step #1 in section 8.0 reiterates the 30 feet per bedroom specification. Step #5 in section 8.0 restates the 6 foot center-to-center spacing allowance. Interestingly, Step #8 in all three subsections in section 8.0 cites a limitation of "…the distance from the outermost edges of the Presby pipe are not more than 3 ft from the outermost edges of the System Sand." This states that the infiltrative surface as designed to meet the disposal area requirements of the TGM may be up to 3 feet away from the outermost edge of the outside pipe row. Again, we question how the effluent will get from the 12-inch diameter pipe to an infiltrative surface 3 feet away, with a horizontal travel distance through the "System Sand" of only 6 inches. We submit that in such a layout the effluent must travel along the system sand/native soil interface (infiltrative surface) itself, resulting in saturation of the system sand, which will adversely impact treatment performance.

We provide in Attachment 2 an article titled "Lateral Movement of Water in the Capillary Fringe Under Drainfields", a study undertaken at North Carolina State University (NC State) in 2012. This study included a series of experiments on water flow through the unsaturated and saturated zones beneath a conventional aggregate trench system, within an isotropic, homogeneous sand. Different trench sizes and configurations were simulated to examine the effect of single and multiple trenches and on biomat formation on the trench bottom. The end of the laboratory testing apparatus was constructed using clear polycarbonate sheet, allowing water flow to be visually observed using tracer dyes.

With respect to sand-lined treatment and dispersal systems, the most notable aspect of the NC State study results is that flow from the distribution media is near-vertical until it intercepts the capillary fringe above the water table. Figures 4 and 6 from the NC State paper are provided below to illustrate the flow regime beneath 8-inch-tall by 18-inch-wide (Figure 4) and 8-inch-tall by 12-inch-wide (Figure 6 – includes a simulated biomat on the trench bottom) conventional aggregate trenches. The blue and red tracer dyes beneath the trenches represent water flow paths, which do not have a significant horizontal component until the capillary fringe is encountered. This would preclude water from flowing to the distal end of a sand extension while unsaturated conditions are maintained. If the system sand is allowed to become saturated, the water level in the sand would rise and be applied across the entire sand bed. However, this condition is prohibited by sand-lined treatment and dispersal system manufacturers because the system sand/treatment media becomes anaerobic upon saturation, representing a system malfunction condition.

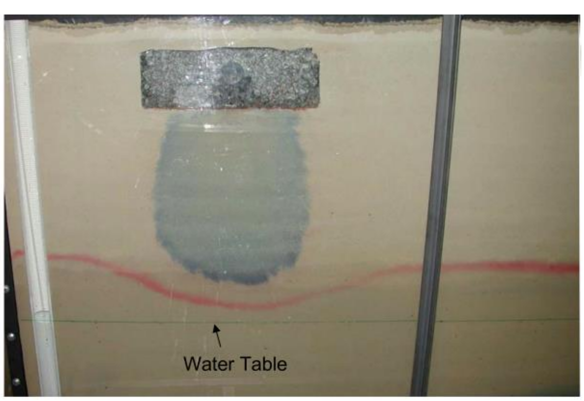


Figure 4. Photograph of the sand box showing the movement of dye into the capillary fringe. The line of red dye on the two sides shows the top of the capillary fringe before the dye solution application.

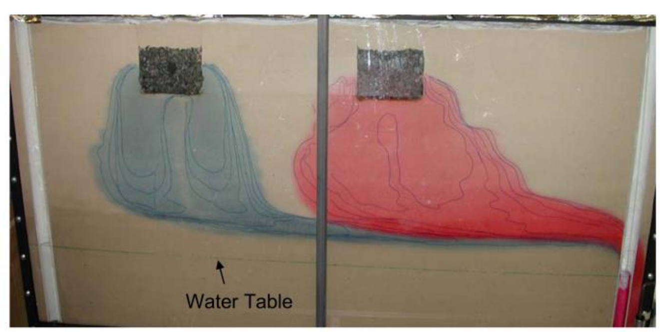


Figure 6. Photograph of the sand box showing the movement of the blue and red dyes into the capillary fringe. The lines drawn within each plume represent the dye front at progressive times.

In conclusion, the Companies submit that the minimum pipe length for the applicant's product is determined by the TGM. The manufacturer's recommendation or requirement for this specification should be considered moot. In addition, there is substantive technical support for the concept that uniform distribution of the effluent over the entire infiltrative surface in a sand-based treatment system is critical with respect to treatment. We believe that language in the TGM speaks to the importance of uniform distribution of effluent with the use of gravelless products as well as sand-based treatment systems. For all of these reasons the Companies respectfully request that the minimum pipe length specifications for use of the Advanced Enviro-Septic product be calculated based upon the TGM-established1.33 ft^2/ft rating, and that the pipe be required to substantially cover the basal area of the system sand footprint.

We thank you in for your, and the TGC's, consideration of these comments. Please contact any of us if any further information is required.

Sincerely,

Dick Bachelder
Science & Government Affairs
Infiltrator Water Technologies, LLC
(603)498-5306

Sheryl Ervin
Director, Regulatory Affairs
Bio-Microbics, Inc.
(913)422-0707

Nicholas Noble
Government Relations Manager
Orenco Systems, Inc.
(800)348-9843, x484

cc: Mr. Matt Gibbs, Infiltrator Water Technologies, LLC

Attachment 1

Presby Environmental, Inc. "*INDIANA TRAINING UPDATE*", December 2009

PRESBY ENVIRONMENTAL, INC.
Protecting You and the Environment

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Tel: 1-800-473-5298 Fax: (603) 837-9864
www.presbyenvironmental.com info@presbyeco.com

*** * * U R G E N T * * ***
INDIANA TRAINING UPDATE
PREVENTING EXCESS HYDRAULIC LOADING

TO: All Certified Indiana Enviro-Septic® Professionals
FROM: Presby Environmental, Inc. and Environmental Septic Solutions, Inc.
RE: Important Training Updates & New Forms
DATED: December, 2009

As you may know, ISDH conducted a number of Enviro-Septic® site inspections this spring to assess how well these systems are functioning. While the vast majority of Enviro-Septic® systems were installed correctly and functioning properly, there were a few design/installation errors that were seen frequently enough to warrant corrective action. The various problems identified had one thing in common—the result was hydraulic overload (flooding) of the treatment field. Since Enviro-Septic® is an aerobic treatment system, saturated conditions are detrimental to its function. Not surprisingly, these problems became most noticeable during the heavy rains that occurred this spring, when onsite systems were subjected to heavy storm water run-off.

There are a few relatively easy installation techniques that are very effective in redirecting surface waters away from the treatment field, including crowning during final grading and the installation of swales. Perimeter drains are also quite effective at lowering the seasonal high water table when properly installed and maintained. It is also important that foundation drains, sump pumps and gutter systems not discharge in the system area. The enclosed Training Update provides detailed information about potential causes of hydraulic overloading and what can be done to prevent it. There is also an update providing details illustrating the correct installation methods for raised connections and tee baffles in the distribution box.

In order to assist our certified Indiana designers and installers, we have developed the enclosed Design Worksheet and Installation Checklist in cooperation with ISDH. In an effort to ensure consistent, high-quality design and installation of Enviro-Septic® systems, PEI and ISDH are **strongly** recommending the use of these forms. We trust you will find that they provide a concise collection of relevant information in a user-friendly format. Consistent use of these forms by all designers and installers will also make it easier for the local health departments to perform their required inspections. In order to assure that everyone involved is “on the same page,” completed forms are to be provided to the designer, the installer, the system owner and the local health officer. A helpful, informative presentation on the use of the new worksheets is available on the Indiana page of our website, www.presbyenvironmental.com.

During these site inspections, it was discovered that some issues were the result of the system owner’s actions after the system was installed. For instance, some homeowners were found to have filled in or altered swales, or failed to inspect the outlets of their perimeter drain to remove obstructions, or directed water from drains or gutter systems to a location where it was having a detrimental effect on the system’s function. Some system owners actually had no idea where their treatment field was located. In an effort to educate homeowners about the proper use and care of an Enviro-Septic® system, we have developed an Owner’s Manual that is available for download from our website, www.presbyenvironmental.com. We recommend that you print out a manual and provide one to each system owner before their new system is put into use, or direct owners to the website and encourage them to familiarize themselves with these important instructions that will enhance their system’s function and maximize its longevity.

No one wants more “paperwork.” We want our systems to work as intended, and we know you do, too. While Enviro-Septic® is “Technology New to Indiana,” it has been used with exceptional results for over 15 years throughout New England and across Canada, with about 100,000 systems in the ground. There is a learning curve when introducing anything “new;” but, once you are accustomed to working with Enviro-Septic®, we are confident you will find our system to be quicker, easier, less expensive and more versatile to design and install. These forms give you the benefit of knowledge and experience we’ve developed through the years, and we’re confident that using them will make your job easier and help ensure the quality of Enviro-Septic® designs and installations in Indiana.

If you have any questions about the enclosed Training Update, Design Worksheet or Installation Checklist, please do not hesitate to contact us. Thank you for choosing to recommend the Enviro-Septic® System to your clients. We look forward to many years of working together with you to provide an effective solution for onsite wastewater treatment in Indiana.

Best regards,

David W Presby
Presby Environmental, Inc.

Michael P. Market
Environmental Septic Solutions, Inc.

Appendix O

5.6 ~~Incinerating Toilets~~Individual Wastewater Incinerator

Revision: ~~December 30, 2010~~May 18, 2016

Table 5-6 shows individual wastewater incinerators~~ing toilets~~ currently ~~certified~~approved by DEQ

Table 5-6. ~~Incinerating toilets certified~~Individual wastewater incinerators approved by DEQ.

Incinerating Toilets	Model	Notes	Requirements	~~Certification~~Approval Date
SWSLOO, Inc. 2005 FM 1704 Elgin, TX 78621-5522 Phone: (866) 797-3566 (ELOO) E-mail: info@swsloo.com Website: www.swsloo.com	THE ENVIRO LOO® 2010 Standard THE ENVIRO LOO® 2040 Standard	Solar and Wind Evaporative Toilet	N/A	2010
~~Global Inventive Industries, Inc.~~ ~~P.O. Box 3752~~ ~~Costa Mesa, CA 92628~~ ~~1-800-ECOJOHN (714-568-1077)~~ ~~GII, Inc.~~ ~~17150 Newhope St. Ste. 707~~ ~~Fountain Valley, CA 92708~~ ECOJOHN 17282 Mount Wynne Circle Fountain Valley, CA 92708 714-658-1077 1-866-ECOJOHN	ECOJOHN SR WC5 Mini WC5 WC32 WC48 WC64	Gas-fired Propane or gas-fired Propane, gas, or diesel-fired Propane, gas, or diesel-fired Propane, gas, or diesel-fired Propane, gas, or diesel-fired	N/A Toilets only 25 GPD max, 600 gallon storage tank 75 GPD max, 800 gallon storage tank 125 GPD max, 1,000 gallon storage tank 300 GPD max, 1,000 gallon tank	2007 2016 2016 2016 2016 2016
Research Products/Blankenship Incinolet (800) 527-5551	CF (120v) TR (208v, 240v) RV (120v) WB (120v 208v, 240v)	120 V or 240 V Marine	N/A	2001
Storburn (519) 442-4731	60K	Gas-fired	N/A	1993

N/A: Not applicable; GPD – gallons per day