State of Idaho
Department Of Environmental Quality
Technical Guidance Committee

Technical Guidance Committee

Minutes

October 23, 2012

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

TGC ATTENDEES:

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

GUESTS:

Barry Burnell, Water Quality Division Administrator, DEQ
Chas Ariss, P.E., Wastewater Program Manager, DEQ
Lindsey Stanton, Administrative Assistant, DEQ
Ryan Spiers, Alternative Wastewater Systems, LLC
Brent Gee, Northern Aerobic, LLC
Matt Gibbs, Infiltrator, Inc.
Kellye Eager, Environmental Health Director, Eastern Idaho Public Health Department (via telephone)
Nathan Taylor, Environmental Health Supervisor, Eastern Idaho Public Health Department (via telephone)
Raymond Keating, Environmental Health Specialist, Eastern Idaho Public Health Department (via telephone)
Paul Hook, Intermountain Aquatics, Inc. (via telephone)

CALL TO ORDER/ROLL CALL:

Meeting called to order at 9:15 a.m.
Committee members and guests introduced themselves.

MEETING MINUTES:

June 19, 2012 Draft TGC Meeting Minutes: Review, Amend or Approve

Motion: David Loper moved to accept the minutes as presented.

Second: Mike Reno.

Voice Vote: Motion carried unanimously.

Minutes will post as final. See DEQ webpage and Appendix A.

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.

ETPS SUBCOMMITTEE UPDATE:

DEQ introduced the selected ETPS subcommittee members. They are as follows:

- Tyler Fortunati (DEQ representative and subcommittee chairman)
- David Loper (TGC member representative)
- Bob Erickson (TGC member representative)
- Jay Loveland (Panhandle Health District Representative)
- Raymond Keating (Eastern Idaho Public Health District Representative)
- James Bell (Executive Vice President of Bio-Microbics- Manufacturer Representative)
- Ryan Spiers (Alternative Wastewater Systems, LLC.- Service Provider Representative)
- Brent Gee (Effluent Technologies, Inc.- Operation and Maintenance Entity Representative)
- Kim Walker (Simple Septic Solutions, Inc.- Service Provider Representative)

Brent Gee was granted permission to address the committee after introduction of the subcommittee members. Brent Gee presented CDs containing a presentation that he would like the TGC and ETPS subcommittee members to review and consider. The presentation is to address the ETPS troubleshooting that Mr. Gee feels is not currently considered in the State of Idaho in relation to servicing and testing ETPS units. Specifically Mr. Gee discussed the use of pH testing to indicate the performance of the ETPS units. Mr. Gee identified pH testing as a screening tool and that the pH needed to be between 6.4 and 8.4 (standard units).

Mike Reno asked Mr. Gee if he had tried or utilized the methods and information presented in the CD. Mr. Reno also asked if Mr. Gee is looking to replace the TSS/$CBOD_5$ testing currently in place with the pH testing. Mr. Gee stated that he has utilized the information and that it appears to work, additionally he would like the pH testing to take the place of the TSS/$CBOD_5$. Mr. Reno asked if the pH was an indicator that the ETPS system will meet the current TSS/$CBOD_5$ requirements as presented in the TGM. Mr. Gee states that it is not. Mr. Gee states that Wyoming has dropped the testing program and that Washington and Massachusetts may be good programs to look into.

David Loper suggests that he would like to see the subcommittee review the history of the ETPS program in the State of Idaho. Specifically, Mr. Loper would like to review where the program has been to get where it is currently. He would also like an overview of other state ETPS/ATU management systems. Another topic for discussion by the subcommittee is the variability of sample results from lab to lab on split samples.

The TGC agreed to review the CD from Mr. Gee.

The first meeting date for the Subcommittee is being planned for the week of November 12.

OLD BUSINESS:

2.4 Evaluating Fill Material

This TGM section was posted for public comment. There was one comment to which Tyler Fortunati and Barry Burnell responded. A discussion ensued on the certification requirements for the professional designing the fill project. DEQ prefers that a certified soil scientist uses or develops the plan, but alternatively the plan may be submitted by a professional engineer licensed in the State of Idaho. There was also a concern raised as to how the health districts would charge for a multiple year project following the proposed fill guidance. The TGC does not set health district fees, nor do they have a role in the fee structure, therefor the TGC decided this is not for their discussion or decision. The fee structure will need to be determined by each health district.

Joe Canning raised the issue that section 2.4.8 of the fill material guidance had an error under item 6 where it refers to section 0. Tyler Fortunati stated that this was an error in the switch from a Word document to a PDF where the 0 should actually be 2.4.7. This was removed due to the hyperlink that was built in to the Word document. When the section is included into the TGM it will state 2.4.7.

Motion: David Loper moved that the TGC recommend final approval to DEQ of the rewritten Evaluating Fill Material Section 2.4.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously. See Appendix B.

3.2 Components of Standard Systems

Drainfield Greater than 1500 ft^2

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

Motion: David Loper moved that the TGC recommend final approval to DEQ of the newly added Drainfield Greater than 1500 ft^2 subsection of Section 3.2 Components of Standard Systems.

Second: Joe Canning.

Voice Vote: Motion carried unanimously. See Appendix C.

Pump to Drop Box

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

David Loper was under the impression that this would appear in its own subsection and not under section 3.2 of the TGM. Mike Reno disagreed that it should appear in its own section but does believe that it should be included under the pressure distribution section of the TGM. David Loper agrees and would like to see it added under the pressure distribution section after the in-tank pump subsection, he would also like to see a figure included with this subsection to provide a description of what it is. David Loper is not on board with the complex licensing requirements for installers on this installation type. George Miles stated that the pump must be sized, which is engineering by definition. Mike Reno would like to know why the health district inspection process is not adequate to prove the pump is working. David Loper would not like to see the hardship placed on the homeowner for trivial issues like pump sizing requiring them to hire an engineer, this is a basic system minus the lifting of the effluent. Barry Burnell addressed the committee and stated that the first page of the alternative system section of the TGM discusses when EHS and Engineers are allowed to design a system. Bob Erickson remembers that only a complex license was required not an engineer. Joe Canning states that pump selection is not designing and that he sees engineer involvement at the EHS's discretion. George would like an amendment to the section that states the system may require engineering. Joe Canning also stated that he would not like to see the effluent velocity exceed 4 feet per second and that there should be a statement added to the guidance that requires the flow rate to be 2-4 feet per second. Mike Reno would like the pump rate to be limited to 10 gallons per minute or less in the guidance language, and this should be included in the guidance after the first sentence.

Motion: George Miles moved that the TGC tables the issue to the next meeting, and for DEQ to revise the text to reflect the discussion, add a figure and place the revised material in TGM Section 4.20.

Second: David Loper.

Voice Vote: Motion carried unanimously.

Section 4.25 Sand Mound

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

David Loper has an issue with the twelve inches of cover being struck out from design section item 2(f). Tyler Fortunati replied that this was struck out to conform to the cover requirements presented in figure 2-24. Mike Reno motions that the cover requirements be changed to 12 inches over the mound with the cover crowned to 18 inches at the mound center.

George Miles states that there needs to be a basal area check and slope correction factor included into the Sand Mound Design Checklist. He will provide more information to DEQ for the inclusion of these factors into the design checklist for review and approval at a later meeting.

Motion: Joe Canning moved that the TGC recommend final approval to DEQ of Section 4.25 Sand Mound with the proposed cover changes in design section 2(f) and figure 2-24, and that the slope correction factors and basal area check be added to the TGC parking lot for later consideration.

Second: Bob Erickson.

Voice Vote: Motion carried unanimously. See Appendix D.

Section 4.26 Seepage Pit

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

Bob Erickson is concerned that the TGC is opening up the permitting of seepage pits statewide, and that there is potential for these systems to become injection wells. It was brought to the committee's attention that the proposed number 4 under the conditions of approval needs to be moved back to number 2 so that the language in IDAPA 58.01.03.008.12 is not affected. This will require that the current conditions of approval number 1 and 2 need to be changed to items 1a and 1b respectively.

Discussion ensued as to how seepage pits are sized. David Loper proposed that the effective soil depth chart (IDAPA 58.01.03.008.02.c) be added to the conditions of approval for seepage pits. David would also like to see table 4-23 deleted and replaced with new language on calculating the size of the seepage pit based solely on sidewall area below the effluent pipe.

George Miles would like to see the addition of language that recommends the use of effluent filters.

Motion: Joe Canning moved that the TGC table Section 4.26 Seepage Pits until the next meeting for review of the section to include the proposed changes from this meetings discussion.

Second: George Miles .

Voice Vote: Motion carried unanimously.

Section 5.10 Piping Materials for Specified Uses and Section 3.2 Components of Standard Systems

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

Tyler Fortunati states that section 3.2 Components of Standard Systems page 3-5 is included in this section for piping changes that are reflected in Section 5.10 Piping Materials for Specified Uses to be consistent across the TGM.

Motion: Joe Canning moved that the TGC recommend final approval to DEQ of Section 5.10 Piping Materials for Specified Uses and Section 3.2 Components of Standard Systems page 3-5 as rewritten.

Second: Mike Reno.

Voice Vote: Motion carried unanimously. See Appendix E.

The meeting was adjourned for Lunch.
Lunch 11:50 a.m. – 1:00 p.m.

NEW BUSINESS/DRAFT REVIEW:

2.1 Medium Sand

The committee reviewed the proposed editing of section 2.1 Medium Sand of the TGM. The committee had no comment on the proposed changes.

Motion: Mike Reno moved that the TGC recommend preliminary approval of section 2.1 Medium Sand pending public comment and that DEQ issue the revised section 2.1 Medium Sand for public comment.

Second: Joe Canning.

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.

4.20 Pressure Distribution

The committee reviewed the proposed changes to section 4.20 Pressure Distribution- In-Tank Pumps.

Bob Erickson brought up the potential use for shop applications and other small flows. Discussion ensued about tank sizes. The TGC recommended that a condition be added to allow the use of in-tank pumps if flows are less than 100 gallons per day.

David Loper would like the proposed condition number 2 to be struck from the revision based upon the restriction to flows less than 100 gallons per day.

Motion: Mike Reno moved to recommend that the TGC recommend preliminary approval of section 4.20 Pressure Distribution- In-Tank Pumps pending public comment and that DEQ issue the revised section 4.20 Pressure Distribution- In-Tank Pumps for public comment.

Second: Bob Erickson.

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.

4.12 Gravelless Trench System

The committee reviewed the proposed changes to section 4.12 Gravelless Trench System of the TGM. The committee had no comment on the proposed changes.

Motion: Bob Erickson moved that the TGC recommend preliminary approval of section 4.12 Gravelless Trench System pending public comment and that DEQ issue the revised section 4.12 Gravelless Trench System for public comment.

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.

Installer Tests

This portion of the TGC meeting was closed to the public. The TGC reviewed and approved test questions for both the basic and complex installer exams to be utilized by the public health districts to meet the requirements of IDAPA 58.01.03.006.02. Copies of the approved test questions and the associated answer key will be provided to the Environmental Health Directors for each health district. These new test questions are to replace all current test questions in use statewide beginning January 1, 2013.

TGC Parking Lot

This is a running list of issues requested to be prepared and presented to the TGC:

- O&M content in Chapter 7 and in Chapter 4

- Serial Distribution vs. Parallel Distribution
- Sand Mound slope correction factors and basal area checking (George Miles will send information on this).

NEXT MEETING:

The next committee meeting is scheduled to be on January 30, 2013, 9:15 a.m. – 4:30 p.m., at the DEQ State Office building.

Motion: Mike Reno moved to adjourn the meeting.

Second: David Loper.

Voice Vote: Motion carried unanimously.

The meeting adjourned at 4:20 p.m.

Appendix A
March 13, 2012 Final TGC Minutes

Appendix B
Section 2.4 Evaluating Fill Material
Status: Final

Appendix C
Section 3.2 Components of Standard Systems- Drainfield Greater than 1500 ft^2
Status: Final

Appendix D
Section 4.25 Sand Mound
Status: Final

Appendix E
Section 5.10 Piping Materials for Specified Uses and Section 3.2 Components of Standard Systems- page 3-5
Status: Final

Appendix F
Section 2.1 Medium Sand (DRAFT)
Status: Preliminary approval- posted for public comment.

Appendix G
Section 4.20 Pressure Distribution- In-Tank Pumps (DRAFT)

Status: Preliminary approval- posted for public comment.

Appendix H
Section 4.12 Gravelless Trench System (DRAFT)
Status: Preliminary approval- posted for public comment.

State of Idaho
Department Of Environmental Quality
Technical Guidance Committee

Appendix A

Technical Guidance Committee

Minutes

June 19, 2012

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

TGC ATTENDEES:

Bob Erickson, Senior Environmental Health Specialist, South Central Health District
Mike Reno, Environmental Health Supervisor, Central District Health Department
Joe Canning, P.E., B&A Engineers
George Miles, P.C., Advanced Wastewater Engineering (via telephone)
David Loper, Environmental Health Director, Southwest District Health Department

GUESTS:

Barry Burnell, Water Quality Division Administrator, DEQ
AJ Maupin, P.E., Wastewater Program Lead Engineer, DEQ
Chas Ariss, P.E., Wastewater Program Manager, DEQ
Lindsey Stanton, Administrative Assistant, DEQ
Tyler Fortunati, Central District Health Department
Ryan Spiers, Alternative Wastewater Systems, LLC
Stefan Johansson, EcoJohn (via telephone)
Gerald Williams, P.E., RGF (via telephone)
PaRee Godsill

CALL TO ORDER/ROLL CALL:

Meeting called to order at 9:15 a.m.
Committee members and guests introduced themselves.

MEETING MINUTES:

March 13, 2012 Draft TGC Meeting Minutes: Review, Amend or Approve

Motion: Bob Erickson moved to accept the minutes as presented.

Second: Mike Reno.

Voice Vote: Motion carried unanimously.

Minutes will post as final. See DEQ webpage and Appendix A.

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.

Stefan Johansson presented the EcoJohn Waste Combustion Series Incinerating Toilet to the TGC. DEQ had denied approval because the product does not fit into the TGM's description of an incinerating toilet. The TGM description of Incinerating Toilets states "Toilets within a dwelling or other structure that store and incinerate non-water carried human urine and feces." Incinerating toilets must not use water. This particular product is designed to function with low-flush toilets. Also, Idaho requires that flushing toilets are tied to a septic system. A question and answer session regarding the product ensued.

Stefan Johansson agreed to prepare a package of additional information about his product so that the TGC can evaluate it at the next meeting. The package of information needs to explain how this product fits into the Incinerating Toilet section of the TGM, or suggest modifications to the TGM, and the current status of the product for NSF 157 testing.

Gerald Williams presented on three topics including recirculating gravel filters tanks and separation distance to seasonal high ground water, gravelless chambers in the TGM (a topic which will be discussed at a future TGC meeting), and the extra drainrock option.

Recirculating Gravel Filter. Mr.Williams requested that the TGC review the 2nd condition for approval (TGM pg 4-65) that states: " the bottom of the filter must not come within twelve inches of seasonal high ground water." The request was to allow the RGF tank to be designed similar to a septic tank, which is allowed to be placed in the seasonal high ground water. Design elements of buoyancy, structure, and water tightness were discussed with the TGC members. By allowing the RGF tank to be placed lower in the septic system profile the landscape for the dwelling can easily accommodate a smaller profile that is above grade. Access to the media was discussed, lids vs. mounded and seeded with a factor allowed for infiltration on open systems. TGM requires that "access to the filter surface must be provided to facilitate maintenance."

Gravelless Trench System Design. A proposal was presented to allow the use of suspended perforated pipe to span the gravelless trench distance in order to facilitate distribution of septic tank effluent. The gravelless trench system is on the TGC parking lot for revision. Questions and examples were provided of how to get septic tank effluent distributed across the gravelless trench.

Shadow and masking was discussed for perforated pipe that was to rest on the soil surface. The proposal is to hang the perforated pipe. Septic tank effluent distribution through perforated pipe has been studied (University of Wisconsin and possibly Colorado School of Mines) and the research will need to be used in preparation of the revised Gravelless Trench System.

Extra Drainrock Drainfield. Request was for consideration to be allowed to use ASTM C-33 Medium sand in the system design instead of the drainrock. A discussion about the In-Trench Sand Filter section ensued with this being pointed out as an acceptable alternative to overcome hardpans or caliche layers. A discussion of biomat build up on the ASTM C-33 sand in comparison to the larger void space of the drainrock was held.

ETPS SUBCOMMITTEE UPDATE:

DEQ will post an announcement to the website requesting nominations for the new subcommittee. It will be open for a 30-day time period for interested members of the public, O&M entities, industry representatives, and service providers to self-nominate for participation on the subcommittee along with health department representatives and DEQ staff. The subcommittee will discuss and make recommendations on topics including:

Generic ETPS reminder notification,
Service refusal letters,
Financial Issues such as refusal to pay annual dues,
ETPS systems testing,
O&M Transition
Service Provider Transition, and
Title company and real estate transition notices, information, and education.

DEQ will send letters to service providers and ETPS management teams to alert them of this activity. The subcommittee will be formed before the next TGC meeting.

A discussion was held on which two TGC members would participate. George was excused due to a conflict of interest. David Loper and Bob Erikson self-nominated to serve on the subcommittee.

OLD BUSINESS:

4.8 Evapotranspiration and Evapotranspiration/Infiltrative Systems

This TGM section was posted for public comment. There was one comment to which AJ Maupin responded. A discussion on the language used for the sand was held. ASTM C-33 is listed as the required sand for these systems. The committee decided to change the requirement to “concrete sand,” which is equivalent to ASTM C-33, and is less expensive. The use of modified sand was not selected for this system. Figures 4.5 and 4.6 have been modified to reflect the change to concrete sand.

The committee gave final review and recommendation for Section 4.8 Evapotranspiration and Evapotranspiration/Infiltrative Systems.

Motion: David Loper moved that the TGC recommend final approval to DEQ of the rewritten Evapotranspiration and Evapotranspiration/Infiltrative Systems Section 4.8.

Second: Joe Canning.

Voice Vote: Motion carried unanimously. See Appendix B.

The TGC Requested: That the USDA medium sand description on page 2.6 in Table 2.6 be either deleted or adjusted to match Table 2.5. See TGC parking lot of issues.

NEW BUSINESS/DRAFT REVIEW:

4.10 Extended Treatment Package System (ETPS)

AJ discussed his handout on Pathogen Reduction, ETPS/ISF/RGF & UV Disinfection. See Appendix C. Pathogen reduction in Intermittent Sand and Recirculating Gravel filters in an unsaturated state is a minimum of 3 log and a maximum pathogen reduction of 7 log. While the minimum pathogen reduction in Aerobic Treatment Units is 2 logs and the maximum is a 5 log reduction. The difference in pathogen reduction is 1 log under a worst-case scenario, and is 2 log under the best case scenario. A discussion of providing an additional 2 log pathogen reduction by using disinfection methods ensued. Points in the discussion included disinfection capabilities. UV is a potential remedy, but for UV to be completely effective the equipment needs to be properly operated and maintained and the colloidal and particulate constituents need to be removed to ensure adequate exposure to UV radiation. Additionally, because UV does not typically kill pathogens, but instead destroys their capability to replicate, initial bacterial density is also a factor. Wastewater attributes that effect UV disinfection was discussed. No UV disinfection systems have been certified by NSF STD 46.

The committee decided that under the worst case scenario the difference between a sand filter (3 log removal) and an ETPS system (2 log removal) is likely to be 1 log. The question then becomes does the 1 foot of effective soil depth below these systems render the pathogen reduction difference in treatment insignificant. The TGC asked for DEQ to investigate the capabilities of medium sand (the coarsest suitable soil type) under unsaturated flow conditions to provide pathogen reduction and to bring that information back to the committee.

Salcor and MBRs will be discussed at the next meeting.

The meeting was adjourned for Lunch.
Lunch 12:00 p.m. – 1:00 p.m.

2.1 Evaluating Fill Material

The committee reviewed and revised the Evaluating Fill Material section 2.1 of the TGM. This was a TGM work session discussing in detail the proposed Fill Material section. The TGC suggested several edits to the proposed Fill Material revision.

Motion: Mike Reno moved to recommend that DEQ issue the revised Fill Material section for public comment. The TGC recommended preliminary approval of the Fill Material section pending public comment.

Second: Joe Canning.

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

3.2 Components of Standard Systems – The TGC reviewed three draft sections as part of the Components of Standard System section of the TGM.

- **Piping Materials ASTM D3033 (TGM pg 3-5).** AJ presented the piping materials section. ASTM D3033 pipe is no longer manufactured and therefor the TGM needed to be updated. The proposal is to remove reference to ASTM D3033. Also Table 5.10 was revised to a different presentation style in the Approved Installers and Suppliers section of the TGM. Minor adjustments were made to this table by the TGC.

  Motion: Mike Reno moved to provide a preliminary recommendation to DEQ for the Piping Materials section.

  Second: Joe Canning.

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

- **Drainfields Greater Than 1,500 ft^2 (TGM pg 3-7).** The committee added a paragraph at the end of the section on drainfields that discusses when a standard (gravity) drainfield is not authorized by rule. This was a simple change that matched up with the recent update to the pressure distribution system section.

  Motion: Mike Reno moved to provide a preliminary recommendation to DEQ for the paragraph on page 3 -7 as indicated.

  Second: Joe Canning.

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

- **Pump to Drop Box (TGM pg 3-7).** The TGC was presented a proposal to address the pump to drop box issue. Discussion was held on the installers that can install pressurized systems, the design and the guidance. The committee was split on the approach to take for installers and design. The committee discussed if only complex installers should be allowed to install pump to drop box systems, there was dispute on this issue. The proposal identified pump to drop box as a type of complex system requiring installation by a complex installer. The design is open to the districts to follow their procedures for complex system design. The proposal was modified and simplified. The committee edited the new Pump to Drop Box as a subsection in the Components of a Standard System section of the TGM.

  Motion: Bob Erickson moved to provide a preliminarily recommendation to DEQ for the pump to drop box section as modified in the meeting and to send out for public comment.

  Second: George Miles

  Voice Vote: Motion passed 4-2. See Appendix E and provide public comment to Tyler Fortunati at 373-0140 or by email at tyler.fortunati@deq.idaho.gov.

  The TGC Requested: That the In-Tank Pump Section be placed in the TGC parking lot and the direction provided was for the TGM to be revised to limit the application of this approach to areas too small for installation of a standard dosing chamber. See TGC parking lot of issues.

4.25 Sand Mound. The committee reviewed the proposed changes to the sand mound section to allow for up to 2 feet of filter sand (modified ASTM C-33 Medium Sand - <2% passing the #200 sieve). Construction designs with 24 inches of filter sand below the absorption bed will receive the same vertical setbacks as an intermittent sand filter. The proposal followed and the committee recommended modifications with a couple of minor changes.

Motion: Mike Reno moved to provide a preliminarily recommendation of approval to DEQ for the TGM Section 4.25 Sand Mound as edited.

Second: Joe Canning.

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

The TGC Requested: That the Sand mound section be reviewed for slope correction factor and be placed in the TGC parking lot. Additional information is to be provided by George Miles. See TGC parking lot of issues.

4.26 Seepage Pits. The committee reviewed the proposed modifications to section 4.26 Seepage Pits. The committee discussed the rule change that occurred in 1990. The committee discussed the applicability of seepage pit systems. The purpose of this change was to recognize the rule requirements in the Seepage Pit alternative system section. The committee added a condition of approval to identify the process for districts to authorize use of seepage pits.

2. For all other districts, replacement seepage pits may be allowable as a last resort if no other alternatives are feasible, and the site meets conditions of approval 2-6. (IDAPA 58.01.03.008.12).

Motion: Mike Reno moved to provide a preliminarily recommendation of approval to DEQ for the TGM Section 4.26 Seepage Pit Sand Mound section as edited.

Second: Joe Canning.

Voice Vote: Motion passed 5-1. See Appendix G and provide public comment to Tyler Fortunati at 373-0140 or by email at tyler.fortunati@deq.idaho.gov.

Installer Test. Discussion of the installer test was postponed until the next meeting due to time constraints.

TGC Parking Lot. This is a running list of issues requested to be prepared and presented to the TGC:

- O&M content in Chapter 7 and in Chapter 4
- Serial Distribution vs. Parallel Distribution
- Gravelless Trench System – rewrite
- USDA Medium Sand – fix or delete table 2.6.
- In-Tank Pump Systems – limit to areas too small for a dosing chamber
- Sand Mound slope correction factors (George Miles will send information on this).

NEXT MEETING:

The next committee meeting was scheduled to be on October 23, 2012, 9:00 a.m. – 4:00 p.m., at the DEQ State Office building.

Motion: Mike Reno moved to adjourn the meeting.

Second: David Loper.

Voice Vote: Motion carried unanimously.

The meeting adjourned at 4:37 p.m.

Appendix A
March 13, 2012 Final TGC Minutes

Appendix B
Section 4.8 Evapotranspiration and Evapotranspiration/Infiltrative Systems
Status: Final

Appendix C
Pathogen Reduction, ETPS/ISF/RGF & UV Disinfection
Status: Informational

Appendix D
Section 2.1 Evaluating Fill Material (DRAFT)
Status: Preliminary Approval – accepting public comments

Appendix E
Components of Standard Systems

- Piping Materials (DRAFT)
- Drainfield greater than 1500 ft^2 (DRAFT)
- Pump to Drop Box (DRAFT)

Status: Preliminary Approval – accepting public comments

Appendix F
Section 4.25 Sand Mound (DRAFT)
Status: Preliminary Approval – accepting public comments

Appendix G
Section 4.26 Seepage Pit (DRAFT)
Status: Preliminary Approval – accepting public comments

Appendix B

2.4 Evaluating Fill Material

Revision: October 23, 2012

This section provides general information for property owners to consider when filling a site, and it is not an approved alternative design. Property owners interested in pursuing a fill material project will need to get prior approval of their site modification plan. The site modification plan will be part of an application for a septic system permit. It is recommended that the property owner seek assistance from a certified soil scientist in preparing the site modification plan. Fill material typically has great variability, and property proposed for fill will require more extensive on-site investigation to determine the existence of restrictive layers.

2.4.1 Weathered Fill

Weathered or natural settling of fill will, over time, give fill similar characteristics to that of the natural soils. The annual precipitation cycle causes fill to settle and compact. Idaho has a wide range of precipitation, ranging from about 7 inches to near 80 inches. Differences in annual precipitation affect the rate and amount fill material will settle or compact. Normal settling and compaction will usually take at least 10 years to occur, depending on soil texture, fill depth, and precipitation. Fill in low precipitation zones may never become naturally compacted enough to prevent settling in the drainfield area. Table 2-11 shows the natural settling of fill. Fill depths in excess of the moisture penetration depths will not naturally settle in 10 years.

Table 2-11. Natural settling of fill over a 10-year period.

Soil Class	Precipitation Zones (inches)		
	7–16	16–24	>24
	Depth of Moisture Penetration and Settling (inches)		
A	40	60	120
B	30	48	60
C	20	30	40

2.4.2 Supplemental Irrigation

Supplemental spray irrigation water can be used to aid settling where natural precipitation is not adequate. Generally, fill must be adequately saturated by irrigation for a minimum of 5 years to ensure natural settling. Ideally, potential drainfield sites in fill should be planned 5–7 years in advance. Adequate depth and area should be planned, and the site should be leveled before the settling period begins. For additional details, see section 2.4.8.

2.4.3 Fill Material Sites

Fill material sites must have a minimum of 12 inches of unsaturated suitable soil above the seasonal high ground water level. Judgment in site evaluation will be necessary when layers of different textures occur.

2.4.4 Fill Material

If a fill has a continuous horizontal layer of a finer-textured soil, the settling should be calculated for the most restrictive soil. For example, most of a fill is an A soil, but a continuous layer of C soil occurs at 20 inches or less in a 7- to16-inch precipitation zone. In this situation, the fill should be considered a C soil. If the layer occurred at 30 inches then the depth between 30 and 40 inches may lack natural compaction. Understanding field capacity of the soils is critical to determining if the fill material has adequately settled.

2.4.5 Acceptable Fill Material

Fill material must be an acceptable soil type and free of trash, garbage, solid waste, demolition materials, woody debris (e.g., stumps, branches, sticks, forest slash, and mill yard debris), organic material (e.g., manure, grass and lawn clippings, biosolids, sludge, and compost), unsuitable soils, and large rocks. Based on the site evaluation, the fill material must be no more permeable than the next soil subgroup of the receiving soil. Fill material may be less permeable than the receiving soils.

2.4.6 Mechanical Compaction Not Authorized

Mechanical compaction of fill soils is not an acceptable substitute to weathered fill. Mechanical compaction has its place in providing buildings with structurally stable level bases, essentially preventing the building from settling. The soil-based treatment system of a drainfield, while it too needs a stable base, is easily over-compacted resulting in horizontal flow paths and break out (a type of system failure), or greatly reduced long-term infiltration and subsequent system failure.

2.4.7 Site Preparation

Thick vegetative mats should be removed. Prior to placement of any fill, the natural ground surface should be scarified or plowed to a depth of 6 to 8 inches. This will increase stability and avoid the problems associated with a layer of organic material. Include enough area to run compaction and settling tests. This area should not be included in the drainfield area calculations because the test pit excavations will destroy the area for use as a drainfield.

The original soil should not be compacted before the placement of fill. Compaction can easily happen at construction sites if equipment or other types of vehicles have been operated during periods when the site was wet. On sloping areas, preventing compaction is very critical because saturation zones can develop just above the compacted layer, creating stability problems. Loose soils with significant amounts of volcanic ash are particularly susceptible to compaction. No pneumatic-tired equipment should be permitted on the fill area and fill material in order to prevent soil compaction.

Sites should be avoided where fill has been dumped in piles for a long period and then leveled out because differential settling occurs. The calculation of settling time will begin after leveling.

2.4.8 Enhanced Weathering Procedures

Supplemental irrigation may be employed to shorten the fill weathering time. Enhanced weathering of fill is a process that mimics the yearly or annual hydrologic cycle of soil weathering. The fill soils are brought up to their field capacity by using an irrigation system to mimic rainfall, and then the fill soils are left to dry and settle. Irrigation application methods need to avoid erosion of the fill and formation of rills that allow runoff to occur. A sufficient timeline between irrigation sets needs to be determined based on soil transpiration or soil measurements. Natural weathering of fill material can be enhanced by using supplemental spray irrigation and drying. Fill depth and fill soil type are key factors in determining the length of time needed for this type of site modification.

Elements of a site modification plan for enhanced weathering procedures should include, but may not be limited to the following:

1. Site modification plan application information
   a. Proposed fill area including
      1) Primary and replacement drainfield areas in square feet (ft^2)
      2) Test pads of sufficient size are calculated.
         a) Testing pads are sacrificed by excavation to bottom of fill to determine soil structure/weathering.
   b. Site map
2. Site evaluation
   a. Topography
      1) Elevation
      2) Primary wind direction
   b. Climate
      1) Precipitation and evaporation based on the 30-year averages (this will be an important part of field capacity analysis and natural weathering for the test period)
   c. Access
      1) Equipment access for site ingress and egress
   d. Setbacks
   e. Ground water level determination
3. Soil characterization
   a. Native soil horizons and native soil types
   b. Effective soil depth determination
   c. Soil structural characteristics
   d. Percent rock/gravel
   e. Limiting layers
4. Site modification plan details
   a. Fill depth needed to achieve effective soil depth
   b. Proposed soil type for fill
      1) Follow TGM particularly on sloped ground.
      2) Use information gained in the soil characterization (step 3) to determine fill soil type.

c. Determine fill soil field capacity.
   1) Soil type for the fill will determine the field capacity of the soil.
   2) A soil scientist should determine the volume of fill and corresponding field capacity for the fill. This step is critical to determine the amount of water to apply to the fill material.
   3) The goal is to simulate a natural weathering cycle through artificial water sprinkler application.
d. Irrigation water management plan
   1) The objective is to apply enough water through the sprinkler system to achieve the field capacity of the fill material.
   2) Describe the source of irrigation water, method of application, length of application based on calculated sprinkler flows, and length of the resting period.
   3) Supplemental water application must be through a metered supply with sprinkler coverage measured and monitored.
   4) Irrigation days with high winds and hot temperature (> 90 °F) should be avoided as the water from the sprinkler system will drift and evaporate out of the fill material and not achieve field capacity.
   5) Soil lysimeters can be installed at several depths to measure field capacity and determine when sprinkler application can stop.
      a) The lysimeters provide certainty that the irrigation system is achieving field capacity.
   6) Without lysimeters, additional test pad areas are likely to be needed, along with potentially longer time frames to complete the enhanced weathering process.
   7) Sprinkler activity is on a month-by-month basis to achieve the equivalent of a 10 year soil weathering cycle for a deep fill project.
      a) The sprinkler application period should occur during the growing season, which is typically May–October.
      b) The water cycle must stop during the non-growing season and allow the fill materials to completely dry out to replicate the weathering pattern.
      c) Sprinkler activity should occur over two summers, with additional sprinkler activity in years 3 and 4 depending on the test pad results.

5. Submit plans for review.
6. Install fill material as per section 0 and any additional conditions identified in the plan review.
7. Monitoring
   a. Monitor sprinkler application rate to confirm calculated time for the sprinkler set.
   b. Monitor sprinkler coverage to ensure no areas are left dry.
      1) Ensure overlap of sprinkler coverage.
   c. Monitor lysimeters to confirm field capacity has been met.
   d. Fill material monitoring
      1) Test holes are first excavated with a soil auger to determine soil stability.
      2) Holes that collapse when the soil auger is removed indicate that the fill is not ready for further tests.
      3) Refill hole and tag or mark the spot as sacrificed.
         a) Do not test in this location again.

4) If necessary, repeat test hole soil auger determination until test hole remains open and does not collapse.
    a) This process will require extra weathering time before repeating test hole auger determination.

8. Fill material weathering tests
    a. Excavate test hole with backhoe after the soil auger stability tests are successful.
        1) Test hole excavation needs to be done carefully.
            a) Collapse of the test hole is likely in deep fill materials or with inadequate sprinkling.
            b) Follow safety protocols for septic tank excavation. Be cautious of cave in and sidewall collapse.
            c) Observe the soil structure. Look for massive collapses or sections of sidewall collapse—this is a failure.
            d) Refill test hole and tag or mark the spot as sacrificed.
                a. Do not test in this location again.
            e) Additional sprinkling over the entire area is needed if areas have massive sidewall collapse.
                a. Minor sidewall collapse may be acceptable as this can easily occur with poor excavation technique.
            f) Observing the excavation is critical to determine if partial soil collapse was a result of the mechanical disturbance by the backhoe.
            g) U-shaped trenches indicate unstable soil sidewalls and the need for additional weathering.
    b. Use a geology pick to look for penetration on side walls.
        1) Follow test hole safety protocols.
        2) To check for compaction run a knife or geology pick point vertically on the pit face.
            a) Penetration depth should be about one-half inch to 1 inch into the soil.
            b) A change in resistance to the movement of this sharp object across the soil horizons indicates compaction.
        3) Very distinct platy structure or high bulk density is also indicates compaction.
        4) Field soil densitometer tests should be run, and laboratory bulk density tests should be collected and analyzed.
            a) Compare results to normal soil values for the soil type.
    c. If fill, other than sand, is loose or can be easily dug out by a gloved hand, then adequate settling has not occurred.
9. Fill is ready for installation of a septic system when the pick test, soil densitometer, and soil bulk density test show normal soil compaction.

Appendix C

3.2.4 Drainfields

Whether it is a trench or a bed, the drainfield should not be constructed when the soil is near or wetter than its optimum moisture (IDAPA 58.01.03.008.06). At optimum moisture, a soil will compact to its maximum ability and thus reduce its capability to transmit water. This ability to compact and restrict flow is particularly true of finer soils, such as silt loams and clay loams. It is not as critical in sands or sandy loams.

If it is entirely unavoidable to excavate the drainfield when the soil is drier than optimum, then the sides and bottom should be raked to relieve any compaction. Backhoe buckets and teeth can effectively smear both trench sidewalls and trench bottoms. Therefore, raking should be done manually with a strong iron garden rake after all excavation with a backhoe is complete and before the drainrock is put in place.

Drainrock should be checked for cleanliness before it is placed in the trenches. Long transportation time may generate additional fines. If drainrock is found to be unsuitably dirty when it arrives at the site, it can often be cleaned in the truck by tipping the truck bed slightly and washing the rock with a strong stream of water.

Trenches do not have to be constructed straight. It is always preferable to follow the contour of the land. The drainfield must not be installed in floodways, at slope bases, in concave slopes, or depressions. Drainfield areas shall be constructed to allow for surface drainage and to prevent ponding of water over the drainfield.

Error! Reference source not found. gives the lengths of trenches in the seven soil subgroups (A-2 as two application rates; see section 2.3, Table 2-10).

Drainfields larger than 1,500 ft^2 trench area bottom are prohibited from being constructed as a standard (gravity) drainfield (IDAPA 58.01.03.008.04). Drainfields exceeding 1,500 ft^2 in total trench bottom area must be pressure-dosed (section 4.20).

Appendix D

4.25 Sand Mound

Description

A soil absorption facility consisting of a septic tank, pumping chamber or dosing siphon and chamber, mound fill of selected sand with a small diameter pipe distribution system, cap and top soil. See **Figure 4-24** for a diagram of a sand mound.

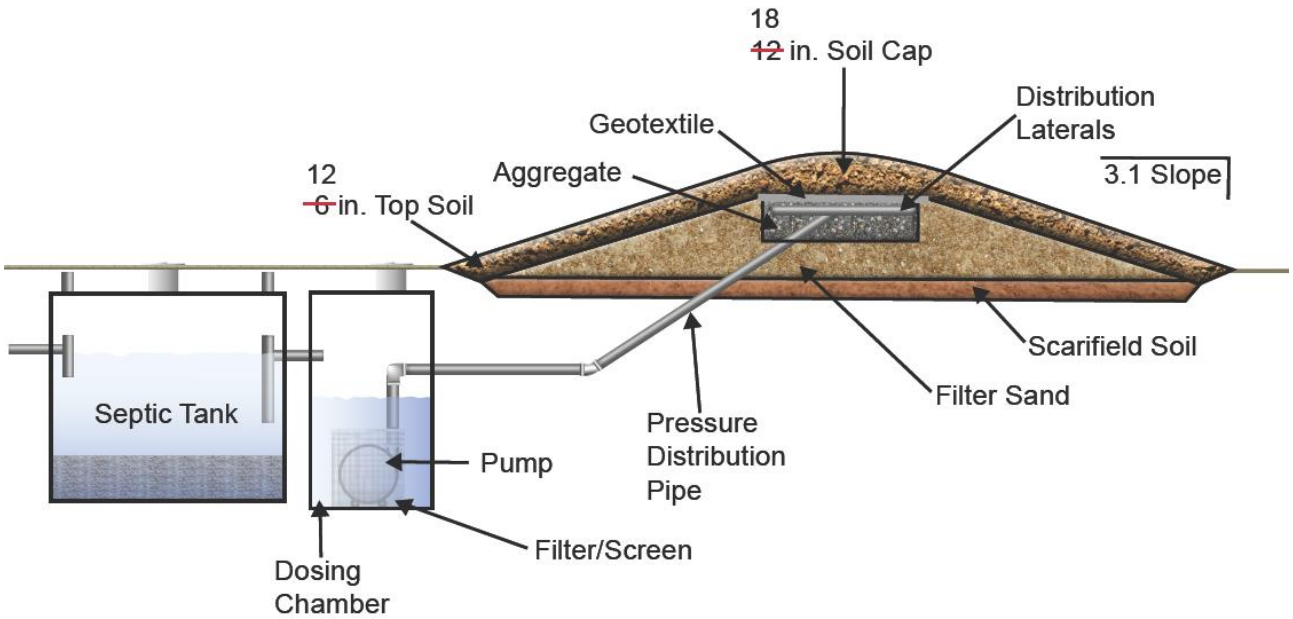


Figure 4-24. Cross-Sectional View of Sand Mound

1.

Conditions for Approval

Effective soil depth to limiting layers may vary depending upon thickness of filter sand beneath the absorption bed:

a. If 12” of filter sand is placed beneath the absorption bed, then Table 4-19 lists the minimum depth of natural soil to the limiting layer.

b. If 24” of filter sand is placed beneath the absorption bed, then Table 4-17, in the intermittent sand filter section, identifies the effective soil depth to limiting layers.

Table 4-19. Minimum Depth of Natural Soil to Limiting Layer, in Feet

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

2. For Soil Textural classifications of Sandy Clay, Silty Clay, Clay or coarser textured soils with percolation rates from 60 to 120 min. per inch, the minimum depth of natural soil to the limiting layer shall conform to that for Soil Design Group C.

3. Table 4-20 shows the maximum slope of natural ground, listed by soil design group.

Table 4-20. Maximum Slope of Natural Ground

Design Group	A	B	C-1	C-2
Slope, Percent	20	20	12	6

4. The sand mound must not be installed in flood ways, areas with large trees and boulders, in concave slopes, slope bases or depressions.

5. The minimum pretreatment of sewage prior to disposal to the mound must be a septic tank sized according to the rules. Design flow must be 1.5 times the wastewater flow.

Design

Figure 4-15 can be used with Table 4-22 (Sand Mound Design Checklist) for flat and sloped sites.

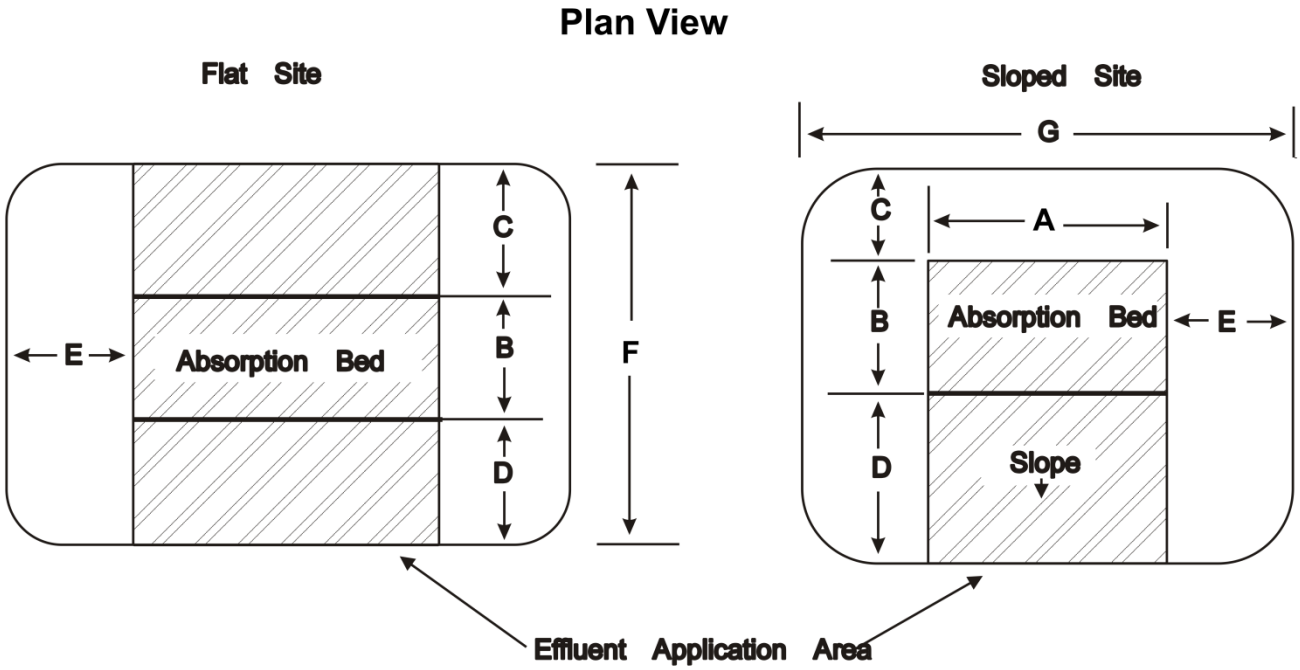


Figure 4-15. Illustration Used in Conjunction with Sand Mound Design Checklist for Flat and Sloped Sites

1. Bed design:

   a) Only absorption beds may be used. The maximum bed area should be 2250 square feet (A x B). Beds in commercial or large systems should be a maximum of fifteen feet (B < 15') wide and beds for individual dwellings less than ten feet (B < 10') wide. Beds should be as long and narrow as practical, particularly on sloped ground, to minimize basal loading.

   b) The application rate of effluent in the sand bed should be calculated at 1.0 gallon per square foot (sand AR = 1.0 g/ft^2).

   c) Absorption beds for commercial establishments that discharge other than normal strength domestic waste should be sized at 0.5 gallons per square foot (0.5 g/ft^2) or 40 lbs. BOD/acre/day, whichever is greater.

   d) The bed must be filled with nine inches (9") of clean drain rock.

2. e) The drain rock portion of the sand mound must be covered with a geotextile after installation and testing of the pressure distribution system.

   Sand fill design:

   a) Filter sand must conform to ASTM C-33, with less than 2% passing the # 200 sieve. Manufactured sand is recommended.

   b) The minimum depth of filter sand below the bed shall be one foot (1'), and the effective soil depths to limiting layers are identified in Table 4-19. If two feet (2') of filter sand is placed

beneath the bed, then effective soil depth to limiting layers may be reduced to those listed in the intermittent sand filter section Table 4-17.

c) Flat sites: The effective area will be A x (C+B+D).

d) Sloped sites: The effective area will be A x (B+D).

Equation shows the calculation for the absorption bed area.

Equation 4-16. Effluent Application Area = $\dfrac{\text{Design Flow (gpd)}}{\text{Soil Application Rate } (\text{gpd}/\text{ft}^2)}$

e) The slope of all sides must be 3 horizontal to 1 vertical (3:1) or flatter.

f) The sand mound must be covered with a minimum topsoil depth of twelve (12) inches. The soil cap at the center of the mound must be crowned to eighteen (18) inches. Topsoil and soil cap must be a sandy loam, loamy sand, or silt loam.

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

h) The sand fill area must be as long and narrow as practical, with plan view dimension G exceeding dimension F. (Refer to **Figure 4-1**5.)

Construction

1. The pressure line from the dosing chamber should be installed first and should be located up-slope of the mound. If located downslope, consider using anti-seep collars on trench. If a pump is to be used the pressure line should slope down to the pump so that the pressure line will drain between discharges.

2. Grass, shrubs, and trees must be cut close to ground surface and removed from the mound site. If extremely heavy vegetation or organic mat exists, these materials should be removed prior to scarification and replaced with filter sand (typically 3 or 4 inches of filter sand is added.) When the soil is dry the ground in the area of the sand fill should then be scarified or ripped to a depth of 6” to 8”. The importance of the ripping is to provide vertical windows in the soil. Tree stumps are not to be removed. If stumps are numerous, additional area should be calculated into the total sand area to compensate for the lost area.

3. The sand fill will then be placed and shaped before it freezes or rains. No pneumatic-tired vehicles should be permitted on the sand or plowed area in order to prevent the soils from being compacted. For sloped sites, all work is done from the up-slope side.

4. The absorption bed will be shaped and filled with clean drain rock.

5. After leveling the drain rock, the low pressure distribution system manifold and laterals will be installed. The system should be tested for uniformity of distribution.

6. Geotextile must be placed over the absorption bed and backfilled with twelve (12) inches of soil on sides and shoulders, and eighteen (18) inches of soil on the top center. Soil types must be

sandy loam, loamy sand, or silt loam.

7. Typical lawn grasses and other appropriate low-profile vegetation should be established as soon as possible, preferably before the system is put into operation. Do not plant trees or shrubs on the mound. Trees with roots that aggressively seek water must be planted at least fifty (50) feet from the mound (poplar, willow, cottonwood, maple, elm, etc…).

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

8. ***Inspections***

Site inspections must be made by the Director before, during and after construction.

1. The designer or owner must certify that the system has been installed per the approved plans.

2. Table 4-21 is a sample sand mound design checklist, and Table 4-22 is a blank checklist for sand mound design.

Table 4-21. Sample Sand Mound Design Checklist

	SAND MOUND DESIGN CHECKLIST **{Example for a 3 bedroom house on B-2 soils, flat site}**	
1	Determine soil Application Rate (AR) {Ex: B-2 soil}	AR = GPD/ft^2 {Ex: 0.45 gpd/ft^2}
2	Determine Daily Flow Rate (DFR) {Ex: 250 GPD x 1.5 safety factor}	DFR = GPD {Ex: 375 GPD}
	BED DESIGN:	
3	$Area = \frac{Daily_Flow_Rate_GPD(\#2)}{Sand_Application_Rate_{}^{GPD}/_{ft^2}\left(1.0_{}^{GPD}/_{ft^2}\right)}$	Area = ft^2 {Ex: 375 ft²}
4	Width (B): $Width_(B) = \sqrt{\frac{Area_(\#3) \times Soil_AR_(\#1)}{Sand_Application_Rate_\left(1.0\,{}^{GPD}/_{ft^2}\right)}}$ Maximum Bed Width: Commercial = 15 ft., Residential = 10 ft. Ex: $Width_(B) = \sqrt{\frac{(\#3 \times \#1)}{1.0\,{}^{GPD}/_{ft^2}}} \approx 13\,ft$	Width (B) = ft. {Ex: 13 ft. or 10 ft. max} {Ex: use 10 ft.}
5	Length (A): $Length_(A) = Area_(\#3)/Width_(\#4)$ {Ex: 375 ft² / 10 ft.}	(A) ft. {Ex: 37.5 ft.}
	SAND MOUND DESIGN:	
6	Total Area (TA): $EAA = DFR_(\#2)/soil_AR_(\#1$ {Ex: 375 gal / 0.45 gal/ft^2}	TA = ft^2 {Ex. 833 ft²}
7	Effluent Application Area (EAA) = Total Area - Bed Area: EAA = TA (#6) – Area (#3) = {Ex. 833 ft^2 – 375 ft^2}	EAA = ft^2 {Ex. 458 ft²}
8	Flat site perimeter (C,D): 0.5x[EAA (#7) / Length (#5)] {Ex. 458/37.5)/2} {5.25 ft. minimum}	(C) = (D) = ft. {Ex. 6.1 ft.}
9	Sloped site: Downslope Length (D) = EAA (#7) / Length (#5)	(D) = ft.
10	Sloped site: Upslope (C) = (Bed depth + max. sand depth) x 3	(C) = ft.
11	End slope (E) = (Bed depth + max. sand depth) x 3 {Ex: (0.75 ft. + 1.0 ft.) x (3)}	(E) = ft. {Ex. 5.25 ft.}
12	Total Width (F) = B + C + D {Ex. 10 + 6.1 + 6.1}	(F) = ft. {Ex: 22.2 ft.}
13	Total length (G) = A+(2 x E) (G > F) {Ex: (G) = 37.5 ft. + 2 x 5.25 ft.}	(G) = ft. {Ex: 48 ft.}
	FINISHED MOUND DIMENSIONS:	
14	Sand Mound Length + 6 ft. Min. (G + 6) {Ex: 48 ft. + 6 ft.}	(G+6) = ft. {Ex: 54 ft.}
15	Sand Mound Width + 6 ft. Min. (F + 6) {Ex: 22.2 ft. + 6 ft.}	(F+6) = ft. {Ex: 28.2 ft.}

Table 4-22. Sand Mound Design Checklist

	SAND MOUND DESIGN CHECKLIST	
1	Determine soil Application Rate (AR)	AR = _____GPD/ft^2
2	Determine Daily Flow Rate (DFR)	DFR = _____GPD
	BED DESIGN:	
3	$Area = \frac{Daily_Flow_Rate_GPD(\#2)}{Sand_Application_Rate_{}^{GPD}/_{ft^2}\left(1.0_{}^{GPD}/_{ft^2}\right)}$	Area = _____ft^2
4	Width (B): $Width_(B) = \sqrt{\frac{Area_(\#3) \times Soil_AR_(\#1)}{Sand_Application_Rate_\left(1.0\,{}^{GPD}/_{ft^2}\right)}}$ Maximum Bed Width: Commercial = 15 ft., Residential = 10 ft.	Width (B) = _____ft.
5	Length (A): $Length_(A) = Area_(\#3)/Width_(\#4)$	(A) _____ft.
	SAND MOUND DESIGN:	
6	Total Area (TA): $EAA = DFR_(\#2)/soil_AR_(\#1)$	TA = _____ft^2
7	Effluent Application Area (EAA) = Total Area - Bed Area: EAA = TA (#6) – Area (#3)	EAA = _____ft^2
8	Flat site perimeter (C,D): 0.5 x [EAA (#7) / Length (#5)] {5.25 ft. minimum}	(C) = (D) = _____ft.
9	Sloped site: Downslope Length (D) = EAA (#7) / Length (#5)	(D) = _____ft.
10	Sloped site: Upslope (C) = (Bed depth + max. sand depth) x 3	(C) = _____ft.
11	End slope (E) = (Bed depth + max. sand depth) x 3	(E) = _____ft.
12	Total Width (F) = B + C + D	(F) = _____ft.
13	Total length (G) = A+(2 x E) (G > F)	(G) = _____ft.
	FINISHED MOUND DIMENSIONS:	
14	Sand Mound Length + 6 ft. Min. (G + 6)	(G+6) = _____ft.
15	Sand Mound Width + 6 ft. Min. (F + 6)	(F+6) = _____ft.

Appendix E

5.10 Pipe Materials for Specified Uses

Revision: October 23, 2012

Table 0-2 shows pipe materials for specified uses.

Table 0-2. Pipe materials for specified uses.

Pipe Material and Specification[a]		Function				
		House to Tank[b]	Tank to Dosing Chamber	Tanks to Drainfield[c,d]	Gravity Drainfield[c,d]	Pressure Distribution System
ABS Sch. 40[e]	ASTM D2661		X	X	X	X
	ASTM F628		X	X	X	X
PVC	ASTM D3034[f]		X	X	X	
	ASTM D2729				X	
	ASTM D2241		X	X	X	X
	AWWA C900		X	X	X	X
	ASTM D2665		X	X	X	
	ASTM D1785		X	X	X	X
PE	AWWA C906		X	X	X	X
	ASTM F810[g]			X	X	
	ASTM F405[h]				X	

Notes: polyvinyl chloride (PVC); acrylonitrile-butadiene-styrene (ABS); polyethylene (PE); American Society for Testing and Materials (ASTM); American Water Works Association (AWWA)
a. Or equivalent materials as specified by ASTM or AWWA.
b. See State of Idaho Division of Building Safety, Plumbing Bureau.
c. Specified in section 3.2.2 of the *Technical Guidance Manual for Individual and Subsurface Sewage Disposal Systems* (TGM).
d. Must use ASTM D3034 or equivalent as specified in 3.2.3 of the TGM. ASTM D3033 piping was previously approved for use spanning the tank to dosing chamber, tank to drainfield, and in the drainfield.
e. ABS Schedule 40 or piping material of equal or greater strength. Required by IDAPA 58.01.03.007.21.a.
f. Excavation must be compacted with fill material to 90% standard proctor density, with a minimum of 12 inches of cover material. Required by IDAPA 58.01.03.007.02.b.
g. Smooth wall high-density polyethylene (HDPE), white suitable for effluent and drainfield piping.
h. Corrugated HDPE, black with stripe, flexible, suitable for drainfield piping.

3.2.3 Septic Tanks and Dosing Chambers

Both concrete septic tanks and dosing chambers should be placed on original soil. They should not be placed on unconsolidated or un-compacted fill greater than 6 inches deep. Some fill is often needed to make a smooth bearing surface in the bottom of the excavation that will receive the tank or chamber.

Concrete tanks or chambers often leak if not coated with a bituminous coating or other sealer. Such sealing is recommended in all dosing chambers and septic tanks placed in or near ground water or in porous soils.

All plastic, polyethylene, and fiberglass tanks must be installed according to the manufacturers' recommendations (IDAPA 58.01.03.007.18).

All septic tanks must have a riser if the manhole opening of the tank is deeper than 24 inches below the ground surface. The riser must come within 18 inches of the surface (IDAPA 58.01.03.007.19). Dosing chambers must have the manhole extended to the ground surface.

ABS Schedule 40 or equivalent is recommended to connect septic tanks to dosing chambers. It is also recommended that the pipe span the septic tank excavation and extend at least 3 feet beyond. Thinner-walled ASTM D3034 plastic pipe may be used if the void at the tank's side is compacted with fill material. The material must be granular, clean, and compacted to 90% proctor density. The ASTM D3034 grade of plastic pipe is suitable if placed on undisturbed earth, used as the house sewer, and used as the distribution line to the drainfield and within the drainfield. There should not be less than 12 inches of cover over thin-walled plastic pipe. ASTM D2729 pipe is acceptable for use as the effluent pipe. ASTM D2729 is not a suitable class of pipe to span the septic tank or for dosing chamber excavation. ASTM D2729 must be laid on a stable base and not driven over by excavation equipment. See IDAPA 58.01.03.007.21 for inlet and outlet piping requirements.

Appendix F

2.1.4 Medium Sand

The following definitions may be used to determine if a soil texture is a medium sand:

1. Conforms to the gradation requirements of American Society for Testing and Materials (ASTM) C-33 and less than 2% passes a #200 sieve (**Table 0-3**).

2. ~~Conforms to the USDA definition of a medium sand (Table 2-6).~~

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

Table 0-3. Modified ASTM C-33 medium sand allowable particle size percent composition.

Sieve Size	Passing (%)
4	95–100
8	80–100
16	50–85
30	25–60
50	10–30
100	2–10
200	< 2

~~**Table 2-6. United States Department of Agriculture test for medium sand.**~~

~~Sieve Size~~	~~Millimeter Size~~	~~Passing (%)~~
~~4~~	~~2–10~~	~~100~~
~~10~~	~~1–2~~	~~75~~
~~16~~	~~0.1–1~~	~~50~~
~~140~~	~~0.05–0.1~~	~~0–15~~

Appendix G

4.20.3.5 In-tank Pumps

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

1. The site is too small for the installation of a dosing chamber or a septic tank with a segregated dosing chamber compartment, or the flows are less than 100 gallons per day.

~~1.~~2. Sewage effluent pumps must be placed in an approved pump vault.

~~2.~~3. Effluent drawdown from the septic tank is limited to a maximum 120 gallons per dose with a maximum pump rate of 30 GPM.

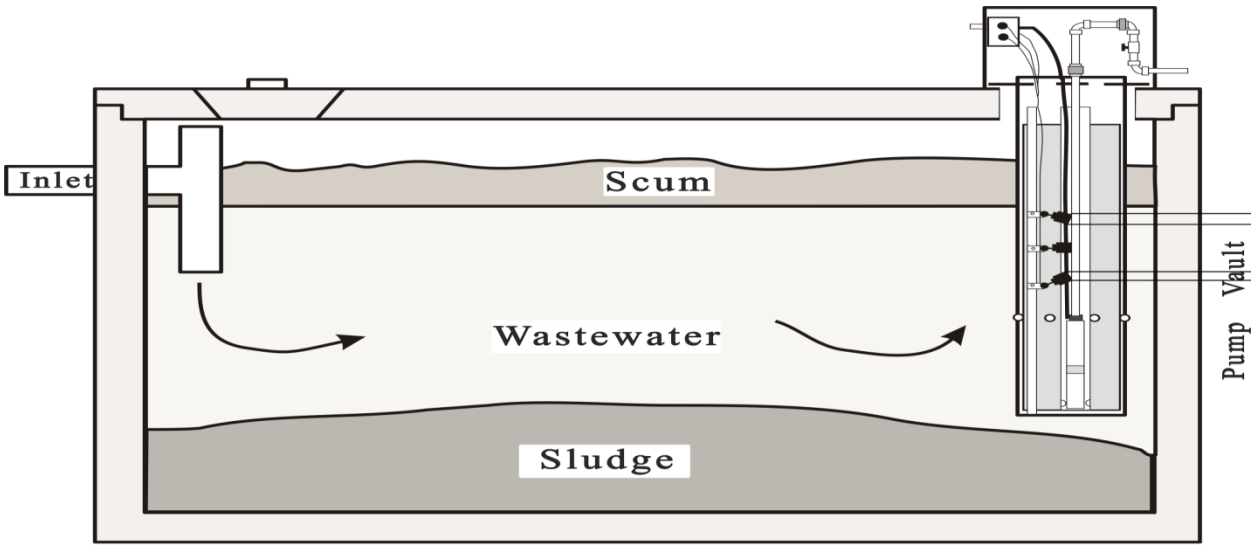
~~3.~~4. Septic tanks must be sized to allow for 1-day flow above the high-water alarm, unless a duplex pump is used.

~~4.~~5. Pump vault inlets must be set at 50% of the liquid volume.

~~5.~~6. Pump vault placement inside the septic tank shall be in accordance with the manufacturer's recommendations.

~~6.~~7. Pump vault screens shall be one-eighth inch holes, or slits (or smaller); be constructed of noncorrosive material; and have a minimum area of 12 ft^2.

~~7.~~8. Pump vault and pump placement must not interfere with the floats or alarm, and the pump vault should be easy to remove for cleaning (Figure 0-2).



In-Tank Pump Vault

Figure 0-2. Example of effluent pump installed into single-compartment septic tank.

Appendix H

4.12 Gravelless Trench System

Revision: October 23, 2012

4.12.1 Description

A gravelless trench system meets all the requirements of a standard trench system except that the drainrock is replaced by an approved gravelless trench component (section 5.7). Typical components include gravelless chambers, large diameter nylon fabric wrapped piping of varying dimensions, and drainrock substitution systems. Gravelless trench systems are allowed a reduction in trench bottom square footage due to the reduced masking of infiltrative surface. The reduction is only allowed in trench designs up to 36 inches in width. No reduction is allowed for installation widths greater than 36 inches, or for installation in sand mound designs.

4.12.2 Approval Conditions

1. Unless otherwise noted, the system must be installed according to the gravelless trench component manufacturer's recommendations.
2. An approved septic tank effluent filter (section 5.9), based on manufacturer's recommendations may be installed at the septic tank outlet for basic drainfield applications (pump chamber and extended treatment system applications are exempt from this approval condition).

~~1.~~3. Reduction in square footage cannot be in addition to other allowable disposal area reductions (i.e., drainfield reductions due to increased application rates for treatment).

4.12.3 Design

1. Length of ~~pipe~~ gravelless trench product needed should be calculated on the following basis:

   a. ~~8 inch diameter pipe = 2 ft^2 effective area~~ Disposal trench length is determined by the application rating for each product (section 5.7, table 5-5, rating column).

      Example (large diameter pipe):

      i. Product selected has a rating (square feet of application area per linear foot) of 1.33 ft^2/ft. based on one pipe per trench installation (see Section 5.7, table 5-6, for application rates based on the installed width of the product such as two pipes per trench).

      ii. 3 bedroom home (250 GPD) in soil design subgroup B-1 soils (application rate of 0.6 gallons per day/square foot)

      ~~i.~~iii. ([250 GPD]/[0.6 GPD/ft^2])/(1.33 ft^2/ft.) = 314 linear feet of gravelless trench product

      Example (gravelless chamber):

i. Product selected has a rating (square feet of application area per linear foot) of 4.0 ft^2/ft

ii. 3 bedroom home (250 GPD) in soil design subgroup B-1 soils (application rate of 0.6 gallons per day/square foot)

~~i.~~iii. ([250 GPD]/[0.6 GPD/ft^2])/(4.0 ft^2/ft) = 105 linear feet of gravelless trench product

b. ~~10-inch diameter pipe = 3 ft effective area~~Disposal trench length is calculated the same way for both gravelless pipe and gravelless chamber products (attention must be paid to specific product application ratings). Gravelless pipe application rate will increase if installed in a side-by-side application (refer to Section 5.7, table 5-6, rating column based on installed product width.

~~b.~~c. Width of trench is dependent upon the manufacturer's installation requirements for each approved product.

~~Effective area is equivalent to trench bottom area.~~

~~2.~~ ~~Example: A three-bedroom home (250 GPD) on a site with sandy loam soil (soil design subgroup B-1, 0.6 GPD/ft^2) would require 209 linear feet of 8-inch pipe ([250/0.6]/2) or 139 linear feet of 10-inch pipe ([250/0.6]/3).~~

2. Individual lines in soil design group C soils should be as long as possible, not exceeding the 100-foot maximum.

~~4. An inspection port/sludge sump should be installed at the end of each line.~~

4.12.4 Construction

1. The trench should follow the contour of the land~~, and the pipe should be installed between 18 and 36 inches below the surface~~.

2. Trench excavations should not be less than ~~18~~12 inches wide and no more than 36 inches wide. Width dimensions will be dependent upon the manufacturer's installation instructions.

3. Pipe must be installed level ~~with an allowable variation of not more than one-half inch per 100 feet~~. A transit, engineer's level, or surveying station is required.

4. An inspection port/sludge sump should be installed at the end of each line.

5. Large diameter gravelless pipe products should be covered with geotextile fabric, untreated building paper, or a 3 inch layer of straw unless the product has a built in filter fabric in the design.

   a. Gravelless chambers are not required to be covered with geotextile fabric, untreated building paper, or straw unless specifically required by the manufacturer.

6. Care must be taken not to over-excavate trench width wider than the product width

a. If over-excavation is unavoidable hand backfilling of trench should be performed up to the product height and fill should be walked in to ensure sidewall support of the product.

~~*Note*: Gravelless domed chamber systems are awarded a 25% reduction in size if arranged in trenches. No reduction is allowed for bed or sand mound designs.~~