Ch 25 Stakeholder Comments 1

Gina Johnson <gina.johnson@wyo.gov>

Fwd: CH 25 comments

1 message

William Tillman <william.tillman@wyo.gov> Wed, Feb 27, 2013 at 9:49 AM
To: Gina Johnson <gina.johnson@wyo.gov>

---------- Forwarded message ----------
From: Hannes Stueckler <hannes.stueckler@wyo.gov>
Date: Mon, Feb 4, 2013 at 5:07 PM
Subject: CH 25 comments
To: William Tillman <william.tillman@wyo.gov>

Section 6
(a) "...shall not be located beneath buildings or irrigated landscaping. Small wastewater systems shall not be located underneath parking lots, roadways, driveways or similarly compacted areas unless specifically designed for this application and approved by the administrator."

This will allow for systems such as the Presby Enviroseptic, which can be effectively used in these circumstances.

(d) Question: Is the mounding from figures 1 - 6 to be added to the 4 foot separation requirement under all circumstances? This would mean that our ground water separation distance requirement for a typical residential application would have increased from 4 feet to between 4.2 and 9.5 feet. This is contrary to practices found elsewhere and to evidence indicating that four feet may be too conservative.

Section 10
(c) " as level as possible. Inflow to the tee fitting shall be perpendicular to both of the outflow ports."

Section 16

General: Should have separate requirements for single use residential and multi-family/commercial. The language has already been written and is available.

(b) (ii) (B) & (C): Directly contradicts Chapter 21. The treatment and exposure requirements are more stringent for treated residential greywater than they are for municipal sewage treated to the same level. The treated greywater rules should not be any more restrictive than a Class A treated municipal wastewater if we are going to require the same level of treatment for both (2.2 fc/ 100ml or less).

(c) (ii) (B): We do not need to overflow treated, Class A water to the blackwater system. Suggest "Shall have an overflow to to an approved greywater system or blackwater system."

(c) (ii) (C) (I): Should be "(c) (ii) (D)"; Contradicts (c) (ii) (C), as septic tank design requires 36 hour detention; Strongly Disagree. Not all outdoor greywater holding tanks need to be 1000+ Gallons due to maximum 24 hour detention time.; Tank does not need to be buried. Most greywater systems are gravity flow designs, and head pressure is the driving factor in almost all layout. Requiring a below grade tank would not only make a pump mandatory, it would also make it completely unfeasible for a single residence system. I suggest the following language:

(C) Shall be constructed and installed in compliance with Chapter 25, Section 9 with the following exceptions.
(I) Seasonal use or freeze protected settling tanks do not need to be installed below grade.
(II) The settling tank can be smaller than 1000 gallons.

(III) Settling tanks can be directly vented if not connected by gravity drain to building plumbing.

(c) (ii) (E) (I) should be moved to (c) (ii) (E); Will lead to putrification of solids collected in the tank.; Suggest "Filtration, if called for in the design, shall occur prior to the greywater collection tank."

(c) (ii) (E) Filters should be moved to (c) (iii)

(c) (iii) (C) Can lead to checkvalve destruction if located too close to the pump discharge. Suggest "Shall be protected against backflow with a checkvalve."

(c) (iii) (D) Suggest "Pressurized irrigation systems fed by potable water systems shall be isolated by air gap backflow prevention. Air gap

shall be at a higher elevation than all holding tank overflow, and shall be at least two pipe diameters in length."

Ch 25 Stakeholder Comments 2

(c) (v) (A) (I) (7) Suggest "Compost piles are shall be designed according to (c) (v) (A) (I) (5)& (6)."

(c) (v) (B) (I) (3) Replace "exceed" with "in excess of"

(c) (v) (A) (II) Contradicts Chapter 21, as mentioned previously.

(c) (v) Disinfection should be (c) (vi) Disinfection.

(c) (v) (A) (I) & (II) Second use of "shall be" should say "of".

(d) (i) (B) Contradicts Ch 21, as previously stated.

(d) (i) (C) What is the justification for the language change from requiring written permission to cross property boundaries?

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"Live like there's no tomorrow. One day you'll be right"

Ch 25 Stakeholder Comments 3

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Fwd: Chapter 25 Comments

1 message

William Tillman <william.tillman@wyo.gov> Wed, Feb 27, 2013 at 9:49 AM
To: Gina Johnson <gina.johnson@wyo.gov>

---------- Forwarded message ----------
From: Steve Warner <steve.warner@fremontcountygovernment.org>
Date: Tue, Feb 5, 2013 at 11:03 AM
Subject: Chapter 25 Comments
To: william.tillman@wyo.gov

Bill -

Enclosed is the PDF draft copy of Chapter 25. I have highlighted and inserted comments where I felt appropriate. If this format isn't acceptable, please let me know and I will write out my comments and re-send them to you. You will note that I do have a few questions. Hope to get some answers from you at your convenience.

Thank you for allowing me to participate in the review process.

Sincerely,

Steve Warner

Small Wastewater Specialist

Fremont County, WY

--
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Chapter 25
SMALL WASTEWATER SYSTEMS

Table of Contents

CHAPTER 25

SMALL WASTEWATER SYSTEMS

Section 1. Authority.

This rule is promulgated pursuant to Wyoming Statutes (W.S.) 35-11-101 through 35-11-1701, specifically 35-11-302(a)(iii).

Section 2. Objective.

This Chapter contains the minimum standards for the design and construction of small wastewater systems which are defined by W.S. 35-11-103(c)(ix). The two thousand (2,000) gallons defined in the statute shall be the average flow of domestic sewage per day.

Section 3. Definitions.

(a) "**Absorption surface**" means the interface where treated effluent infiltrates into native or fill soil.

(b) **"Advanced treatment"** means a treatment process that achieves an effluent being discharged to the absorption surface or native soil with 5 day biochemical oxygen demand (BOD_5) and total suspended solids (TSS)less than or equal to 30 mg/L.

(c) "**Bed**" means a soil treatment and dispersal system, the width is greater than three (3) feet.

(d) **"Bedrock"** means geological layers, of which greater than 50 percent by volume consist of unweathered in-place consolidated rock or rock fragments. Bedrock also means weathered in-place rock which cannot be hand augered or penetrated with a knife blade.

(e) **"Bedroom"** means any room that is or may be used for sleeping.

(f) **"Blackwater"** means water containing fecal matter and urine.

(g) **"Building sewer"** means the pipe which carries wastewater from the building.

(h) **"Chamber"** means a domed open bottom structure that is used in lieu of perforated distribution pipe and gravel media.

(i) **"Delegated small wastewater program"** means a local governmental entity, delegated by the Administrator, with the authority to administer the provisions of W.S. 35-11-301(a) (iii) for small wastewater systems pursuant to the provisions of W.S. 35-11-304.

(j) **"Domestic wastewater"** means a combination of the liquid or water-carried wastes from residences, business buildings, institutions, and other establishments arising from normal living activities.

(k) **"Domestic Septage"** means liquid or solid material removed from a waste treatment vessel that has received only wastes from residences, business buildings, institutions, and other establishments arising from normal living activities.

(l) **"Dosing tank"** means a tank equipped with an automatic siphon or pump designed to discharge effluent on an intermittent basis.

(m) **"Drain field"** means a shallow, covered, excavation made in unsaturated soil into which pretreated wastewater is discharged through distribution piping for application onto absorption surfaces through porous media or manufactured components placed in the excavations.

(n) **"Effluent"** means a liquid flowing out of a septic tank, other treatment vessel or system.

(o) **"Effluent filter"** means a removable, cleanable device inserted into the outlet piping of a septic tank or other treatment vessel designed to trap solids that would otherwise be transported to the drain field or other downstream treatment components.

(p) **"Evapotranspiration"** means the combined loss of water from soil by evaporation from the soil or water surface and by transpiration from plants.

(q) **"Greywater"** means household wastewater which has not been contaminated by toilet discharge. Greywater includes wastewater from baths, showers, bathroom wash basins, clothes washing machines, sinks (including kitchen sinks) and laundry tubs.

(r) **"Grease interceptor"** means a device designed to separate fats, oils, and grease from the wastewater.

(s) **"Groundwater"** means subsurface water that fills available openings in rock or soil materials such that they may be considered water saturated under hydrostatic pressure.

(t) **"High groundwater"** means seasonally or periodically elevated levels of groundwater.

(u) **"High Strength Wastewater"** means a wastewater stream with a five (5) day BOD higher than 200 mg/l.

(v) "**Holding Tank"** means a watertight receptacle designed to receive and store wastewater.

(w) **"Manifold"** means a non-perforated pipe that distributes effluent to individual distribution pipes.

(x) **"Mound system"** means an onsite wastewater system where the bottom of the absorption surface is above the elevation of the existing site grade, and the absorption surface is contained in a mounded fill body above the grade.

(y) **"Percolation Rate"** means the time expressed in minutes per inch required for water to seep into saturated soil at a constant rate during a test.

(z) **"Percolation test"** means the method used to measure the percolation rate of water into soil as described in Appendix A.

(aa) **"Pressure distribution"** means a network of distribution pipes in which effluent is forced through orifices under pressure.

(bb) **"Pretreatment"** means any technology or combination of technologies that precedes discharge to a drain field or other final treatment unit or process before final dissemination into the receiving environment.

(cc) **"Restrictive layer"** means a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide unfavorable root conditions. Examples are bedrock, cemented layers, dense layers, and frozen layers.

(dd) **"Septic tank"** means a buried, watertight tank designed and constructed to receive and treat raw wastewater.

(ee) **"Service provider"** means a person authorized and trained by a system manufacturer or their vendor to operate and maintain any proprietary system which provides advanced treatment

(ff) **"Trench"** means an absorption surface with a width of three (3) feet or less.

Section 4. <u>Design Flows.</u>

The quantity of wastewater shall be determined by one of the following:

(a) Tables 1 and 2 provided in this section.

(b) Metered water supply data from the facility.

(c) Metered water supply data from another facility where similar water demands have been demonstrated.

Table 1. Residential Average Design Flow Rates per Bedroom (gallons per day, gpd)[1]

1 bedroom	150
2 bedrooms	280
3 bedrooms	390
4 bedrooms	470
5 bedrooms	550
6 bedrooms	630

[1]An unfinished basement is considered an additional bedroom

Table 2. Non-Residential Average Wastewater Design Flow Rates

Facility	Unit	Flow (gallons/unit/day)
Airports	person	4
Apartment	bedroom	120
Automobile Service Station	vehicle served	10
Bars	seat	20
Bathhouses and swimming pools	person	10
Campgrounds (w/ toilets only)	person	25
Campgrounds (w/shower facility)	person	45
Church	person	4
Country Club	member	25
Day School, Office building, Retail Store, Warehouse (no showers)	person	15
Hospital	bed	250
Industrial Building (sanitary waste only)	employee	20
Laundry (self-service)	machine	450
Motel, Hotel, Resort	bedroom	210
Rest Home, Care Facility, Boarding School	bed	100
Restaurant	meal	10
Theater	seat	3

Section 5. <u>Systems not Specifically Covered by this rule.</u>

This section is provided to encourage new technology and equipment and provide a process for evaluating and permitting designs which deviate from this rule. The proposed construction of facilities and processes not in compliance with this rule will be permitted provided that the facility, when constructed, can operate meeting the purpose of these rules.

(a) Each application for a permit to construct will be evaluated on a case-by-case basis using the best available technology. The application shall include at least one of the following:

(i) Data obtained from a full scale, comparable installation which demonstrates the acceptability of the design.

(ii) Data obtained from a pilot plant operated under the design condition for a sufficient length of time to demonstrate the acceptability of the design.

(iii) Data obtained from the theoretical evaluation of the design which demonstrates a reasonable probability of the facility meeting the design objectives.

(iv) An evaluation of the flexibility of making corrective changes to the constructed facility in the event it does not function as planned

(b) If an applicant wishes to construct a pilot plant to provide data necessary to show the design will meet the purpose of the act, a permit to construct must be obtained.

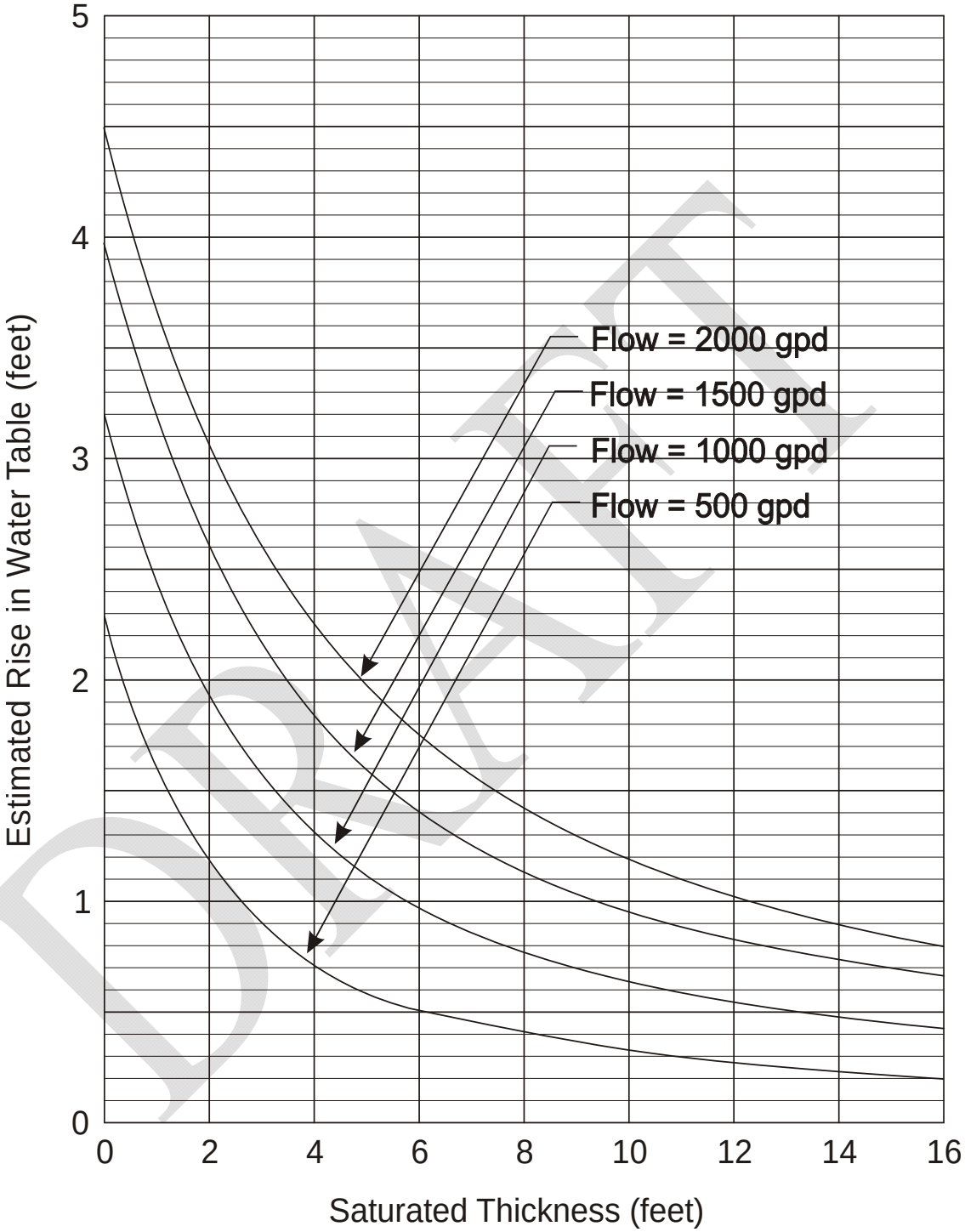
Section 6. Site Suitability.

(a) Locate the small wastewater system where the surface drainage is good. Avoid depressions and bases of slopes and areas in the path of runoff from roofs, patios, driveways, or other paved areas unless surface drainage is provided. Small wastewater systems shall not be located beneath buildings, parking lots, roadways, driveways, irrigated landscaping or other similarly compacted areas.

(b) The site must be large enough to include area for a future replacement drain field. Both the proposed and replacement drain fields shall be sized to receive one-hundred (100%) percent of the wastewater flow. If a trench system is used, the replacement drain field may be located between the trenches of the proposed drain field if there is at least nine (9) feet of spacing between trench sidewalls.

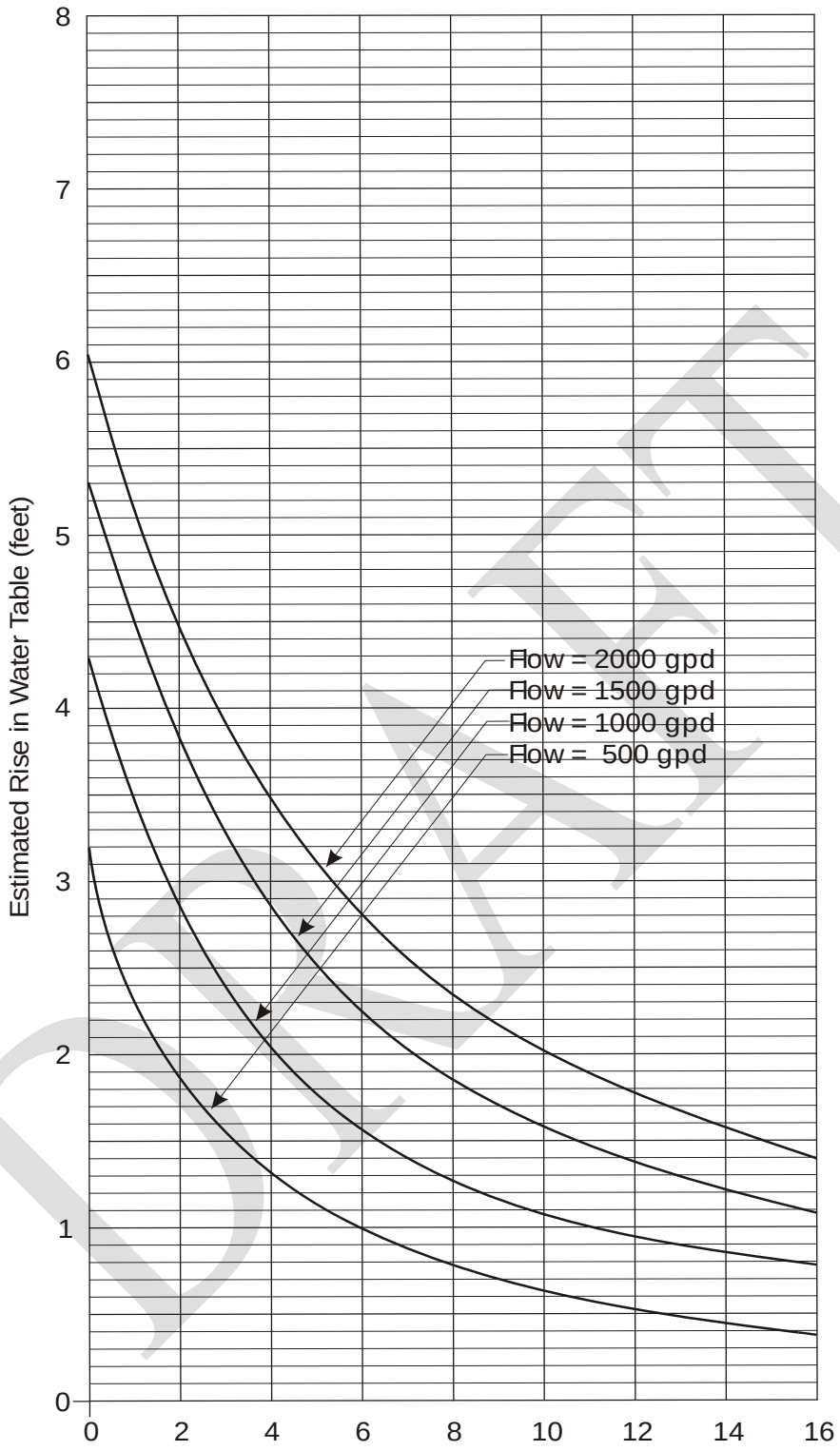
(c) For standard drain fields, effective suitable soil depth shall extend at least four (4) feet below the bottom of the drain field to any restrictive layer or highly permeable material.

(d) The depth of the high groundwater shall be at least four (4) feet below the bottom of the drain field excavation. The high groundwater shall be based on the seasonally high groundwater elevation plus the estimated rise in the water table shown on figures 1 through 6. In areas of high groundwater, this vertical separation requirement is most commonly satisfied by a mound and pressure dosed drain field.



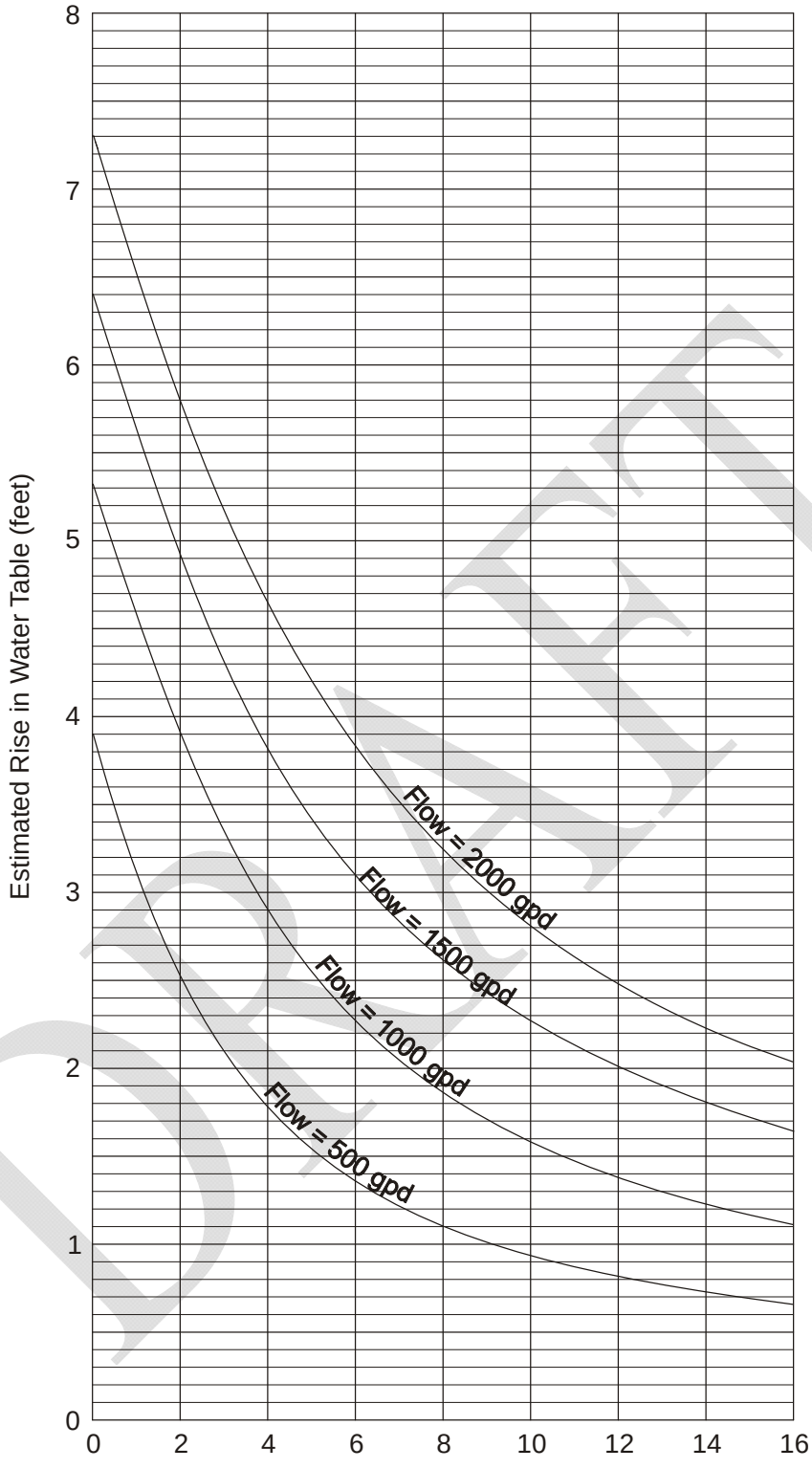
BASED ON A SOIL PERCOLATION RATE = 10 min/inch

FIGURE 1



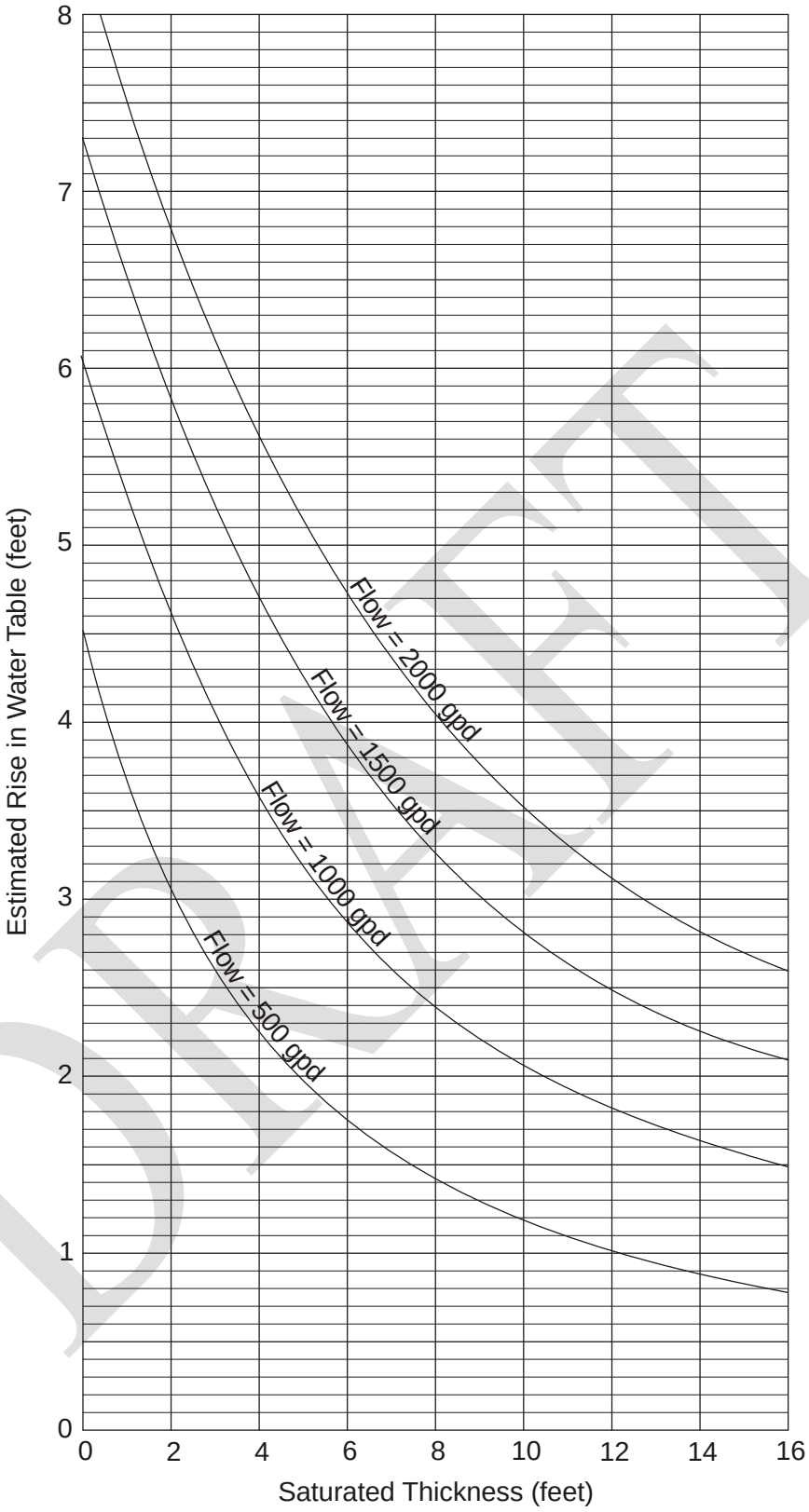
BASED ON A SOIL PERCOLATION RATE = 20 min/inch

FIGURE 2



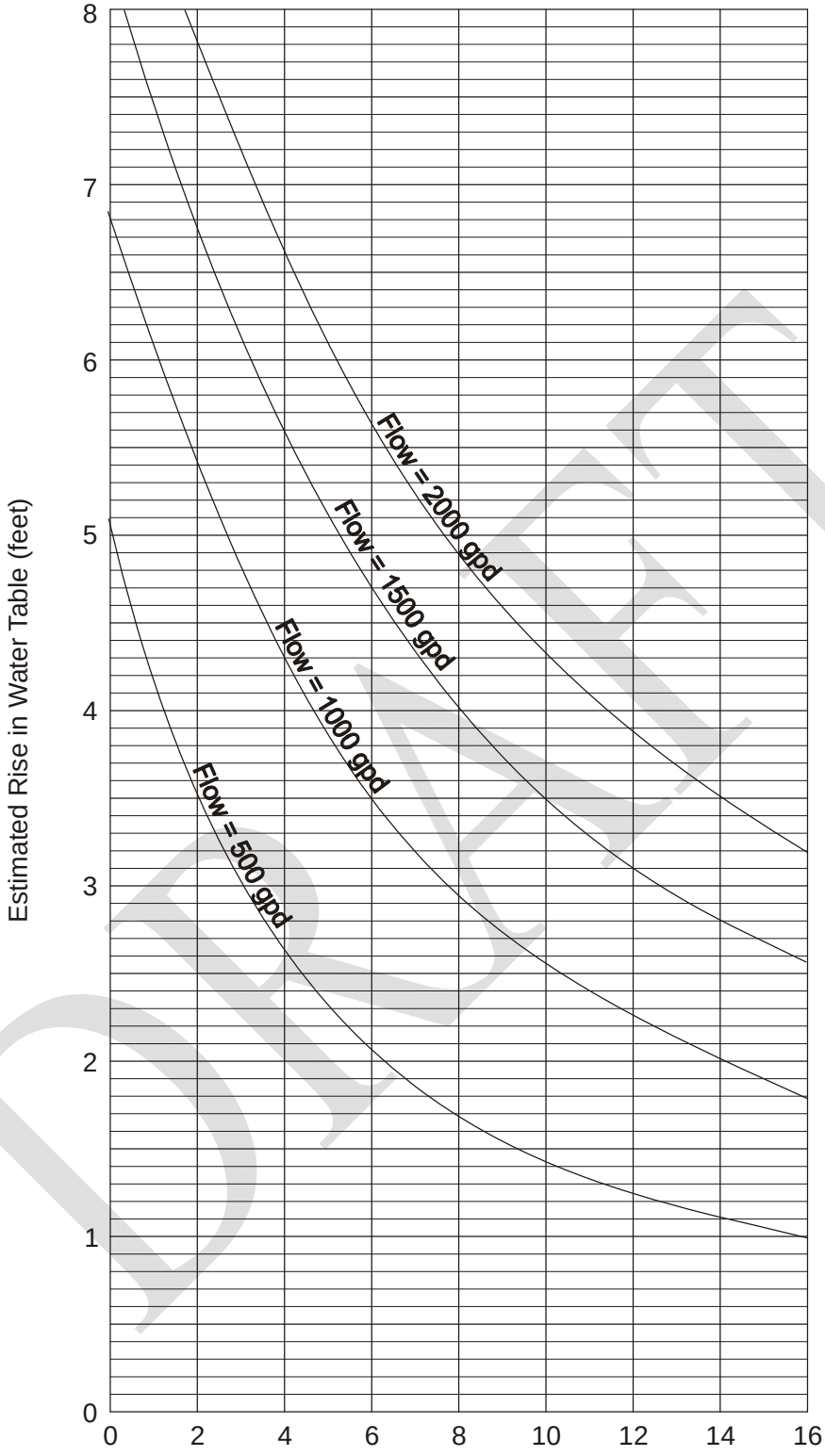
BASED ON A SOIL PERCOLATION RATE = 30 min/inch

FIGURE 3



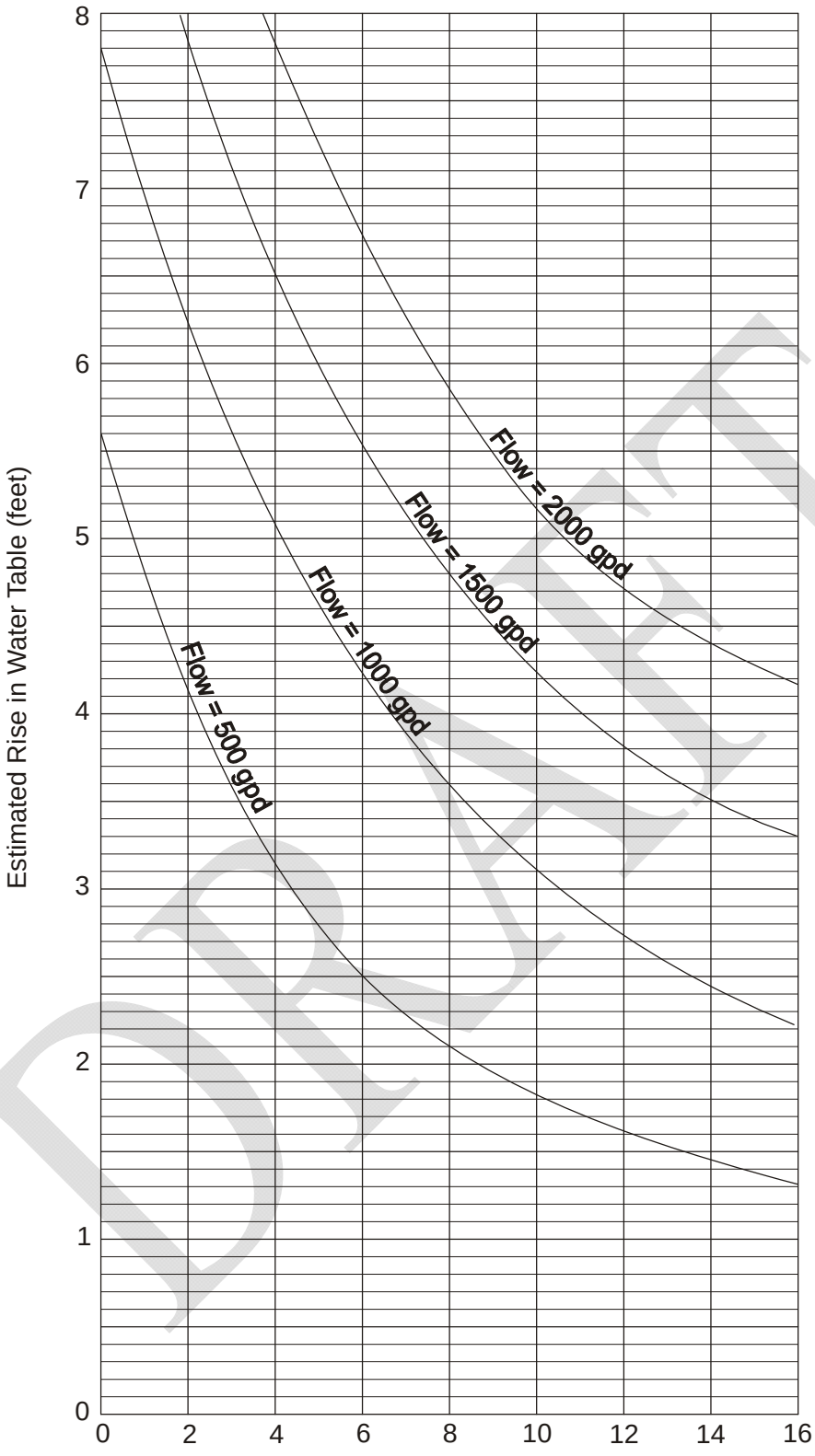
BASED ON A SOIL PERCOLATION RATE = 40 min/inch

FIGURE 4



BASED ON A SOIL PERCOLATION RATE = 50 min/inch

FIGURE 5



BASED ON A SOIL PERCOLATION RATE = 60 min/inch

FIGURE 6

(e) Slope

(i) The natural slope of the site will not exceed twenty-five percent 25%, 4-feet horizontal to 1-foot vertical. The following are the maximum permissible slopes on which an absorption system may be constructed.

Table 3. Slope and Percolation Rates for Absorption Systems

Percolation Rate (minutes/inch)	Maximum Slope[1]
Faster than 5	25%
6-45	20%
46-60	15%

[1] Flatter slopes may be required where the effluent may surface downslope.

(ii) Serial distribution, with the use of drop boxes or approved fittings, is the preferred installation method for sloping terrain. The bottom of individual trenches shall be level and the trenches shall be constructed to follow the contours of the land.

(iii) The placement of multiple trenches, with each subsequent trench down slope of the previous trench shall be avoided when the addition of effluent to the drain field trenches may lead to either an unstable slope or seepage down slope.

(iv) All absorption surfaces must be located at least 15 feet from the top of any break in slope which exceeds the maximum slope allowed.

(f) Minimum horizontal setback distances (in feet) are as follows:

Table 4. Minimum Horizontal Setbacks[1]

From	**To Septic Tank Or Equivalent**	**To Absorption System**
Wells (includes neighboring wells)	50	100
Public Water Well	50/500[2]	200/1000[2]
Property lines	10	10
Foundation Wall	15	25
Subsurface drains	10	25
Potable Water Pipes	25	25
Septic tank	NA	10
Surface Water, Spring (including seasonal and intermittent)	50	50

[1] For disposal of non-domestic wastewater, the isolation distance shall be determined by a hydrogeological study in accordance with Section 15(b) of Chapter 3, but shall not be less than the distances shown in Table 4.

[2] The larger horizontal setback shall apply when the soil absorption system discharges to the same aquifer that the public water well draws from.

(g) Soil exploration pit and percolation tests

(i) Delegated small wastewater programs shall require a percolation test in addition to the soil exploration pit.

(ii) A minimum of one soil exploration pit within the proposed drain field location shall be excavated to a minimum depth of four (4) feet below the bottom of the proposed drain field to evaluate the subsurface conditions.

(iii) The percolation test shall be performed in accordance with Appendix A of this chapter. An evaluation of the soil texture, in the proposed drain field location, by a person experienced in soils classification, may be used to confirm the percolation rate.

Section 7. Drain Field Sizing.

(a) The total infiltrative surface area of a drain field shall be calculated by dividing the design flow rates (gpd) from Table 1 or Table 2 by the loading rate (gpd/ft^2) found in Table 5.

(b) The total infiltrative area shall be defined as follows:

(i) For standard trenches, perforated pipe embedded in aggregate, the total infiltrative area shall be calculated by multiplying the total length of the trench (ft) by the sum of the bottom width (ft) and the height (ft) of each sidewall. The sidewall height is the depth below the flowline of the pipe to the bottom of the trench. The height of the sidewall shall not exceed twelve (12) inches.

(ii) For chamber trenches, the total infiltrative area shall be calculated by multiplying the total length of the trench (ft) by the sum of the bottom width (ft) of the chamber and the height (ft) of each sidewall. The sidewall height is the height of the slotted sidewall of the chamber. The height of the sidewall shall not exceed twelve (12) inches.

(iii) For bed systems, the total infiltrative area shall be calculated by multiplying the total length (ft) by the width (ft) of the bed. The sidewall shall not be used in calculating the total infiltrative area for a bed system.

(c) Fast and slow percolating soils

(i) Coarse sand or soils having a percolation rate less than five (5) minute per inch are unsuitable for subsurface effluent disposal. These soils may be used if a one (1) foot layer of fine sand or loamy sand is placed below the constructed soil absorption system. The soil absorption system shall be sized based on the percolation rate of the fill material.

Table 5. Rates of Wastewater Application for Drain Field Areas[1]

Percolation Rate (mpi)	Loading Rate (gpd/ft^2)	Percolation Rate (mpi)	Loading Rate (gpd/ft^2)
5	0.80	33	0.38
6	0.75	34	0.37
7	0.71	35	0.37
8	0.68	36	0.36
9	0.65	37	0.36
10	0.62	38	0.35
11	0.60	39	0.35
12	0.58	40	0.35
13	0.56	41	0.34
14	0.54	42	0.34
15	0.52	43	0.34
16	0.50	44	0.33
17	0.49	45	0.33
18	0.48	46	0.33
19	0.47	47	0.32
20	0.46	48	0.32
21	0.45	49	0.32
22	0.44	50	0.32
23	0.43	51	0.31
24	0.43	52	0.31
25	0.42	53	0.31
26	0.41	54	0.31
27	0.41	55	0.31
28	0.40	56	0.30
29	0.40	57	0.30
30	0.39	58	0.30
31	0.39	59	0.30
32	0.38	60	0.30

[1] If the percolation rate is less than 5 or greater than 60, a Wyoming Registered Professional Engineer must determine the loading for your site specific conditions.

(d) Drain fields for high strength wastewater

(i) The allowable loading rate shall be reduced by the factor calculated by multiplying the loading rate by 200 and dividing by the five (5) day BOD loading of the wastewater.

(ii) All drain fields shall be dosed and include a pressure distribution system.

Section 8. <u>Building Sewer Pipes.</u>

All building sewers shall be installed in accordance with the 2012 International Plumbing Code (IPC). In the absence of an approved plumbing code, and in addition to the IPC, the building sewer shall comply with the following:

(a) Suitable building sewer pipe materials are Polyvinyl Chloride (PVC) and Acyrlonitrile–Butadiene-Styrene (ABS). The septic tank inlet and outlet pipes shall be schedule 40 PVC or ABS pipe and shall span the excavations for the septic tank and/or dosing chamber. Standard Dimension Ratio (SDR) 35 American Society for Testing and Materials (ASTM) D-3034 plastic pipe may be used if the void at the tank's side is filled with material which is granular, clean and compacted.

(b) Building sewer pipes shall not be smaller than four (4) inches in diameter and sized to handle the peak hourly flow from the building. When two different sizes or types of sewer pipes are to be connected, a proper type of fitting or conversion adapter shall be used.

(c) Sewer pipe shall not decrease in size flowing downstream.

(d) Building sewer pipes should be laid at a standard slope of 1/4 inch per foot, but shall not be flatter than 1/8 inch per foot.

(e) Cleanouts shall be provided at every change in alignment and at least every 100 feet in straight runs. 

(f) All sewer piping shall be laid on a firm bed throughout its entire length. It shall be protected from damage due to rocks, hard lumps of soil, debris and the like.

(g) Special care shall be utilized to prevent lateral movement or deformation during backfill. The backfill material shall be compacted to a density at least equivalent to the trench walls. Backfill over the pipe shall be of sufficient depth to protect the pipe from expected traffic loads and the wastewater from freezing.

Section 9. <u>Septic Tanks and Other Treatment Tanks.</u>

(a) Septic tanks

(i) Septic tanks shall be fabricated or constructed of concrete, fiberglass or an approved material. Tanks shall be water tight and fabricated to constitute an individual structure, and shall be designed and constructed to withstand anticipated loads. The design of prefabricated septic tanks shall be reviewed for compliance with applicable construction standards prior to approval for installation.

(ii) The septic tank shall be placed on a level grade and a firm bedding to prevent settling. Where rock or other undesirable protruding obstructions are encountered, the opening for the septic tank shall be over excavated, as needed, and backfilled with sand, crushed stone, or gravel to the proper grade.

(A) Septic tanks shall not be buried deeper than the tank manufacturer's maximum designed depth for the tank. The minimum depth of soil cover over the top of the tank is six (6) inches.

(B) Backfill around and over the septic tank shall be placed in such a manner as to prevent undue strain or damage to the tank or connected pipes.

(C) Septic tanks shall not be placed in areas subject to vehicular traffic unless engineered for the anticipated load.

(iii) Size

(A) The minimum liquid volume of a septic tank shall be 1000 gallons for residences up to a four (4) bedroom capacity. Additional capacity of 250 gallons per bedroom shall be provided for each bedroom over four (4).

(B) Septic tanks for high strength wastewater or non-residential units shall have a minimum effective liquid capacity sufficient to provide at least 48 hour retention at peak flow or 1,000 gallons, whichever is greater.

(iv) Configuration

(A) Septic tanks shall have not less than two (2) compartments. The inlet compartment shall not be less than one-half (1/2) of the total capacity of the tank. The liquid depth shall not be less than three (3) feet nor greater than six (6) feet.

(B) The septic tank shall have a length to width ratio of no less than two (2) to one (1), or be partitioned to protect against short circuiting flowing.

(C) The total depth shall not be less than eight (8) inches greater than the liquid depth. The partition shall allow venting of gases between compartments and out through the vent stack on the plumbing system of the house. Gases generated during liquefaction of the solids are normally vented through the building's plumbing stack vent

(D) The inlet and outlet on all tanks or tank compartments shall be provided with open-ended sanitary tees or baffles made of approved materials constructed to distribute flow and retain scum in the tank or compartments.

(I) The tees or baffles shall extend a minimum of six (6) inches above and nine (9) inches below the liquid level, but shall not exceed one-third (1/3) the liquid depth.

(II) A minimum of three (3) inches of clear space shall be provided over the top of the baffles or tees.

(III) The inlet pipe shall be at least two (2) inches higher than the outlet pipe. The outlet elevation shall be designed to provide a distance of 20 percent of the liquid depth between the top of the liquid and the bottom of the septic tank cover for scum storage.

(v) If additional septic tank capacity over 1,000 gallons is needed, it may be obtained by joining tanks in series provided the following requirements are met:

(A) The outlet of each successive tank shall be at least two (2) inches lower than the outlet of the preceding tank, and shall be unrestricted except for the inlet to the first tank and the outlet for the last tank.

(B) For new construction, the first tank shall be equal to or larger than any subsequent tank in the series.

(vi) A riser shall be provided to each compartment of the septic tank for inspection and cleaning.

(A) The riser shall have a minimum diameter of twenty (20) inches. Both inlet and outlet devices shall be accessible.

(B) The riser shall terminate at a maximum of six (6) inches below the ground surface. Riser covers terminating above grade shall have an approved locking device.

(vii) Land application of domestic septage in remote areas that meet the conditions found in Appendix B will be permitted as a permit by rule. Delegated small wastewater programs may issue individual permits.

(viii) An effluent filter with an opening of 1/8-inch or smaller shall be provided on the outlet of a septic tank or other tank that precedes a small diameter pressure distribution system. Effluent filters are recommended but not required for all septic tanks.

(b) Pump tanks

(i) Pump tanks shall meet the same material and installation requirements as septic tanks. Pump tanks shall have a 20-inch diameter access riser and it shall be brought to the ground surface.

(ii) The minimum pump tank size is 750 gallons for residential dwellings with four bedrooms or less. For systems with greater than 350 gpd design flow, the pump tank shall be 750 gallons plus one half (1/2) the daily flow greater than 350 gpd up to a maximum capacity of 1500 gallons.

(iii) A pump vault may be placed in the second compartment of a septic tank. The septic tank's size shall then be increased by a minimum of 500 gallons.

(iv) High water alarms shall be provided for all tanks that utilize pumps or siphons. The alarm device shall be an audible alarm or an indoor illuminated alarm or both.

(v) The minimum effluent level shall achieve complete submergence of the pump.

(vi) Dosed systems using a siphon shall have a dose counter installed to check for continued function of the siphon.

(c) Holding tanks

(i) Holding tanks shall meet the same material requirements as septic tanks. Holding tanks shall have a twenty (20)-inch diameter access riser and it shall be brought to ground surface.

(ii) Holding tanks shall not be used for residential systems when other alternative systems are available, except on a temporary, seasonal or intermittent basis, or when used to correct a failed drain field when other alternatives are unavailable.

(iii) Holding tanks must be located in an area readily accessible to the pump truck and where the tank itself will not float due to a high groundwater. If seasonal high groundwater may be present, the tank shall be properly anchored.

(iv) The minimum liquid volume shall be the greater of 1,000 gallons or seven (7) days storage based upon flow rate determined from Section 4.

(v) All holding tanks shall be equipped with a high water level alarm. The device shall be an audible alarm or an indoor illuminated alarm or both. The alarm level shall be placed at 3/4 the depth of the tank.

(d) Grease Interceptors

(i) A commercial or institutional food preparation facility with a waste stream containing fat, oil, and grease (FOG) in excess of 25 mg/L shall install an exterior grease interceptor or a device approved by the delegated health department or county. Facilities that typically have waste streams high in FOG are, but not limited to, restaurants, cafeterias, slaughterhouses, or institutional kitchens.

(ii) Waste streams high in FOG shall be plumbed separately and directly to a grease interceptor prior to the waste treatment process.

(iii) Waste streams from sanitary facilities such as bathrooms, toilets, urinals, or other similar fixtures shall not be discharged into the grease interceptor. These sources must be connected at least 4-6 feet downstream of the grease interceptor's discharge. The design shall prevent any backflow from the sanitary sources into the grease interceptor.

(iv) Only one source facility per grease interceptor shall be allowed.

(v) Grease interceptors shall be located so that they are easily accessible for inspection, cleaning, and removal of the collected wastes. The interceptor shall not be closer than fifteen (15) feet from the last discharging fixture and no further away than thirty-five (35) feet.

(vi) Grease interceptors shall have at least two (2) compartments with a 20-inch diameter clean out riser for each compartment. Each clean out riser shall be brought to the surface and have a sealed lid that is rated for any anticipated load. There shall be a means provided to sample the effluent.

(vii) There shall be no internal cleanout tees or bypasses.

(viii) The inlet and outlet of the grease interceptor shall be vented. The vent pipe shall be at least two (2) inches in diameter. The inlet and outlet vents shall not be interconnected.

(ix) The outlet invert shall be no more than two (2) inches lower than the inlet invert.

(x) The dividing wall between compartments shall be the same height as the other walls and the cover must contact the top of the dividing wall.

(xi) The effluent from each compartment shall be drawn from the bottom of a riser pipe that terminates at least eighteen (18) inches below the inlet invert of that same compartment.

(xii) Grease interceptors shall be accessible during normal business hours without interrupting normal business operations.

(xiii) Grease interceptors shall be installed in accordance with the manufacturer's instructions and applicable requirements of this section. A copy of the manufacturer's instructions shall be submitted with every permit to construct application submitted to DEQ.

(xiv) Grease interceptors shall be sized according to the following:

(A) The minimum volume shall not be less than 750 gallons.

(B) Shall be sized according to the following:

Kitchens (grease, garbage)

Number of meals per peak hour	**X**	Waste Flow rate*	**X**	Retention time**	**X**	Storage factor***	=	Interceptor size (liquid capacity)

*Waste flow rate – see Table 2.

**Retention times

Kitchen waste:	
Dishwasher and/or disposal	2.5 hours
Single service kitchen:	
Single serving with disposal	1.5 hours

***Storage factors

Fully equipped commercial kitchen	8 hr. operation: 1 16 hr. operation: 2 24 hr. operation: 3
Single service kitchen:	1.5

(e) Other interceptors

(i) Interceptors are required for oil, grease, sand and other substances harmful or hazardous to the building drainage system, or the small wastewater treatment system.

(A) Laundries

(I) Commercial laundries, Laundromats, and dry-cleaners shall be equipped with an interceptor in order to reduce the quantity of lint and silt that enter the collection system.

(II) The system must be of adequate size and design to allow for cool-down of wastewater so that separation can be more readily achieved.

(III) The interceptor must be installed with a wire basket or similar device, removable for cleaning, that prevents passage into the drainage system of solids ½ inch (12.7 mm) or larger in size, string, rags, buttons, or other materials detrimental to the waste treatment system.

(IV) Sizing must be in accordance with the following formula:

Laundries (grease, lint, silt)

Total gallons per cycle	**X**	Cycles per hour	**X**	Retention time*	**X**	Storage factor**	=	Lint interceptor

*Retention times

Institutional laundries	2.5 hours
Standard commercial laundry	2.0 hours
Light commercial laundry	1.5 hours

**Storage factors

8 hours of operation	1.0
12 or more hours of operation	1.5

(B) Car Washes

(I) Where automobiles are washed (including detail shops utilizing hand- wash practices), separators shall have a minimum capacity of 1000 gallons for the first bay, with an additional 500 gallons of capacity for every other bay.

(II) Additionally, wash racks must be constructed to eliminate or minimize the impact of run-off from rain/storm events. Minimum requirements are roofed structures with at least two walls and appropriate grading to prevent stormwater infiltration into the sanitary sewer.

(III) An effluent sampling point is required.

(g) Treatment for high strength wastewater

(i) Any onsite wastewater treatment system handling high strength wastewater shall install either a pretreatment unit ahead of the septic tank and/or expand the size of the soil absorption system.

(ii) The pretreatment unit and septic tank shall be designed and sized to reduce the effluent five (5) day BOD loading to less than 140 mg/l.

(iii) A sample port shall be installed before the soil absorption system to allow for sampling of the effluent.

(h) Abandonment of septic and holding tanks

The following is the procedure to abandon septic tanks and holding tanks when the system is upgraded, equipment replacement is necessary, or central sewer lines are made available.

(i) The abandoned tank should be pumped and hauled to a licensed facility approved to receive the waste or pump the septage into the newly constructed septic or holding tank. Discharging to a central sewer requires coordination with, and the approval of, the owner/operator of the sewer system.

(ii) Once the abandoned tank is empty, it should be removed and the excavation backfilled. As an alternative to removing the tank, the access covers can be removed and the tank filled with native soil, pit run, or sand.

(iii) If the abandoned tank is part of a Class V UIC facility, the abandonment must also be in compliance with Chapter 16, Section 12.

Section 10. Effluent Distribution Devices.

Distribution boxes, flow divider tees and straight tees suitable for level or nearly level ground and are installed before the drain field with the goal of splitting flows equally between drain field laterals. Drop boxes are suitable for sloping ground and are installed to achieve serial loading.

(a) Distribution boxes

(i) The distribution box shall be installed on a level, stable base to ensure against tilting or settling, and to minimize movement from frost heave.

(ii) Boxes shall be watertight and constructed of concrete or other durable material.

(iii) Boxes shall be designed to accommodate the inlet pipe and the necessary distribution lines. The inlet piping to the distribution box shall be at least one (1) inch above the outlet pipes and all pipes shall have a watertight connection to the distribution box.

(iv) The box shall be protected against freezing and made accessible for observation and maintenance.

(v) Boxes shall have flow equalizers installed on each outflow.

(b) Flow divider tees may be used in place of distribution boxes.

(c) Straight tees may be used in place of distribution boxes. Where straight tees are used, all distribution piping and laterals must be constructed as level as possible.

(c) Drop boxes are suitable for sloping ground and are installed to achieve serial loading. The drop boxes shall meet the requirements in paragraphs (a)(i through v) of this section.

Section 11. Standard Drain Field Systems.

(a) General Design Requirements:

(i) All drain fields shall be designed in such a manner that the effluent is effectively filtered and retained below ground surface. The absorption surface accepts, treats, and disperses wastewater as it percolates through the soil.

(ii) Drain fields shall not be excavated when the soil is wet enough to smear or compact easily. Open drain field excavations shall be protected from surface runoff to prevent the entrance of silt and debris. All smeared or compacted surfaces shall be raked to a depth of one (1) inch, and loose material removed before filter or filler material is placed in the drain field excavation.

(iii) Drain fields shall be designed to approximately follow the ground surface contours so that variation in excavation depths will be minimized. The trenches may be installed at different elevations, but the bottom of each individual trench shall be level throughout its length.

(iv) Shallow drain field depths are encouraged to promote treatment and evapotranspiration. The minimum soil cover depth over the drain field is one (1) foot. The maximum depth to the bottom absorption surface of a drain field is four (4) feet. Finished grading shall prevent ponding and promote surface water runoff.

(v) Pipes, chambers or other products shall be bedded on firm, stable material. Heavy equipment shall not be driven in or over drain fields during construction or backfilling.

(vi) Standard trenches refer to perforated pipe embedded in aggregate-filled trenches which shall conform to the following:

(A) The perforated pipe shall have a minimum diameter of 4 inches. Suitable pipe materials include: ASTM D-2729-11 PVC, ASTM D-3034-08 PVC, Schedule 40 PVC ASTM d1784-11, and ASTM F810-07 PE.

(B) The aggregate shall be crushed rock, gravel or other acceptable, durable and inert material which is free of fines, and has an effective diameter between ½ inch and 2-1/2 inches.

(C) Prior to backfilling, the aggregate shall be covered throughout with acceptable geotextile materials or a three (3) inch layer of straw.

(D) Aggregate shall extend the full width and length of the drain field to a depth of at least twelve (12) inches with at least six (6) inches of drain gravel under the distribution pipe and at least two (2) inches over the distribution pipe.

(E) Maximum width of trench excavation is three (3) feet.

(F) Minimum spacing of trenches (wall to wall) is three (3) feet. Trench spacing shall be increased to nine (9) feet when the area between each trench is considered as reserve area or for clay loam soils that have percolation rates slower than 60 min/in. For clay loam soils, the nine (9) foot spacing shall not be considered as reserve area.

(vii) Standard beds shall conform to the same pipe and aggregate requirements for trenches as found in subparagraphs (vi)(A through D) of this section. Standard beds shall also conform to the following:

(A) The soils shall be absent of clay with percolation rates faster than 60 minutes per inch. The bottom of the bed must be level, therefore the site shall be relatively flat, sloping no more than one (1) foot from the highest to the lowest point in the installation area.

(B) Distribution laterals within a bed must be spaced on not greater than six (6) feet centers. Sidewalls shall be more than three (3) feet from a distribution lateral.

(C) Beds must not be wider than twenty-five (25) feet if gravity distribution is used. Multiple beds must be spaced at one-half the bed width.

(D) Rubber tired vehicles must not be driven on the bottom surface of any bed excavation.

(viii) Chambered trenches, when used in lieu of perforated pipe and aggregate, shall be installed in conformance with the manufacturer recommendations. No cracked, weakened, modified, or otherwise damaged chamber units shall be used in any installation.

(A) All chambers shall be an open, arch-shaped structure of durable, non-degradable design, suitable for distribution of effluent without filter material

(B) All chamber endplates shall be designed so that the bottom elevation of the inlet pipe is at least six (6) inches from the bottom of the chamber.

(C) Inlet and outlet effluent sewer pipes shall enter and exit the chamber endplates. Vents shall be installed at all inlet and outlet effluent sewer pipes.

(D) All chambers shall have a splash plate under the inlet pipe or another design feature to avoid unnecessary channeling into the trench bottom.

(E) Maximum width of trench excavation is three (3) feet.

(F) Minimum spacing of trenches (wall to wall) is three (3) feet. Trench spacing shall be increased to nine (9) feet when the area between each trench is considered as reserve area or for clay loam soils that have percolation rates slower than 60 min/in. For clay loam soils, the nine (9) foot spacing shall not be considered as reserve area.

(ix) Chambered beds shall conform to the same requirements for chambered trenches as found in subparagraphs (viii)(A through D) of this section. Aggregate, as specified in subparagraph (vi)(B) of this section, or native soil shall be used to fill the space between the chambers.

(x) Serial sidehill trench:

(A) A minimum of six (6) feet of undisturbed soil shall be maintained between adjacent trench or bed side walls.

(B) The bottom of each serial trench or bed system shall be level.

(C) The overflow pipe between serial leach systems shall be set no higher than the mid-point of the upstream distribution pipe. The overflow pipe shall not be perforated.

(b) A design package for a standard drain field is provided online at the Division's website to assist you in submitting a completed application for a properly designed wastewater treatment and disposal system. The worksheet and calculations were prepared by a registered professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. The general design requirements stated in this section are incorporated into the worksheets such that by completing the forms, the system will comply with those requirements.

Section 12. <u>Pressure Distribution Systems.</u>

(a) General Design Requirements:

(i) The basic elements of a pressure distribution system include a pump tank, filter, and a means to deliver specified doses to a small diameter pipe network within a drain field. Pressure distribution is required for mound systems or for bed systems with a width greater than twenty-five (25) feet.

(ii) Pumps must be sized to match the distribution system curve or demand. Pumps shall be designed for sewage pumping applications and be accessible from the ground surface.

(iii) The control system for the pump and pump tank shall, at a minimum, consist of a "pump off" switch, a "pump on" switch, a "high liquid alarm".

(A) All electrical connections must be made outside of the chamber in either an approved weatherproof box or an explosion-proof junction box.

(B) The wiring from the junction box to the control box must pass through a sealing fitting to prevent corrosive gases from entering the control panel.

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

(iv) The pressure transport piping between the tank and the drain field shall be designed to drain after each pump cycle to prevent freezing.

(A) The ends of lateral piping shall be constructed with long sweep elbows or an equivalent method to bring the end of the pipe to finished grade. The ends of the pipe shall be provided with threaded plugs, caps, or other devices to allow for access and flushing of the lateral.

(B) All joints in the manifold, lateral piping, and fittings shall be solvent-welded using the appropriate joint compound for the pipe material. Pressure transport piping may be solvent-welded or flexible gasket jointed.

(C) Where automatic siphons or other devices are used, they shall be designed to empty the dosing tank in less than ten (10) minutes.

(c) A design package for a pressure distribution system is provided online at the Division's website to assist you in submitting a completed application for a properly designed wastewater treatment and disposal system. The worksheet and calculations were prepared by a registered professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. The general design requirements stated in this section are incorporated into the worksheets such that by completing the forms the system will comply with those requirements.

Section 13. Sand Mound Systems.

The sand mound consists of a sand fill, an aggregate bed and a soil cap. Pressure distribution shall be used in conjunction with sand mound systems.

(a) Selection Criteria:

The high groundwater level, bedrock or impervious clay layer is less than four (4) feet below the level of the drain field excavation.

(b) Site Requirements:

(i) A minimum of one (1) foot of vertical separation of the native soil is required between the bottom of the sand fill and the top of the high groundwater level, any restrictive layer, or any highly permeable material.

(ii) The percolation rate of the native soil at the interface of the sand fill shall be greater than five (5) and less than sixty (60) minutes per inch. The percolation shall be measured in the top twelve (12) inches of native soil.

(c) General Design Requirements:

(i) Sand Layer

(A) Filter sand shall conform to ASTM C-33, with less than 2% passing the #200 sieve.

(B) The minimum depth of sand below the aggregate bed surface shall be one (1) foot.

(C) The sand mound shall have a combination of at least four (4) vertical feet of filter sand and unsaturated native soil above the high groundwater level.

(D) The top of the sand layer under the aggregate bed shall be level in all directions.

(E) The sand layer shall fill around the perimeter of and to the top of the aggregate bed.

(F) The slope of all sides shall be three (3) horizontal to one (1) vertical or flatter.

(G) The infiltrative area which is the bottom of the sand fill shall be calculated by dividing the design flowrates (gpd) from Table 1 or Table 2 by the loading rate (gpd/ft^2) found in Table 5.

(ii) Aggregate Bed

(A) The aggregate shall be crushed rock, gravel or other acceptable, durable and inert material which is free from fines, and has an effective diameter between one-half (1/2) inch and two and one half (2 ½) inch.

(B) The aggregate bed depth shall not be less than nine (9) inches with a minimum of six (6) inches of clean aggregate placed below the distribution pipe and two (2) inches above the distribution pipe. The aggregate shall be covered with an approved geotextile material after installation and testing of the pressure distribution system.

(C) The design shall be a long, narrow bed design with a maximum width of fifteen (15) feet.

(D) The infiltrative area, which is the bottom of the aggregate bed, shall be calculated by dividing the design flowrates (gpd) from Table 1 and Table 2 by the loading rate of 0.8 gpd/ft^2.

(iii) Soil Cover

(A) The soil cap shall be constructed of a sandy loam, loamy sand, or silt loam. The depth of the soil cap shall be at least six (6) inches at the edges to twelve (12) inches at the center. The slope of all sides shall be three (3) horizontal to one (1) vertical or flatter.

(B) A layer of top soil at least six (6) inches thick shall be placed over the entire sand mound area. The sand mound should be planted with vegetation that does not require watering and will not establish deep roots. Native grasses are commonly used.

(d) A design package for a sand mound system is provided online at the Division's website to assist you in submitting a completed application for a properly designed wastewater treatment and disposal system. The worksheet and calculations were prepared by a registered professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. The general design requirements stated in this section are incorporated into the worksheets such that by completing the forms the system will comply with those requirements.

Section 14. Small Wastewater Lagoons.

(a) Selection Criteria:

(i) Lagoons shall only be considered in areas of the State where the annual evaporation exceeds the annual precipitation during the active use of the lagoon.

(ii) Lagoons shall only be allowed when the percolation rate exceeds 120 minutes per inch and the soil extends vertically down at least two (2) feet from the bottom of the lagoon to the seasonal high groundwater table or bedrock formations.

(iii) A lagoon shall not be installed on a property less than three (3) acres in size.

(iv) A lagoon shall not be constructed within the 100 year flood plain.

(b) General Design Requirements:

(i) Beyond the horizontal setback distances requirements specified in Section 6(d) of this rule, the lagoon shall not be placed within one hundred (100) feet of the owner's property line.

(ii) The use of a septic tank which meets the specifications in Section 9 of this rule shall be required before the small wastewater lagoon.

(iii) The lagoon shall be located and constructed so it will not receive surface runoff water.

(iv) The slope of the lagoon site shall not exceed five (5) percent.

(v) The lagoon site must be located in an area of maximum exposure to sun and wind.

(vi) The lagoon shall be designed for complete retention.

(vii) The area of the lagoon shall be calculated based on the following formula.

$$A = \frac{584 \times Q \times 1.3}{(365 \times S) + (E - P)}$$

A = Area of the lagoon at the 5 foot depth water level in square feet

Q = Daily sewage flow determined from Table 1 or 2, gallons per day.

E = Average annual lake evaporation in inches per year. (Note: lake evaporation is less than pan evaporation; lake evaporation equals pan evaporation times a pan coefficient of about 0.7)

P = Average annual precipitation rate in inches per year.

S = Seepage rate in decimal form.

(viii) The slopes of the dikes shall not be steeper than three (3) horizontal to one (1) vertical. The minimum width of the top of the dike shall be four (4) feet.

(ix) All fill shall consist of impervious material that is well compacted and free of rocks, frozen soil, or other large material.

(x) The minimum operating depth shall be two (2) feet. The dikes shall provide a minimum freeboard of one (1) foot.

(xi) The floor of the lagoon shall be level and maintained free of all vegetation.

(xii) The influent line into the lagoon must discharge near the center onto a concrete apron at least two (2) feet square.

(xiii) A cleanout or manhole shall be provided in the influent line near the dike.

(xiv) The area around the small wastewater lagoon shall be fenced to preclude the entrance of livestock, pets, and humans. The fence shall be equipped with a locking gate. The gate shall have a sign indicating "NO TRESPASSING – WASTEWATER LAGOON".

(c) A design package for a small wastewater lagoon is provided online at the Division's website to assist you in submitting a completed application for a properly designed wastewater treatment and disposal system. The worksheet and calculations were prepared by a registered

professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. The general design requirements stated in this section are incorporated into the worksheets such that by completing the forms the system will comply with those requirements.

Section 15. Privies.

Pre-fabricated privies and outhouses with sealed, water-tight vaults that meet the following conditions will be permitted as a permit by rule. Delegated Local health departments and counties may require and issue individual privy permits.

(a) A DEQ permit to construct is not required if the following conditions are met:

(i) The isolation requirements for sealed privies shall comply with Section 6(a)(i) for septic tanks.

(ii) The depth to seasonally high groundwater from the bottom of a water tight vault shall be sufficient to prevent floatation of the empty vault.

(iii) The vault must have sufficient capacity for the dwelling served, and must have at least 27 cubic feet or 200 gallons of capacity.

(iv) The privy must be easily maintained and insect tight. The door must be self-closing. The privy seat must include a cover. All exterior openings, including vent openings, shall be screened.

(v) Privies must be adequately vented.

(b) For unsealed pit privies, the following conditions must be met.

(i) Privies shall serve structures that have no plumbing fixtures or running water (piped water supply).

(ii) Pit privies shall be located to exclude surface water.

(iii) The isolation requirements for privies shall comply with Section 6(a)(i) for drain fields and be at least 100 feet from any property or right-of-way line.

(iv) The bottom of the unsealed pit must have a minimum four (4) feet vertical separation distance to the seasonal high ground water level.

Section 16. Greywater Systems.

It is the intent of this section to encourage and facilitate the productive and safe reuse of greywater from domestic wastewater.

(a) Applicability

(i) This section applies to any person who utilizes greywater for a beneficial irrigation uses.

(ii) This section does is not applicable if the intent is to provide treatment wastewater.

(iii) Local greywater codes and building regulations supercede Chapter 25, Section 16.

(b) Greywater Applications.

(i) Subsurface Irrigation

(A) Subsurface irrigation with greywater may be used to irrigation land and vegetation.

(B) Greywater shall not be used to irrigate any food crops for human consumption.

(C) Subsurface irrigation shall not surcharge to overland flow.

(ii) Surface Irrigation

(A) Greywater used for surface irrigation shall receive a level of disinfect so the maximum fecal coliform levels is 2.2/100 ml or less.

(B) Surface irrigation with greywater that has been treated by disinfection may be used for irrigation of land and vegetation.

(C) Greywater that has been treated by disinfection shall not be used to irrigate any food crops for human consumption.

(iii) Set Backs

(A) A 30 foot buffer zone is required between the greywater application site and adjacent property lines and any public right-of-way.

(B) A 30 foot separation distance is required between greywater application sites and all surface waters.

(C) A 100 foot separation distance is required between greywater application sites and all potable water supply wells.

(D) Drip irrigation systems. The buffer zone requirements above may be met by the use of drip irrigation systems.

(c) Greywater Components and Configurations

(i) Flow Diversion

(A) All greywater systems shall have a flow diverter which directs greywater to either the blackwater system or the greywater system.

(B) Diverter valves shall not have the potential to allow backflow from the blackwater system into the greywater system.

(C) Pipe elbows with rotatable compression fittings or equivalent components may be used to connect greywater sources with the greywater system or blackwater system as long as the pipe can only be connected to one system at a time. A capping device such as a rubber slip cap with band clamp must be used to seal the plumbing of the system that is not in use.

(D) The rubber discharge hose from a laundry washing machine may be moved between a vertical blackwater riser pipe and a vertical greywater riser pipe without the need for a diverter valve.

(ii) Greywater Collection Tank

(A) Shall be covered to prevent access by flying insects, rodents, domestic animals and people.

(B) Shall have an overflow to the blackwater system.

(C) Shall not hold greywater for more than 24 hours

(I) Outside collection tank shall meet the requirements of a septic tank

(II) Inside collection tank shall be install in accordance with the International Building Code for internal plumbing for black water.

(D) All greywater collection tanks shall be vented with a suitable screen.

(E) Filters

(I) All discharges from the greywater collection tank shall have suitable filters to retain solids in the greywater collection tank and to prevent clogging of the irrigation system.

(II) Shall be accessible for cleaning and maintenance.

(III) Shall be selected based upon expected loading, flow, and pressure.

(iii) Pumps

(A) Shall be accessible for cleaning and maintenance.

(B) Shall be selected based upon expected flow, pressure and anticipated solids handling according to the overall design.

(C) Shall have a check valve on the discharge of the pump.

(D) Pressurized irrigation systems that are connection to the domestic water system shall have an anti-siphon vacuum breaker installed on the connection to the domestic water system.

(iv) Piping

(A) Greywater conveyance pipes shall be permanently labeled for Greywater or shall be colored purple. Non-paint marking pens are not acceptable as permanent labeling.

(B) Gravity flow pipes shall be constructed to allow complete draining of the pipe.

(C) Pressurized pipe systems shall be constructed and design to be drained or the water be evacuated by compressed air for winterization.

(v) Irrigation

(A) Subsurface Irrigation

(I) Mulch Basin

1. A Mulch basin is an excavated area that has been refilled with a highly permeable media, organic and inorganic materials intended to distribute greywater to irrigate vegetation.

2. Shall be sized to contain 3 times the peak hourly flow anticipated at the discharge point.

3. Mulch does not need to be covered or may be covered with no more than 3 inches of topsoil

4. Shall not be deeper than the root zone of the plants to be irrigated.

5. Free flow outlets

a. Greywater is applied at the top of the mulch.

b. Application point(s) are protected from access by flying insects, rodents, domestic animals and people. Protections are constructed in such a manner as to allow easy access for cleaning and maintenance.

c. Inlet piping to the mulch basin shall be no less than 1 inch higher than the surface to which it is applied to allow for a free fall of water.

6. Sub-mulch outlets

a. Greywater is applied below the surface of the mulch into one or more distribution chambers constructed of perforated material.

b. Inlet piping to distribution chamber of the mulch basin shall be no less than 2 inches higher than the surface to which it is applied to allow for a free fall of water.

c. Distribution chamber shall be constructed for easy cleaning and maintenance.

7. A compost pile is considered a mulch pile.

(II) Drip systems

1. Shall be filtered according to Section (4) (a) (iii) prior to point of application or be designed in such a manner as to prevent frequent clogging.

2. Discharge nozzles shall be specifically designed for the application of greywater without clogging.

3. Drilled pipe drip system holes shall be no smaller than ¼" in diameter.

4. Point of application flow shall be low enough to prevent any surface flow of greywater.

(III) Permeable pipe systems, designed for greywater, shall be installed according to manufacturer's recommendations.

(B) Surface Irrigation

(I) Flood irrigation

1. Shall not cause channeling or erosion of the application site.

2. Shall use a distribution system to evenly distribute flows across the site

3. Shall not pond exceed ¼ inch in depth.

4. Shall not remain on the ground surface for more than 15 minutes after source flow has stopped.

(II) Spray Irrigation

1. Spray irrigation of greywater is not permited.

(v) Disinfection

All greywater to be used for surface irrigation shall be disinfected.

(A) The greywater shall be disinfected in the greywater collection tank.

(I) Chlorine

1. The disinfection system shall be adequately size to maintain a residual free chlorine concentration shall be 5mg/L.

(II) Bromine

1. The disinfection system shall be adequately size to maintain a residual free bromine concentration shall be 5mg/L.

(III) Ozonation.

1. Ozonation system for disinfection shall provide a range of chemical feed of 5-10 mg/L.

2. Ozone disinfection systems shall be designed and installed according to manufacturer's recommendations.

(IV) Ultraviolet

1. Ultraviolet (UV) disinfection systems shall be designed and installed according to the manufacture's recommendations.

2. The greywater into the UV disinfection until shall have a UV transmittance less than the UV transmittance rated by the manufacture.

3. The max flow rate of the UV disinfection system shall not be exceeded.

(d) Greywater Operation and Requirements

(i) Restrictions

(A) The installation of a greywater system shall not reduce or alter the sizing requirements of the onsite wastewater system.

(B) Minimize human contact with greywater and soil irrigated with greywater.

(C) Greywater shall not leave the property on which it is generated.

(D) Water which has been used to wash diapers or similarly soiled or infectious garments shall not enter the greywater system.

(E) Water which contains hazardous materials such paint, solvents, petroleum products, oil, gasoline, antifreeze, solvents, pesticides and herbicides shall not enter the greywater system.

(F) Greywater systems shall not be installed in a delineated floodplain.

(G) The volume of greywater shall not exceed an average of 2000 gallons per day.

(H) Greywater shall not come in direct contact with or adversely impact surface or groundwater.

(ii) Odor Control

(A) Odor control of the greywater system shall meet the requirement of Wyoming DEQ Air Quality Regulations Chapter 2, Section 11.

(iii) Stormwater

(A) The greywater system shall not be located in a drainage way.

(B) The greywater system shall prevent storm runoff from carrying the greywater off the application site.

(iv) Winter Operation

(A) If the greywater system is to be used during the winter, the greywater system shall be designed to prevent freezing.

Section 17. <u>Operation and Maintenance.</u>

(a) For small wastewater systems that are considered advanced treatment, permitted through delegated small wastewater programs, the following conditions are required:

(i) A contract maintenance agreement with a service provider shall be a condition of the issued permit. A copy of the contract shall be maintained by the county issuing the permit.

(ii) The owner of the small wastewater system shall provide an easement for maintenance of the system.

(iii) If the owner of the small wastewater system fails to maintain the advanced treatment system according to the manufacturer's recommendations, it will constitute a violation of these regulations.

(b) For any system that disposes of wastewater through land application or subsurface filtration, the owner shall not add any chemical or biochemical additive to the system that would adversely affect the quality of the groundwater as stated in the WDEQ Water Quality Rules & Regulations, Chapter VIII.

(c) Septic tanks shall be pumped as needed to prevent solids carryover into the drain field.

(d) Holding tanks and sealed vaults shall be pumped prior to reaching their maximum capacity. It is preferable that these types of tanks be pumped before the wastewater volume exceeds 75% of the tank's capacity.

(e) Any service provider that pumps septic tanks, holding tanks, or sealed vaults, shall dispose of the wastewater contents at a permitted wastewater treatment facility or in a manner approved by the Division or delegated authority.

(f) Damaged fittings and broken, crushed or plugged piping associated with any small wastewater system shall be replaced in a timely manner.

(g) Composting or non-discharging toilets where permitted shall have their waste disposed of at a permitted wastewater treatment facility or landfill, or in a manner approved by the Division or delegated authority.

APPENDIX A
Percolation Test Procedure

Properly conducted percolation tests are used to determine absorption system site suitability and to size the absorption system. Percolation tests shall not be conducted in test holes which extend into groundwater, bedrock, or frozen ground. The percolation test should be conducted only after the soil exploration pit has been dug and examined by the delegated health department or county for suitable soils and groundwater table information. This percolation test procedure applies to each percolation test hole.

(a) The percolation test holes shall be spaced uniformly over the proposed drain field site. The delegated health department of the county shall establish the required number of test holes.

(b) A 6 inch to 10 inch diameter hole shall be dug or bored to the proposed depth of the drain field.

(i) The walls shall be vertical.

(ii) To expose a natural soil surface, the sides and bottom shall be scarified with a sharp pointed instrument and the loose material shall be removed from the hole.

(iii) Two (2) inches of gravel or coarse sand shall be placed in the bottom of the hole to prevent it from scouring and sealing during water addition.

(c) Presoaking

The purpose of presoaking is to have the water conditions in the soil reach a stable condition similar to that which exists during continual wastewater application. The minimum time of presoaking varies with soil conditions but must be sufficiently long so that the water seeps away at a constant rate.
The following presoaking instructions are usually sufficient to obtain a constant rate.

(i) Fill each hole with clear water to a level at least 12 inches above the gravel or coarse sand. If the 12 inches of water seeps away in 60 minutes or less, add 12 inches of water a second time.

(ii) If the first and second fillings of 12 inches of water seeps away in 60 minutes or less or the soil is sandy, the percolation test should be started immediately after presoaking. If both the first and second fillings have percolation rates faster than 5 minutes per inch, the test may be stopped.

(iii) If either the first or second fillings of 12 inches of water does not seep away in 60 minutes or other soils, 12 inches of water must be maintained in the hole for at least 4 hours to presoak the hole.

(d) Percolation rate measurement

(i) Remove any loose material on top of gravel and adjust the water level to six inches above the gravel or coarse sand.

(ii) Establish a fixed reference point and measure the drop in water level at constant time intervals. The water level drop should be measured to the nearest 1/8 of an inch.

(iii) Refill the water level to 6-inches after each measurement. Do not exceed the 6-inch depth of water.

(iv) The test may be terminated when the water drop level stabilizes and is consistent for three consecutive measurements.

(v) The percolation rate is calculated for each hole using the following formula:

$$\frac{\text{Time Interval (Minutes)}}{\text{Final Water Level Drop (inches)}} = \text{Percolation Rate (minutes/inch)}$$

(e) The following information must be recorded:

(i) Date(s) of test(s),

(ii) Location, diameter, and depth of each test hole,

(iii) Duration of presoak,

(iv) Time of day for beginning and end of each water-level drop interval,

(v) Each water-level drop measurement,

(vi) Calculated percolation rate,

(v) Name and signature of person performing test,

(vi) Name of owner or project name, and

(vii) Certify that the percolation test was done in accordance with Wyoming Water Quality Rules and Regulations Chapter 25 Appendix A.

APPENDIX B
Land Application of Domestic Septage in Remote Areas

To qualify for the land application of domestic septage in remote areas, the following conditions must be met.

(a) Location restrictions shall adhere to the following:

(i) Domestic septage generated on a specific property may be land applied on said property, and shall not be transported to another location for land application.

(ii) No land application of domestic septage shall occur within 1,000 feet of all adjacent properties.

(iii) No land application of domestic septage shall occur within 300 feet of a public road, permanent surface water body, or intermittent stream.

(b) Site restrictions shall adhere to the following:

(i) The land application of domestic septage shall only occur on those sites with established vegetation such as rangeland, pasture or hay meadows.

(ii) No more than 5,000 gallons of domestic septage per acre per year shall be land applied.

(iii) No land application of domestic septage shall occur where the site's slope exceeds five percent (5%) or where the depth to groundwater is less than four (4) feet.

(iv) The land application of domestic septage shall not occur between November 1 and May 1, or any other time when frozen or saturated ground conditions exits.

(v) No public access shall be allowed for one (1) year to any site where domestic septage has been applied.

(vi) No grazing animals shall be allowed access for 30 days to any site where domestic septage has been land applied.

(c) Crop restrictions shall adhere to the following:

(i) No root crops shall be harvested for 38 months from soils where domestic septage has been land applied.

(ii) No truck crops (harvested parts touch land surface) shall be harvested for 14 months from soils where domestic septage has been land applied.

(iii) No commodity crops (other food, feed, and fiber crops whose harvested parts do not touch land surface) shall be harvested for 30 days from soils where domestic septage has been land applied.

(iv) No turf shall be harvested for one (1) year from soils where domestic septage has been land applied.

(d) Reporting requirements:

(i) The property owner shall notify the appropriate Department of Environmental Quality, Water Quality Division (DEQ/WQD) District Engineer prior to the land application of domestic septage to confirm the requirements and to arrange a possible DEQ/WQD inspection of the land application.

(ii) All records concerned with each septage application will be maintained for at least five (5) years.

(iii) There is a worksheet online that must be completed, signed and returned to the DEQ/WQD or the appropriate delegated local permitting authority within 15 days of the land application.

Ch 25 Stakeholder Comments 45

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Chapter 25 amendments

1 message

William Tillman <william.tillman@wyo.gov> Wed, Feb 27, 2013 at 9:50 AM
To: Gina Johnson <gina.johnson@wyo.gov>

---------- Forwarded message ----------
From: Rich Cripe <rich.cripe@wyo.gov>
Date: Thu, Feb 7, 2013 at 11:09 AM
Subject: Fwd: Chapter 25 amendments
To: William Tillman <william.tillman@wyo.gov>

fyi

---------- Forwarded message ----------
From: Sidney Fox <sidneyfox@carbonwy.com>
Date: Thu, Feb 7, 2013 at 10:37 AM
Subject: Chapter 25 amendments
To: "rich.cripe@wyo.gov" <rich.cripe@wyo.gov>

Rich,

A couple comments concerning administration of the Small Wastewater Systems programs in non-delegated Counties. Carbon County requires the WDEQ permit be submitted before we will issue a building permit. We have had some issues when a building permit is required but there is an existing non-permitted\pre-existing wastewater treatment system on the site.

I don't think there are any provisions in the current rules to help us administer this type of circumstance.

Consider adding provision similar to

Expanded Use of Existing System: A permit shall be required for expanded use of an existing system. (or similar)

Pre-existing non-conforming system: Upon failure or need of repair or alteration, pre-existing non-conforming system must be brought up to current standards of a 2 compartment septic tank and the required square footage of absorption area. (or similar)

Thanks

Sid Fox, AICP
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Ch 25 Stakeholder Comments 46

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"Live like there's no tomorrow. One day you'll be right"

Ch 25 Stakeholder Comments 47

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Chapter 25 Review

1 message

William Tillman <william.tillman@wyo.gov> Wed, Feb 27, 2013 at 9:52 AM
To: Gina Johnson <gina.johnson@wyo.gov>

---------- Forwarded message ----------
From: James Brough <james.brough@wyo.gov>
Date: Mon, Feb 11, 2013 at 12:25 PM
Subject: Fwd: Chapter 25 Review
To: William Tillman <william.tillman@wyo.gov>
Cc: Rich Cripe <rich.cripe@wyo.gov>, Frank Strong <frank.strong@wyo.gov>, Hannes Stueckler <hannes.stueckler@wyo.gov>

Bill,

Attached are comments from Joy Hill and Nick Wilson with Big Horn County Planning Office.

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---------- Forwarded message ----------
From: Joy Hill <joy.hill@bighorncountywy.gov>
Date: Mon, Feb 11, 2013 at 9:44 AM
Subject: Chapter 25 Review
To: James Brough <james.brough@wyo.gov>
Cc: Nick Wilson <nick.wilson@bighorncountywy.gov>

James,

I have done a pretty thorough review of Chapter 25. You will find lots of comments and suggestions on the attached version. I realize that my “beginner” level of understanding may make some of my comments moot. I do not expect everything I wrote to be taken into consideration. From my perspective, the sections of the document should fall in an order that mimics the design and installation process itself. Thus, open with definitions, an overview of the process parts, and then dive into the parts. It does that to a degree already. Also, I approached this document from the perspective of someone who does not know all of the terminology, thus may need a few more things defined. I guess it ultimately depends on who your audience is. Nick and I have discussed everything within the attached document.

Thanks,

Joy

Joy Hill

Big Horn County

Land Planner/GIS Manager

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Ch 25 Stakeholder Comments 48

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"Live like there's no tomorrow. One day you'll be right"

DEQ_20130201Chapter25Draft.pdf

1079K

Chapter 25
SMALL WASTEWATER SYSTEMS

Page numbering needs to be fixed.

Table of Contents

Interestingly, the definition does not appear anywhere in this document!

Curious as to why these headings are indented so deeply.

Seems awkward to mention this when the rest of the definition has not been included.

CHAPTER 25

SMALL WASTEWATER SYSTEMS

Section 1. Authority.

This rule is promulgated pursuant to Wyoming Statutes (W.S.) 35-11-101 through 35-11-1701, specifically 35-11-302(a)(iii).

Section 2. Objective.

This Chapter contains the minimum standards for the design and construction of small wastewater systems which are defined by W.S. 35-11-103(c)(ix). The two thousand (2,000) gallons defined in the statute shall be the average flow of domestic sewage per day.

Section 3. Definitions.

(a) "**Absorption surface**" means the interface where treated effluent infiltrates into native or fill soil.

Should this say "bed system" rather than bed?

a 5-day average

(b) **"Advanced treatment"** means a treatment process that achieves an effluent being discharged to the absorption surface or native soil with 5 day biochemical oxygen demand (BOD_5) and total suspended solids (TSS)less than or equal to 30 mg/L.

add aggregate definition

system where the

(c) "**Bed**" means a soil treatment and dispersal system, the width is greater than three (3) feet.

(d) **"Bedrock"** means geological layers, of which greater than 50 percent by volume consist of unweathered in-place consolidated rock or rock fragments. Bedrock also means weathered in-place rock which cannot be hand augered or penetrated with a knife blade.

designed or

Add BOD definition.

(e) **"Bedroom"** means any room that is or may be used for sleeping.

(f) **"Blackwater"** means water containing fecal matter and urine.

(g) **"Building sewer"** means the pipe which carries wastewater from the building.

domed, open-bottom

(h) **"Chamber"** means a domed open bottom structure that is used in lieu of perforated distribution pipe and gravel media.

Does this need to be defined?

(i) **"Delegated small wastewater program"** means a local governmental entity, ~~delegated by the~~ Administrator, with the authority to administer the provisions of W.S. 35-11-301(a) (iii) for small wastewater systems pursuant to the provisions of W.S. 35-11-304.

liquid-

(j) **"Domestic wastewater"** means a combination of the liquid or water-carried wastes from residences, business buildings, institutions, and other establishments arising from normal living activities.

Use of the serial comma is not consistent throughout the document.

(k) **"Domestic Septage"** means liquid or solid material removed from a waste treatment vessel that has received only wastes from residences, business buildings, institutions, and other establishments arising from normal living activities.

Also referred to as chamber in the document.

(l) **"Dosing tank"** means a tank equipped with an automatic siphon or pump d to discharge effluent on an intermittent basis.

(m) **"Drain field"** means a shallow, covered, excavation made in unsaturated soil into which pretreated wastewater is discharged through distribution piping for application onto absorption surfaces through porous media or manufactured components placed in the excavations.

(n) **"Effluent"** means a liquid flowing out of a septic tank, other treatment vessel or system.

(o) **"Effluent filter"** means a removable, cleanable device inserted into the outlet piping of a septic tank or other treatment vessel designed to trap solids that would otherwise be transported to the drain field or other downstream treatment components.

(p) **"Evapotranspiration"** means the combined loss of water from soil by evaporation from the soil or water surface and by transpiration from plants.

(q) **"Greywater"** means household wastewater which has not been contaminated by toilet discharge. Greywater includes wastewater from baths, showers, bathroom wash basins, clothes washing machines, sinks (including kitchen sinks) and laundry tubs.

(r) **"Grease interceptor"** means a device designed to separate fats, oils, and grease from the wastewater.

water-saturated

(s) **"Groundwater"** means subsurface water that fills available openings in rock or soil materials such that they may be considered water saturated under hydrostatic pressure.

(t) **"High groundwater"** means seasonally or periodically elevated levels of groundwater.

five-day

High-strength wastewater

(u) **"High Strength Wastewater"** means a wastewater stream with a five (5) day BOD higher than 200 mg/l.

(v) "**Holding Tank"** means a watertight receptacle designed to receive and store wastewater.

(w) **"Manifold"** means a non-perforated pipe that distributes effluent to individual distribution pipes.

on-site

(x) **"Mound system"** means an onsite wastewater system where the bottom of the absorption surface is above the elevation of the existing site grade, and the absorption surface is contained in a mounded fill body above the grade.

"(expressed in minutes per inch)" or "time, expressed in minutes per inch,"

(y) **"Percolation Rate"** means the time expressed in minutes per inch required for seep into saturated soil at a constant rate during a test.

I recommend a more thorough definition than this either here or in the appendix.

Missing space between (z) and (aa).

(z) **"Percolation test"** means the method used to measure the percolation rate of water into soil as described in Appendix A.

(aa) **"Pressure distribution"** means a network of distribution pipes in which effluent is forced through orifices under pressure.

Wondering if pressure dosing should be defined.

(bb) **"Pretreatment"** means any technology or combination of technologies that ...des discharge to a drain field or other final treatment unit or process before final ...mination into the receiving environment.

(cc) **"Restrictive layer"** means a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide unfavorable root conditions. Examples are bedrock, cemented layers, dense layers, and frozen layers.

receptacle?

(dd) **"Septic tank"** means a buried, watertight tank designed and constructed to receive and treat raw wastewater.

(ee) **"Service provider"** means a person authorized and trained by a system manufacturer or their vendor to operate and maintain any proprietary system which provides advanced treatment

missing punctuation

should trench system be defined or possibly wrapped into the trench definition somehow?

(ff) **"Trench"** means an absorption surface with a width of three (3) feet or less.

...tion 4. Design Flows.

Determining Use Type and Design Flow Rates

The quantity of wastewater shall be determined by one of the following:

volume of domestic wastewater

(a) Tables 1 and 2 provided in this section.

(b) Metered water supply data from the facility.

(c) Metered water supply data from another facility where similar water demand... have been demonstrated.

The width of each column in this table could be decreased to make the table easier to read.

Table 1. Residential Average Design Flow Rates per Bedroom (gallons per day, gpd...

1 bedroom	150
2 bedrooms	280
3 bedrooms	390
4 bedrooms	470
5 bedrooms	550
6 bedrooms	630

[1]An unfinished basement is considered an additional bedroom

What is the definition of an apartment? Would a duplex be considered two apartments?

Table 2. Non-Residential Average Wastewater Design Flow Rates

Facility	Unit	Flow (gallons/unit/day)
Airports	person	4
Apartment	bedroom	120
Automobile Service Station	vehicle served	10
Bars	seat	20
Bathhouses and swimming pools	person	10
Campgrounds (w/ toilets only)	person	25
Campgrounds (w/shower facility)	person	45
Church	person	4
Country Club	member	25
Day School, Office building, Retail Store, Warehouse (no showers)	person	15
Hospital	bed	250
Industrial Building (sanitary waste only)	employee	20
Laundry (self-service)	machine	450
Motel, Hotel, Resort	bedroom	210
Rest Home, Care Facility, Boarding School	bed	100
Restaurant	meal	10
Theater	seat	3

What is a meal? A platter per person or three meals served per day?

Section 5. Systems not Specifically Covered by this rule.

This section is provided to encourage new technology and equipment and provide a process for evaluating and permitting designs which deviate from this rule. The proposed construction of facilities and processes not in compliance with this rule will be permitted provided that the facility, when constructed, can operate meeting the purpose of these rules.

(a) Each application for a permit to construct will be evaluated on a case-by-case basis using the best available technology. The application shall include at least one of the following:

full-scale

consider adding a definition for this.

(i) Data obtained from a full scale, comparable installation which demonstrates the acceptability of the design.

(ii) Data obtained from a pilot plant operated under the design condition for a sufficient length of time to demonstrate the acceptability of the design.

need space between (i) and (ii)

(iii) Data obtained from the theoretical evaluation of the design which demonstrates a reasonable probability of the facility meeting the design objectives.

(iv) An evaluation of the flexibility of making corrective changes to the constructed facility in the event it does not function as planned

in the event that it does not function as planned.

(b) If an applicant wishes to construct a pilot plant to provide data necessary to show the design will meet the purpose of the act, a permit to construct must be obtained.

Section 6. Site Suitability.

Site Suitability Requirements or Selecting a Suitable Site

(a) Locate the small wastewater system where the surface drainage is good. Avoid depressions and bases of slopes and areas in the path of runoff from roofs, patios, driveways, or other paved areas unless surface drainage is provided. Small wastewater systems shall not be located beneath buildings, parking lots, roadways, driveways, irrigated landscaping or other similarly compacted areas.

It's okay to just say 100%.

(b) The site must be large enough to include area for a future replacement drain field. Both the proposed and replacement drain fields shall be sized to receive one-hundred (100%) percent of the wastewater flow. If a trench system is used, the replacement drain field may be located between the trenches of the proposed drain field if there is at least nine (9) feet of spacing between trench sidewalls.

define?

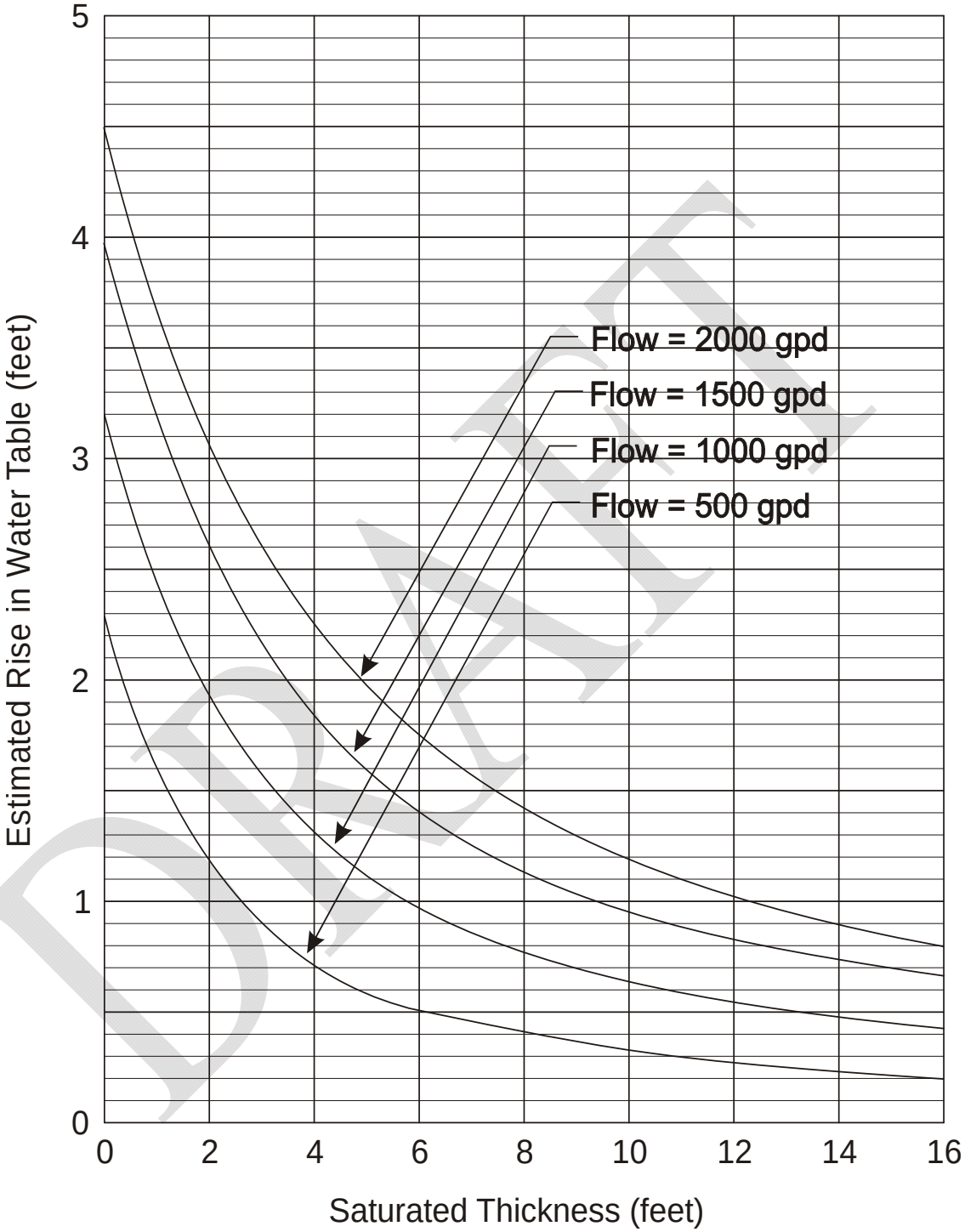
A graphic would be helpful for this item.

(c) For standard drain fields, effective suitable soil depth shall extend at least four (4) feet below the bottom of the drain field to any restrictive layer or highly permeable material.

seasonal?

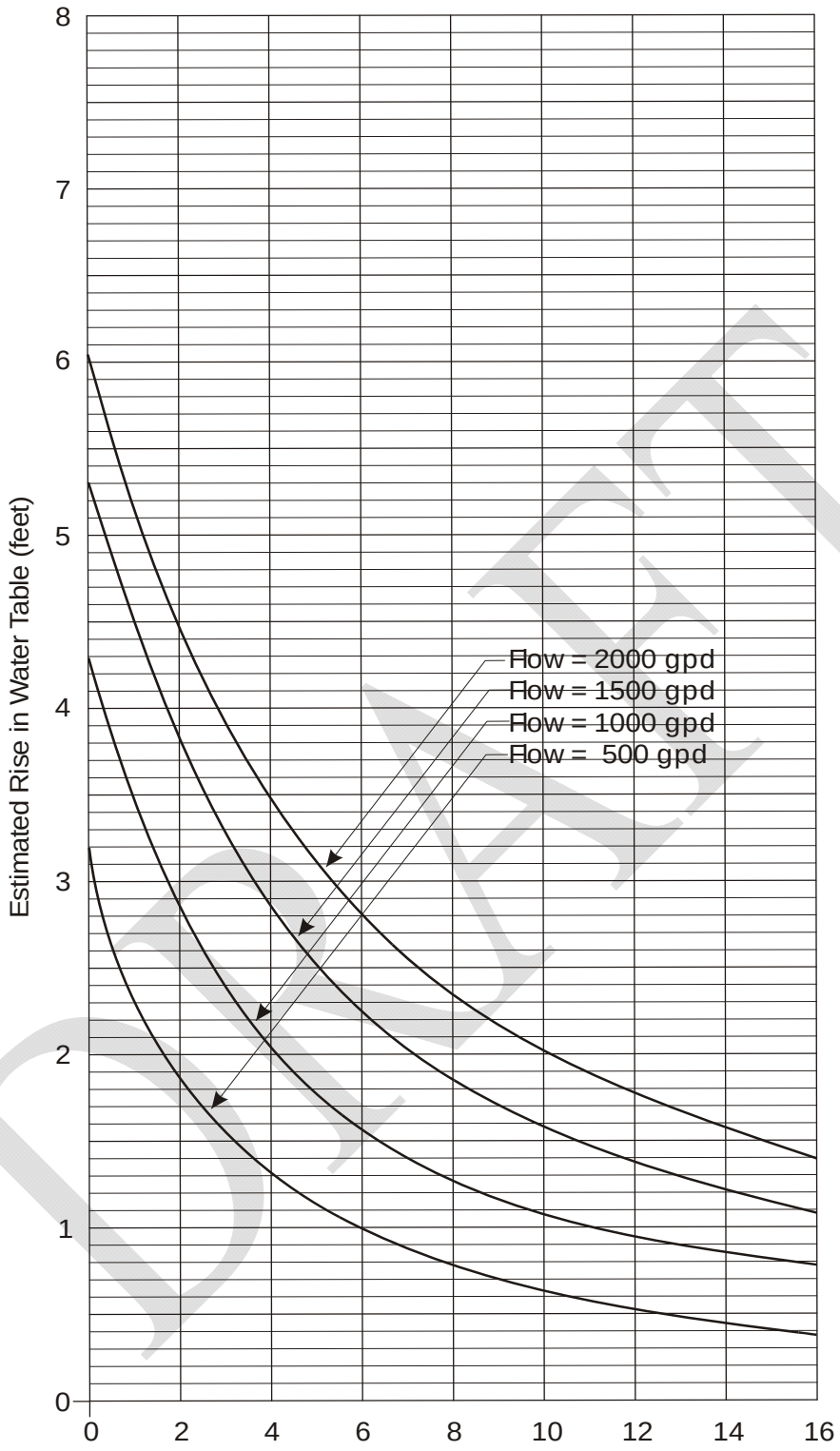
(d) The depth of the high groundwater shall be at least four (4) feet below the bottom of the drain field excavation. The high groundwater shall be based on the seasonally high groundwater elevation plus the estimated rise in the water table shown on figures 1 through 6. In areas of high groundwater, this vertical separation requirement is most commonly satisfied by a mound and pressure dosed drain field.

pressure-dosed



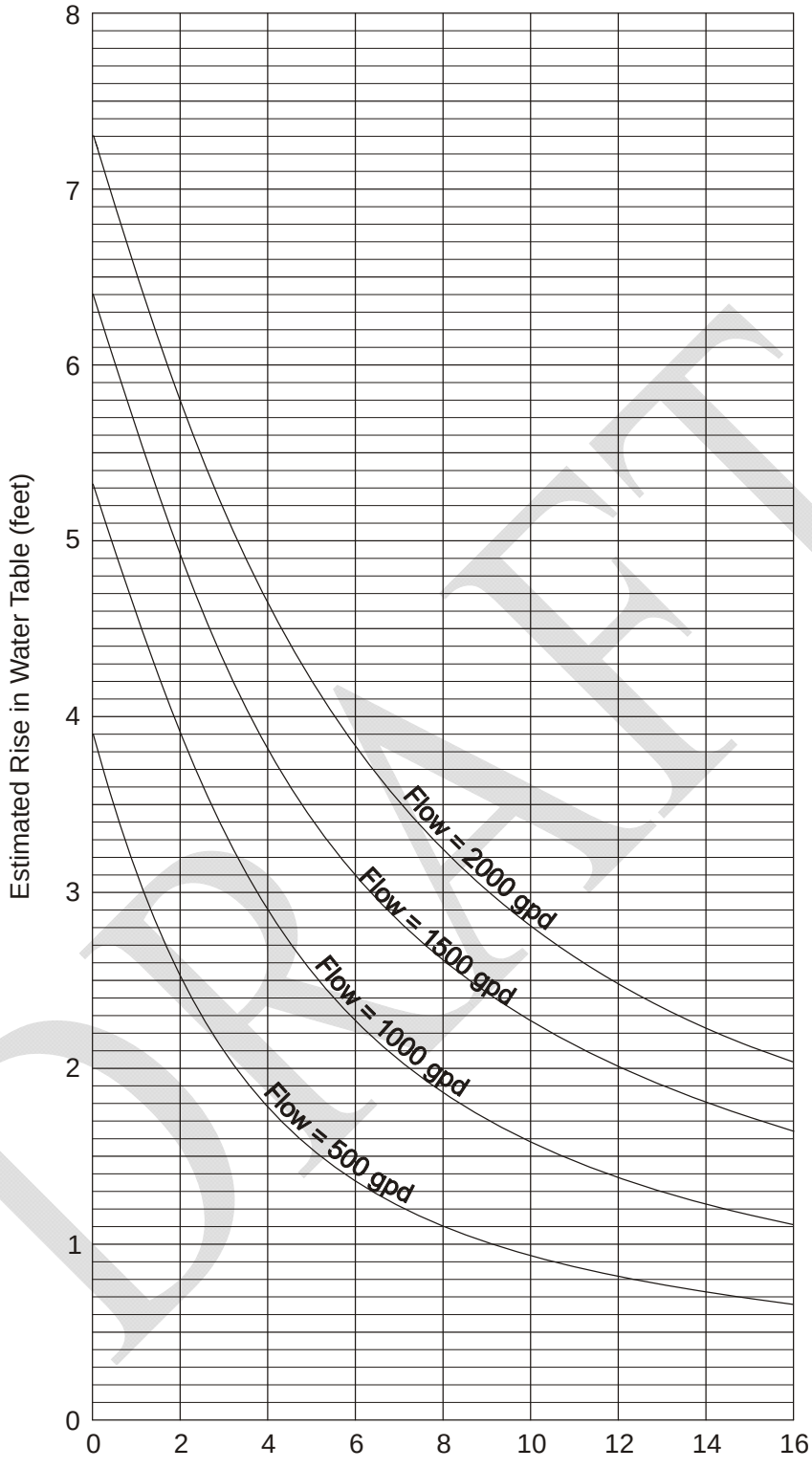
BASED ON A SOIL PERCOLATION RATE = 10 min/inch

FIGURE 1



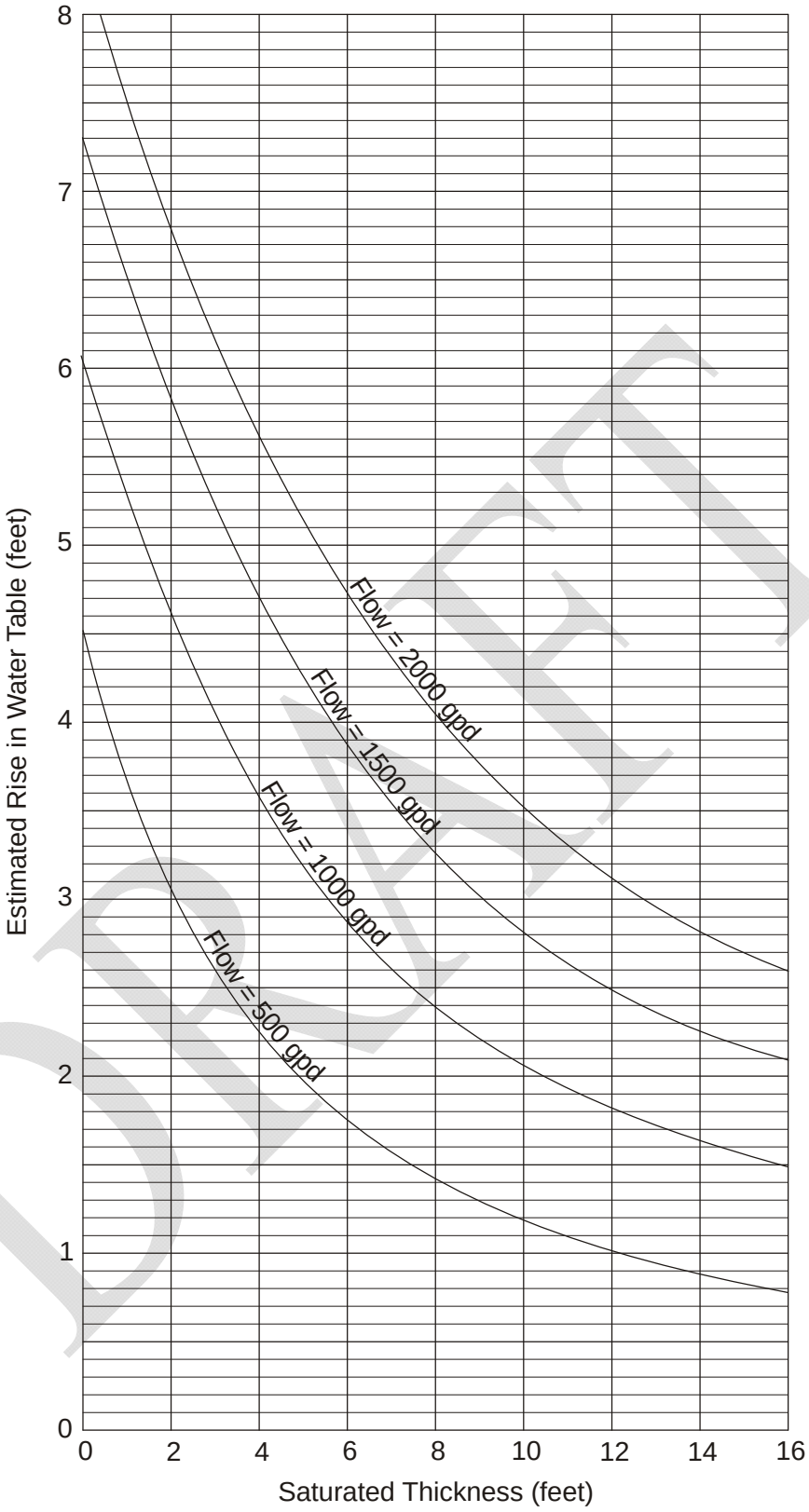
BASED ON A SOIL PERCOLATION RATE = 20 min/inch

FIGURE 2



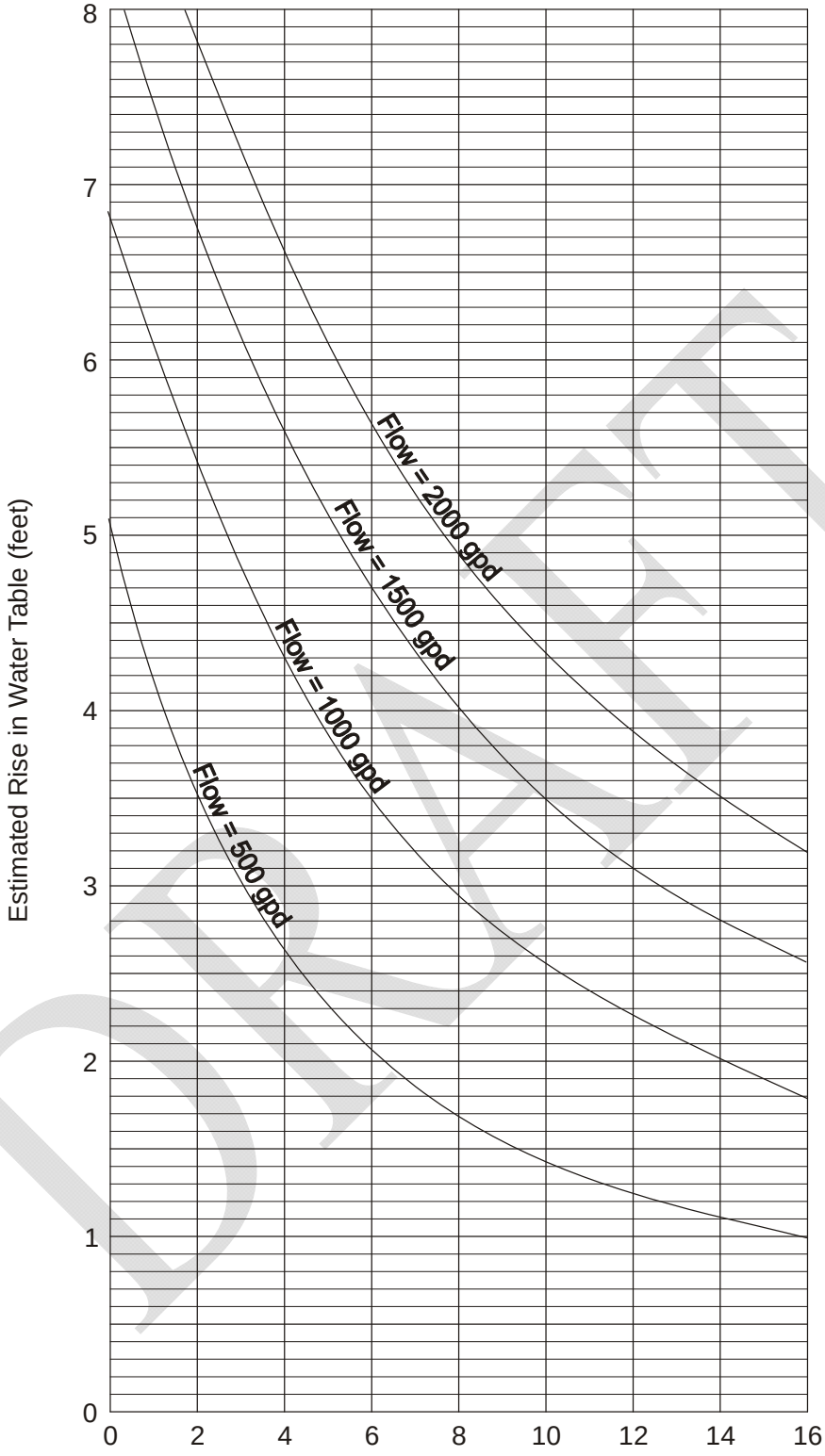
BASED ON A SOIL PERCOLATION RATE = 30 min/inch

FIGURE 3



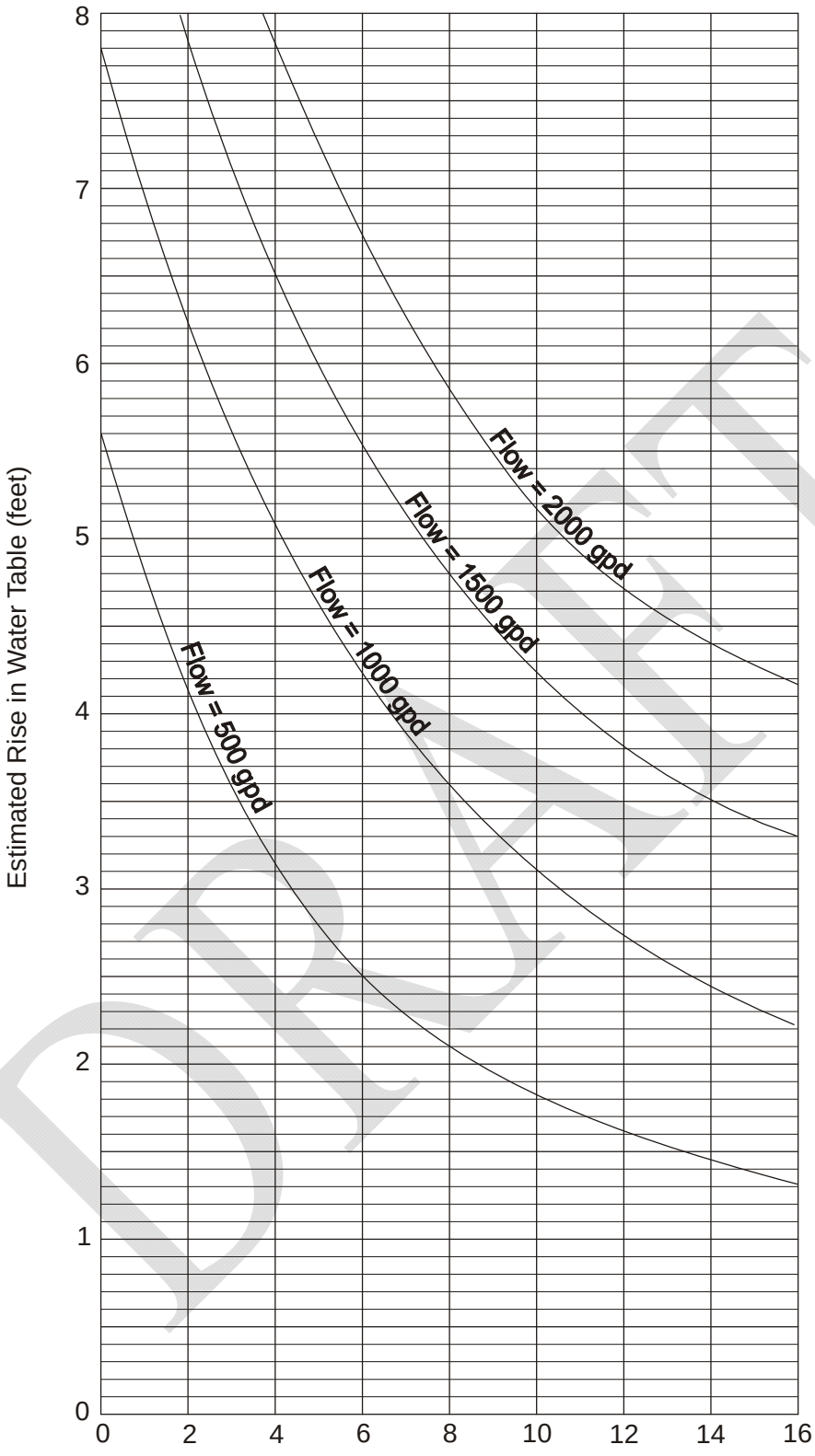
BASED ON A SOIL PERCOLATION RATE = 40 min/inch

FIGURE 4



BASED ON A SOIL PERCOLATION RATE = 50 min/inch

FIGURE 5



BASED ON A SOIL PERCOLATION RATE = 60 min/inch

FIGURE 6

(e) Slope

shall

not necessary to spell it out

(i) The natural slope of the site will not exceed twenty-five percent 25%, 4-feet horizontal to 1-foot vertical. The following are the maximum permissible slopes on which an absorption system may be constructed.

Table 3. Slope and Percolation Rates for Absorption Systems

Percolation Rate (minutes/inch)	Maximum Slope[1]
Faster than 5	25%
6-45	20%
46-60	15%

[1] Flatter slopes may be required where the effluent may surface downslope.

add definition

(ii) Serial distribution, with the use of drop boxes or approved fittings, is the preferred installation method for sloping terrain. The bottom of individual trenches shall be level and the trenches shall be constructed to follow the contours of the land.

need comma

(iii) The placement of multiple trenches, with each subsequent trench down slope of the previous trench shall be avoided when the addition of effluent to the drain field trenches may lead to either an unstable slope or seepage down slope.

(iv) All absorption surfaces must be located at least 15 feet from the top of any break in slope which exceeds the maximum slope allowed.

probably better to say this in the table caption or headers

inconsistent capitalization

(f) Minimum horizontal setback distances (in feet) are

Table 4. Minimum Horizontal Setbacks[1]

underlined?

Setback Distances; also, this is the second footnote on the page and it is #1. Also, the footnotes do not appear on this page - they are on the next page.

From	**To Septic Tank Or Equivalent**	**To Absorption Syste**
Wells (includes neighboring wells)	50	100
Public Water Well	50/500[2]	200/1000[2]
Property lines	10	10
Foundation Wall	15	25
Subsurface drains	10	25
Potable Water Pipes	25	25
Septic tank	NA	10
Surface Water, Spring (including seasonal and intermittent)	50	50

[1] For disposal of non-domestic wastewater, the isolation distance shall be determined by a hydrogeological study in accordance with Section 15(b) of Chapter 3, but shall not be less than the distances shown in Table 4.

[2] The larger horizontal setback shall apply when the soil absorption system discharges to the same aquifer that the public water well draws from.

require a soil exploration pit as well as a percolation test.

(g) Soil exploration pit and percolation tests

(i) Delegated small wastewater programs shall require a percolation test in addition to the soil exploration pit.

(ii) A minimum of one soil exploration pit within the proposed drain field location shall be excavated to a minimum depth of four (4) feet below the bottom of the proposed drain field to evaluate the subsurface conditions.

(iii) The percolation test shall be performed in accordance with Appendix A of this chapter. An evaluation of the soil texture, in the proposed drain field location, by a person experienced in soils classification, may be used to confirm the percolation rate.

Section 7. <u>Drain Field Sizing.</u>

(a) The total infiltrative surface area of a drain field shall be calculated by dividing the design flow rates (gpd) from Table 1 or Table 2 by the loading rate (gpd/ft^2) found in Table 5.

(b) The total infiltrative area shall be defined as follows:

(i) For standard trenches, perforated pipe embedded in aggregate, the total infiltrative area shall be calculated by multiplying the total length of the trench (ft) by the sum of the bottom width (ft) and the height (ft) of each sidewall. The sidewall height is the depth below the flowline of the pipe to the bottom of the trench. The height of the sidewall shall not exceed twelve (12) inches.

(ii) For chamber trenches, the total infiltrative area shall be calculated by multiplying the total length of the trench (ft) by the sum of the bottom width (ft) of the chamber and the height (ft) of each sidewall. The sidewall height is the height of the slotted sidewall of the chamber. The height of the sidewall shall not exceed twelve (12) inches.

(iii) For bed systems, the total infiltrative area shall be calculated by multiplying the total length (ft) by the width (ft) of the bed. The sidewall shall not be used in calculating the total infiltrative area for a bed system.

(c) Fast and slow percolating soils

of

minutes

one (1) foot deep

(i) Coarse sand or soils having a percolation rate less than five (5) minute per inch are unsuitable for subsurface effluent disposal. These soils may be used if a ~~one (1) foot~~ layer of fine sand or loamy sand is placed below the constructed soil absorption system. The soil absorption system shall be sized based on the percolation rate of the fill material.

Table 5. Rates of Wastewater Application for Drain Field Areas[1]

Percolation Rate (mpi)	Loading Rate (gpd/ft^2)	Percolation Rate (mpi)	Loading Rate (gpd/ft^2)
5	0.80	33	0.38
6	0.75	34	0.37
7	0.71	35	0.37
8	0.68	36	0.36
9	0.65	37	0.36
10	0.62	38	0.35
11	0.60	39	0.35
12	0.58	40	0.35
13	0.56	41	0.34
14	0.54	42	0.34
15	0.52	43	0.34
16	0.50	44	0.33
17	0.49	45	0.33
18	0.48	46	0.33
19	0.47	47	0.32
20	0.46	48	0.32
21	0.45	49	0.32
22	0.44	50	0.32
23	0.43	51	0.31
24	0.43	52	0.31
25	0.42	53	0.31
26	0.41	54	0.31
27	0.41	55	0.31
28	0.40	56	0.30
29	0.40	57	0.30
30	0.39	58	0.30
31	0.39	59	0.30
32	0.38	60	0.30

[1] If the percolation rate is less than 5 or greater than 60, a Wyoming Registered Professional Engineer must determine the loading for your site specific conditions.

high-strength

(d) Drain fields for high strength wastewater

(i) The allowable loading rate shall be reduced by the factor calculated by multiplying the loading rate by 200 and dividing by the five (5) day BOD loading of the wastewater.

five-day biochemical oxygen demand (BOD_5)

(ii) All drain fields shall be dosed and include a pressure distribution system.

and the locally-approved plumbing code.

Section 8. Building Sewer Pipes.

a locally-approved

All building sewers shall be installed in accordance with the 2012 International Plumbing Code (IPC). In the absence of an approved plumbing code, ~~and in addition to the IPC,~~ the building sewer shall comply with the following:

(a) Suitable building sewer pipe materials are Polyvinyl Chloride (PVC) and Acyrlonitrile-Butadiene-Styrene (ABS). The septic tank inlet and outlet pipes shall be schedule 40 PVC or ABS pipe and shall span the excavations for the septic tank and/or dosing chamber. Standard Dimension Ratio (SDR) 35 American Society for Testing and Materials (ASTM) D-3034 plastic pipe may be used if the void at the tank's side is filled with material which is granular, clean and compacted.

(b) Building sewer pipes shall not be smaller than four (4) inches in diameter and sized to handle the peak hourly flow from the building. When two different sizes or types of sewer pipes are to be connected, a proper type of fitting or conversion adapter shall be used.

(c) Sewer pipe shall not decrease in size flowing downstream.

and?

(d) Building sewer pipes should be laid at a standard slope of 1/4 inch per foot, but shall not be flatter than 1/8 inch per foot.

(e) Cleanouts shall be provided at every change in alignment and at least every 100 feet in straight runs.

(f) All sewer piping shall be laid on a firm bed throughout its entire length. It shall be protected from damage due to rocks, hard lumps of soil, debris and the like.

(g) Special care shall be utilized to prevent lateral movement or deformation during backfill. The backfill material shall be compacted to a density at least equivalent to the trench walls. Backfill over the pipe shall be of sufficient depth to protect the pipe from expected traffic loads and the wastewater from freezing.

Section 9. Septic Tanks and Other Treatment Tanks.

(a) Septic tanks

insert comma

(i) Septic tanks shall be fabricated or constructed of concrete, fiberglass or an approved material. Tanks shall be water tight ~~and~~ fabricated to constitute an individual structure, and shall be designed and constructed to withstand anticipated loads. The design of prefabricated septic tanks shall be reviewed for compliance with applicable construction standards prior to approval for installation.

(ii) The septic tank shall be placed on a level grade and a firm bedding to prevent settling. Where rock or other undesirable protruding obstructions are encountered, the opening for the septic tank shall be over excavated, as needed, and backfilled with sand, crushed stone, or gravel to the proper grade.

what does this mean?

(A) Septic tanks shall not be buried deeper than the tank manufacturer's maximum designed depth for the tank. The minimum depth of soil cover over the top of the tank is six (6) inches.

(B) Backfill around and over the septic tank shall be placed in such a manner as to prevent undue strain or damage to the tank or connected pipes.

For residences with more than four bedrooms, tank capacity must be increased by 250 gallons per each additional bedroom. For example, a six-bedroom home would require a minimum tank volume of 1500 gallons.

(C) Septic tanks shall not be placed in areas subject to vehicul engineered for the anticipated load.

with up to four (4) bedrooms.

(iii) Size

(A) The minimum liquid volume of a septic tank shall be 1000 gallons for residences up to a four (4) bedroom capacity. Additional capacity of 250 gallons per bedroom shall be provided for each bedroom over four (4).

high-strength

(B) Septic tanks for high strength wastewater or non-residential units shall have a minimum effective liquid capacity sufficient to provide at least 48 hour retention at peak flow or 1,000 gallons, whichever is greater.

48-hour

(iv) Configuration

a minimum of

(A) Septic tanks shall have not less than two (2) compartments. The inlet compartment shall not be less than one-half (1/2) of the total capacity of the tank. The liquid depth shall not be less than three (3) feet nor greater than six (6) feet.

(B) The septic tank shall have a length to width ratio of no less than two (2) to one (1), or be partitioned to protect against short circuiting flowing.

short-circuiting flow?

be at least

(C) The total depth shall not be less than eight (8) inches greater than the liquid depth. The partition shall allow venting of gases between compartments and out through the vent stack on the plumbing system of the house. Gases generated during liquefaction of the solids are normally vented through the building's plumbing stack vent

be equipped with? or have?

(D) The inlet and outlet on all tanks or tank compartments shall be provided with open-ended sanitary tees or baffles made of approved materials constructed to distribute flow and retain scum in the tank or compartments.

(I) The tees or baffles shall extend a minimum of six (6) inches above and nine (9) inches below the liquid level, but shall not exceed one-third (1/3) the liquid depth.

of

(II) A minimum of three (3) inches of clear space shall be provided over the top of the baffles or tees.

(III) The inlet pipe shall be at least two (2) inches higher than the outlet pipe. The outlet elevation shall be designed to provide a distance of 20 percent of the liquid depth between the top of the liquid and the bottom of the septic tank cover for scum storage.

%

(v) If additional septic tank capacity over 1,000 gallons is needed, it may be obtained by joining tanks in series provided the following requirements are met:

(A) The outlet of each successive tank shall be at least two (2) inches lower than the outlet of the preceding tank, and shall be unrestricted except for the inlet to the first tank and the outlet for the last tank.

(B) For new construction, the first tank shall be equal to or larger than any subsequent tank in the series.

(vi) A riser shall be provided to each compartment of the septic tank for inspection and cleaning.

(A) The riser shall have a minimum diameter of twenty (20) inches. Both inlet and outlet devices shall be accessible.

(B) The riser shall terminate at a maximum of six (6) inches below the ground surface. Riser covers terminating above grade shall have an approved locking device.

(vii) Land application of domestic septage in remote areas that meet the conditions found in Appendix B will be permitted as a permit by rule. Delegated small wastewater programs may issue individual permits.

?

(viii) An effluent filter with an opening of 1/8-inch or smaller shall be provided on the outlet of a septic tank or other tank that precedes a small diameter pressure distribution system. Effluent filters are recommended but not required for all septic tanks.

(b) Pump tanks

(i) Pump tanks shall meet the same material and installation requirements as septic tanks. Pump tanks shall have a 20-inch diameter access riser and it shall be brought to the ground surface.

(ii) The minimum pump tank size is 750 gallons for residential dwellings with four bedrooms or less. For systems with greater than 350 gpd design flow, the pump tank shall be 750 gallons plus one half (1/2) the daily flow greater than 350 gpd up to a maximum capacity of 1500 gallons.

(iii) A pump vault may be placed in the second compartment of a septic tank. The septic tank's size shall then be increased by a minimum of 500 gallons.

(iv) High water alarms shall be provided for all tanks that utilize pumps or siphons. The alarm device shall be an audible alarm or an indoor illuminated alarm or both.

(v) The minimum effluent level shall achieve complete submergence of the pump.

(vi) Dosed systems using a siphon shall have a dose counter installed to check for continued function of the siphon.

(c) Holding tanks

(i) Holding tanks shall meet the same material requirements as septic tanks. Holding tanks shall have a twenty (20)-inch diameter access riser and it shall be brought to ground surface.

20-inch was used earlier

(ii) Holding tanks shall not be used for residential systems when other alternative systems are available, except on a temporary, seasonal or intermittent basis, or when used to correct a failed drain field when other alternatives are unavailable.

(iii) Holding tanks must be located in an area readily accessible to the pump truck and where the tank itself will not float due to a high groundwater. If seasonal high groundwater may be present, the tank shall be properly anchored.

(iv) The minimum liquid volume shall be the greater of 1,000 gallons or seven (7) days storage based upon flow rate determined from Section 4.

(v) All holding tanks shall be equipped with a high water level alarm. The device shall be an audible alarm or an indoor illuminated alarm or both. The alarm level shall be placed at 3/4 the depth of the tank.

(d) Grease Interceptors

(i) A commercial or institutional food preparation facility with a waste stream containing fat, oil, and grease (FOG) in excess of 25 mg/L shall install an exterior grease interceptor or a device approved by the delegated health department or county. Facilities that typically have waste streams high in FOG are, but not limited to, restaurants, cafeterias, slaughterhouses, or institutional kitchens.

(ii) Waste streams high in FOG shall be plumbed separately and directly to a grease interceptor prior to the waste treatment process.

(iii) Waste streams from sanitary facilities such as bathrooms, toilets, urinals, or other similar fixtures shall not be discharged into the grease interceptor. These sources must be connected at least 4-6 feet downstream of the grease interceptor's discharge. The design shall prevent any backflow from the sanitary sources into the grease interceptor.

four to six

(iv) Only one source facility per grease interceptor shall be allowed.

(v) Grease interceptors shall be located so that they are easily accessible for inspection, cleaning, and removal of the collected wastes. The interceptor shall not be closer than fifteen (15) feet from the last discharging fixture and no further away than thirty-five (35) feet.

cleanout or clean-out

(vi) Grease interceptors shall have at least two (2) compartments with a 20-inch diameter clean out riser for each compartment. Each clean out riser shall be brought to the surface and have a sealed lid that is rated for any anticipated load. There shall be a means provided to sample the effluent.

(vii) There shall be no internal cleanout tees or bypasses.

(viii) The inlet and outlet of the grease interceptor shall be vented. The vent pipe shall be at least two (2) inches in diameter. The inlet and outlet vents shall not be interconnected.

(ix) The outlet invert shall be no more than two (2) inches lower than the inlet invert.

(x) The dividing wall between compartments shall be the same height as the other walls and the cover must contact the top of the dividing wall.

(xi) The effluent from each compartment shall be drawn from the bottom of a riser pipe that terminates at least eighteen (18) inches below the inlet invert of that same compartment.

(xii) Grease interceptors shall be accessible during normal business hours without interrupting normal business operations.

(xiii) Grease interceptors shall be installed in accordance with the manufacturer's instructions and applicable requirements of this section. A copy of the manufacturer's instructions shall be submitted with every permit to construct application submitted to DEQ.

(xiv) Grease interceptors shall be sized according to the following:

(A) The minimum volume shall not be less than 750 gallons.

(B) Shall be sized according to the following:

Kitchens (grease, garbage)

Number of meals per peak hour	**X**	Waste Flow rate*	**X**	Retention time**	**X**	Storage factor***	=	Interceptor size (liquid capacity)

*Waste flow rate – see Table 2.

**Retention times

Kitchen waste:	
Dishwasher and/or disposal	2.5 hours
Single service kitchen:	
Single serving with disposal	1.5 hours

***Storage factors

Fully equipped commercial kitchen	8 hr. operation: 1 16 hr. operation: 2 24 hr. operation: 3
Single service kitchen:	1.5

(e) Other interceptors

(i) Interceptors are required for oil, grease, sand and other substances harmful or hazardous to the building drainage system, or the small wastewater treatment system.

(A) Laundries

(I) Commercial laundries, Laundromats, and dry-cleaners shall be equipped with an interceptor in order to reduce the quantity of lint and silt that enter the collection system.

(II) The system must be of adequate size and design to allow for cool-down of wastewater so that separation can be more readily achieved.

(III) The interceptor must be installed with a wire basket or similar device, removable for cleaning, that prevents passage into the drainage system of solids ½ inch (12.7 mm) or larger in size, string, rags, buttons, or other materials detrimental to the waste treatment system.

size, such as string...

(IV) Sizing must be in accordance with the following formula:

Laundries (grease, lint, silt)

Total gallons per cycle	**X**	Cycles per hour	**X**	Retention time*	**X**	Storage factor**	=	Lint interceptor

*Retention times

Institutional laundries	2.5 hours
Standard commercial laundry	2.0 hours
Light commercial laundry	1.5 hours

**Storage factors

8 hours of operation	1.0
12 or more hours of operation	1.5

(B) Car Washes

hand-washing

(I) Where automobiles are washed (including detail shops utilizing hand- wash practices), separators shall have a minimum capacity of 1000 gallons for the first bay, with an additional 500 gallons of capacity for every other bay.

(II) Additionally, wash racks must be constructed to eliminate or minimize the impact of run-off from rain/storm events. Minimum requirements are roofed structures with at least two walls and appropriate grading to prevent stormwater infiltration into the sanitary sewer.

(III) An effluent sampling point is required.

Any detail needed regarding where this should be or what form it should be in?

(g) Treatment for high strength wastewater

(i) Any onsite wastewater treatment system handling high strength wastewater shall install either a pretreatment unit ahead of the septic tank and/or expand the size of the soil absorption system.

(ii) The pretreatment unit and septic tank shall be designed and sized to reduce the effluent five (5) day BOD loading to less than 140 mg/l.

(iii) A sample port shall be installed before the soil absorption system to allow for sampling of the effluent.

(h) Abandonment of septic and holding tanks

The following is the procedure to abandon septic tanks and holding tanks when the system is upgraded, equipment replacement is necessary, or central sewer lines are m available.

the tank should be hauled or the contents of the tank should be hauled? Seems like the latter.

(i) The abandoned tank should be pumped and hauled to a licensed facility approved to receive the waste or pump the septage into the newly constructed septic or holding tank. Discharging to a central sewer requires coordination with, and the approval of, the owner/operator of the sewer system.

(ii) Once the abandoned tank is empty, it should be removed and the excavation backfilled. As an alternative to removing the tank, the access covers can be removed and the tank filled with native soil, pit run, or sand.

(iii) If the abandoned tank is part of a Class V UIC facility, the abandonment st also be in compliance with Chapter 16, Section 12.

Define distribution boxes and drop boxes?

Section 10. Effluent Distribution Devices.

Distribution boxes, flow divider tees and straight tees are suitable for level or nearly level ground and are installed before the drain field with the goal of splitting flows equally between drain field laterals. Drop boxes are suitable for sloping ground and are installed to achieve serial loading.

prevent

(a) Distribution boxes

(i) The distribution box shall be installed on a level, stable base to ensure against tilting or settling, and to minimize movement from frost heave.

(ii) Boxes shall be watertight and constructed of concrete or other durable material.

(iii) Boxes shall be designed to accommodate the inlet pipe and the necessary distribution lines. The inlet piping to the distribution box shall be at least one (1) inch above the outlet pipes and all pipes shall have a watertight connection to the distribution box.

(iv) The box shall be protected against freezing and made accessible for observation and maintenance.

(v) Boxes shall have flow equalizers installed on each outflow.

(b) Flow divider tees may be used in place of distribution boxes.

the last item was (c)

(c) Straight tees may be used in place of distribution boxes. Where straight tees are used, all distribution piping and laterals must be constructed as level as possible.

(c) Drop boxes are suitable for sloping ground and are installed to achieve serial loading. The drop boxes shall meet the requirements in paragraphs (a)(i through v) of this section.

Section 11. Standard Drain Field Systems.

(a) General Design Requirements:

(i) All drain fields shall be designed in such a manner that the effluent is effectively filtered and retained below ground surface. The absorption surface accepts, treats, and disperses wastewater as it percolates through the soil.

the

(ii) Drain fields shall not be excavated when the soil is wet enough to smear or compact easily. Open drain field excavations shall be protected from surface runoff to prevent the entrance of silt and debris. All smeared or compacted surfaces shall be raked to a depth of one (1) inch, and loose material removed before filter or filler material is placed in the drain field excavation.

(iii) Drain fields shall be designed to approximately follow the ground surface contours so that variation in excavation depths will be minimized. The trenches may be installed at different elevations, but the bottom of each individual trench shall be level throughout its length.

Is there more than one absorption surface?

(iv) Shallow drain field depths are encouraged to promote treatment and evapotranspiration. The minimum soil cover depth over the drain field is one (1) foot. The maximum depth to the bottom absorption surface of a drain field is four (4) feet. Finished grading shall prevent ponding and promote surface water runoff.

could this be TOO shallow for some locations with freeze concerns?

What?? THIS is maximum depth?

(v) Pipes, chambers or other products shall be bedded on firm, stable material. Heavy equipment shall not be driven in or over drain fields during construction or backfilling.

(vi) Standard trenches refer to perforated pipe embedded in aggregate-filled trenches which shall conform to the following:

(A) The perforated pipe shall have a minimum diameter of 4 inches. Suitable pipe materials include: ASTM D-2729-11 PVC, ASTM D-3034-08 PVC, Schedule 40 PVC ASTM d1784-11, and ASTM F810-07 PE.

(B) The aggregate shall be crushed rock, gravel or other acceptable, durable and inert material which is free of fines, and has an effective diameter between ½ inch and 2-1/2 inches.

(C) Prior to backfilling, the aggregate shall be covered throughout with acceptable geotextile materials or a three (3) inch layer of straw.

What is reserve area and is it required? If so, what becomes reserve area for those trenches in clay soils?

(D) Aggregate shall extend the full width and length of the drain field to a of at least twelve (12) inches with at least six (6) inches of drain gravel under the ution pipe and at least two (2) inches over the distribution pipe.

(E) Maximum width of trench excavation is three (3) feet.

(F) Minimum spacing of trenches (wall to wall) is three (3) feet. Trench spacing shall be increased to nine (9) feet when the area between each trench is considered as reserve area or for clay loam soils that have percolation rates slower than 60 min/in. For clay loam soils, the nine (9) foot spacing shall not be considered as reserve area.

(vii) Standard beds shall conform to the same pipe and aggregate requirements for trenches as found in subparagraphs (vi)(A through D) of this section. Standard beds shall also conform to the following:

(A) The soils shall be absent of clay with percolation rates faster than 60 minutes per inch. The bottom of the bed must be level, therefore the site shall be relatively flat, sloping no more than one (1) foot from the highest to the lowest point in the installation area.

(B) Distribution laterals within a bed must be spaced on not greater than six (6) feet centers. Sidewalls shall be more than three (3) feet from a distribution lateral.

(C) Beds must not be wider than twenty-five (25) feet if gravity distribution is used. Multiple beds must be spaced at one-half the bed width.

Rubber-tired

(D) Rubber tired vehicles must not be driven on the bottom surface of any bed excavation.

manufacturer's

(viii) Chambered trenches, when used in lieu of perforated pipe and aggregate, shall be installed in conformance with the manufacturer recommendations. No cracked, weakened, modified, or otherwise damaged chamber units shall be used in any installation.

(A) All chambers shall be an open, arch-shaped structure of durable, non-degradable design, suitable for distribution of effluent without filter material

(B) All chamber endplates shall be designed so that the bottom elevation of the inlet pipe is at least six (6) inches from the bottom of the chamber.

?

(C) Inlet and outlet effluent sewer pipes shall enter and exit the chamber endplates. Vents shall be installed at all inlet and outlet effluent sewer pipes.

(D) All chambers shall have a splash plate under the inlet pipe or another design feature to avoid unnecessary channeling into the trench bottom.

(E) Maximum width of trench excavation is three (3) feet.

(F) Minimum spacing of trenches (wall to wall) is three (3) feet. Trench spacing shall be increased to nine (9) feet when the area between each trench is considered as reserve area or for clay loam soils that have percolation rates slower than 60 min/in. For clay loam soils, the nine (9) foot spacing shall not be considered as reserve area.

(ix) Chambered beds shall conform to the same requirements for chambered trenches as found in subparagraphs (viii)(A through D) of this section. Aggregate, as specified in subparagraph (vi)(B) of this section, or native soil shall be used to fill the space between the chambers.

define

(x) Serial sidehill trench:

(A) A minimum of six (6) feet of undisturbed soil shall be maintained between adjacent trench or bed side walls.

(B) The bottom of each serial trench or bed system shall be level.

(C) The overflow pipe between serial leach systems shall be set no higher than the mid-point of the upstream distribution pipe. The overflow pipe shall not be perforated.

(b) A design package for a standard drain field is provided online at the Division's website to assist you in submitting a completed application for a properly designed wastewater treatment and disposal system. The worksheet and calculations were prepared by a registered professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. The general design requirements stated in this section are incorporated into the worksheets such that by completing the forms, the system will comply with those requirements.

Section 12. <u>Pressure Distribution Systems.</u>

(a) General Design Requirements:

(i) The basic elements of a pressure distribution system include a pump tank, filter, and a means to deliver specified doses to a small diameter pipe network within a drain field. Pressure distribution is required for mound systems or for bed systems with a width greater than twenty-five (25) feet.

no need to spell out

(ii) Pumps must be sized to match the distribution system curve or demand. Pumps shall be designed for sewage pumping applications and be accessible from the ground surface.

(iii) The control system for the pump and pump tank shall, at a minimum, consist of a "pump off" switch, a "pump on" switch, a "high liquid alarm".

(A) All electrical connections must be made outside of the chamber in either an approved weatherproof box or an explosion-proof junction box.

(B) The wiring from the junction box to the control box must pass through a sealing fitting to prevent corrosive gases from entering the control panel.

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

(iv) The pressure transport piping between the tank and the drain field shall be designed to drain after each pump cycle to prevent freezing.

(A) The ends of lateral piping shall be constructed with long sweep elbows or an equivalent method to bring the end of the pipe to finished grade. The ends of the pipe shall be provided with threaded plugs, caps, or other devices to allow for access and flushing of the lateral.

(B) All joints in the manifold, lateral piping, and fittings shall be solvent-welded using the appropriate joint compound for the pipe material. Pressure transport piping may be solvent-welded or flexible gasket jointed.

(C) Where automatic siphons or other devices are used, they shall be designed to empty the dosing tank in less than ten (10) minutes.

(c) A design package for a pressure distribution system is provided online at the Division's website to assist you in submitting a completed application for a properly designed wastewater treatment and disposal system. The worksheet and calculations were prepared by a registered professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. The general design requirements stated in this section are incorporated into the worksheets such that by completing the forms the system will comply with those requirements.

A sand mound system

Section 13. Sand Mound Systems.

The sand mound consists of a sand fill, an aggregate bed and a soil cap. Pressure distribution shall be used in conjunction with sand mound systems.

(a) Selection Criteria: criterion

The high groundwater level, bedrock or impervious clay layer is less than four (4) feet below the level of the drain field excavation.

(b) Site Requirements:

(i) A minimum of one (1) foot of vertical separation of the native soil is required between the bottom of the sand fill and the top of the high groundwater level, any restrictive layer, or any highly permeable material.

(ii) The percolation rate of the native soil at the interface of the sand fill shall be greater than five (5) and less than sixty (60) minutes per inch. The percolation shall be measured in the top twelve (12) inches of native soil.

(c) General Design Requirements:

through

(i) Sand Layer

(A) Filter sand shall conform to ASTM C-33, with less than 2% passing the #200 sieve.

(B) The minimum depth of sand below the aggregate bed surface shall be one (1) foot.

(C) The sand mound shall have a combination of at least four (4) vertical feet of filter sand and unsaturated native soil above the high groundwater level.

(D) The top of the sand layer under the aggregate bed shall be level in all directions.

(E) The sand layer shall fill around the perimeter of and to the top of the aggregate bed.

(F) The slope of all sides shall be three (3) horizontal to one (1) vertical or flatter.

(G) The infiltrative area which is the bottom of the sand fill shall be calculated by dividing the design flowrates (gpd) from Table 1 or Table 2 by the loading rate (gpd/ft^2) found in Table 5.

(ii) Aggregate Bed

(A) The aggregate shall be crushed rock, gravel or other acceptable, durable and inert material which is free from fines, and has an effective diameter between one-half (1/2) inch and two and one half (2 ½) inch.

be consistent with use of numbers and fractions throughout.

(B) The aggregate bed depth shall not be less than nine (9) inches with a minimum of six (6) inches of clean aggregate placed below the distribution pipe and two (2) inches above the distribution pipe. The aggregate shall be covered with an approved geotextile material after installation and testing of the pressure distribution system.

(C) The design shall be a long, narrow bed design with a maximum width of fifteen (15) feet.

(D) The infiltrative area, which is the bottom of the aggregate bed, shall be calculated by dividing the design flowrates (gpd) from Table 1 and Table 2 by the loading rate of 0.8 gpd/ft^2.

(iii) Soil Cover

(A) The soil cap shall be constructed of a sandy loam, loamy sand, or silt loam. The depth of the soil cap shall be at least six (6) inches at the edges to twelve (12) inches at the center. The slope of all sides shall be three (3) horizontal to one (1) vertical or flatter.

could just say 3:1

(B) A layer of top soil at least six (6) inches thick shall be placed over the entire sand mound area. The sand mound should be planted with vegetation that does not require watering and will not establish deep roots. Native grasses are commonly used.

(d) A design package for a sand mound system is provided online at the Division's website to assist you in submitting a completed application for a properly designed wastewater treatment and disposal system. The worksheet and calculations were prepared by a registered professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. The general design requirements stated in this section are incorporated into the worksheets such that by completing the forms the system will comply with those requirements.

Section 14. Small Wastewater Lagoons.

(a) Selection Criteria:

(i) Lagoons shall only be considered in areas of the State where the annual evaporation exceeds the annual precipitation during the active use of the lagoon.

(ii) Lagoons shall only be allowed when the percolation rate exceeds 120 minutes per inch and the soil extends vertically down at least two (2) feet from the bottom of the lagoon to the seasonal high groundwater table or bedrock formations.

(iii) A lagoon shall not be installed on a property less than three (3) acres in size.

(iv) A lagoon shall not be constructed within the 100 year flood plain.

what about the other systems?

100-year

(b) General Design Requirements:

(i) Beyond the horizontal setback distances requirements specified in Section 6(d) of this rule, the lagoon shall not be placed within ~~one hundred~~ (100) ~~-~~ feet of the owner's property line.

(ii) The use of a septic tank which meets the specifications in Section 9 of this rule shall be required before the small wastewater lagoon.

how about between the source and the lagoon?

(iii) The lagoon shall be located and constructed so it will not receive surface runoff water.

5%

(iv) The slope of the lagoon site shall not exceed five (5) percent.

(v) The lagoon site must be located in an area of maximum exposure to sun and wind.

(vi) The lagoon shall be designed for complete retention.

(vii) The area of the lagoon shall be calculated based on the following formula.

$$A = \frac{584 \times Q \times 1.3}{(365 \times S) + (E - P)}$$

A = Area of the lagoon at the 5 foot depth water level in square fe~~et~~ in

Q = Daily sewage flow determined from Table 1 or 2, gallons per day.

E = Average annual lake evaporation in inches per year. (Note: lake evaporation is less than pan evaporation; lake evaporation equals pan evaporation times a pan coefficient of about 0.7)

P = Average annual precipitation rate in inches per year.

S = Seepage rate in decimal form. ?

add definition

(viii) The slopes of the dikes shall not be steeper than three (3) horizontal to one (1) vertical. The minimum width of the top of the dike shall be four (4) feet.

(ix) All fill shall consist of impervious material that is well compacted and free of rocks, frozen soil, or other large material.

(x) The minimum operating depth shall be two (2) feet. The dikes shall provide a minimum freeboard of one (1) foot.

define

(xi) The floor of the lagoon shall be level and maintained free of all vegetation.

(xii) The influent line into the lagoon must discharge near the center onto a concrete apron at least two (2) feet square.

(xiii) A cleanout or manhole shall be provided in the influent line near the dike.

(xiv) The area around the small wastewater lagoon shall be fenced to preclude the entrance of livestock, pets, and humans. The fence shall be equipped with a locking gate. The gate shall have a sign indicating "NO TRESPASSING – WASTEWATER LAGOON".

(c) A design package for a small wastewater lagoon is provided online at the Division's website to assist you in submitting a completed application for a properly designed wastewater treatment and disposal system. The worksheet and calculations were prepared by a registered

professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. The general design requirements stated in this section are incorporated into the worksheets such that by completing the forms the system will comply with those requirements.

Section 15. Privies.

Pre-fabricated privies and outhouses with sealed, water-tight vaults that meet the following conditions will be permitted as a permit by rule. Delegated Local health departments and counties may require and issue individual privy permits.

(a) A DEQ permit to construct is not required if the following conditions are met:

(i) The isolation requirements for sealed privies shall comply with Section 6(a)(i) for septic tanks.

(ii) The depth to seasonally high groundwater from the bottom of a water tight vault shall be sufficient to prevent floatation of the empty vault.

(iii) The vault must have sufficient capacity for the dwelling served, and must have at least 27 cubic feet or 200 gallons of capacity.

(iv) The privy must be easily maintained and insect tight. The door must be self-closing. The privy seat must include a cover. All exterior openings, including vent openings, shall be screened.

(v) Privies must be adequately vented.

(b) For unsealed pit privies, the following conditions must be met.

(i) Privies shall serve structures that have no plumbing fixtures or running water (piped water supply).

(ii) Pit privies shall be located to exclude surface water.

(iii) The isolation requirements for privies shall comply with Section 6(a)(i) for drain fields and be at least 100 feet from any property or right-of-way line.

(iv) The bottom of the unsealed pit must have a minimum four (4) feet vertical separation distance to the seasonal high ground water level.

Section 16. Greywater Systems.

It is the intent of this section to encourage and facilitate the productive and safe reuse of greywater from domestic wastewater.

(a) Applicability

(i) This section applies to any person who utilizes greywater for a beneficial irrigation uses.

add space between (ii) and (iii).

(ii) This section ~~does~~ is not applicable if the intent is to provide treatment wastewater.

(iii) Local greywater codes and building regulations supercede Chapter 25, Section 16.

(b) Greywater Applications.

(i) Subsurface Irrigation

(A) Subsurface irrigation with greywater may be used to irrigat~~ion~~ land and vegetation.

(B) Greywater shall not be used to irrigate any food crops for human consumption.

(C) Subsurface irrigation shall not surcharge to overland flow.

(ii) Surface Irrigation

(A) Greywater used for surface irrigation shall receive a level of disinfect so the maximum fecal coliform levels is 2.2/100 ml or less.

(B) Surface irrigation with greywater that has been treated by disinfection may be used for irrigation of land and vegetation.

(C) Greywater that has been treated by disinfection shall not be used to irrigate any food crops for human consumption.

(iii) Set Backs

(A) A 30 foot buffer zone is required between the greywater application site and adjacent property lines and any public right-of-way.

lines, as well as

(B) A 30 foot separation distance is required between greywater application sites and all surface waters.

(C) A 100 foot separation distance is required between greywater application sites and all potable water supply wells.

setback distance

(D) ~~Drip irrigation systems.~~ The ~~buffer zone~~ requirements above may be met by the use of drip irrigation systems.

(c) Greywater Components and Configurations

(i) Flow Diversion

(A) All greywater systems shall have a flow diverter which directs greywater to either the blackwater system or the greywater system.

(B) Diverter valves shall not have the potential to allow backflow from the blackwater system into the greywater system.

add space between B and C

(C) Pipe elbows with rotatable compression fittings or equivalent components may be used to connect greywater sources with the greywater system or blackwater system as long as the pipe can only be connected to one system at a time. A capping device such as a rubber slip cap with band clamp must be used to seal the plumbing of the system that is not in use.

(D) The rubber discharge hose from a laundry washing machine may be moved between a vertical blackwater riser pipe and a vertical greywater riser pipe without the need for a diverter valve.

(ii) Greywater Collection Tank

(A) Shall be covered to prevent access by flying insects, rodents, domestic animals and people.

(B) Shall have an overflow to the blackwater system.

(C) Shall not hold greywater for more than 24 hours

why are these subsets of C?

(I) Outside collection tank shall meet the requirements of a septic tank

(II) Inside collection tank shall be install in accordance with the International Building Code for internal plumbing for black water.

(D) ~~All greywater collection tanks~~ shall be vented with a suitable screen.

You could make this E.

(E) Filters

(I) ~~All~~ discharges ~~from the greywater collection tank~~ shall have suitable filters to retain solids in the greywater collection tank and to prevent clogging of the irrigation system.

(II) Shall be accessible for cleaning and maintenance.

(III) Shall be selected based upon expected loading, flow, and pressure.

(iii) Pumps

(A) Shall be accessible for cleaning and maintenance.

(B) Shall be selected based upon expected flow, pressure and anticipated solids handling according to the overall design.

(C) Shall have a check valve on the discharge of the pump.

(D) Pressurized irrigation systems that are connection to the domestic water system shall have an anti-siphon vacuum breaker installed on the connection to the domestic water system.

(iv) Piping

fix spacing

(A) Greywater conveyance pipes shall be permanently labeled for Greywater or shall be colored purple. Non-paint marking pens are not acceptable as permanent labeling.

(B) Gravity flow pipes shall be constructed to allow complete draining of the pipe.

(C) Pressurized pipe systems shall be constructed and design to be drained or the water be evacuated by compressed air for winterization.

(v) Irrigation

(A) Subsurface Irrigation

(I) Mulch Basin

tighten up spacing

1. A Mulch basin is an excavated area that has been refilled with a highly permeable media, organic and inorganic materials intended to distribute greywater to irrigate vegetation.

2. Shall be sized to contain 3 times the peak hourly flow anticipated at the discharge point.

3. Mulch does not need to be covered or may be covered with no more than 3 inches of topsoil

4. Shall not be deeper than the root zone of the plants to be irrigated.

5. Free flow outlets

a. Greywater is applied at the top of the mulch.

b. Application point(s) are protected from access by flying insects, rodents, domestic animals and people. Protections are constructed in such a manner as to allow easy access for cleaning and maintenance.

c. Inlet piping to the mulch basin shall be no less than 1 inch higher than the surface to which it is applied to allow for a free fall of water.

6. Sub-mulch outlets

a. Greywater is applied below the surface of the mulch into one or more distribution chambers constructed of perforated material.

b. Inlet piping to distribution chamber of the mulch basin shall be no less than 2 inches higher than the surface to which it is applied to allow for a free fall of water.

c. Distribution chamber shall be constructed for easy cleaning and maintenance.

7. A compost pile is considered a mulch pile.

(II) Drip systems

1. Shall be filtered according to Section (4) (a) (iii) prior to point of application or be designed in such a manner as to prevent frequent clogging.

2. Discharge nozzles shall be specifically designed for the application of greywater without clogging.

3. Drilled pipe drip system holes shall be no smaller than ¼" in diameter.

4. Point of application flow shall be low enough to prevent any surface flow of greywater.

(III) Permeable pipe systems, designed for greywater, shall be installed according to manufacturer's recommendations.

(B) Surface Irrigation

(I) Flood irrigation

1. Shall not cause channeling or erosion of the application site.

2. Shall use a distribution system to evenly distribute flows across the site

3. Shall not pond exceed ¼ inch in depth. ?

4. Shall not remain on the ground surface for more than 15 minutes after source flow has stopped.

(II) Spray Irrigation

1. Spray irrigation of greywater is not permited.

(v) Disinfection

All greywater to be used for surface irrigation shall be disinfected.

(A) The greywater shall be disinfected in the greywater collection tank.

(I) Chlorine

1. The disinfection system shall be adequately size to maintain a residual free chlorine concentration shall be 5mg/L.

(II) Bromine

1. The disinfection system shall be adequately size to maintain a residual free bromine concentration shall be 5mg/L.

(III) Ozonation.

1. Ozonation system for disinfection shall provide a range of chemical feed of 5-10 mg/L.

2. Ozone disinfection systems shall be designed and installed according to manufacturer's recommendations.

(IV) Ultraviolet

1. Ultraviolet (UV) disinfection systems shall be designed and installed according to the manufacture's recommendations.

2. The greywater into the UV disinfection until shall have a UV transmittance less than the UV transmittance rated by the manufacture.

3. The max flow rate of the UV disinfection system shall not be exceeded.

(d) Greywater Operation and Requirements

(i) Restrictions

(A) The installation of a greywater system shall not reduce or alter the sizing requirements of the onsite wastewater system.

(B) Minimize human contact with greywater and soil irrigated with greywater.

(C) Greywater shall not leave the property on which it is generated.

(D) Water which has been used to wash diapers or similarly soiled or infectious garments shall not enter the greywater system.

(E) Water which contains hazardous materials such paint, solvents, petroleum products, oil, gasoline, antifreeze, solvents, pesticides and herbicides shall not enter the greywater system.

flowing into the UV disinfection unit?

insert an r

insert an r

on-site

insert as

(F) Greywater systems shall not be installed in a delineated floodplain.

(G) The volume of greywater shall not exceed an average of 2000 gallons per day.

(H) Greywater shall not come in direct contact with or adversely impact surface or groundwater.

(ii) Odor Control

(A) Odor control of the greywater system shall meet the requirement of Wyoming DEQ Air Quality Regulations Chapter 2, Section 11.

(iii) Stormwater

(A) The greywater system shall not be located in a drainage way.

(B) The greywater system shall prevent storm runoff from carrying the greywater off the application site.

of

(iv) Winter Operation

(A) If the greywater system is to be used during the winter, the greywater system shall be designed to prevent freezing.

Section 17. Operation and Maintenance.

(a) For small wastewater systems that are considered advanced treatment, permitted through delegated small wastewater programs, the following conditions are required:

(i) A contract maintenance agreement with a service provider shall be a condition of the issued permit. A copy of the contract shall be maintained by the county issuing the permit.

(ii) The owner of the small wastewater system shall provide an easement for maintenance of the system.

(iii) If the owner of the small wastewater system fails to maintain the advanced treatment system according to the manufacturer's recommendations, it will constitute a violation of these regulations.

(b) For any system that disposes of wastewater through land application or subsurface filtration, the owner shall not add any chemical or biochemical additive to the system that would adversely affect the quality of the groundwater as stated in the WDEQ Water Quality Rules & Regulations, Chapter VIII.

(c) Septic tanks shall be pumped as needed to prevent solids carryover into the drain field.

(d) Holding tanks and sealed vaults shall be pumped prior to reaching their maximum capacity. It is preferable that these types of tanks be pumped before the wastewater volume exceeds 75% of the tank's capacity.

(e) Any service provider that pumps septic tanks, holding tanks, or sealed vaults, shall dispose of the wastewater contents at a permitted wastewater treatment facility or in a manner approved by the Division or delegated authority.

(f) Damaged fittings and broken, crushed or plugged piping associated with any small wastewater system shall be replaced in a timely manner.

(g) Composting or non-discharging toilets where permitted shall have their waste disposed of at a permitted wastewater treatment facility or landfill, or in a manner approved by the Division or delegated authority.

toilets, where permitted,

APPENDIX A
Percolation Test Procedure

Properly conducted percolation tests are used to determine absorption system site suitability and to size the absorption system. Percolation tests shall not be conducted in test holes which extend into groundwater, bedrock, or frozen ground. The percolation test should be conducted only after the soil exploration pit has been dug and examined by the delegated health department or county for suitable soils and groundwater table information. This percolation test procedure applies to each percolation test hole.

(a) The percolation test holes shall be spaced uniformly over the proposed drain field site. The delegated health department of the county shall establish the required number of test holes.

(b) A 6 inch to 10 inch diameter hole shall be dug or bored to the proposed depth of the drain field.

(i) The walls shall be vertical.

(ii) To expose a natural soil surface, the sides and bottom shall be scarified with a sharp pointed instrument and the loose material shall be removed from the hole.

(iii) Two (2) inches of gravel or coarse sand shall be placed in the bottom of the hole to prevent it from scouring and sealing during water addition.

(c) Presoaking

The purpose of presoaking is to have the water conditions in the soil reach a stable condition similar to that which exists during continual wastewater application. The minimum time of presoaking varies with soil conditions but must be sufficiently long so that the water seeps away at a constant rate.
The following presoaking instructions are usually sufficient to obtain a constant rate.

(i) Fill each hole with clear water to a level at least 12 inches above the gravel or coarse sand. If the 12 inches of water seeps away in 60 minutes or less, add 12 inches of water a second time.

(ii) If the first and second fillings of 12 inches of water seeps away in 60 minutes or less or the soil is sandy, the percolation test should be started immediately after presoaking. If both the first and second fillings have percolation rates faster than 5 minutes per inch, the test may be stopped.

?

(iii) If either the first or second fillings of 12 inches of water does not seep away in 60 minutes or other soils, 12 inches of water must be maintained in the hole for at least 4 hours to presoak the hole.

(d) Percolation rate measurement

the

(i) Remove any loose material on top of gravel and adjust the water level to six inches above the gravel or coarse sand.

(ii) Establish a fixed reference point and measure the drop in water level at constant time intervals. The water level drop should be measured to the nearest 1/8 of an inch.

(iii) Refill the water level to 6-inches after each measurement. Do not exceed the 6-inch depth of water.

drop in water level

(iv) The test may be terminated when the water drop level stabilizes and is consistent for three consecutive measurements.

(v) The percolation rate is calculated for each hole using the following formula:

$$\frac{\text{Time Interval (Minutes)}}{\text{Final Water Level Drop (inches)}} = \text{Percolation Rate (minutes/inch)}$$

(e) The following information must be recorded:

(i) Date(s) of test(s),

(ii) Location, diameter, and depth of each test hole,

(iii) Duration of presoak,

(iv) Time of day for beginning and end of each water-level drop interval,

(v) Each water-level drop measurement,

(vi) Calculated percolation rate,

(v) Name and signature of person performing test,

Certification

(vi) Name of owner or project name, and

(vii) Certify that the percolation test was done in accordance with Wyoming Water Quality Rules and Regulations Chapter 25 Appendix A.

APPENDIX B
Land Application of Domestic Septage in Remote Areas

To qualify for the land application of domestic septage in remote areas, the following conditions must be met.

(a) Location restrictions shall adhere to the following:

(i) Domestic septage generated on a specific property may be land applied on said property, and shall not be transported to another location for land application.

(ii) No land application of domestic septage shall occur within 1,000 feet of all adjacent properties.

(iii) No land application of domestic septage shall occur within 300 feet of a public road, permanent surface water body, or intermittent stream.

(b) Site restrictions shall adhere to the following:

(i) The land application of domestic septage shall only occur on those sites with established vegetation such as rangeland, pasture or hay meadows.

(ii) No more than 5,000 gallons of domestic septage per acre per year shall be land applied.

land-applied or applied to the land

(iii) No land application of domestic septage shall occur where the site's slope exceeds ~~five percent (~~5%~~)~~ or where the depth to groundwater is less than four (4) feet.

(iv) The land application of domestic septage shall not occur between November 1 and May 1, or any other time when frozen or saturated ground conditions exits.

(v) No public access shall be allowed for one (1) year to any site where domestic septage has been applied.

(vi) No grazing animals shall be allowed access for 30 days to any site where domestic septage has been land applied.

either hyphenate or use "applied to the land."

(c) Crop restrictions shall adhere to the following:

(i) No root crops shall be harvested for 38 months from soils where domestic septage has been land applied.

(ii) No truck crops (harvested parts touch land surface) shall be harvested for 14 months from soils where domestic septage has been land applied.

(iii) No commodity crops (other food, feed, and fiber crops whose harvested parts do not touch land surface) shall be harvested for 30 days from soils where domestic septage has been land applied.

(iv) No turf shall be harvested for one (1) year from soils where domestic septage has been land applied.

(d) Reporting requirements:

(i) The property owner shall notify the appropriate Department of Environmental Quality, Water Quality Division (DEQ/WQD) District Engineer prior to the land application of domestic septage to confirm the requirements and ~~to~~ arrange a ~~possible~~ DEQ/WQD inspection of the land application.

potentially

(ii) All records concerned with each septage application will be maintained for at least five (5) years.

related to

(iii) There is a worksheet online that must be completed, signed and returned to the DEQ/WQD or the appropriate delegated local permitting authority within 15 days of the land application.

add comma

ALBANY COUNTY PLANNING OFFICE

1002 S. 3rd Street, Laramie, WY 82070

(307) 721-2568 FAX (307) 721-2570

Office of the Albany County Water and Wastewater Engineer

February 14, 2013

To: Mr. William Tillman
Water Quality Division, Water and Wastewater Section
Herschler Building 4W
122 West 25th Street
Cheyenne, WY 82002

From: Bernard J. "Barney" Bisson, P.E.
Albany County Water and Wastewater Engineer

Dear Mr. Tillman:

Per your request, I have reviewed Chapter 25, Small Wastewater Systems of Wyoming's Water Quality Rules and Regulations. I judge that you are asking those of us who have received this document to provide any thoughts we may have regarding additions and/or deletions that we may judge to be worthy of consideration.

I want to make clear that I am very impressed with the amount of work that went into the preparation of this document and the items that I am presenting in this letter, in no way, are meant to denigrate such a difficult effort. In some cases, what I am presenting are simple corrections to typos while other notes are meant to call attention to thoughts I may have in how to make the document clearer or possibly addressing something that I thought might be appropriate.

I was a Consulting Engineer in several states on the east coast for over forty years and some of their requirements seem to be a bit different from what is presented in your document and I am pointing them out for whatever your edification. Obviously, you should take them or leave them as you see fit.

The following items are referred to by page number followed by the appropriate paragraph or sentence designation:

Page 25-1 - It might be appropriate to define "BOD" since this document might often be referred to by those who may not have scientific or engineering knowledge.

Page 25-3 - I note that the design flows are no longer a linear progression with the number of bedrooms that are specified. This will result in proportionately smaller septic fields as the number of bedrooms increase. Was that the intention or should the size criteria be directly proportionate to number of bedrooms?

Page 25-6 - You might want to define "Saturated Thickness" somewhere ahead of the curves. Installers may not be aware of the term?

Page 25-13 (c) (i) - I note that you are designating the percolation rates faster than 5 min/inch or slower than 60 min/inch as unsuitable for septic fields unless special action is taken. You provide for a layer of sand under the field which is what was usually required in the past for systems faster than 1 min/inch so this is a more conserve and appropriate approach. Also, it has been my experience that septic fields in areas with percolation rates greater than 60 minutes per inch will possibly be dealing with groundwater inundation at the wet times of the year and will probably need the incorporation of land drains and/or mounding. I would suggest that, given such complications, a P.E. should design the system rather than simply sizing it.

Page 25-15 (a) - While many installers are very skilled at backfilling over the main sewer pipe leading from the building to the septic tank, there is always the klutz who will drop a boulder on the pipe resulting in partial blockage, usually discovered on Thanksgiving, Christmas, Easter and other such holidays when a lot of people get together, eat to their heart's content and use the bathroom an extraordinary amount. I suggest that the main sewer pipe be always schedule 40. Incidentally, this problem has occurred here in Albany County a number of times.

Page 25-15 (c) - I've had quite a number of applications where the main sewer pipe has a branch in it to serve another function such as a toilet in a garage or simply another stack within the house. I suggest that branches have cleanouts at the point where the branch intersects the main trunk line.

Page 25-15 - High efficiency boilers/furnaces are becoming a severe problem where the very slow flowing condensate, flowing into the sewer pipe, freezes and forms a blockage in the pipe. This especially occurs when the sewer pipe is near the surface of the ground. We have difficulty preventing this problem because the boiler/furnace is usually installed long after we inspect the septic system. Should some reference be made to this problem? One plumber alone in Laramie has unplugged over twenty pipes this winter.

Page 25-16 iv – A - My understanding is that the conventional tank proportions are 2/3 – 1/3 in order to provide more space for solid/fecal matter. Incidentally, there is a manufacturer in Wheatland who manufactures septic tanks of only one compartment. Just thought I would make you aware of this in case you want to discuss this with him.

Page 25-17 viii - The septic tank filter has become mandatory in many states. Might it not be less of an argumentative factor if we simply required it for all applications? We don't currently require it in Albany County but I have seen situations where strange foreign objects (such as a child's rubber ducky – no kidding) have made it through a two compartment tank and into the field. The tank had proper baffles. If that could happen, what else could get through? Beyond that, I also require that the filter be present whenever a pump is used to move fecal matter to the septic tank since the pump will change the form of the fecal matter from semi-solid to a slurry.

Page 25-17 - Safety feature - important; We have instituted a code requirement in Albany County that all septic tanks and other "chambers" be "childproof". This came about after we became aware of several accidental deaths that occurred in Montana. I felt that it was appropriate to protect anybody from drowning in a tank and to protect the state, county and installers from aggressive lawyers (as is currently happening in at least one case that I know of in Montana). Since we incorporated this requirement, I am familiar with another such death in Lander and something similar occurred at Devil's Tower. I have conducted an internet search to see just how prevalent such deaths are and I am shocked to find that they are prevalent all over the country in fairly large numbers. Here in Albany County we have two such "childproof" configurations; when the "Vaughn" tank is specified, we call for a "plug" inserted into the tank

access as well as a cover over the "pipe access". If the tank is from "Colorado Precast", where the access pipes that they furnish don't permit one to insert and remove a "plug", we allow the use of two re-bars forming a cross half way up the access pipe and embedded in the concrete. With plastic/fiberglass tanks we ask that they be bolted and/or padlocked.

Page 25-18 ii - Every once in a while we get the issue of "holding" tanks coming up in Albany County; generally we are able to determine quite easily if "alternatives" are available. However, we have come up against infrequent situations where city sewers are "nearby" but not necessarily "available". A particular irritant occurred in Centennial which does have a sewer system. A resident, immediately outside of the sewer district who refused to pay the district fees, wanted to put in a holding tank. Because he was only a few feet away from the sewer line we refused a permit for the tank. Possibly a more precise definition of "availability" might be helpful.

Page 25-19 xi - Might the distance of the pipe from the floor of the grease trap be more appropriate? Not sure about this but thought I would mention it.

Page 25-21 i - I suggest that this should read as follows: The abandoned tank shall be pumped *and the septage* shall be hauled . . . .

Page 25-22 iv - I absolutely concur with the need to keep septic fields shallow. However, we occasionally come across a situation where greater depth might be necessary, usually because of some inadequacy in the land contours. We allow (but discourage) depths as great as six feet providing the trenches are vented.

Page 25-23 viii - We require that a screw be driven through the neck of the chamber and into the pipe to assure that it (the pipe) cannot disengage from the chamber. Some installers have placed rocks against the pipes to hold them in and we have found this approach to be less than satisfactory.

Page 25-23 (C) - Most homeowners will be very unhappy with vents at each end of each chamber trench, particularly if the trenches are only three feet deep as is usually the case and especially if the trenches are near driveways or roads. We constantly hear of cars, garden tractors, whatever, running into the vents, breaking them off and resulting in a major repair to the chambers since the "pushing over" of the vent pipe disturbs the chambers. This is particularly true in the winter when the vents could be covered with snow. I ran up against this argument when we first required venting. We limit the venting requirement to depths of four feet or greater; this to limit venting to situations that really required it.

Page 25-24 (A) - Bottom of page – We do allow the electrical connections in a NEMA-4 box to be attached to the 22" access pipe just below the concrete lid. Is this OK? Otherwise, I would expect that the connection box would have to be placed

1. Aat the building which might be quite far from the tank with potentially poor voltage drop.
2. On a pillar near the pump which could get knocked over by vehicles

Page 25-25, 26, 27 Sand mounds & soil cover – general – The prevalent requirement that I am familiar with (from my days on the east coast) is for sand mounds to be constructed of material with a maximum of 5% passing the #200 sieve. While 2% sand may be readily available here in Wyoming, I wonder if this requirement is too stringent. Also, we have allowed mounds to be built up of native (on-site) soil with no sign of a problem. Without doubt mounds are necessary in many places but I fear that the 2% criteria may place mounding outside of budget limits for

many with limited resources. On the east coast it got to the point where only certain sand pits were acceptable for leach fields (in some cases only parts of certain sand pits) and the materials had to be trucked for many miles (28 miles when I had to mound my own system) to comply with the code. I have also found that lateral break-out can occur with only two to three feet of material around the sides of the field. I have always called for five to ten feet.

Page 25-29, Privies, venting – Should a vent stack be required? I can imagine an open door or a "half-moon" be specified as sufficient.

Page 25-29 – I was happy to see the "Greywater Systems" section. We get asked about this quite often.

Page 25-33 (II)4 – Probably should specify that the holes drip downward – seems obvious but just to be sure.

Page 25-33 B (I) 3 – Change *exceed* to *exceeding* .

Page 25-34 (IV) Ultraviolet 2 – Change *until* to *unit*

Page 25-34 (E) Insert *as* between such & paint.

Page A-1 Appendix A, Percolation Rate Procedure – I have found the use of augers or backhoes for the digging of percolation test holes to present some problems depending on the nature of the soil. It is my speculation that the sideways pressure exerted by these hydraulically powered machines can compact the soil to the point where the usual "scraping" of the sides of the hole will not be sufficient to eliminate the compaction of the soil, particularly if the soil has a lot of silt or clay content. Especially with hardpan soil, the perceived percolation rate could indicate that the soil is unusable when it may still be acceptable. I generally recommend to all of my clients that they dig the hole by hand regardless of how onerous that task may be.

I hope that these observations are useful to you. I don't mean to sound like a know-it-all; just trying to help in places where I might have stubbed my toe in the past. If you have any questions or comments you would like to direct to me, I am in the office, all day, on Tuesdays and Thursdays and also on Wednesdays following May first.

Yours sincerely,

Bernard J. Bisson, P.E.

Bernard J. "Barney" Bisson, P.E.
Albany County Water and Wastewater Engineer

Ch 25 Stakeholder Comments 94

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Comments on Chapter 25

1 message

William Tillman <william.tillman@wyo.gov> Wed, Feb 27, 2013 at 9:56 AM
To: Gina Johnson <gina.johnson@wyo.gov>

---------- Forwarded message ----------
From: James Brough <james.brough@wyo.gov>
Date: Thu, Feb 21, 2013 at 3:25 PM
Subject: Comments on Chapter 25
To: William Tillman <william.tillman@wyo.gov>
Cc: Frank Strong <frank.strong@wyo.gov>, Rich Cripe <rich.cripe@wyo.gov>

Bill,

Attached are my comments.

--
James S. Brough, P.E.
Northwest District Engineer
Water Quality Division

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--
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"Live like there's no tomorrow. One day you'll be right"

JSB Comments on Proposed Ch25.docx
32K

MEMORANDUM

To: Bill Tillman, Regulatory and Enforcement Section Leader

Through: Rich Cripe, Water and Wastewater Program Manager
Frank Strong, SRF Principal Engineer

From: James Brough, NW District Engineer

References	Comments
Section 4 (b) & (c)	The design flows must be based upon a maximum day flow, rather than an average day flow. This is because maximum day flows were considered when the long term soil loading rates were determined. This needs to be considered in subsections (b) and (c) if metered water supply data is used. Perhaps a peaking factor (e.g., 1.5 to 3.0) should be applied when metered data is used. *"A problem can arise when metered or averaged hydraulic loading rates are used to size the infiltration surface. These rates can be more than two times what the soil below the undersized system is actually able to accept." (EPA 2002 Manual, p 4-37)* *"State codified design flows for residential systems typically are 2 to 5 times greater than the average daily flow actually generated in the home." This occurs because the design flow is based on the number of bedrooms and as a result the actual daily flow is often a fraction of the design flow." (EPA 2002 Manual, p 4-37)*
Section 4, Table 1	The word "Average" needs to be removed from Table 1 title. These design flows are closer to maximum day flows for residents on septic systems. Design values taken from reference books which include (I/I), etc. do not reflect average flows from single residential homes to septic systems.
Section 4, Table 2	The word "Average" needs to be removed from Table 2 title.
Section 4, Table 2	Are we aware of any hospitals or theaters in Wyoming that are served by septic systems? Perhaps these two facility items could be removed from the table.
Section 4, Table 2	The design flow per bedroom of 210 gpd for a motel, hotel or resort is high.
Section 6 (b)	States the site must be large enough to include area for a future replacement drain field. I have heard and witnessed multiple replacement drainfields were this regulation has not been satisfied. Some failed drain fields have been over excavated and replaced with fill material. In some cases, both the reserve area and setback requirements have been mutually exclusive. A few times, DEQ has granted a variance to a setback distance for a replacement drainfield after a satisfactory field investigation.
Section 6 (b)	There is no incentive to use the undisturbed area between trenches as reserve area if the required wall-to-wall separation is nine feet. Recommend deleting the last sentence.
Section 6 (c)	It would be useful to have an appendix to illustrate or give examples of a restrictive layer or highly permeable material.
Section 6 (d)	I believe that a reduction to the four (4) vertical separation can be considered if

	either the distribution method is improved (i.e., pressure dosing rather than gravity) or if pretreatment is used to obtain a cleaner wastewater effluent. Investigation was done on the Presby system and a policy was written that allows a 2-foot vertical separation.
Section 6 (d)	The existing regulations require a minimum of three feet of unsaturated soil maintained between the bottom of the drainfield and the estimated groundwater mound imposed on the seasonally high groundwater table. The proposed regulations don't distinguish between saturated and unsaturated conditions which can make a world of difference in terms of treatment that occurs in the subsurface. Pressure distribution promotes unsaturated conditions. I believe that credit should be given where credit is due (e.g., allow a three-foot vertical separation for pressure distribution systems).
Section 6 (d)	From whence did the existing table come for the "Estimated Rise in Water Table?" How were they derived? The mounding analysis only considers a flow rate (average or maximum?), a saturated thickness, and a soil percolation rate. How often is the saturated thickness really known? How accurate and repeatable is the percolation rate? Another mounding analysis considered several other important parameters such as layout (e.g., bed vs. trench, length to width ratio, etc.), average flow, horizontal permeability of soil, specific yield of receiving soil and the time since beginning of wastewater application. When mounding analysis have been required in other places, it appears to be for large bed systems where the hydraulic conductivity of the saturated zone is low, or the saturated zone is thin.
Section 6 (d)	We need to consider slope restrictions for bed systems. I have seen a bed depth vary between 3-feet to greater than 7-feet due to the slope of the natural grade which was less than 25%. Deep trenches promote anaerobic conditions which is not as effective. Also we are proposing maximum depth installations.
Section 6 (f), Table 4	It appears that a new category of "Subsurface drain" was created from building foundations. Was this intended to be separated out? How will the inspector know the location of subsurface drains?
Section 6 (f), Table 4	Why the increased horizontal setback distances for foundation walls? The increased horizontal setback distance from foundation walls to septic system will probably create compliance issues for septic systems on smaller lots and for replacement systems.
Section 6 (f), Table 4, Footnote 1	I doubt that a hydrogeological study will ever be performed for disposal of non-domestic wastewater if one can default to the setback distances in Table 4. That being said, I believe this footnote is unnecessary!
Section 6 (f), Table 4, Footnote 2	Soil absorption systems should not be discharging into the same aquifer that public water wells draw from! If a public water well draws from an unconfined aquifer, it should not be shallow (e.g., less than 50 feet deep). Basically, I have a hard time seeing this footnote being regulated in practice. A more practical approach is to ensure that public water wells have a proper grout seal and that public water wells draw water from aquifer(s) that are not susceptible to contamination from a shallow soil absorption system.
Section 6 (g) (iii)	Include language that the percolation test be performed at the same depth as the

	proposed drain field.
Section 6 (g) (iii)	The regulations allow a soil texture evaluation, but fail to show how it may correlate or compare with a percolation test.
Section 7 (b)	Section 605 in the 2012 International Plumbing Code (IPC) specifies that the aborption area be computed by using only the bottom area. The required area for beds is increased by about 25% over that of trenches. The 2002 EPA manual in Section 4.4.5 discusses why including the sidewall area as an active infiltration surface in design should be avoided. Counting sidewall areas will produce less conservative designs. Little of the trench sidewall is engaged with gravity dosing. Flow peaks are attenuated by house plumbing and the septic tank, so flow surges are not large enough to pond water to any significant depth in the trench. Significant sidewall absorption would only occur if the entire trench bottom was on the verge of hydraulic failure, forcing effluent to pond in the trench all of the time.
Section 7 (b)	Will we be granting a size reduction or assigning an equivalent area to chambers in either trench or bed configurations?
Section 7 (c), Table 5	This table could be simplified to the tenth decimal, rather than the hundred decimal, since percolation tests are not accurate. Also Section 6 (g) (iii) allows a soil texture analysis as a cross check or verification of soil percolation rates. How do the two correlate?
Section 7 (c), Table 5, Footnote 1	Delete “less than 5 or” since Section 7(c)(i) allows one to over excavate and place one foot of fine sand or loamy sand is placed below the soil absorption system. As a side note, a chamber placed on 1 foot of fine sand or loamy sand will likely sink into the sandy material.
Section 7 (c), Table 5, Footnote 1	What design criteria or soil loading rates can a professional engineer use for soils that perc slower than 60 mpi if it isn’t addressed in Chapter 25?
Section 7 (d)(i)	This regulation does not distinquish between raw wastewater strength and septic tank effluent strength. How will the applicant or regulator know the BOD strength for a new system? Should DEQ provide a table? Are there any studies that suggest a linear relationship between effluent strength and appropriate drainfield size? Should the drainfield size be considered in conjunction with septic tank sizing or with pretreatment?
Section 7 (d)(ii)	I don’t think that pressure dosing should be mandated for high-strength wastewater. There may be other, more efficient options such as an additional tank with an aeration unit.
Section 9 (a)(i)	The last sentence indicates that DEQ will no longer have an “Approved List” for prefabricated tanks. Is this the direction we want to pursue?
Section 9 (a)(ii)(A)	Manufacturers of concrete tanks don’t provide a maximum design depth for their tanks according to Marcel Lopez (formerly with Wind River Concrete)
Section 9 (a)(iii)(B)	The size and/or number of septic tanks should be increased for non-residential facilities where the wastewater strength is stronger than typical residential strength (e.g. BOD > 500 mg/L)
Section 9 (a)(iv)(A) & (B)	Combine the requirements of either having not less than two compartments of a length to width ratio of at least two to one. Perhaps the sentence in subsection (B) could replace the first sentence in subsection (A). Proposed Language for Section 9(a)(iv)(A) shown below:

	"The septic tank shall have at least two compartments or have a length to width ratio of no less than two (2) to one (1) to protect against short circuiting flowing. When septic tanks are divided into compartments, the volume of the first compartment must be equal to one-half to two-thirds the total tank volume."
Section 9 (a)(iv)(D)(II)	The IPC 2012 requires that the clear space over the top of baffles or tees be at least 2 inches, rather than 3 inches. Also subsection (C) requires that the total depth be at least 8 inches greater than the liquid depth. The tees or baffles must extend at least 6 inches above the liquid. In short, 8 inches minus 6 inches equals 2 inches. The clear space would need to be increased from 8 inches to 9 inches to allow a clear space of 3 inches above the top of the baffle or tee.
Section 9 (a)(iv)(D)(III)	The second sentence can be deleted since it is repeating the requirement of having the total depth at least 8 inches greater than the liquid depth to allow for scum storage. The 8-inch difference comes from the 2012 IPC.
Section 9 (a)(vii)	Replace "Delegated small wastewater programs" with "Delegated health departments and counties"
Section 9(b)(ii)	Replace this subsection with *"The minimum pump tank size is 750 gallons for residential dwellings and the total liquid depth in the tank must be at least three feet or greater."*
Section 9(e)	Chapter 10 of the 2012 IPC addresses traps, interceptors, and separators for various facilities.
Section 9(e)(i)(A)	Section 1003.6 of the 2012 IPC discusses having an interceptor equipped with a wire basket or similar device, removable for cleaning, that prevents passage into the drainage system of solids ½-inch or larger. Basically a septic tank with an effluent filter would be satisfactory.
Section 9(e)(i)(A)(IV)	The sizing of interceptors for laundry can be related back to Table 2 for the design flow rates of non-residential facilities and the septic tank sizing requirements.
Section 9(e)(i)(B)	Section 1003.4.2 of the 2012 IPC states *"Where automobiles are serviced, greased, repaired or washed or where gasoline is dispensed, oil separators shall have a capacity of at least 6 cubic feet (45 gal) for the first 100 square feet, plus 1 cubic foot for each additional 100 square feet of area to be drained into the separator.*
Section 9(g)(ii)	The definition defines high strength wastewater having a BOD higher than 200 mg/L. This subsection requires that the pretreatment and septic tank reduce the BOD to less than 140 mg/L. The two different numbers will probably promote confusion.
Section 9(g)(iii)	It may be better to sample the terminal portion of the tank via an access riser rather than a sampling port.
Section 10	Field experiences indicate that straight tees don't work to evenly distribute flows. Furthermore, there is very little vertical control for installing drainfield laterals level even though the contractor may have the proper equipment. In short, we will be going backwards in several counties by allowing straight tees to evenly split flows.
Section 10(a)(iv)	This subsection discusses having distribution boxes that are protected against freezing and made accessible for observation and maintenance. These two

	requirements may be somewhat mutually exclusive. If the box is accessible for inspection, it is probably more susceptible to freezing.
Section 10(a)(v)	Requiring flow equalizers in distribution boxes and then allowing straight tees to evenly distribute flows is inconsistent with each other. Field inspectors have asked how equal flows will be determined in the field with flow equalizers.
Section 11(a)(v)	Suggest adding "Over excavation shall be avoided." Chambers are known to settle in non-compacted fill.
Section 11(a)(vi)(F)	Delete everything after the first sentence. Section 605.1 in the 2012 IPC requires a minimum 6-foot sidewall-to-sidewall spacing. The EPA 2002 Manual on page 4-17 under Configuration states: *"The sidewall-to-sidewall spacing must be sufficient to enable construction without damage to the adjacent trenches. Only in very tight soils will normally used spacings be inadequate because of high soil wetness and capillary fringe effects, which can limit oxygen transfer."* *"The finer (tighter) the soil, the greater the trench spacing should be to provide oxygen transfer."*
Section 11 (a)(vii)(B)	Section 605.2 in the 2012 IPC indicates that distribution laterals within a bed must be uniformly spaced a maximum of 5 feet and a minimum of 3 feet apart, and a maximum of 3 feet and a minimum of 1 foot from the sidewall or headwall.
Section 11 (a)(viii)(C)	Vents are specified for chambered systems, but not for pipe and aggregrate systems. Also having vents at all inlet and outlet effluent sewer pipes is probably overkill. Suggestion to add: *"It is recommended, but not required to have either inspection ports or vents at the terminal end of all laterals."*
Section 11 (a)(viii)(E)	Remove this subsection which requires a maximum width of trench excavation for chambers. The contractor needs enough space to install a 34-inch wide chamber and to walk-in or compact the fill material on both sides of the chambers.
Section 11 (a)(viii)(F)	See previous comment for Section 11(a)(vi)(F)
Section 12 (a)(ii)	Replace the word "sewage" with "effluent." The pumps should not been pumping solids to the drain field. Sewage pumps are not required.
Section 12 (a)(iii)	Insert "and" prior to "high liquid alarm."
Section 13 (a)	See previous comments for Section 6(d). Figure A-3 in the Appendix of the 2012 IPC shows a 3-foot minimum vertical separation between the bottom of trench (bed) and the high groundwater or limiting layer.
Section 13 (b)(ii)	Suggest redefining the acceptable soil percolation range or deleting the first sentence. Sand mounds with pressure distribution have been used on soils with a greater percolation range than 5 to 60 minutes per inch (mpi).
Section 13 (c)(i)(C)	Replace four feet with three feet. See previous comments for Section 6(d) and Section 13(a). Also, the existing

	regulations allow 3-feet vertical separation for unsaturated conditions which are achieved by pressure distribution.
Section 13 (c)(ii)(C)	Recommend deleting this subsection.
Section 14 (a)(ii)	Proposed language instead of specifying a threshold based upon a percolation rate. *"Lagoons may be considered in soils with a high clay content and poor drainage."*
Section 14(a)(iii)	Propose deleting this subsection since subsection b(i) calls for a 100 feet horizontal setback distance from the property line.
Section 14(a)(vii)	Allow the lagoon to be sized based upon the formula or a mass balance approach (spreadsheet has been developed).
Section 14(a)(vii)	Remove the 1.3 factor of safety in the equation. Residential lagoons have been sized larger than needed. A comparison was made with Nebraska's sizing formula. Comparing "apples" to "apples", Wyoming is sizing lagoon slightly more than 30% larger than Nebraska's formula.
Section 14(a)(vii)	A = Area of the lagoon at the maximum operating level. Lagoons shallower than 5-feet function satisfactory, especially when preceded by a septic tank and a minimum liquid depth is not required for odor control.
Section 14(a)(vii)	Q – Lagoon sizing is based upon annual average flow, not maximum day flow. The daily flows determined from Table 1 or Table 2 do not reflect average day flows.
Section 14(a)(vii)	The maximum seepage rate is not specified which is currently ¼" or 0.25 inches per day. Also, how will the seepage rate be estimated in the field?
Section 16	It is noted that a large portion of the proposed regulations came from Chapter 21, "Standards for the Reuse of Treated Wastewater." This appears to contradict Chapter 21, Section 2(g) which states "*These regulations are not applicable to the disposal of gray water."*
Section 16(b)(i)(B)	The requirement the subsurface irrigation of gray water shall not be used to irrigate any food crops for human consumption contradicts Chapter 21, Section 12.
Section 16(b)(ii) (A)&(B)	Requiring disinfection to achieve a Class "A" is very restrictive and not practical to monitor. I disagree that gray water needs to be disinfected in order to irrigate land and vegetation.
Section 16(b)(iii)	The setback distances were established for municipal treated wastewater and are not necessarily applicable to private gray water systems.
Section 16(c)(ii)(C)	There is a contradiction here. Subsection C states that greywater shall not be held for more than 24 hours. However, subsection (I) states that an outside collection tanks shall meet the requirements of a septic tank. One of those requirements is a minimum of 36 hours retention time. In short, a grey water collection tank should not necessarily be required to abide by all the requirements for a septic tank.
Section 16(c)(ii)(D)	Why would vents be required for gray water tanks when they are not required for septic tanks?
Section 16(c)(ii)(E)	Why would filters be required for gray water tanks when they are not required for septic tanks?
Section 16(c)(iii)	I doubt this section on pumps is necessary for small gray water systems. How many residential gray water systems are there with a pumping system? I

	understand that one of the purposes of rewriting the regulations is to simplify were possible, not add requirements that will never or very seldom be used.
Section 16(c)(v) (A)(I)(2)	This is easier said than done.
Section 16(c)(v) (A)(I)(4)	We are being inconsistent here in that we are being more stringent with gray water than with black water.
Section 16(c)(v) (A) & (B)	These regulations are too prescriptive and impractical to regulate at the residential level.
Section 16(c)(vi)	If it is the consensus that all gray water to be used for surface irrigated must be disinfected, then we should simply not allow surface irrigation!
Section 16(d)(i)(A)	I disagree with this requirement. There are several summer time facilities were gray water systems will reduce the hydraulic load. The designer should be allowed to design accordingly.
Section 17(a)(ii)	Requiring small wastewater owners to provide an easement (legal document filed and platted with the county) for maintenance of an advanced small wastewater system would be burdensome and challenging to implement.

Ch 25 Stakeholder Comments 102

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Chapter 25 Revision comments

1 message

William Tillman <william.tillman@wyo.gov> Wed, Feb 27, 2013 at 9:56 AM
To: Gina Johnson <gina.johnson@wyo.gov>

---------- Forwarded message ----------
From: <macysservices@cs.com>
Date: Thu, Feb 21, 2013 at 5:07 PM
Subject: Chapter 25 Revision comments
To: william.tillman@wyo.gov

Dear Bill

Here are some comments on the latest draft of Chapter 25.

Please contact me with any questions. I appreciate being part of the process.

Thanks

Dwight Reppa

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Small_wastewater_regulation_comments2-20-2013.docx
19K

February 20, 2013

To: Bill Tillman, Regulatory and Enforcement Section Leader

From: Dwight Reppa
Macy's Services

Re: Review and Comments of the Draft of the Small Wastewater Regulations dated 2/1/13

Here are some comments regarding the draft. Let me know if you have any questions.

Sec. 4 Table 1

The design flow rates per Bedroom are not an average, but are usually considered maximum flows per day. The term "Average" should be removed from the table.
I was wondering where these design flows came from and the reason these flows were picked. Should 80 gpd be used for more than 6 bedrooms?
Remove the 5 & 6 bedrooms from the table and add after 4 bedrooms , "Each additional bedroom – Add 80 gpd per bedroom.

Sec. 4 Table 2

The term "Average" should be removed from the table.

Sec. 6 (b)

The 9 foot separation between trenches is too large and should be reduced to 6 foot separation.

Sec. 6 (d)

Are the Estimated Rise in Water Tables really needed? If they are used, the definitions of Saturated Thickness and Estimated Rise in Water need to be added.

Sec. 6 Table 4

Foundation Wall – Why was the distance for the septic tank increased? This addition could create additional problems on smaller lots.

Sec. 7 (b) (i)

The sidewall height in the infiltrative area calculation is not being used typically anymore. I believe this should be removed from the calculation.

Sec 7 (c) Fast and slow percolating soils

(i) This paragraph addresses fast percolating soils.
There is no paragraph addressing slow percolating soils. I believe this was omitted by accident.

Sec. 9 (a) (iv) (D) (I)

There needs to be a designation between the inlet baffle and the outlet baffle, the outlet baffle needs to be extended to the middle third of the liquid level or 40% of the liquid level. The inlet baffle should be a minimum of 6 inches below the liquid level. The outlet baffle length standard is typically 40% of the liquid level. This is closer to the clear liquid area of the tank.

Sec. 9 (b)(i)

The access riser should be a minimum of 24-inch, it is too difficult to access the tank interior if needed to do repairs through a 20 inch access riser. This suggestion is from experience, it can be very difficult to get through a access riser of more than 2 feet tall if it is 20 inches in diameter. Typically most pump tank openings are 24 inches in diameter, reducing this diameter doesn't make sense.

Sec. 9 (d) (vi)

The word "minimum" needs to be added before a "20-inch diameter clean out. Most grease interceptor access openings are already 24 inches in diameter and decreasing the opening size doesn't make sense. The cleaning of grease interceptors can be difficult and a large opening helps facilitate cleaning them. It allows for better pumping and scraping the walls and baffles, if needed.

Sec. 9 (d) (viii)

Is the venting being confused with an interior grease interceptor? Venting of the inlet and outlet is not typical, since the inlet line can serve as the vent for the grease interceptor. Venting of the grease interceptor can cause a serious odor problem. Please explain.

Sec. 9 (d) (x)

The dividing wall between the compartments should have a vent hole in it at the top of the wall.

Sec. 9 (d) (xi)

I don't understand what you are describing. There is typically an inlet baffle and outlet baffle of different lengths depending on the manufacturer, but usually at least 18 inches long. There is typically a crossover in the dividing wall approximately in the middle of the liquid depth depending on the manufacturer.

Sec. 10

Straight tees should be removed from the first sentence.

Sec. 10 (a) (iv)

If freezing is a potential problem, the access riser could be insulated or buried below ground surface and a marker placed above it.

Sec. 10 (b) (c)

Straight tees should never be used, you will never be able to achieve equal flows. There is technology available that will achieve equal flows if installed correctly. I believe straight tees were used many years ago because that was the technology that was available at the time. The price might also have been a reason to use them.

Sec. 11 (a) (viii) (C)

Seems like a lot of vents being installed and probably not needed.

Sec. 12 (a) (iii) (A)

All explosion-proof junction boxes can be used in the interior of a chamber, because they water and gas proof. There are also UL listed junction boxes that are rated for interior chamber use.

Sec. 12 (a) (iii) (B)

Should the “scaling fitting” have been “sealing fitting”?

Sec. 12 (iv)

The pressure transport piping should be designed to prevent freezing. This could be accomplished by draining the pipe or putting the pipe deep enough to prevent it from freezing. Some designs are long runs and the engineers don’t want to put all that water back in the pump chamber.
I would suggest changing the paragraph to say it should be designed to prevent the transport line from freezing.

Ch 25 Stakeholder Comments 106

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Chapter 25 Comments

1 message

William Tillman <william.tillman@wyo.gov> Wed, Feb 27, 2013 at 9:57 AM
To: Gina Johnson <gina.johnson@wyo.gov>

---------- Forwarded message ----------
From: Mark Baron <mark.baron@wyo.gov>
Date: Thu, Feb 21, 2013 at 5:21 PM
Subject: Chapter 25 Comments
To: William Tillman <william.tillman@wyo.gov>
Cc: Frank Strong <frank.strong@wyo.gov>

Bill and Frank attached are my comments I have also attached a MOU that the Water and Wastewater Section has with the Engineering Board on the designing and permitting of septic systems.

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Sincerely

Mark D. Baron, P.E.
Southwest District Engineer
Wyoming Department of Environmental Quality
Wyoming Water Quality Division
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E-Mail to and from me, in connection with the transaction
of public business, is subject to the Wyoming Public Records
Act and may be disclosed to third parties.

--
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"Live like there's no tomorrow. One day you'll be right"

Live like there's no tomorrow. One day you'll be right

Ch 25 Stakeholder Comments 107

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2 attachments

Mark Baron Comments on 2-1-2013 Chapter 25 Draft.pdf
233K

State Engineering Board and DEQ MOU.pdf
126K

To: Bill Tillman

From: Mark Baron

Subject: Comments on the 2/1/2013 Chapter 25 Draft

Date: February 21, 2013

Under Section 4. Design Flows. I suggest that Table 1 allows for a more comprehensive list of sewage flows. Based my permitting experience there has been a strong demand to construct employee housing and office space for natural gas and oil production. In addition to the facilities listed in Table 2, I propose that Recreational Vehicles be added at 100 gallons per day per space. I also propose that an Office Employee be added to Table 2 at 30 gallons per day per employee. Since is very hard to control the number of employees when a business is expanding, the rate of 30 gallon per day per employee adds a factor of safety. I would also propose to add in sewage flows for schools as listed in the following EPA Manual.

From the USEPA Onsite Wastewater Treatment Systems Manual (EPA/625/R-00/008 February 2002)

Page 3-7 Table 3-4. Typical wastewater flow rates from commercial sources gal/day/unit.

Facility	Unit	Range	Typical	Requested
Boarding House	Person	25-60	40	50
Hotel	Guest	40-60	50	40
Office	Employee	7-16	13	30

Page 3-8 Table 3-5. Typical wastewater flow rates from institutional sources gal/day/unit.

Facility	Unit	Range	Typical	Requested
School, day only				
With cafeteria, gym, shower	Student	15-30	25	30
With cafeteria only	Student	10-20	15	20
Without cafeteria, gym, or shower	Student	5-17	11	17

Page 3-9 Table 3-6. Typical wastewater flow rates from recreational facilities gal/day/unit.

Facility	Unit	Range	Typical	Requested
Cabin, resort	Person	8-50	40	50
Camps:				
Trailer Camp	Trailer	75-150	125	100
Dormitory/bunkhouse	Person	20-50	40	50

Under Section 6. Site Suitability. In item (d) reference is made to the estimated rise in the water table shown on figures 1 through 6. There needs to be an explanation of what is meant by the saturated thickness and how and when it is to be used along with the basis for figures 1 through 6. What is the source of these figures is it analytical, empirical or statistical or some other results? For example if there is no ground water present below the proposed leach field the saturated thickness curves indicate a rise in the groundwater level. How can there be a rise if there is no groundwater?

Under Section 6. Site Suitability. In item (f) Table 4 Minimum Horizontal Setbacks - footnote 2 requires a 500 foot separation between a public water well and a septic tank when the soil absorption system discharges to the same aquifer that the public water well draws from. There appears to be some confusion as to what the groundwater protection requirements are within the State of Wyoming. Chapter 8, Section 3 (c) of the Wyoming Water Quality Rules and Regulations requires that protection shall be afforded all underground water bodies (including water in the vadose zone). Water being used for a purpose indentified in W.S. 35-11-102 and 103 (c)(i) shall be protected for its intended use and uses for which it is suitable. Water not being put to use shall be protected for all uses for which it is suitable. Groundwater that supplies private water wells must be afforded the same protection as the groundwater that supplies public water wells. I f it has been determined that a septic tank must be placed 500 feet from a public water well to protect groundwater this rule must also be applied to private water wells.

Under Section 6. Site Suitability. In item (f) Table 4 Minimum Horizontal Setbacks - footnote 2 requires a 200 foot separation between a public water well and a soil absorption system when the soil absorption system does not discharges to the same aquifer that the public water well draws from and footnote 2 requires a 1000 foot separation between a public water well and a soil absorption system when the soil absorption system discharges to the same aquifer that the public water well draws from. As stated in the above comment Chapter 8, Section 3 (c) of the Wyoming Water Quality Rules and Regulations does not make a distinction between public and private water wells therefore all water wells must be afforded the same protection. Chapter 12, Section 9 (b)(i)(B) of the Wyoming Water Quality Rules and Regulations lists the requirements for the separation distance between public water wells and disposal fields which are consistent with Chapter 11, Section 35 (a)(I,ii,iii) of the Wyoming Water Quality Rules and Regulations. The propose rule of a 1000 foot separation distance is a 900 percent increase over the current rules in Chapter 12 and Chapter 11 what is the basis for the 900 percent increase?

The best way to approach or determine a safe separation distance between a water well and a septic soil absorption system is to apply the science of water well hydraulics. Two such sources on the science of water well hydraulics are the Flow of Homogeneous Fluids Through Porous Media, by M. Muskat, Ph.D., Copyright 1937 and Groundwater and Wells, 2nd edition, by Fletcher G. Driscoll, Ph.D., Copyright 1986. This same science of water well hydraulics is what is used for a Chapter 23 Subdivision review under Appendices A,B and C.

Under Section 6. Site Suitability. In item (f) Table 4 Minimum Horizontal Setbacks - footnote 1 makes reference to the wrong Chapter 3 section. Footnote 1 should read - in accordance with Section 17 (b,c,d,e and f) of the Chapter 3 Wyoming Water Quality Rules and Regulations.

Under Section 7. Drain Field Sizing. Item (c)(i) states that if the percolation rate is less than 5 mpi a foot of imported soil can placed in the soil absorption system to slow the percolation rate down. At the same time footnote 1 under Table 5 requires a Wyoming P.E. if the percolation rate is outside of the range of 5 to 60 mpi. I can understand having a P.E. submit the application if the percolation is over 60 mpi but not if the percolation is under 5 mpi. Since the proposed regulations allow for the importation of soil when the percolation is less than 5 mpi the requirement for a Wyoming P.E. adds nothing to the process and is no guarantee the groundwater will be protected. A groundwater user would be better protected if the separation distance from the leach field to any water wells was increased. The Wyoming P.E. for soil less than 5 mpi needs to be removed.

Under Section 7. Drain Field Sizing. Item (d) drain fields for high strength wastewater in addition to the items (i) and (ii) add item (iii) A Wyoming Registered Professional Engineer must design and submit a permit application which provides additional wastewater treatment such that pressure dosing can be used.

Under Section 8. Building Sewer Pipes. Item (a) add in high density polyethylene (HDPE) pipe.

Under Section 11. Standard Drain Field System. Item (a)(iv) The maximum depth to the bottom absorption surface of a drain field is four (4) feet. This requirement is not consistent with Chapter 8, Section 3 (c) of the Wyoming Water Quality Rules and Regulations as stated above. For example if a drain field is being constructed to serve a home with a basement is an area where the groundwater is deep there is no reason to limit the depth of a drain field.

Under Section 11. Standard Drain Field System. Item (a)(vi)(F) requires 9 foot spacing between trenches when the percolation rate is slower than 60 mpi (should this read greater than 60 mpi). I don't increasing the space from 3 to 9 foot will change anything. If a leach field is being constructed in clay soils oversize the leach field from the start.

Under Section 11. Standard Drain Field System. Item (a)(vii)(C) limits bed with to 25 feet and requires a spacing of one-half the bed width between beds. Since the treatment of septic tank effluent is a function of soil type and depth limiting bed width will not improve the treatment of septic tank effluent. By using flow splitters the septic effluent can be uniformly distributed across a bed.

Under Section 12. Pressure Distribution Systems Chapter 3 Section 6 (b)(ii) of the Wyoming Water Quality Rules and Regulations requires that all pressure distribution systems must be design by a Wyoming Registered Professional Engineer and a permit application along with P.E. plans must be submitted to the DEQ. Also in order to be in compliance with the agreement that the Water and Wastewater Section has with the Wyoming Engineering Board a Wyoming Registered Professional Engineer must design all pressure distribution systems.

Under Section 12. Pressure Distribution Systems Add in a requirement to follow the National Electrical Code under Section 12 (a)(iii).

Under Section 13. Sand Mound Systems. Item (c)(i)(A) it is not necessary to use ASTM C-33 sand. Clean sand will work will a pressure dosed system. ASTM C-33 is a specification for concrete sand which will add additional cost to a sand mound with no improvement to treatment.

Under Section 13. Sand Mound Systems. Item (c)(i)(C) a pressure dosed sand mound with 2 foot vertical separation above the groundwater will provided enough treatment. Instead of going with a 4 foot vertical requirement better results would be achieved by increasing both the length and width of the sand mound with the additional sand.

Under Section 14. Small Wastewater Lagoons. Item (a) (ii) states that lagoons shall only be allowed when the percolation rate exceeds 120 minutes per inch and the soil extends vertically down at least two (2) feet from the bottom of the lagoon to the seasonal high groundwater table or bedrock formations. Groundwater protection for a lagoon should be equivalent to that of a leach field.

The requirement to not allow sewage lagoons until the percolation rate reaches 120 minutes per inch is not consistent with the groundwater protection requirements within the State of Wyoming. Chapter 8, Section 3 (c) of the Wyoming Water Quality Rules and Regulations requires that protection shall be afforded all underground water bodies (including water in the vadose zone). Water being used for a purpose indentified in W.S. 35-11-102 and 103 (c)(i) shall be protected for its intended use and uses for which it is suitable. Water not being put to use shall be protected for all uses for which it is suitable. Groundwater located from the ground surface to say 10 feet below the groundwater is not going to be a Class 1 groundwater and is not requiring to be protected as such. It is an acceptable practice to construct sewage lagoon which allow for some seepage into the groundwater.

Since the percolation test is not a scientific measurement a lagoon design based on onsite observations of soil types and soil saturation levels by an experienced small waste person is going to be more protective of groundwater.

The requirement to not allow sewage lagoons unless there is two feet of soil above the groundwater is not consistent with groundwater flow theory. Darcy's Law demonstrates that the movement of water through a porous medium is proportional to the pressure drop over a given distance. If the bottom of a lagoon is below the groundwater the movement of water through the lagoon liner will be impeded according to Darcy's Law which is turn protects the groundwater from contamination. It is the low permeability of the liner that creates protection for the groundwater.

For example at a loading rate of 0.8 gallon per day per square foot it will take an average of about 37 days for sewage effluent to move through four foot of unsaturated soil. Which is 9.25 days per foot of soil. At a loading rate of 0.3 gallon per day per square foot it will take an average of about 100 days for sewage effluent to move through four foot of unsaturated soil. Which is 25 days per foot of soil. Based on a percolation rate of 60 mpi if a one foot thick clay lagoon liner is saturated it is going to take more than 25 days for the sewage effluent to move through the liner soil. Therefore a one foot clay lagoon liner at 60 mpi is more protective of the groundwater then 4 foot of 5 mpi soil.

Under Section 14. Small Wastewater Lagoons. Item (a) (ii) states that lagoons shall only be allowed on three acres of property. This requirement should be left up to each county. If a homeowner uses an enhanced treatment system before the lagoon there is no reason to have a minimum lot size.

Under Section 14. Small Wastewater Lagoons. Item (b) (iv) states that the lagoon site slope shall not exceed five percent. What is the basis for this requirement? If a lagoon is constructed of clay soils and compacted the site slope is not going to be an issue. A slope site allows for the use of a gravity sewer and also allows for diverting surface water.

Under Section 14. Small Wastewater Lagoons. Item (b) (xiv) requires a fence. A minimum fence height, the fence type, the opening size of the fence needs to be stated as part of this section.

Under Section 15. Privies Privies should not be permitted by rule. The DEQ/WDQ should create a State Wide Permit for the Forest Service, BLM, State Parks and others. We need to see what is being proposed to be built and where it is going to built.

Under Section 16. Greywater Systems. Grey water reuse needs to follow the requirements of Chapter 21 of the Wyoming Water Quality Rules and Regulations. Grey water should treated as a Class B wastewater per Chapter 21 where the fecal count can range from 2.2 fecal colonies/100 ml to 200 fecal colonies/100 ml. Grey water should be regulated by the source (clothes washing, shower and bath, and hand sink) . If grey water is required to be disinfected to reduce the fecal count below 200 fecal colonies/100 ml the wastewater source is not a grey water source. Grey water must be limited to simple residential systems where the homeowner has complete control over the grey water discharge and its location of discharge.

The grey water section as written is containing many non-regulatory requirements on irrigation, plumbing, disinfection, mulching ect. Section 16 needs to be rewritten such that only three items should be considered for grey water reuse which are:

1) Protection of public health.
2) Protection of surface water.
3) Protection of ground water.

Under Section 17. Operation and Maintenance. Item (a)(i) owners of advance treatment systems should be able to maintain their own advance treatment systems. Maintaining an advance treatment system is less complex than car maintenance.

Under Section 17. Operation and Maintenance. Item (a)(ii) states that owner of an advance treatment system shall provide an easement for maintenance of the system. Every requirement for the easement must be listed in this section. For example who is to have access to the easement, how wide should the easement be, should the easement include the leach, where is the easement to be recorded, what happens when the property is sold, can the owner use Legal Zoom or does an attorney have to draw up the easement?

MEMORANDUM

TO: Small Wastewater Treatment Facility (SWTF) Delegated Local Officials; DEQ/WQD District Engineers

FROM: Larry Robinson, Program Manager

DATE: September 23, 2003

SUBJECT: Design of small on-site wastewater systems serving non-commercial facilities receiving 2,000 gallons or less of domestic waste per day; Policy 9.2.4

This memorandum is to clarify the manner in which the delegated local officials and the Department of Environmental Quality/Water Quality Division (DEQ/WQD) staff engineers are to administer the small wastewater system permitting program.

Your responsibility is to review applications for compliance with either the (DEQ/WQD) Chapter 11, Part D regulations or the regulations that have been adopted by the delegated authority as part of the delegation agreement. Neither the delegated local official nor the DEQ/WQD staff engineer has the authority to design the system for the applicant. You are authorized only to review the application and direct the applicant on how to comply with the regulations.

Many applicants for small wastewater system permits have little if any knowledge or background with on-site sewage systems. As such, there is a strong tendency for the applicant to lean on the permitting authority to design the system for them. However, the rules of the Wyoming State Board of Registration for Professional Engineers and Land Surveyor prohibit anyone who isn't a licensed engineer from designing facilities for other people. Therefore, all program administrators must guide the applicant towards a system that meets the standards and is consistent with the pre-engineered designs which have been developed by the DEQ/WQD engineering staff. ~~The process of using of pre-engineered designs detailed in the DEQ/WQD small wastewater treatment system handouts has been approved by the Wyoming State Board of Registration for Professional Engineers and Land Surveyors.~~ The Board agrees w/ the process of pre-engineered designs.

Please contact your DEQ/WQD district engineer or the DEQ/WQD program manager if you have any questions about how to administer your small wastewater treatment system permitting program.

DAILYWORK:POLICY9.2.4

This design information package with the various system handouts for small wastewater treatment facilities has been prepared by licenced professional engineers employed by the Department of Environmental Quality/Water Quality Division (DEQ/WQD).

Properly conducting the site evaluation including percolation tests and determining the depth to groundwater, will provide the applicant's data for the design. Using this data, following the instructions and accurately completing the necessary sheets for the chosen system, should ensure that the applicant's design will comply with the DEQ/WQD Chapter 11 Rules and Regulation.

By _____ _____, PE

Kwilso@state.wy.us

Krista Wilson

ctark@state.wy.us

MINUTES OF MEETING

September 15, 2003 – 8:00 a.m.
Plaza Hotel.
116 East Park
Thermopolis, Wyoming

OPEN MEETING MINUTES

BOARD MEMBERS PRESENT: William J. Edwards; Peter J. Hutchison; Stanton J. Abell, Jr; Martin A. Pedersen; Patrick T. Tyrell; David L. Whitman; and Richard C. Moore

STAFF MEMBERS PRESENT: Christine Turk, Executive Director and Jennifer Wilhelm, Licensing Officer.

VISITORS PRESENT: Darel Danyluk and Neil Windsor from the Association of Professional Engineers, Geologists, and Geophysicists of Alberta (APEGGA); Rick Hudson; Don Davis, President of PLSW; and Jeff Hermansky and Larry Robinson, DEQ.

PRESENTATION BY APEGGA: A presentation was given by the representatives from APEGGA regarding licensing requirements in Canada and bilateral agreements with individual states and encouraging state Boards to seek legislative change to have the authority to enter into these agreements.

FOLLOW-UP ON CORRESPONDENCE FROM JAMES D. WHITE, PE #3150: Mr. White had been informed by Sublette County that he was not allowed to design his own wastewater treatment systems. Jeff Hermansky and Larry Robinson from the DEQ discussed DEQ's licensing requirements and had contacted Sublette County regarding Mr. White's complaint. Permitting authority has been given to certain counties based on pre-approved engineering plans that may be used for single residential systems without hiring a PE. Sublette County was informed that Mr. White, being a PE, should have been allowed to design his own system. DEQ representatives informed the Board that Mr. White's system is already installed. DEQ asked the Board's approval of a proposed memo to be distributed to the individual counties supporting the use of pre-approved designs prepared by a Professional Engineer. The Board raised concerns that the plans be signed and sealed by the engineer who prepared them, and that the memo be clear that the Board was not approving the plans, merely supporting the use of pre-approved plans. Rick Moore brought up that counties might have specific concerns not addressed in the pre-approved plans. Mr. Robinson re-assured that no permits would be approved that conflict with local interests. A suggestion was made to add a statement to the plan packet that there may be local issues that need to be addressed.

APPROVAL OF JUNE 2003 MINUTES: Rick Moore asked about the addition to the renewal form of the number of carry-over hours a registrant has; he was informed that staff had already added this field to the renewal form. A motion was made by Martin Pedersen, seconded by Peter Hutchison and carried to approve the minutes with corrections noted at meeting.

APPROVAL OF BUDGET AND TREASURER REPORTS: Motion made by Peter Hutchison, seconded by Martin Pedersen and carried to accept the Budget and Treasurer Reports as distributed.

REINSTATEMENT APPLICATIONS: Martin Pedersen proposed all expired licenses to require updated references and employment information in addition to payment of fees. Christine Turk pointed out that Wyoming Statute § 33-29-131 (c) gives the Board authority to require new application after two years; therefore, no change in the rules and regulations is necessary. A motion was made by Martin Pedersen, seconded by Rick Moore and carried to start requiring applicants seeking re-registration to provide an update to their employment record and reference to cover the period from when they last renewed to their current request for re-registration.

BOARD SALARY: A motion was passed at the meeting of June 27, 2003, to begin paying Board members for all time spent attending meetings, etc., where they are directly representing the Board. Pat Tyrrell advised that an estimated amount has been added to the upcoming biennial budget, and the funds will be transferred as needed for expenses until that time. As the motion passed at the June meeting was to be effective immediately, the Board members should

Ch 25 Stakeholder Comments 116

Gina Johnson <gina.johnson@wyo.gov>

Fwd: WDEQ Ch 25 Draft Comments 2-2013

1 message

William Tillman <william.tillman@wyo.gov> Wed, Feb 27, 2013 at 9:53 AM
To: Gina Johnson <gina.johnson@wyo.gov>, Rich Cripe <rich.cripe@wyo.gov>

---------- Forwarded message ----------
From: Gene Smith <gsmith@parkcounty.us>
Date: Thu, Feb 21, 2013 at 10:55 AM
Subject: WDEQ Ch 25 Draft Comments 2-2013
To: "william.tillman@wyo.gov" <william.tillman@wyo.gov>
Cc: James Brough <james.brough@wyo.gov>, Hannes Stueckler <hannes.stueckler@wyo.gov>

Gentleman,

I have attached my comments, and questions regarding the updated Chapter 25. I'll review this again prior to the deadline and submit additional input as needed. Over all I feel if was well done and complete.

One other thing do you think we should or could require septic tanks suppliers to record the SWW permit #'s on the tank receipt at time of sale or delivery? Might cut down on unpermitted systems being installed.

Sincerely,

Gene Smith

Small Wastewater Administrator

Park County Courthouse

1002 Sheridan Ave

Cody, Wyoming 82414

Attn: Planning & Zoning Dept.

307-527-8549 fax: 307-527-8515

gsmith@parkcounty.us

Ch 25 Stakeholder Comments 117

--
William Tillman, P. E.
Water and Wastewater Section
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Herschler Building, 4-W
122 West 25th Street
Cheyenne, WY 82002
(307)777-6941
(307)777-6779 (FAX)
william.tillman@wyo.gov

"Live like there's no tomorrow. One day you'll be right"

WDEQ Ch 25 Draft Comments 2-2013.doc
57K

Gene Smith
Small Wastewater
Administrator
527-8549 or (800) 786-2844
Cell 307-272-8858
Fax 307-527-8515

Original Park
County Courthouse
Cody, Wyoming
Completed 1912
Park County
Wyoming
Organized 1911

COUNTY OF PARK

February 21, 2013

William Tillman, WQD
william.tillman@wyo.gov

Re: Comment on purposed new Chapter 25 Small Wastewater System.

Let me start by saying that most of my concerns and question with the first draft of this document have been addressed.

I would like to see a statement or section in this chapter that deals with the Presby AES systems and a reference to the fact that the regulations established in the Wyoming Manual for the Design, and Installation must be adhered to.

25-12
Table 4
What is the reasoning for the increase from 5' to 15' from Foundation Walls to the Septic Tank? Is this for all foundation, or for full basement foundations?

25-13
Section 7
(b) (i) The Height of the sidewall shall not exceed twelve (12) inches. Need clarification on this, our county files are full of deep sidewall trench systems from past years that are still functioning.

(c) (i) If fast percolation soils < 5mpi can be used with the addition of 1' fine or loamy sand with a perc rate 5 mpi or greater, then why is it required in the footnote 1 below table 5 found on 25-14 require a Wy Registered PE to determine the loading rate?

25-22
Section 11
(iv) I like the idea, and reasoning for the maximum drain field being 4', but how are we going to deal with existing system when they need replaced? Will lift stations be required? Wording to that effect would help!

25-23
(vii)
(C) "Vents shall be installed at all inlet and outlet effluent sewer pipes." Please explain: example size of vent, height, design etc.

Sincerely,

Gene Smith
Small Wastewater Administrator

1002 Sheridan Avenue Cody, Wyoming 82414 (307) 527-8540 Fax: (307) 527-8515

Ch 25 Stakeholder Comments 120

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Chapte r 25

1 message

William Tillman <william.tillman@wyo.gov> Wed, Feb 27, 2013 at 9:55 AM
To: Gina Johnson <gina.johnson@wyo.gov>

---------- Forwarded message ----------
From: James Brough <james.brough@wyo.gov>
Date: Thu, Feb 21, 2013 at 3:22 PM
Subject: Re: Chapter 25
To: Gabe Klamer <GKlamer@tetonwyo.org>
Cc: William Tillman <william.tillman@wyo.gov>

Gabe,

I'm directing your comments to Bill Tillman.

On Thu, Feb 21, 2013 at 2:17 PM, Gabe Klamer <GKlamer@tetonwyo.org> wrote:

> James,
>
> I have listed a few comments below regarding the Chapter 25 revision.
>
> 6(b). Requiring a 9' horizontal spacing would enlarge a leach field to a point where it would negate any incentive of doing this.
>
> 6(e). Steeper slopes than 25% should be considered if advanced treatment methods such as pressure dosing are used. Often in Teton County homes are located on hillsides which are steep. If 25' setbacks from leach fields to foundations are required, these steep lots will be unable to obtain swf permits.
>
> 6(f). Table 4. Increased setbacks from foundation walls will create issues on small lots, lots that are oddly shaped and lots that are sloped.
>
> 7(b). Are we doing away with size reduction/equivalent areas for chambered system?
>
> 7(d)(ii). Aeration units such as Advantex units may be more efficient than pressure dosing at times. These systems should also be allowed.
>
> 9A(iv)A&B. These should be combined. It currently sounds like you have to have a 2 compartment tank and they have to be 2:1 ratio. It should be either/or.
>
> 9(b)(ii). This section is confusing.
>
> 9(g)(ii). Is it 200mg/L or 140mg/L?

Ch 25 Stakeholder Comments 121

10. Straight tees should be eliminated. D-boxes and flow dividers are readily available and work more effectively.

16(c)(ii)D. Why would the contact time be less than 36 hours like septic tank requirements?

General Comments for the gray water section: I feel these new requirements are more stringent than black water requirements and will deter people from actually installing gray water systems. If gray water cannot be used as surface irrigation unless it is disinfected then why not disallow surface irrigation with gray water all together?

Thank you for the opportunity to comment.

Gabe Klamer, Sanitarian/Engineering Technician

TETON COUNTY OLD LIBRARY

320 S King St.

PO Box 3594

Jackson, WY 83001

307-733-3317 PH

307-734-3864 FAX

www.tetonwyo.org

--
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Ch 25 Stakeholder Comments 122

Ch 25 Stakeholder Comments 123

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Draft Chapte r 25 Com ments

1 message

William Tillman <william.tillman@wyo.gov> Wed, Feb 27, 2013 at 9:57 AM
To: Gina Johnson <gina.johnson@wyo.gov>

---------- Forwarded message ----------
From: David Anderson <planner@washakiecounty.net>
Date: Mon, Feb 25, 2013 at 2:17 PM
Subject: Draft Chapter 25 Comments
To: william.tillman@wyo.gov

Dear Mr. Tillman,

I have attached a letter with my comments regarding the proposed Chapter 25, Small Wastewater Systems. Could you please respond to this email so that I know you received them?

Thanks,

David W. Anderson, PELS
Washakie County Planner
1001 Big Horn Avenue
Worland, WY 82401
307-347-6778 (Office)
307-347-9366 (Fax)
307-388-0047 (Mobile)
planner@washakiecounty.net

--
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DraftCh25Review-02-25-13.pdf
243K

Ch 25 Stakeholder Comments 124

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Draft Chapte r 25 - Com ments

1 message

William Tillman <william.tillman@wyo.gov> Wed, Feb 27, 2013 at 2:19 PM
To: Gina Johnson <gina.johnson@wyo.gov>

Here's the Southeast districts stuff.

---------- Forwarded message ----------
From: Ron Ewald <ron.ewald@wyo.gov>
Date: Wed, Feb 27, 2013 at 2:16 PM
Subject: Draft Chapter 25 - Comments
To: William Tillman <william.tillman@wyo.gov>

Attached are my edits, comments, questions, and concerns; with some opinion thrown in for good measure.

--
William Tillman, P. E.
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Act and may be disclosed to third parties.

DRAFT2 Chap 25-SE Dist.docx
29K

MEMO

To: Bill Tillman

From: Ronald Ewald, Assistant Southeast District Engineer
Water Quality Division, Wyoming DEQ

Date: February 27, 2013

Subject: **DRAFT2 Chapter 25 – Comments, Questions, and Concerns**

Section 3. Definitions.

(c) "Bed" - - - the width is greater than *three(3) feet*. Suggest: 6 feet

(f) "Blackwater" - - - fecal matter and/or urine.

Section 4. Design Flows.

(c) **Table 1**. Residential Average Design Flow Rates per Bedroom

	Currently	Proposed Design Flow	Suggested Design Flow
1 bedroom	150 gpd	150 gpd	150 gpd
2 bedroom	300	280	280
3 bedroom	450	390	400
4 bedroom	600	470	500
each add Bedroom	150	80	100
5 bedroom			600 (* 1.5 = 900gal)
6 bedroom		630 (* 1.5 = 945 gal)	

Table 2. Non-Residential Average Wastewater Design Flow Rates

Comment: The SE District questions where many, not all, of these new proposed design flow values came from; and why some of them changed so drastically from our current design flow values? Examples follow: (facility types with design flows unchanged not included)

Facility	Units	Currently	Proposed	Comment
Apartment	bedroom	150	120	why only constant 120 gpd ?
Bars	seat		20	OK- easier than est. patrons
"	Patron	3		OK to change to 20/seat
Campground(w toilets only)	person		25	**NG**- how do you count people
" (w shower)	person		45	at a CG?
" service bldg only	site	75		Leave as per site - easier to
w ind.W&S hook-ups site	"	100		count spaces than people.

Car or truck wash	vehicle	200	???	**Should Include Something**
Church	person		4	
" No food prep or DW	seat	5		seats are easier to count, and
" Food prep and/or DW	seat	7		why only 4gp per, not 5 or 7?
Cottage	person	50	???	Do we want to leave this out?
Country Club	member	100	25	**Why drop to only ¼ flow?**
Office bldg, Retail,Warehouse/person				
" " " "	employee	30	15	Why did these drop to 15 or
Factory	employee	30	???	20 gpd/person, instead of
Industrial Bldg	employee	30	20	remain at 30 gpd/employee?
Hospital	bed	200	250	Increase really justified?
Laundry (self serve)	machine	600	450	justification for decrease?
Motel, Hotel,	bedroom		210	why change to gpd/room from
" "	sing/dou bed	40/80		gpd per bed?
Resort	bedroom		210	Resort more than motel?
Rest home,Care fac,Board sch	bed		100	is there a difference between
Rest Home	resident	100		per bed and per resident?
Boarding School	resident	100		
Day school:	person		15 any type	
" w/o food,gym,shower	student	15		why not specify difference
" with food only	"	20		between with & without
" with food,gym,shower	"	25		cafeterias, gyms, & showers?
Restaurant	meal		10	
" full serve & bathrm	"	13		Why only one value for all
" kitchen waste only	"	6		different types of service and
" Kit waste & dis serve	"	2		levels of waste production?
" Add for bars & lounge	"	2		
Shoping Center	park space	2	???	Leave this out?
Theater	seat		3	why 3 instead of 5 gpd/seat?
" Movie	"	5		
" Drive-in	space	15	???	Do we want to leave this out?
Mobile Home Park	**home**	**350**	**???**	**We can't leave out MH's?**

NOTE - from this point forward there will occasionally be comments similar to "Not consistent with previous statement, or provision, or # value, etc.: in Section ? something."

Section 6.(a) - - - "or other paved areas unless surface drainage diversion is provided. - - - / - - - driveways, ~~irrigated landscaping,~~ or other similarly compacted areas." (lawns OK)

Section 6.(b) - - - "at least 9 feet of spacing between adjacent trench sidewalls."

Section 6.(e)(i) "The natural slope of the site ~~will~~ shall not exceed - - -"

" f) **Table 4. Minimum Horizontal Setbacks**

From	to septic tank	to absorption system
Public Water Well	50 / 500[2]	200 / 1000[2]

[2] The larger horizontal setback shall apply when the soil absorption system discharges to the same aquifer that the public water well draws from.

Comment – how will a home owner or an installer know if and when the soil absorption system discharges into the public water well aquifer ???

Section 7. **Drain Field Sizing.**

(a) - - - "from Table 1 or Table 2, or from other viable calculations or approved sources, by the" -

(b) (i) - - - "the sum of the bottom width and the effective height of each sidewall. The effective sidewall height is - - - / - - - The effective height of the sidewall " - - -

(ii) - - - "the effective height of each sidewall. The sidewall height is the smaller of either the height of the slots on the sidewall or the bottom of the inlet pipe of the chamber. The effective height of the sidewall shall not" - - -

(c)(i) - - - "a percolation rate less than ~~five(5)~~ 1 or 2 mpi are unsuitable for - - - / - - - or loamy sand is placed and compacted to more than 5 mpi below the constructed - - - / - - - based on the percolation rate of the compacted fill material."

Table 5.

Perk Rate (mpi)	
~~5~~[1] 1 or 2	[1] if the perk rate is less than ~~5~~ 1 or 2 or greater than 60,

~~(d)(ii) All drain fields shall be dosed and include a pressure distribution system.~~

NOT NEEDED ON GRAVITY SYSTEMS !!!

Section 9. **Septic Tanks and Other Treatment Tanks.**

(a)(ii)(A) - - - "The minimum acceptable depth of soil cover allowed over the top of the tank is six(6) inches. The minimum required depth of soil cover over the top of the tank, and on the sides if needed, is enough soil and exterior insulation if needed to prevent the tank from freezing.

(a)(iii)(A) The minimum liquid volume of a septic tank shall be 1000 gallons for residences of ~~four(4)~~ ***~~Not consistent with Table 1 Design Flows~~*** – five(5) or six(6) bedrooms or less. Additional capacity of ~~250~~ ***~~Not consistent with Table 1 Design Flow Increments~~*** – 125 or 150 gallons per bedroom shall be provided for each bedroom over ~~four(4)~~ ***~~Not consistent with previous flow values~~***-five or six.

NEW (a)(iii)(C) For non-residential facilities the minimum septic tank size shall be the larger of 1000 gallons or 1½ times the determined design flow(36 hours retention time required).

~~(a)(iv)(B) The septic tank shall have a length to width ratio of no less than two(2) to one(1), or be partitioned to protect against short circuiting flow.~~ ***Not consistent with (a)(iv)(A) which requires two compartments. This is only for single compartment tanks which it appears we are no longer going to allow.***

(a)(iv)(C) The total ~~depth~~ inside height shall not be less than eight(8) inches greater than the liquid depth. Comment/Question: what happened to our 20% scum space requirement? 8 inches is only good for tanks of 40" or less of liquid depth. 20% of 6 feet of liquid depth is 14.4 inches. **It is recommended that we either go back to the 20% requirement or increase the 8 inches to at least 12 inches.**

(a)(iv)D)(III) The inlet pipe shall be at least 2 inches hifher than the outlet pipe. ~~The outlet elevation shall be designed to provide a distance of 20% of the liquid depth between the top of the liquid and the bottom of the septic tank cover for scum storage.~~ ***This should be combined directly into (a)(iv)(C) so that this info is all in the same place.***

(a)(iv)(D)(I) & (II) ***contain 6" and 3" requirements that are inconsistent with the 8" requirement in (a)(iv)(C)***

(a)(v) If additional septic tank capacity over 1000 gallons is needed, it may be obtained by joining tanks in series provided the following requirements are met: ***This will almost always violate the requirement that the first chamber (not the first tank) contain at least 50% of the total septic tank volume since we are requiring two compartment tanks.***

(a)(v)(B) For new or replacement construction, ~~the first tank shall be equal to or larger than any subsequent tank in the series~~ the first compartment of the first tank shall contain at least 50% of the total combined septic tank volume.

(a)(viii) - - - "Effluent filters are ~~recommended~~ allowed but not required ~~for all~~ on septic tanks.

(b)(ii) ***Discusses minimum pump tank sizes but contains values of 750 gal, 4 bedrooms, 350 gpd, 750 gal + ½ the daily flow greater than 350gpd, etc. Question – where did all of these numbers come from and how are they justified ??***

(b)(iii) - - - "septic tank's size shall then be increased by a minimum of 500 gallons , while maintaining the size of the first compartment at more than ½ of the total system volume.

(c) Holding Tanks

(ii) Holding tanks shall not be used for residential systems when other alternative systems are available, except when used when other alternatives are unavailable, impractical, or impossible. Holding tanks may also be used on a temporary, seasonal or intermittent basis, or when used to correct a failed drain field on a case by case basis.

(d)(i) - - - "or a device approved by the ~~delegated health department or county~~ designated small wastewater authority for the county, that is accessible to pump trucks. - - -

(d)(ix) The outlet invert shall be ~~no more than~~ at least two(2) inches lower than the inlet invert. ***Question: Why have we changed from 3 inches below to 2 inches below throughout Chapter 25?***

(g)(i) - - - "and/or expand the size of the soil absorption system. If the soil absorption system is expanded beyond 2000 gpd of design flow, then a UIC permit is required under Chapter 16.

(h)(ii) Once the abandoned tank is empty - - - and the tank filled with ~~native soil~~, pit run, pea gravel, or coarse sand.

Section 11. **Standard Brain Field Systems.**

(a)(iv) - - - "The maximum depth to the bottom absorption surface of a drain field or trench is ~~four(4)~~ five(5) feet." - - - ***Comment: a maximum depth of 4 feet is to shallow to be practical to work with in the field. Recommend it be changed to 5 feet maximum. We have never had a maximumdepth requirement before so this is new.***

(a)(vi)(B) The aggregate shall be washed crushed rock, gravel or other acceptable - - -

(a)(vii)(B) - - - "Sidewalls shall be no more than three(3) feet from a distribution lateral."

(a)(viii) "Chambered trenches, - - - , shall be installed with a level bottom on undisturbed soil (no fill) in conformance with the manufacturer recommendations. No cracked," - - -

(a)(viii)(B) - - - "the inlet pipe is at least six(6) inches ~~from~~ above the bottom of the chamber."

Section 12. **Pressure Distribution Systems.**

Not my expertise – No Comments.

Section 13. **Sand Mound Systems.**

Not my expertise – No Comments.

Section 14. **Small Wastewater Lagoons.**

Looks OK – maybe some typos.

Section 15. **Privies.**

Only Comment – Privies Should NOT be "Permit by Rule". They should require an individual permit because my experience is that privies will hardly ever be constructed anywhere close to properly if an individual permit is required. Second, there are not that many privy applications. And third, requiring permits may discourage their use even more – which would be a good thing.

Section 16. **Greywater Systems.**

Comment – it should be made clear that all greywater systems require a Permit to Construct from the designated Small Wastewater Program Authority for each County.

- ***there may be some typos – see copied pages.***

Section 17. **Operation and Maintenance.**

no comment

APPENDIX A: Percolation Test Proceedure

Comment – the proposed Appendix A should be thrown out and start over!

WHY – Because it represents the purely technically correct scientific way to do a perk test. This is totally impractical in the field, especially when it is snowing sideways, and it is cold. Besides, trying to follow this method will actually introduce more errors into the perk test data than doing it "our by our old DEQ method". Refilling a ½ inch or ¼ inch of water every 10 or 15 minutes accurately in the field is a joke. Therefore, the official DEQ method should be what we have been promoting for the last 10-12 years. After the test hole is properly presoaked, fill the hole to about 18 to 21 inches above the bottom and take continuous measurements until you get close to only 6 inches left. Then refill back to the 18 to 21 inch level and continue. Overall, this will produce more accurate and repeatable measurements, and is practical to perform in the field.

APPENDIX B: Land Application of Domestic Septage in Remote Areas

(a)(i) - - - "shall not be transported to another ~~location~~ property for land application.

(d)(iii) There is a worksheet online that must be completed, signed and returned to the DEQ/WQD ~~or the appropriate delegated local permitting authority~~ within 15 days of the land application. ***Comment – there are not enough of these occurrences to justify getting the counties involved. We can, and should, do them all them for consistency and lack of confusion.***

THE END

Ch 25 Stakeholder Comments 131

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Chapter 25 - Comments Attached

1 message

William Tillman <william.tillman@wyo.gov> Thu, Feb 28, 2013 at 1:12 PM
To: Gina Johnson <gina.johnson@wyo.gov>

---------- Forwarded message ----------
From: Tim Lyons <TimL@crookcounty.wy.gov>
Date: Thu, Feb 28, 2013 at 12:21 PM
Subject: Chapter 25 - Comments Attached
To: "william.tillman@wyo.gov" <william.tillman@wyo.gov>

Hello Mr. Tillman

Attached are three (3) comment letters from Crook County (Growth & Development, County Attorney and Natural Resource District).

Thank you for the opportunity to participate in this revision process.

Timothy R. Lyons

Administrator

Crook County Growth & Development

309 Cleveland Street

P.O. Box 848

Sundance, WY 82729

307-283-4548

www.crookcounty.wy.gov

--
William Tillman, P. E.
Water and Wastewater Section

Regulatory and Enforcement
Herschler Building, 4-W
122 West 25th Street
Cheyenne, WY 82002
(307) 777-6941
(307) 777-6779 (FAX)
william.tillman@wyo.gov

"Live like there's no tomorrow. One day you'll be right"

Ch 25 Stakeholder Comments 132

Act and may be disclosed to third parties.

3 attachments

- WDEQCH25 CCATNYComments.pdf
  1077K
- WDEQCH25 CCGDComments.pdf
  1182K
- WDEQCH25 CCNRDComments.pdf
  87K

CROOK COUNTY AND PROSECUTING ATTORNEY

Crook County Courthouse, 309 Cleveland
Post Office Box 397
Sundance, Wyoming 82729

JOSEPH M. BARON, *County and Prosecuting Attorney* Telephone: 307 283-1090
BRIAN B. WELLS, *Deputy County & Prosecuting Attorney* FAX: 307 283-1091

February 27, 2013

RE: Comments on Chapter 25 Small Waste Water Systems

Dear Mr. Tillman,

Thank you for the opportunity for stakeholders to comment on these proposed rules prior to public comment. We have found that this process leads to better rules and compliance with the rules. My comments are based upon my experience as County Attorney hearing complaints from landowners and government employees that have dealt with septic systems for the past 26 years. Please consider the following additions and comments:

ADD to page 25-1

"Section 1 Authority

(b) Enforcement All Small Waste Water Systems plans shall be submitted and preapproved by WDEQ prior to installation or the Landowner shall be fined a minimum of $500.00.

(c) Notice If plans are not preapproved, or any type of violation if found to exist a "Notice of Non-Compliance" shall be immediately recorded by WDEQ upon the land records.

(d) Release Once the fine is paid and the permits are approved then a Release would be recorded on the land records.

(e) Violation of Rules Any violation of these rules is punishable by W. S. 35-11-901 up to $25,000 per day of violation or imprisoned not more than one (1) year or both.

COMMENT: You need to make it very clear up front, what the potential penalties are, and the best place to put them is on the front page, then the agency needs to take action to insure compliance. These simple measures will increase compliance.

ADD to page 25-3

Section 3 Definitions

(gg) "**100 year flood plain**" is that area declared by a local government entity as such, or if no declaration has been made (like in Crook County) the high water mark as determined by an engineer or affidavit of an old timer with personal knowledge of the highest level of flooding in his lifetime.

COMMENT Our problem in Crook County is that the county has never passed a Flood Plain Ordinance. The rules needs to deal with that issue so that septic systems are not built in flood plains.

ADD to page 25-4

Section 5 (c) Preapproval All new technology shall be preapproved by WDEQ.

ADD to page 25-4

Section 6. Site Suitability (a) at the end of the paragraph add the following sentence. "No part of the Small Waste Water System shall be located or nearer than 100 feet of any body of water, 100 year flood plain, in any drainage or any perennial stream, creek or river."

ADD to page 25-12 Table 4. Minimum Horizontal Setbacks.

No setback should be less than 50 feet.

Anything proposed as 50 feet should be 100 feet.

The only exception would be the distance from the Septic Tank to the absorption field.

Also, add a field in the graph for:

"Roads and easements [**and all items listed in Section 6 (a)**] 50 feet setback from the Septic tank and 50 feet from the Absorption field."

COMMENT This is the biggest area of concern. No one surveys a drain field or septic system. The biggest conflict comes when a drain field or septic system are built to close to the neighbors. What happens is that one neighbor puts in his water well or sewer system in first and that restricts the neighbor from developing his land. For example, the current rules indicate 50 feet set back from a water well, but only 10 feet from the property line. That just made 40 feet of the neighbor's land unusable for his water well or sewer system. In addition, most subdivisions have

10 to 20 feet wide utility easements around them. This is another reason to keep sewer systems away from the lot lines and neighbors.

ADD to Page 25-15 Section 9 (a) (i) change "approved" to "preapproved"

ADD to Page 25-16 Section 9 (a) (iv) (C) All septic tanks shall be vented and have a cleanout pipe.

ADD to page 25-27 Section 14 (a) (iii) change from 3 to 5 acres; (a) (iv) add "within 100 feet of a drainage or a 100 year flood plain, or perennial stream, creek, or river"

ADD to page 25-27 Section 14 (b) (i) change from 100 feet to 200 feet.

ADD to page 25-28 Section 14 (b) (xiv) define the height and type of fencing

ADD a rule that applicants are to use the forms provided by WDEQ and that WDEQ will create forms to comply with these rules.

DELEGATED AND NON-DELEGATED COUNTY

These rules have numerous references to a delegated or county health department, and counties that have entered into a delegation agreement.

COMMENT Crook County, its municipalities and many other counties have neither, and rely upon state agencies to enforce all of these state statutory requirements. **The rules need to address non-delegated counties.**

If you have any questions or concerns, please call the number above. Thank you again for the chance to comment on these rules.

Sincerely,

Joseph M. Baron

Crook County
Growth & Development

P.O. Box 848
Sundance, WY 82729-0848

Phone 307-283-4548
Fax 307-283-4549

Timothy R. Lyons, Administrator
timl@crookcounty.wy.gov

Raquel J. Croell, 911 Addressing Coordinator
raquelc@crookcounty.wy.gov

February 27, 2013

Re: Chapter 25, Small Wastewater Systems - Comments.

William Tillman
Water Quality Division, Water & Wastewater Section
Herschler Building 4W
122 W 25th Street
Cheyenne, WY 82002

Dear Mr. Tillman:

Thank you for the opportunity to comment on the revision of the Water Quality Rules and Regulations Chapter 25, Small Wastewater Systems. My comments are based upon my experience from inspecting Small Wastewater Systems for Crook County and from listing to concerns from our local installers over the past six years. Please consider the following comments.

Section 6. Site Suitability.,(b), pg. 25-5
Rather than stating the site must be large enough to include area for a future replacement drain field, there should be a minimum acreage size established.

Section 6. Site Suitability.,(f), pg. 25-12
Table 4. Minimum Horizontal Setbacks, should include the minimum setback for an Existing Absorption System to a new or additional Septic Tank Or Equivalent and Absorption System.

Section 7. Drain Field Sizing.,(b),(i), pg. 25-13
Is the intent of this to establish a maximum of 12 inches of aggregate below the perforated pipe?

Section 7. Drain Field Sizing.,(b),(ii), pg. 25-13
Some chambers that are currently listed on the WDEQ Chamber Systems, Equivalent Areas List exceed the 12 inch sidewall height. Will these chambers no longer be acceptable and be removed from the list?

Section 8. Building Sewer Pipes.,(e), pg.25-15
States that cleanouts shall be provided at every change in alignment and at least every 100 feet in straight runs. Does this mean a change in alignment both horizontally and vertically? Does this requirement apply to the sewer pipe between the building and the tank, and between the tank and the manifold for the drain field? This should also include the direction of the cleanout in the pipe; between the building and tank should the cleanout run back to the building, the tank or both

directions; between the tank and the manifold should cleanout run back to the tank, the manifold or both directions?

Section 9. Septic Tanks and Other Treatment Tanks.,(a),(iv),(A), pg. 25-16
States that septic tanks shall have not less than two (2) compartments. Does this mean that single compartment tanks will no longer be acceptable or permitted? This is a good design practice but will add additional cost to the construction of these systems, which will be passed on to the owner of the system and WDEQ will have to revise the approved tank list.

Section 9. Septic Tanks and Other Treatment Tanks.,(a),(vi),(B), pg. 25-17
I do not agree with allowing the tank risers to be terminated below the ground surface. I do agree that the riser covers should have a locking device.

Section 9. Septic Tanks and Other Treatment Tanks.,(b),(iii), pg. 25-17
I do not agree with allowing a second compartment of the 2 compartment tank to be utilized as the pump vault.

Section 9. Septic Tanks and Other Treatment Tanks.,(b),(iv), pg. 25-17
The alarm device shall include <u>both</u> an audible alarm and an indoor illuminated alarm, the option of one or the other should not be allowed.

Section 9. Septic Tanks and Other Treatment Tanks.,(c),(v), pg. 25-18
The alarm device shall include both an audible alarm and an indoor illuminated alarm, the option of one or the other should not be allowed.

Section 9. Septic Tanks and Other Treatment Tanks.,(d),(i), pg. 25-18
Crook County is not a delegated county nor does Crook County have a delegated health department.

Section 10. Effluent Distribution Devices.
Straight tees should not be allowed in any circumstances.

Section 11. Standard Drain Field System.,(a),(vi),(C), pg. 25-22 and Section 13. Sand Mound Systems.,(c),(ii),(B), pg. 25-26
"geotextile materials", perhaps this should be further defined.

Section 11. Standard Drain Field System.,(a),(vii), pg. 25-23
States: Standard beds shall conform to the same pipe and aggregate requirements for (<u>insert:</u> "standard") trenches as found in subparagraphs…

Section 11. Standard Drain Field System.,(a),(viii),(B), pg. 25-23
States: All chamber endplates shall be designed… (<u>add:</u> "and installed") so that the bottom…

Section 15. Privies.,(a) & (b), pg. 25-29
Under the current rules and regulations privies are required to be permitted and vaulted. I feel that this is a good practice and should continue.

Appendix A., Percolation Test Procedure, pgs. A1 & A2
Crook County is not a delegated county nor does Crook County have a delegated health department.

Appendix A., Percolation Test Procedure,(e),(vii), pg. A2
"Certify" by whom?

WDEQ should also consider adding a Section to Chapter 25 for Enforcement. My suggestion is as follows: If a Wastewater System is found to have been constructed or modified without an approved permit or any other type of violation is found to exist the landowner shall be fined a minimum of $500.00. If the violation exists in a county that is not a delegated county such as Crook County the WDEQ shall immediately record a "Notice of Violation" upon the land records with the County Clerk. Then once the violation has been resolved a "Release" would be recorded upon the land records with the County Clerk. The intent of this is an attempt to prevent the sale of a property that has an existing violation, or at the least cause the violation to be disclosed to the buyer before the sale or transfer of the property.

Feel free to contact me if you have any questions concerning these comments. Thank you again for the opportunity to comment on these rules.

Sincerely,

Timothy R. Lyons
Administrator

February 22nd, 2013

RE: Revisions to Chapter 25 Small Wastewater Systems

Dear Mr. Tillman,

This letter is in regard to the revision of Water Quality Rules and Regulations Chapter 25, Small Wastewater Systems.

The Crook County Natural Resource District (CCNRD) conducts subdivision reviews and soils reports for Crook County, Wyoming; and therefore has concerns in regard to permit acquirement and installation accountability. In respect to percolation testing, the CCNRD suggests WDEQ conduct random percolation tests to instill answerability for applications or require photo documentation. The CCNRD also requests more follow-up visits by WDEQ.

Section 6. Site Suitability. → *The CCNRD respectfully requests that WDEQ more willingly utilize the USDA countywide soil surveys; and/or the soils reports conducted by Conservation Districts for subdivision reviews be taken into further consideration and carry more weight on the overall design and installation.*

Section 9. Septic Tanks and Other Treatment Tanks. (a) Septic Tanks (iv) Configuration (A) → *What is the purpose behind the statement* "Septic tanks shall have not less than two (2) compartments."…?

APPENDIX B Land Application of Domestic Septage in Remote Areas (a) Location restrictions shall adhere to the following: (i) → Domestic septage generated on a specific property may be land applied on said property, and shall not be transported to another location for land application without *written permission from receiving landowner, for WDEQ variance consideration.*

(d) Reporting requirements: (i) → *What about emergency situations? If an "emergency" happens on the weekend, WDEQ would not be in the office to give advance notification to…are there exceptions?*

Question: *What if the county does not have a wastewater treatment facility to take the septage to? Are there exceptions?*

The Crook County Natural Resource District respectfully requests to be put on the email and mail notification list to stay abreast of the proposed changes. Please feel free to contact us with any questions or comments you may have regarding this letter.

Kind regards,

Sarah D. Anderson

Sarah Anderson
CCNRD Office Manager

Ch 25 Stakeholder Comments 140

Gina Johnson <gina.johnson@wyo.gov>

Fwd: chapte r 25 draft - com ments

1 message

William Tillman <william.tillman@wyo.gov> Thu, Feb 28, 2013 at 4:18 PM
To: Gina Johnson <gina.johnson@wyo.gov>

---------- Forwarded message ----------
From: Karen Farley <karen.farley@wyo.gov>
Date: Thu, Feb 28, 2013 at 3:23 PM
Subject: chapter 25 draft - comments
To: William Tillman <william.tillman@wyo.gov>
Cc: Rich Cripe <rich.cripe@wyo.gov>, Frank Strong <frank.strong@wyo.gov>

Here are our comments.

Thanks!

--
Karen L. Farley, P.E.
Northeast District Engineer
152 North Durbin, Ste 100
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307-473-3478

--
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"Live like there's no tomorrow. One day you'll be right"

Chapter 25 comments (1).pdf
613K

Chapter 25
SMALL WASTEWATER SYSTEMS

Table of Contents

CHAPTER 25

SMALL WASTEWATER SYSTEMS

Section 1. Authority.

This rule is promulgated pursuant to Wyoming Statutes (W.S.) 35-11-101 through 35-11-1701, specifically 35-11-302(a)(iii).

Section 2. Objective.

This Chapter contains the minimum standards for the design and construction of small wastewater systems which are defined by W.S. 35-11-103(c)(ix). The two thousand (2,000) gallons defined in the statute shall be the average flow of domestic sewage per day.

Section 3. Definitions.

(a) "**Absorption surface**" means the interface where treated effluent infiltrates into native or fill soil.

(b) **"Advanced treatment"** means a treatment process that achieves an effluent being discharged to the absorption surface or native soil with 5 day biochemical oxygen demand (BOD_5) and total suspended solids (TSS)less than or equal to 30 mg/L.

(c) "**Bed**" means a soil treatment and dispersal system, the width is greater than three (3) feet.

(d) **"Bedrock"** means geological layers, of which greater than 50 percent by volume consist of unweathered in-place consolidated rock or rock fragments. Bedrock also means weathered in-place rock which cannot be hand augered or penetrated with a knife blade.

(e) **"Bedroom"** means any room that is or may be used for sleeping.

(f) **"Blackwater"** means water containing fecal matter and urine.

(g) **"Building sewer"** means the pipe which carries wastewater from the building.

(h) **"Chamber"** means a domed open bottom structure that is used in lieu of perforated distribution pipe and gravel media.

(i) **"Delegated small wastewater program"** means a local governmental entity, delegated by the Administrator, with the authority to administer the provisions of W.S. 35-11-301(a) (iii) for small wastewater systems pursuant to the provisions of W.S. 35-11-304.

(j) **"Domestic wastewater"** means a combination of the liquid or water-carried wastes from residences, business buildings, institutions, and other establishments arising from normal living activities.

(k) **"Domestic Septage"** means liquid or solid material removed from a waste treatment vessel that has received only wastes from residences, business buildings, institutions, and other establishments arising from normal living activities.

(l) **"Dosing tank"** means a tank equipped with an automatic siphon or pump designed to discharge effluent on an intermittent basis.

(m) **"Drain field"** means a shallow, covered, excavation made in unsaturated soil into which pretreated wastewater is discharged through distribution piping for application onto absorption surfaces through porous media or manufactured components placed in the excavations.

(n) **"Effluent"** means a liquid flowing out of a septic tank, other treatment vessel or system.

(o) **"Effluent filter"** means a removable, cleanable device inserted into the outlet piping of a septic tank or other treatment vessel designed to trap solids that would otherwise be transported to the drain field or other downstream treatment components.

(p) **"Evapotranspiration"** means the combined loss of water from soil by evaporation from the soil or water surface and by transpiration from plants.

(q) **"Greywater"** means household wastewater which has not been contaminated by toilet discharge. Greywater includes wastewater from baths, showers, bathroom wash basins, clothes washing machines, sinks (including kitchen sinks) and laundry tubs.

(r) **"Grease interceptor"** means a device designed to separate fats, oils, and grease from the wastewater.

(s) **"Groundwater"** means subsurface water that fills available openings in rock or soil materials such that they may be considered water saturated under hydrostatic pressure.

(t) **"High groundwater"** means seasonally or periodically elevated levels of groundwater.

(u) **"High Strength Wastewater"** means a wastewater stream with a five (5) day BOD higher than 200 mg/l.

(v) "**Holding Tank"** means a watertight receptacle designed to receive and store wastewater.

(w) **"Manifold"** means a non-perforated pipe that distributes effluent to individual distribution pipes.

(x) **"Mound system"** means an onsite wastewater system where the bottom of the absorption surface is above the elevation of the existing site grade, and the absorption surface is contained in a mounded fill body above the grade.

(y) **"Percolation Rate"** means the time expressed in minutes per inch required for water to seep into saturated soil at a constant rate during a test.

(z) **"Percolation test"** means the method used to measure the percolation rate of water into soil as described in Appendix A.

(aa) **"Pressure distribution"** means a network of distribution pipes in which effluent is forced through orifices under pressure.

(bb) **"Pretreatment"** means any technology or combination of technologies that precedes discharge to a drain field or other final treatment unit or process before final dissemination into the receiving environment.

(cc) **"Restrictive layer"** means a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide unfavorable root conditions. Examples are bedrock, cemented layers, dense layers, and frozen layers.

(dd) **"Septic tank"** means a buried, watertight tank designed and constructed to receive and treat raw wastewater.

(ee) **"Service provider"** means a person authorized and trained by a system manufacturer or their vendor to operate and maintain any proprietary system which provides advanced treatment

(ff) **"Trench"** means an absorption surface with a width of three (3) feet or less.

Section 4. Design Flows.

The quantity of wastewater shall be determined by one of the following:

(a) Tables 1 and 2 provided in this section.

(b) Metered water supply data from the facility.

(c) Metered water supply data from another facility where similar water demands have been demonstrated.

Table 1. Residential Average Design Flow Rates per Bedroom (gallons per day, gpd)[1]

1 bedroom	150
2 bedrooms	280
3 bedrooms	390
4 bedrooms	470
5 bedrooms	550
6 bedrooms	630

[1]An unfinished basement is considered an additional bedroom

Table 2. Non-Residential Average Wastewater Design Flow Rates

Facility	Unit	Flow (gallons/unit/day)
Airports	person	4
Apartment	bedroom	120
Automobile Service Station	vehicle served	10
Bars	seat	20
Bathhouses and swimming pools	person	10
Campgrounds (w/ toilets only)	person	25
Campgrounds (w/shower facility)	person	45
Church	person	4
Country Club	member	25
Day School, Office building, Retail Store, Warehouse (no showers)	person	15
Hospital	bed	250
Industrial Building (sanitary waste only)	employee	20
Laundry (self-service)	machine	450
Motel, Hotel, Resort	bedroom	210
Rest Home, Care Facility, Boarding School	bed	100
Restaurant	meal	10
Theater	seat	3

Section 5. Systems not Specifically Covered by this rule.

This section is provided to encourage new technology and equipment and provide a process for evaluating and permitting designs which deviate from this rule. The proposed construction of facilities and processes not in compliance with this rule will be permitted provided that the facility, when constructed, can operate meeting the purpose of these rules.

(a) Each application for a permit to construct will be evaluated on a case-by-case basis using the best available technology. The application shall include at least one of the following:

(i) Data obtained from a full scale, comparable installation which demonstrates the acceptability of the design.

(ii) Data obtained from a pilot plant operated under the design condition for a sufficient length of time to demonstrate the acceptability of the design.

(iii) Data obtained from the theoretical evaluation of the design which demonstrates a reasonable probability of the facility meeting the design objectives.

(iv) An evaluation of the flexibility of making corrective changes to the constructed facility in the event it does not function as planned

(b) If an applicant wishes to construct a pilot plant to provide data necessary to show the design will meet the purpose of the act, a permit to construct must be obtained.

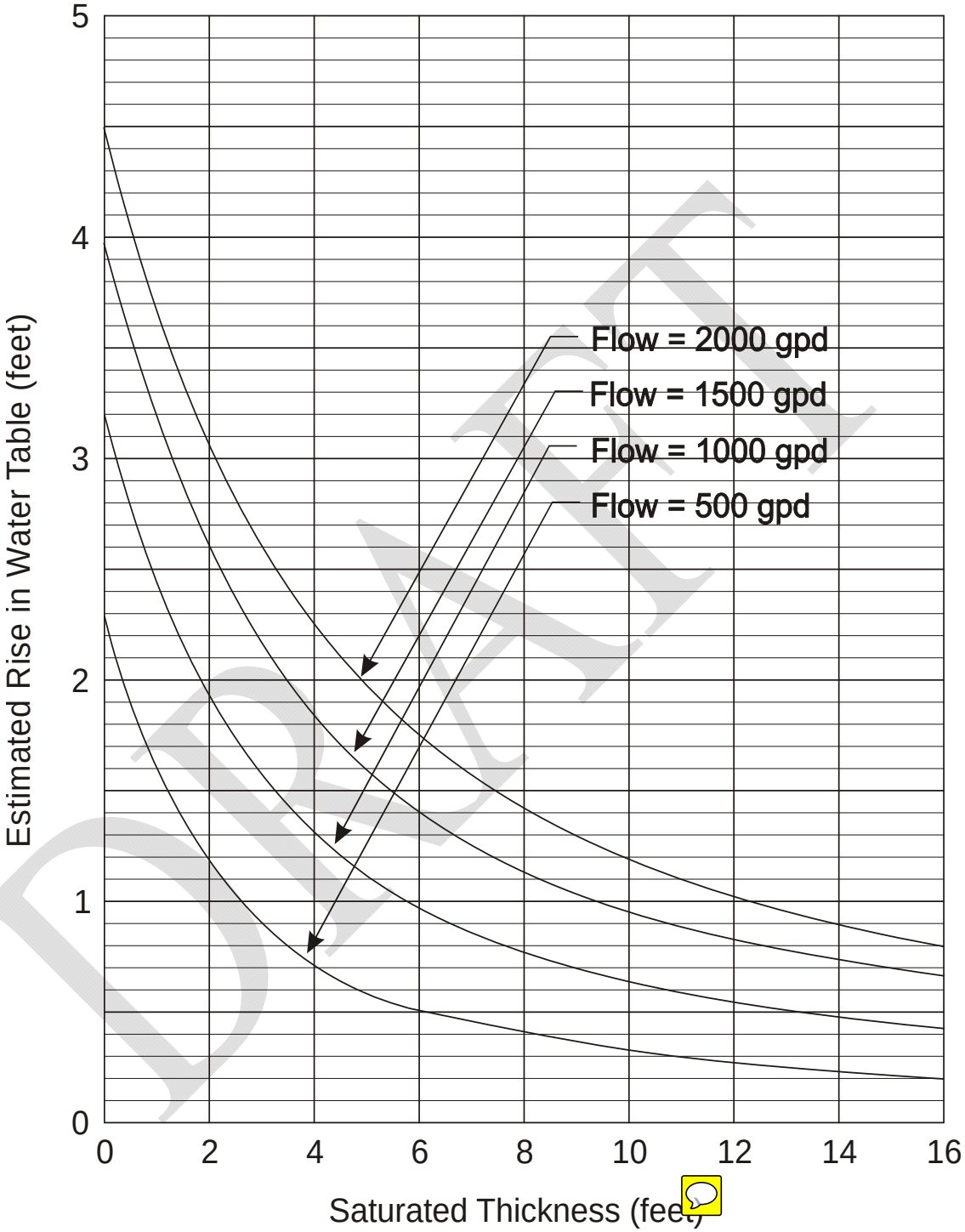
Section 6. Site Suitability.

(a) Locate the small wastewater system where the surface drainage is good. Avoid depressions and bases of slopes and areas in the path of runoff from roofs, patios, driveways, or other paved areas unless surface drainage is provided. Small wastewater systems shall not be located beneath buildings, parking lots, roadways, driveways, irrigated landscaping or other similarly compacted areas.

(b) The site must be large enough to include area for a future replacement drain field. Both the proposed and replacement drain fields shall be sized to receive one-hundred (100%) percent of the wastewater flow. If a trench system is used, the replacement drain field may be located between the trenches of the proposed drain field if there is at least nine (9) feet of spacing between trench sidewalls.

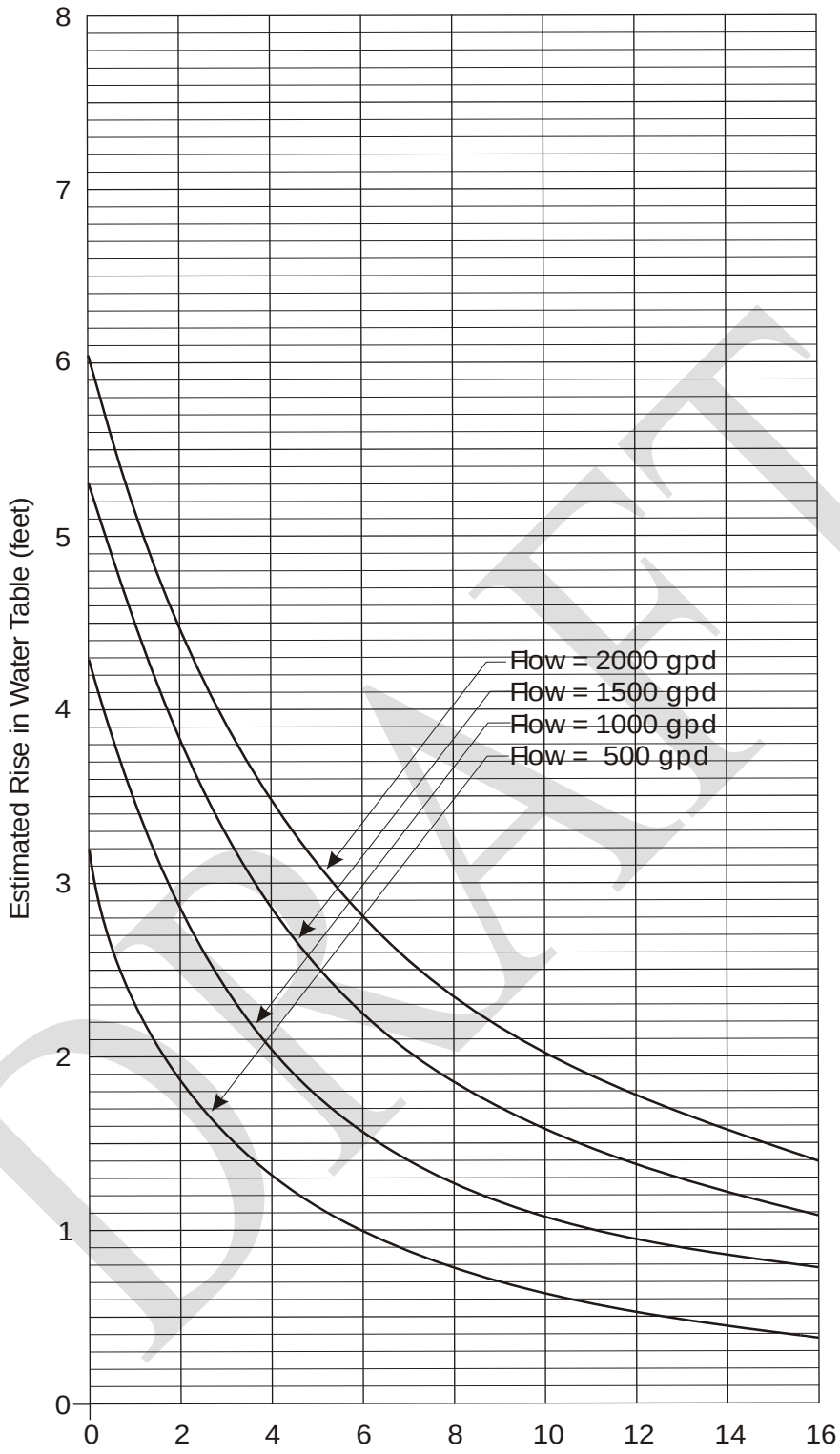
(c) For standard drain fields, effective suitable soil depth shall extend at least four (4) feet below the bottom of the drain field to any restrictive layer or highly permeable material.

(d) The depth of the high groundwater shall be at least four (4) feet below the bottom of the drain field excavation. The high groundwater shall be based on the seasonally high groundwater elevation plus the estimated rise in the water table shown on figures 1 through 6. In areas of high groundwater, this vertical separation requirement is most commonly satisfied by a mound and pressure dosed drain field.



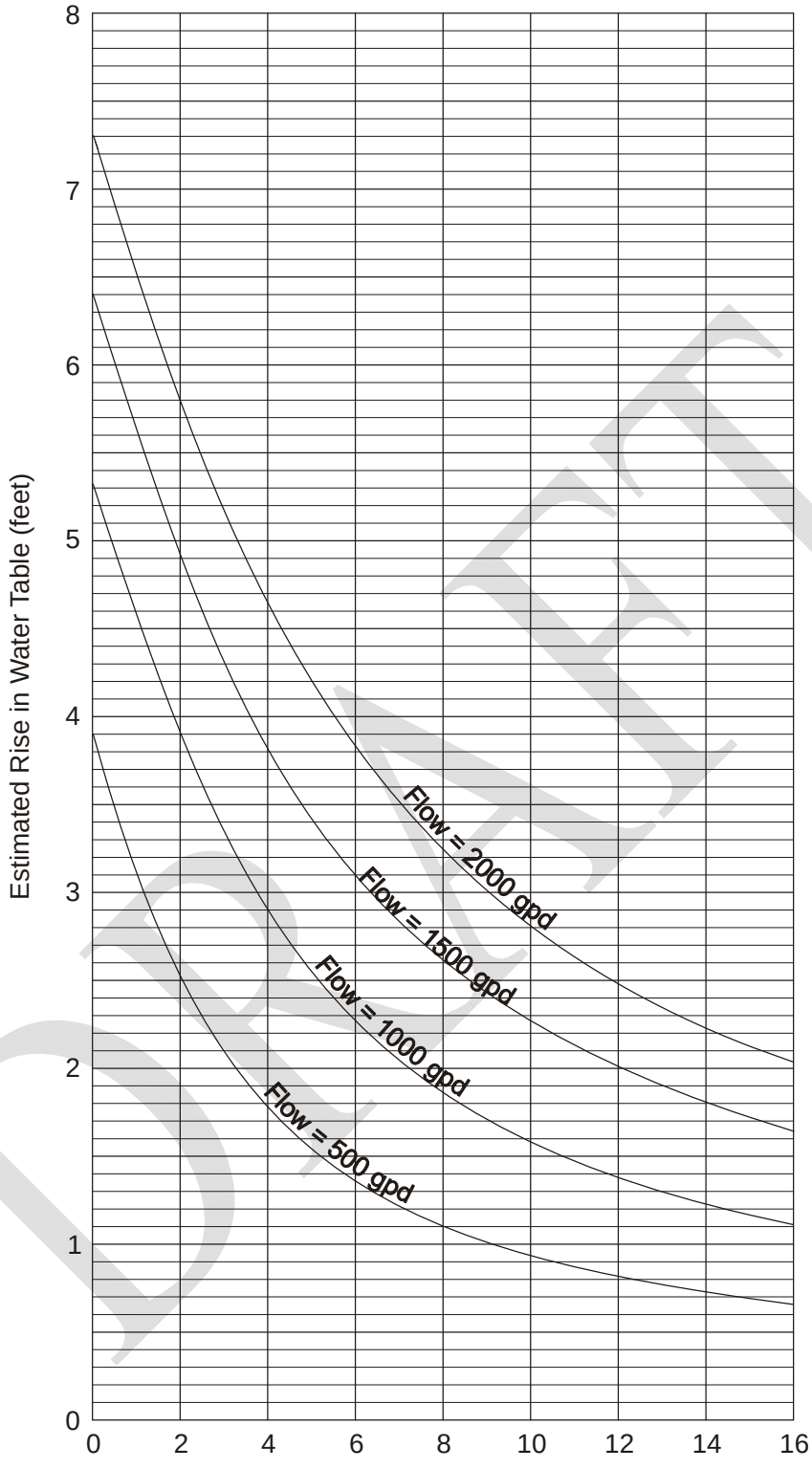
BASED ON A SOIL PERCOLATION RATE = 10 min/inch

FIGURE 1



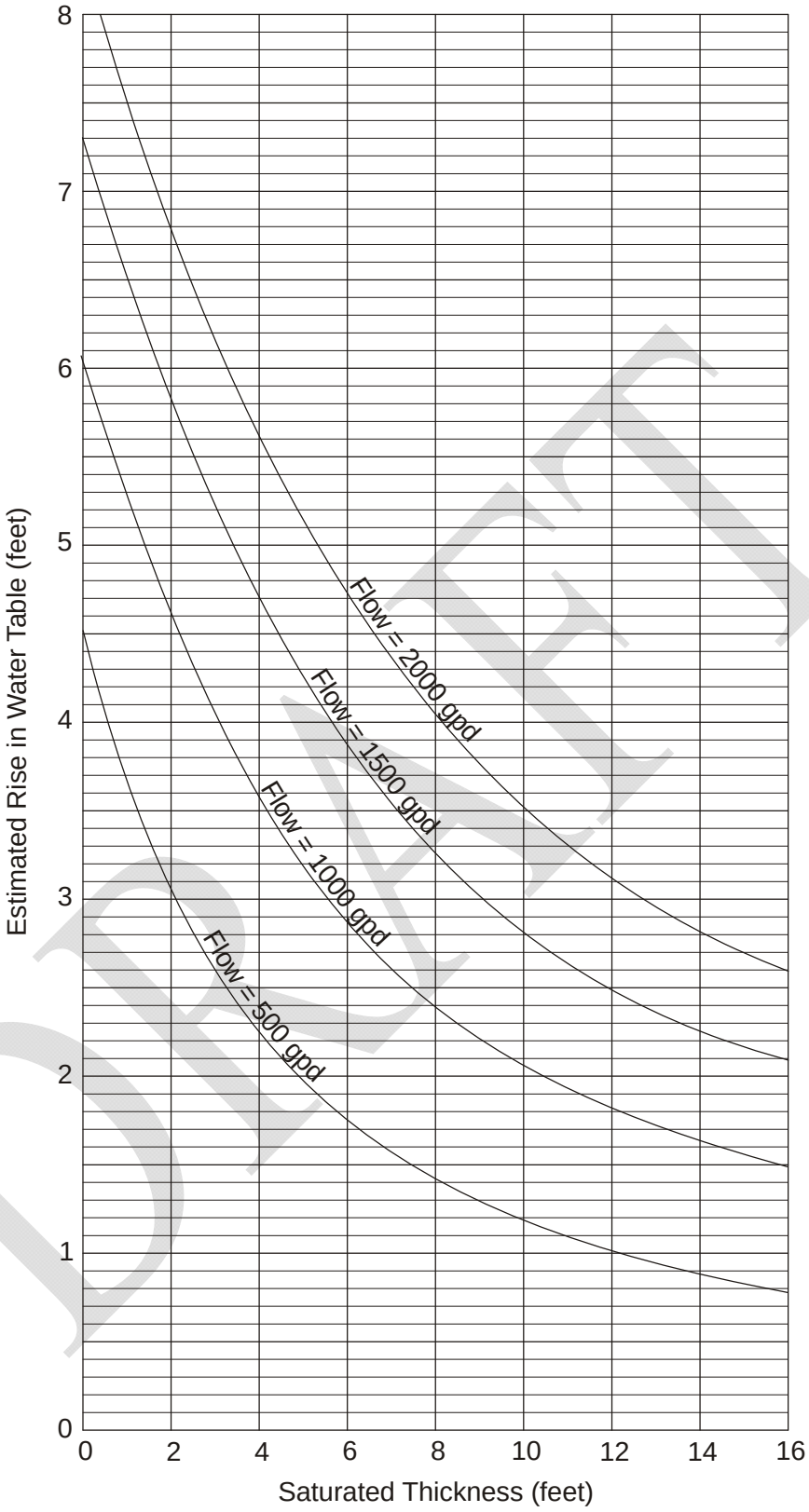
BASED ON A SOIL PERCOLATION RATE = 20 min/inch

FIGURE 2



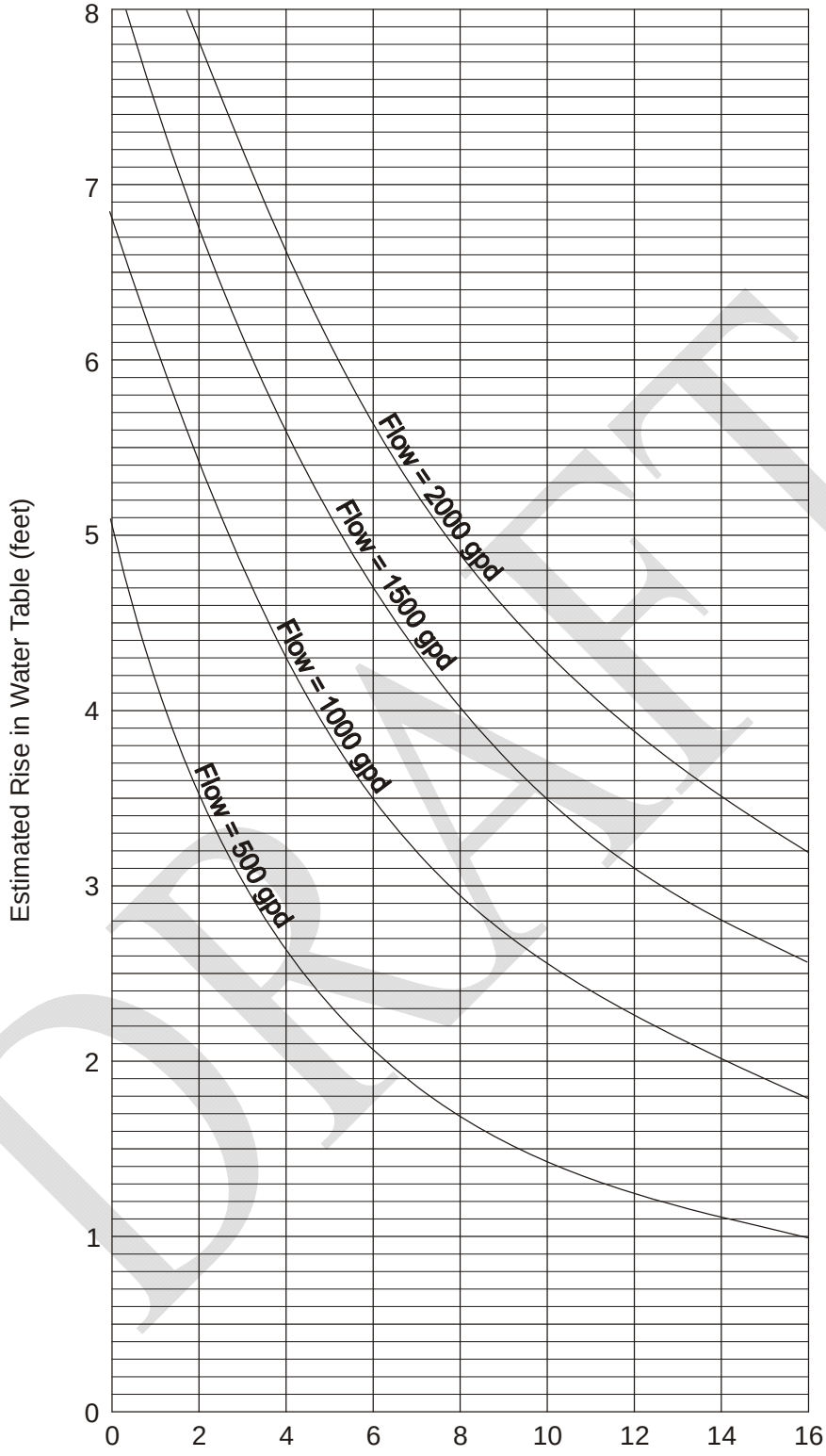
BASED ON A SOIL PERCOLATION RATE = 30 min/inch

FIGURE 3



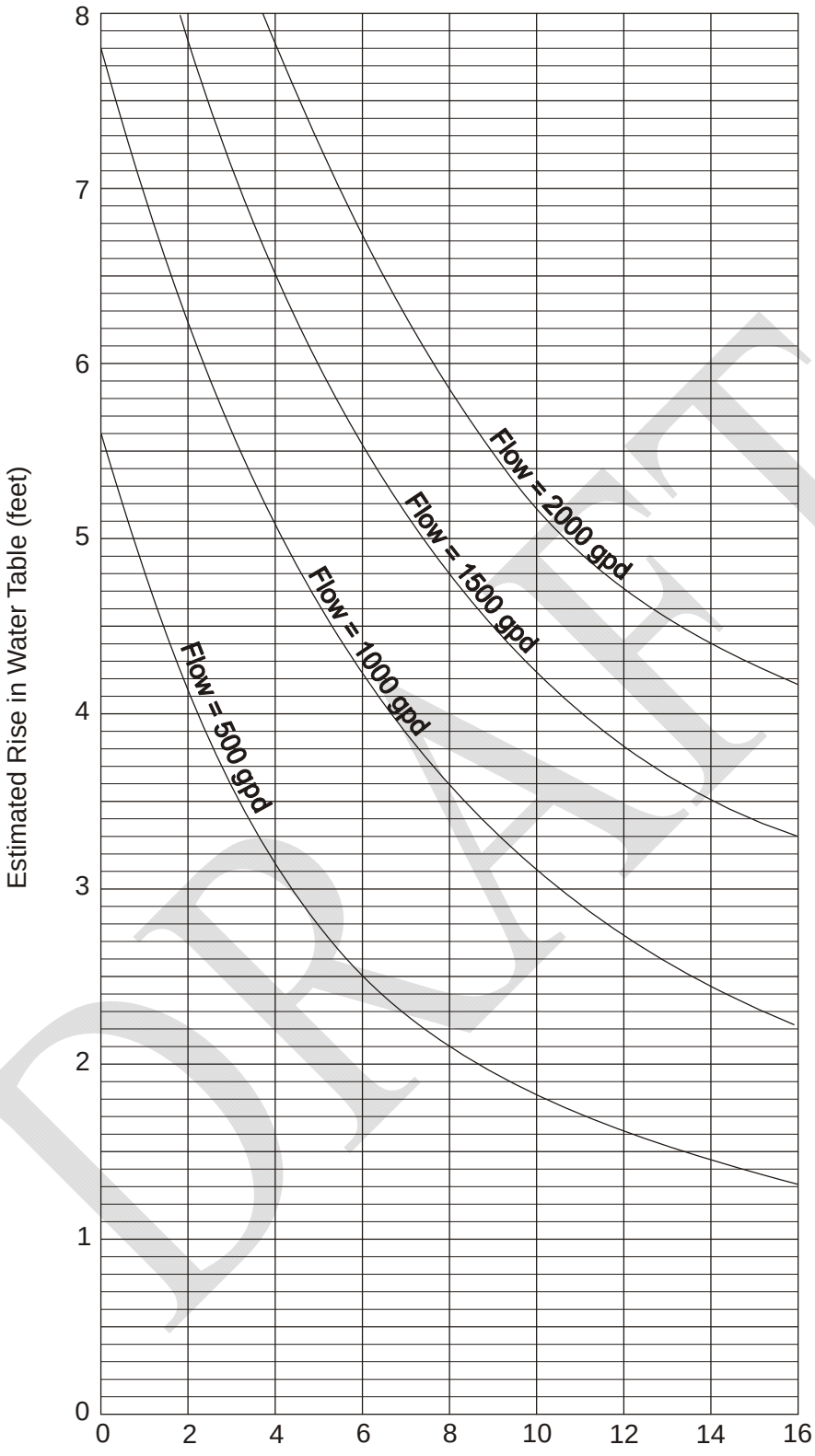
BASED ON A SOIL PERCOLATION RATE = 40 min/inch

FIGURE 4



BASED ON A SOIL PERCOLATION RATE = 50 min/inch

FIGURE 5



BASED ON A SOIL PERCOLATION RATE = 60 min/inch

FIGURE 6

(e) Slope

(i) The natural slope of the site will not exceed twenty-five percent 25%, 4-feet horizontal to 1-foot vertical. The following are the maximum permissible slopes on which an absorption system may be constructed.

Table 3. Slope and Percolation Rates for Absorption Systems

Percolation Rate (minutes/inch)	Maximum Slope[1]
Faster than 5	25%
6-45	20%
46-60	15%

[1] Flatter slopes may be required where the effluent may surface downslope.

(ii) Serial distribution, with the use of drop boxes or approved fittings, is the preferred installation method for sloping terrain. The bottom of individual trenches shall be level and the trenches shall be constructed to follow the contours of the land.

(iii) The placement of multiple trenches, with each subsequent trench down slope of the previous trench shall be avoided when the addition of effluent to the drain field trenches may lead to either an unstable slope or seepage down slope.

(iv) All absorption surfaces must be located at least 15 feet from the top of any break in slope which exceeds the maximum slope allowed.

(f) Minimum horizontal setback distances (in feet) are as follows:

Table 4. Minimum Horizontal Setbacks[1]

From	**To Septic Tank Or Equivalent**	**To Absorption System**
Wells (includes neighboring wells)	50	100
Public Water Well	50/500[2]	200/1000[2]
Property lines	10	10
Foundation Wall	15	25
Subsurface drains	10	25
Potable Water Pipes	25	25
Septic tank	NA	10
Surface Water, Spring (including seasonal and intermittent)	50	50

[1] For disposal of non-domestic wastewater, the isolation distance shall be determined by a hydrogeological study in accordance with Section 15(b) of Chapter 3, but shall not be less than the distances shown in Table 4.

[2] The larger horizontal setback shall apply when the soil absorption system discharges to the same aquifer that the public water well draws from.

(g) Soil exploration pit and percolation tests

(i) Delegated small wastewater programs shall require a percolation test in addition to the soil exploration pit.

(ii) A minimum of one soil exploration pit within the proposed drain field location shall be excavated to a minimum depth of four (4) feet below the bottom of the proposed drain field to evaluate the subsurface conditions.

(iii) The percolation test shall be performed in accordance with Appendix A of this chapter. An evaluation of the soil texture, in the proposed drain field location, by a person experienced in soils classification, may be used to confirm the percolation rate.

Section 7. Drain Field Sizing.

(a) The total infiltrative surface area of a drain field shall be calculated by dividing the design flow rates (gpd) from Table 1 or Table 2 by the loading rate (gpd/ft^2) found in Table 5.

(b) The total infiltrative area shall be defined as follows:

(i) For standard trenches, perforated pipe embedded in aggregate, the total infiltrative area shall be calculated by multiplying the total length of the trench (ft) by the sum of the bottom width (ft) and the height (ft) of each sidewall. The sidewall height is the depth below the flowline of the pipe to the bottom of the trench. The height of the sidewall shall not exceed twelve (12) inches.

(ii) For chamber trenches, the total infiltrative area shall be calculated by multiplying the total length of the trench (ft) by the sum of the bottom width (ft) of the chamber and the height (ft) of each sidewall. The sidewall height is the height of the slotted sidewall of the chamber. The height of the sidewall shall not exceed twelve (12) inches.

(iii) For bed systems, the total infiltrative area shall be calculated by multiplying the total length (ft) by the width (ft) of the bed. The sidewall shall not be used in calculating the total infiltrative area for a bed system.

(c) Fast and slow percolating soils

(i) Coarse sand or soils having a percolation rate less than five (5) minute per inch are unsuitable for subsurface effluent disposal. These soils may be used if a one (1) foot layer of fine sand or loamy sand is placed below the constructed soil absorption system. The soil absorption system shall be sized based on the percolation rate of the fill material.

Table 5. Rates of Wastewater Application for Drain Field Areas[1]

Percolation Rate (mpi)	Loading Rate (gpd/ft^2)	Percolation Rate (mpi)	Loading Rate (gpd/ft^2)
5	0.80	33	0.38
6	0.75	34	0.37
7	0.71	35	0.37
8	0.68	36	0.36
9	0.65	37	0.36
10	0.62	38	0.35
11	0.60	39	0.35
12	0.58	40	0.35
13	0.56	41	0.34
14	0.54	42	0.34
15	0.52	43	0.34
16	0.50	44	0.33
17	0.49	45	0.33
18	0.48	46	0.33
19	0.47	47	0.32
20	0.46	48	0.32
21	0.45	49	0.32
22	0.44	50	0.32
23	0.43	51	0.31
24	0.43	52	0.31
25	0.42	53	0.31
26	0.41	54	0.31
27	0.41	55	0.31
28	0.40	56	0.30
29	0.40	57	0.30
30	0.39	58	0.30
31	0.39	59	0.30
32	0.38	60	0.30

[1] If the percolation rate is less than 5 or greater than 60, a Wyoming Registered Professional Engineer must determine the loading for your site specific conditions.

(d) Drain fields for high strength wastewater

(i) The allowable loading rate shall be reduced by the factor calculated by multiplying the loading rate by 200 and dividing by the five (5) day BOD loading of the wastewater.

(ii) All drain fields shall be dosed and include a pressure distribution system.

Section 8. <u>Building Sewer Pipes.</u>

All building sewers shall be installed in accordance with the 2012 International Plumbing Code (IPC). In the absence of an approved plumbing code, and in addition to the IPC, the building sewer shall comply with the following:

(a) Suitable building sewer pipe materials are Polyvinyl Chloride (PVC) and Acyrlonitrile–Butadiene-Styrene (ABS). The septic tank inlet and outlet pipes shall be schedule 40 PVC or ABS pipe and shall span the excavations for the septic tank and/or dosing chamber. Standard Dimension Ratio (SDR) 35 American Society for Testing and Materials (ASTM) D-3034 plastic pipe may be used if the void at the tank's side is filled with material which is granular, clean and compacted.

(b) Building sewer pipes shall not be smaller than four (4) inches in diameter and sized to handle the peak hourly flow from the building. When two different sizes or types of sewer pipes are to be connected, a proper type of fitting or conversion adapter shall be used.

(c) Sewer pipe shall not decrease in size flowing downstream.

(d) Building sewer pipes should be laid at a standard slope of 1/4 inch per foot, but shall not be flatter than 1/8 inch per foo

(e) Cleanouts shall be provided at every change in alignment and at least every 100 feet in straight runs.

(f) All sewer piping shall be laid on a firm bed throughout its entire length. It shall be protected from damage due to rocks, hard lumps of soil, debris and the like.

(g) Special care shall be utilized to prevent lateral movement or deformation during backfill. The backfill material shall be compacted to a density at least equivalent to the trench walls. Backfill over the pipe shall be of sufficient depth to protect the pipe from expected traffic loads and the wastewater from freezing.

Section 9. Septic Tanks and Other Treatment Tanks.

(a) Septic tanks

(i) Septic tanks shall be fabricated or constructed of concrete, fiberglass or an approved material. Tanks shall be water tight and fabricated to constitute an individual structure, and shall be designed and constructed to withstand anticipated loads. The design of prefabricated septic tanks shall be reviewed for compliance with applicable construction standards prior to approval for installation.

(ii) The septic tank shall be placed on a level grade and a firm bedding to prevent settling. Where rock or other undesirable protruding obstructions are encountered, the opening for the septic tank shall be over excavated, as needed, and backfilled with sand, crushed stone, or gravel to the proper grade.

(A) Septic tanks shall not be buried deeper than the tank manufacturer's maximum designed depth for the tank. The minimum depth of soil cover over the top of the tank is six (6) inches.

(B) Backfill around and over the septic tank shall be placed in such a manner as to prevent undue strain or damage to the tank or connected pipes.

(C) Septic tanks shall not be placed in areas subject to vehicular traffic unless engineered for the anticipated load.

(iii) Size

(A) The minimum liquid volume of a septic tank shall be 1000 gallons for residences up to a four (4) bedroom capacity. Additional capacity of 250 gallons per bedroom shall be provided for each bedroom over four (4).

(B) Septic tanks for high strength wastewater or non-residential units shall have a minimum effective liquid capacity sufficient to provide at least 48 hour retention at peak flow or 1,000 gallons, whichever is greater.

(iv) Configuration

(A) Septic tanks shall have not less than two (2) compartments. The inlet compartment shall not be less than one-half (1/2) of the total capacity of the tank. The liquid depth shall not be less than three (3) feet nor greater than six (6) feet.

(B) The septic tank shall have a length to width ratio of no less than two (2) to one (1), or be partitioned to protect against short circuiting flowing.

(C) The total depth shall not be less than eight (8) inches greater than the liquid depth. The partition shall allow venting of gases between compartments and out through the vent stack on the plumbing system of the house. Gases generated during liquefaction of the solids are normally vented through the building's plumbing stack vent.

(D) The inlet and outlet on all tanks or tank compartments shall be provided with open-ended sanitary tees or baffles made of approved materials constructed to distribute flow and retain scum in the tank or compartments.

(I) The tees or baffles shall extend a minimum of six (6) inches above and nine (9) inches below the liquid level, but shall not exceed one-third (1/3) the liquid depth.

(II) A minimum of three (3) inches of clear space shall be provided over the top of the baffles or tees.

(III) The inlet pipe shall be at least two (2) inches higher than the outlet pipe. The outlet elevation shall be designed to provide a distance of 20 percent of the liquid depth between the top of the liquid and the bottom of the septic tank cover for scum storage.

(v) If additional septic tank capacity over 1,000 gallons is needed, it may be obtained by joining tanks in series provided the following requirements are met:

(A) The outlet of each successive tank shall be at least two (2) inches lower than the outlet of the preceding tank, and shall be unrestricted except for the inlet to the first tank and the outlet for the last tank.

(B) For new construction, the first tank shall be equal to or larger than any subsequent tank in the series.

(vi) A riser shall be provided to each compartment of the septic tank for inspection and cleaning.

(A) The riser shall have a minimum diameter of twenty (20) inches. Both inlet and outlet devices shall be accessible.

(B) The riser shall terminate at a maximum of six (6) inches below the ground surface. Riser covers terminating above grade shall have an approved locking device.

(vii) Land application of domestic septage in remote areas that meet the conditions found in Appendix B will be permitted as a permit by rule. Delegated small wastewater programs may issue individual permits.

(viii) An effluent filter with an opening of 1/8-inch or smaller shall be provided on the outlet of a septic tank or other tank that precedes a small diameter pressure distribution system. Effluent filters are recommended but not required for all septic tanks.

(b) Pump tanks

(i) Pump tanks shall meet the same material and installation requirements as septic tanks. Pump tanks shall have a 20-inch diameter access riser and it shall be brought to the ground surface.

(ii) The minimum pump tank size is 750 gallons for residential dwellings with four bedrooms or less. For systems with greater than 350 gpd design flow, the pump tank shall be 750 gallons plus one half (1/2) the daily flow greater than 350 gpd up to a maximum capacity of 1500 gallons.

(iii) A pump vault may be placed in the second compartment of a septic tank. The septic tank's size shall then be increased by a minimum of 500 gallons.

(iv) High water alarms shall be provided for all tanks that utilize pumps or siphons. The alarm device shall be an audible alarm or an indoor illuminated alarm or both.

(v) The minimum effluent level shall achieve complete submergence of the pump.

(vi) Dosed systems using a siphon shall have a dose counter installed to check for continued function of the siphon.

(c) Holding tanks

(i) Holding tanks shall meet the same material requirements as septic tanks. Holding tanks shall have a twenty (20)-inch diameter access riser and it shall be brought to ground surface.

(ii) Holding tanks shall not be used for residential systems when other alternative systems are available, except on a temporary, seasonal or intermittent basis, or when used to correct a failed drain field when other alternatives are unavailable.

(iii) Holding tanks must be located in an area readily accessible to the pump truck and where the tank itself will not float due to a high groundwater. If seasonal high groundwater may be present, the tank shall be properly anchored.

(iv) The minimum liquid volume shall be the greater of 1,000 gallons or seven (7) days storage based upon flow rate determined from Section 4.

(v) All holding tanks shall be equipped with a high water level alarm. The device shall be an audible alarm or an indoor illuminated alarm or both. The alarm level shall be placed at 3/4 the depth of the tank.

(d) Grease Interceptors

(i) A commercial or institutional food preparation facility with a waste stream containing fat, oil, and grease (FOG) in excess of 25 mg/L shall install an exterior grease interceptor or a device approved by the delegated health department or county. Facilities that typically have waste streams high in FOG are, but not limited to, restaurants, cafeterias, slaughterhouses, or institutional kitchens.

(ii) Waste streams high in FOG shall be plumbed separately and directly to a grease interceptor prior to the waste treatment process.

(iii) Waste streams from sanitary facilities such as bathrooms, toilets, urinals, or other similar fixtures shall not be discharged into the grease interceptor. These sources must be connected at least 4-6 feet downstream of the grease interceptor's discharge. The design shall prevent any backflow from the sanitary sources into the grease interceptor.

(iv) Only one source facility per grease interceptor shall be allowed.

(v) Grease interceptors shall be located so that they are easily accessible for inspection, cleaning, and removal of the collected wastes. The interceptor shall not be closer than fifteen (15) feet from the last discharging fixture and no further away than thirty-five (35) feet.

(vi) Grease interceptors shall have at least two (2) compartments with a 20-inch diameter clean out riser for each compartment. Each clean out riser shall be brought to the surface and have a sealed lid that is rated for any anticipated load. There shall be a means provided to sample the effluent.

(vii) There shall be no internal cleanout tees or bypasses.

(viii) The inlet and outlet of the grease interceptor shall be vented. The vent pipe shall be at least two (2) inches in diameter. The inlet and outlet vents shall not be interconnected.

(ix) The outlet invert shall be no more than two (2) inches lower than the inlet invert.

(x) The dividing wall between compartments shall be the same height as the other walls and the cover must contact the top of the dividing wall.

(xi) The effluent from each compartment shall be drawn from the bottom of a riser pipe that terminates at least eighteen (18) inches below the inlet invert of that same compartment.

(xii) Grease interceptors shall be accessible during normal business hours without interrupting normal business operations.

(xiii) Grease interceptors shall be installed in accordance with the manufacturer's instructions and applicable requirements of this section. A copy of the manufacturer's instructions shall be submitted with every permit to construct application submitted to DEQ.

(xiv) Grease interceptors shall be sized according to the following:

(A) The minimum volume shall not be less than 750 gallons.

(B) Shall be sized according to the following:

Kitchens (grease, garbage)

Number of meals per peak hour	**X**	Waste Flow rate*	**X**	Retention time**	**X**	Storage factor***	=	Interceptor size (liquid capacity)

*Waste flow rate – see Table 2.

**Retention times

Kitchen waste:	
Dishwasher and/or disposal	2.5 hours
Single service kitchen:	
Single serving with disposal	1.5 hours

***Storage factors

Fully equipped commercial kitchen	8 hr. operation: 1 16 hr. operation: 2 24 hr. operation: 3
Single service kitchen:	1.5

(e) Other interceptors

(i) Interceptors are required for oil, grease, sand and other substances harmful or hazardous to the building drainage system, or the small wastewater treatment system.

(A) Laundries

(I) Commercial laundries, Laundromats, and dry cleaners shall be equipped with an interceptor in order to reduce the quantity of lint and silt that enter the collection system.

(II) The system must be of adequate size and design to allow for cool-down of wastewater so that separation can be more readily achieved.

(III) The interceptor must be installed with a wire basket or similar device, removable for cleaning, that prevents passage into the drainage system of solids ½ inch (12.7 mm) or larger in size, string, rags, buttons, or other materials detrimental to the waste treatment system.

(IV) Sizing must be in accordance with the following formula:

Laundries (grease, lint, silt)

Total gallons per cycle	**X**	Cycles per hour	**X**	Retention time*	**X**	Storage factor**	=	Lint interceptor

*Retention times

Institutional laundries	2.5 hours
Standard commercial laundry	2.0 hours
Light commercial laundry	1.5 hours

**Storage factors

8 hours of operation	1.0
12 or more hours of operation	1.5

(B) Car Washes

(I) Where automobiles are washed (including detail shops utilizing hand- wash practices), separators shall have a minimum capacity of 1000 gallons for the first bay, with an additional 500 gallons of capacity for every other bay.

(II) Additionally, wash racks must be constructed to eliminate or minimize the impact of run-off from rain/storm events. Minimum requirements are roofed structures with at least two walls and appropriate grading to prevent stormwater infiltration into the sanitary sewer.

(III) An effluent sampling point is required.

(g) Treatment for high strength wastewater

(i) Any onsite wastewater treatment system handling high strength wastewater shall install either a pretreatment unit ahead of the septic tank and/or expand the size of the soil absorption system.

(ii) The pretreatment unit and septic tank shall be designed and sized to reduce the effluent five (5) day BOD loading to less than 140 mg/l.

(iii) A sample port shall be installed before the soil absorption system to allow for sampling of the effluent.

(h) Abandonment of septic and holding tanks

The following is the procedure to abandon septic tanks and holding tanks when the system is upgraded, equipment replacement is necessary, or central sewer lines are made available.

(i) The abandoned tank should be pumped and hauled to a licensed facility approved to receive the waste or pump the septage into the newly constructed septic or holding tank. Discharging to a central sewer requires coordination with, and the approval of, the owner/operator of the sewer system.

(ii) Once the abandoned tank is empty, it should be removed and the excavation backfilled. As an alternative to removing the tank, the access covers can be removed and the tank filled with native soil, pit run, or sand.

(iii) If the abandoned tank is part of a Class V UIC facility, the abandonment must also be in compliance with Chapter 16, Section 12.

Section 10. <u>Effluent Distribution Devices.</u>

Distribution boxes, flow divider tees and straight pipes are suitable for level or nearly level ground and are installed before the drain field with the goal of splitting flows equally between drain field laterals. Drop boxes are suitable for sloping ground and are installed to achieve serial loading.

(a) Distribution boxes

(i) The distribution box shall be installed on a level, stable base to ensure against tilting or settling, and to minimize movement from frost heave.

(ii) Boxes shall be watertight and constructed of concrete or other durable material.

(iii) Boxes shall be designed to accommodate the inlet pipe and the necessary distribution lines. The inlet piping to the distribution box shall be at least one (1) inch above the outlet pipes and all pipes shall have a watertight connection to the distribution box.

(iv) The box shall be protected against freezing and made accessible for observation and maintenance.

(v) Boxes shall have flow equalizers installed on each outflow.

(b) Flow divider tees may be used in place of distribution boxes.

(c) Straight tees may be used in place of distribution boxes. Where straight tees are used, all distribution piping and laterals must be constructed as level as possible.

Drop boxes are suitable for sloping ground and are installed to achieve serial loading. The drop boxes shall meet the requirements in paragraphs (a)(i through v) of this section.

Section 11. Standard Drain Field Systems.

(a) General Design Requirements:

(i) All drain fields shall be designed in such a manner that the effluent is effectively filtered and retained below ground surface. The absorption surface accepts, treats, and disperses wastewater as it percolates through the soil.

(ii) Drain fields shall not be excavated when the soil is wet enough to smear or compact easily. Open drain field excavations shall be protected from surface runoff to prevent the entrance of silt and debris. All smeared or compacted surfaces shall be raked to a depth of one (1) inch, and loose material removed before filter or filler material is placed in the drain field excavation.

(iii) Drain fields shall be designed to approximately follow the ground surface contours so that variation in excavation depths will be minimized. The trenches may be installed at different elevations, but the bottom of each individual trench shall be level throughout its length.

(iv) Shallow drain field depths are encouraged to promote treatment and evapotranspiration. The minimum soil cover depth over the drain field is one (1) foot. The maximum depth to the bottom absorption surface of a drain field is four (4) feet. Finished grading shall prevent ponding and promote surface water runoff.

(v) Pipes, chambers or other products shall be bedded on firm, stable material. Heavy equipment shall not be driven in or over drain fields during construction or backfilling.

(vi) Standard trenches refer to perforated pipe embedded in aggregate-filled trenches which shall conform to the following:

(A) The perforated pipe shall have a minimum diameter of 4 inches. Suitable pipe materials include: ASTM D-2729-11 PVC, ASTM D-3034-08 PVC, Schedule 40 PVC ASTM d1784-11, and ASTM F810-07 PE.

(B) The aggregate shall be crushed rock, gravel or other acceptable, durable and inert material which is free of fines, and has an effective diameter between ½ inch and 2-1/2 inches.

(C) Prior to backfilling, the aggregate shall be covered throughout with acceptable geotextile materials or a three (3) inch layer of straw.

(D) Aggregate shall extend the full width and length of the drain field to a depth of at least twelve (12) inches with at least six (6) inches of drain gravel under the distribution pipe and at least two (2) inches over the distribution pipe.

(E) Maximum width of trench excavation is three (3) feet.

(F) Minimum spacing of trenches (wall to wall) is three (3) feet. Trench spacing shall be increased to nine (9) feet when the area between each trench is considered as reserve area or for clay loam soils that have percolation rates slower than 60 min/in. For clay loam soils, the nine (9) foot spacing shall not be considered as reserve area.

(vii) Standard beds shall conform to the same pipe and aggregate requirements for trenches as found in subparagraphs (vi)(A through D) of this section. Standard beds shall also conform to the following:

(A) The soils shall be absent of clay with percolation rates faster than 60 minutes per inch. The bottom of the bed must be level, therefore the site shall be relatively flat, sloping no more than one (1) foot from the highest to the lowest point in the installation area.

(B) Distribution laterals within a bed must be spaced on not greater than six (6) feet centers. Sidewalls shall be more than three (3) feet from a distribution lateral.

(C) Beds must not be wider than twenty-five (25) feet if gravity distribution is used. Multiple beds must be spaced at one-half the bed width.

(D) Rubber tired vehicles must not be driven on the bottom surface of any bed excavation.

(viii) Chambered trenches, when used in lieu of perforated pipe and aggregate, shall be installed in conformance with the manufacturer recommendations. No cracked, weakened, modified, or otherwise damaged chamber units shall be used in any installation.

(A) All chambers shall be an open, arch-shaped structure of durable, non-degradable design, suitable for distribution of effluent without filter material

(B) All chamber endplates shall be designed so that the bottom elevation of the inlet pipe is at least six (6) inches from the bottom of the chamber.

(C) Inlet and outlet effluent sewer pipes shall enter and exit the chamber endplates. Vents shall be installed at all inlet and outlet effluent sewer pipes.

(D) All chambers shall have a splash plate under the inlet pipe or another design feature to avoid unnecessary channeling into the trench bottom.

(E) Maximum width of trench excavation is three (3) feet.

(F) Minimum spacing of trenches (wall to wall) is three (3) feet. Trench spacing shall be increased to nine (9) feet when the area between each trench is considered as reserve area or for clay loam soils that have percolation rates slower than 60 min/in. For clay loam soils, the nine (9) foot spacing shall not be considered as reserve area.

(ix) Chambered beds shall conform to the same requirements for chambered trenches as found in subparagraphs (viii)(A through D) of this section. Aggregate, as specified in subparagraph (vi)(B) of this section, or native soil shall be used to fill the space between the chambers.

(x) Serial sidehill trench:

(A) A minimum of six (6) feet of undisturbed soil shall be maintained between adjacent trench or bed side walls.

(B) The bottom of each serial trench or bed system shall be level.

(C) The overflow pipe between serial leach systems shall be set no higher than the mid-point of the upstream distribution pipe. The overflow pipe shall not be perforated.

(b) A design package for a standard drain field is provided online at the Division's website to assist you in submitting a completed application for a properly designed wastewater treatment and disposal system. The worksheet and calculations were prepared by a registered professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. The general design requirements stated in this section are incorporated into the worksheets such that by completing the forms, the system will comply with those requirements.

Section 12. Pressure Distribution Systems.

(a) General Design Requirements:

(i) The basic elements of a pressure distribution system include a pump tank, filter, and a means to deliver specified doses to a small diameter pipe network within a drain field. Pressure distribution is required for mound systems or for bed systems with a width greater than twenty-five (25) feet.

(ii) Pumps must be sized to match the distribution system curve or demand. Pumps shall be designed for sewage pumping application and be accessible from the ground surface.

(iii) The control system for the pump and pump tank shall, at a minimum, consist of a "pump off" switch, a "pump on" switch, a "high liquid alarm".

(A) All electrical connections must be made outside of the chamber in either an approved weatherproof box or an explosion-proof junction box.

(B) The wiring from the junction box to the control box must pass through a sealing fitting to prevent corrosive gases from entering the control panel.

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

(iv) The pressure transport piping between the tank and the drain field shall be designed to drain after each pump cycle to prevent freezing.

(A) The ends of lateral piping shall be constructed with long sweep elbows or an equivalent method to bring the end of the pipe to finished grade. The ends of the pipe shall be provided with threaded plugs, caps, or other devices to allow for access and flushing of the lateral.

(B) All joints in the manifold, lateral piping, and fittings shall be solvent-welded using the appropriate joint compound for the pipe material. Pressure transport piping may be solvent-welded or flexible gasket jointed.

(C) Where automatic siphons or other devices are used, they shall be designed to empty the dosing tank in less than ten (10) minutes.

(c) A design package for a pressure distribution system is provided online at the Division's website to assist you in submitting a completed application for a properly designed wastewater treatment and disposal system. The worksheet and calculations were prepared by a registered professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. The general design requirements stated in this section are incorporated into the worksheets such that by completing the forms the system will comply with those requirements.

Section 13. Sand Mound Systems.

The sand mound consists of a sand fill, an aggregate bed and a soil cap. Pressure distribution shall be used in conjunction with sand mound systems.

(a) Selection Criteria:

The high groundwater level, bedrock or impervious clay layer is less than four (4) feet below the level of the drain field excavation.

(b) Site Requirements:

(i) A minimum of one (1) foot of vertical separation of the native soil is required between the bottom of the sand fill and the top of the high groundwater level, any restrictive layer, or any highly permeable material.

(ii) The percolation rate of the native soil at the interface of the sand fill shall be greater than five (5) and less than sixty (60) minutes per inch. The percolation shall be measured in the top twelve (12) inches of native soil.

(c) General Design Requirements:

(i) Sand Layer

(A) Filter sand shall conform to ASTM C-33, with less than 2% passing the #200 sieve.

(B) The minimum depth of sand below the aggregate bed surface shall be one (1) foot.

(C) The sand mound shall have a combination of at least four (4) vertical feet of filter sand and unsaturated native soil above the high groundwater level.

(D) The top of the sand layer under the aggregate bed shall be level in all directions.

(E) The sand layer shall fill around the perimeter of and to the top of the aggregate bed.

(F) The slope of all sides shall be three (3) horizontal to one (1) vertical or flatter.

(G) The infiltrative area which is the bottom of the sand fill shall be calculated by dividing the design flowrates (gpd) from Table 1 or Table 2 by the loading rate (gpd/ft^2) found in Table 5.

(ii) Aggregate Bed

(A) The aggregate shall be crushed rock, gravel or other acceptable, durable and inert material which is free from fines, and has an effective diameter between one-half (1/2) inch and two and one half (2 ½) inch.

(B) The aggregate bed depth shall not be less than nine (9) inches with a minimum of six (6) inches of clean aggregate placed below the distribution pipe and two (2) inches above the distribution pipe. The aggregate shall be covered with an approved geotextile material after installation and testing of the pressure distribution system.

(C) The design shall be a long, narrow bed design with a maximum width of fifteen (15) feet.

(D) The infiltrative area, which is the bottom of the aggregate bed, shall be calculated by dividing the design flowrates (gpd) from Table 1 and Table 2 by the loading rate of 0.8 gpd/ft^2

(iii) Soil Cover

(A) The soil cap shall be constructed of a sandy loam, loamy sand, or silt loam. The depth of the soil cap shall be at least six (6) inches at the edges to twelve (12) inches at the center. The slope of all sides shall be three (3) horizontal to one (1) vertical or flatter.

(B) A layer of top soil at least six (6) inches thick shall be placed over the entire sand mound area. The sand mound should be planted with vegetation that does not require watering and will not establish deep roots. Native grasses are commonly used.

(d) A design package for a sand mound system is provided online at the Division's website to assist you in submitting a completed application for a properly designed wastewater treatment and disposal system. The worksheet and calculations were prepared by a registered professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. The general design requirements stated in this section are incorporated into the worksheets such that by completing the forms the system will comply with those requirements.

Section 14. <u>Small Wastewater Lagoons.</u>

(a) Selection Criteria:

(i) Lagoons shall only be considered in areas of the State where the annual evaporation exceeds the annual precipitation during the active use of the lagoon.

(ii) Lagoons shall only be allowed when the percolation rate exceeds 120 minutes per inch and the soil extends vertically down at least two (2) feet from the bottom of the lagoon to the seasonal high groundwater table or bedrock formations.

(iii) A lagoon shall not be installed on a property less than three (3) acres in size.

(iv) A lagoon shall not be constructed within the 100 year flood plain.

(b) General Design Requirements:

(i) Beyond the horizontal setback distances requirements specified in Section 6(d) of this rule, the lagoon shall not be placed within one hundred (100) feet of the owner's property line.

(ii) The use of a septic tank which meets the specifications in Section 9 of this rule shall be required before the small wastewater lagoon.

(iii) The lagoon shall be located and constructed so it will not receive surface runoff water.

(iv) The slope of the lagoon site shall not exceed five (5) percent.

(v) The lagoon site must be located in an area of maximum exposure to sun and wind.

(vi) The lagoon shall be designed for complete retention.

(vii) The area of the lagoon shall be calculated based on the following formula.

$$A = \frac{584 \times Q \times 1.3}{(365 \times S) + (E - P)}$$

A = Area of the lagoon at the 5 foot depth water level in square feet

Q = Daily sewage flow determined from Table 1 or 2, gallons per day.

E = Average annual lake evaporation in inches per year. (Note: lake evaporation is less than pan evaporation; lake evaporation equals pan evaporation times a pan coefficient of about 0.7)

P = Average annual precipitation rate in inches per year.

S = Seepage rate in decimal form.

(viii) The slopes of the dikes shall not be steeper than three (3) horizontal to one (1) vertical. The minimum width of the top of the dike shall be four (4) feet.

(ix) All fill shall consist of impervious material that is well compacted and free of rocks, frozen soil, or other large material.

(x) The minimum operating depth shall be two (2) feet. The dikes shall provide a minimum freeboard of one (1) foot.

(xi) The floor of the lagoon shall be level and maintained free of all vegetation.

(xii) The influent line into the lagoon must discharge near the center onto a concrete apron at least two (2) feet square.

(xiii) A cleanout or manhole shall be provided in the influent line near the dike.

(xiv) The area around the small wastewater lagoon shall be fenced to preclude the entrance of livestock, pets, and humans. The fence shall be equipped with a locking gate. The gate shall have a sign indicating "NO TRESPASSING – WASTEWATER LAGOON".

(c) A design package for a small wastewater lagoon is provided online at the Division's website to assist you in submitting a completed application for a properly designed wastewater treatment and disposal system. The worksheet and calculations were prepared by a registered

professional engineer employed by the Wyoming Department of Environmental Quality, Water Quality Division. The general design requirements stated in this section are incorporated into the worksheets such that by completing the forms the system will comply with those requirements.

Section 15. Privies.

Pre-fabricated privies and outhouses with sealed, water-tight vaults that meet the following conditions will be permitted as a permit by rule. Delegated Local health departments and counties may require and issue individual privy permits.

(a) A DEQ permit to construct is not required if the following conditions are met:

(i) The isolation requirements for sealed privies shall comply with Section 6(a)(i) for septic tanks.

(ii) The depth to seasonally high groundwater from the bottom of a water tight vault shall be sufficient to prevent floatation of the empty vault.

(iii) The vault must have sufficient capacity for the dwelling served, and must have at least 27 cubic feet or 200 gallons of capacity.

(iv) The privy must be easily maintained and insect tight. The door must be self-closing. The privy seat must include a cover. All exterior openings, including vent openings, shall be screened.

(v) Privies must be adequately vented.

(b) For unsealed pit privies, the following conditions must be met.

(i) Privies shall serve structures that have no plumbing fixtures or running water (piped water supply).

(ii) Pit privies shall be located to exclude surface water.

(iii) The isolation requirements for privies shall comply with Section 6(a)(i) for drain fields and be at least 100 feet from any property or right-of-way line.

(iv) The bottom of the unsealed pit must have a minimum four (4) feet vertical separation distance to the seasonal high ground water level.

Section 16. Greywater Systems.

It is the intent of this section to encourage and facilitate the productive and safe reuse of greywater from domestic wastewater.

(a) Applicability

(i) This section applies to any person who utilizes greywater for a beneficial irrigation uses.

(ii) This section does is not applicable if the intent is to provide treatment wastewater.

(iii) Local greywater codes and building regulations supercede Chapter 25, Section 16.

(b) Greywater Applications.

(i) Subsurface Irrigation

(A) Subsurface irrigation with greywater may be used to irrigation land and vegetation.

(B) Greywater shall not be used to irrigate any food crops for human consumption.

(C) Subsurface irrigation shall not surcharge to overland flow.

(ii) Surface Irrigation

(A) Greywater used for surface irrigation shall receive a level of disinfect so the maximum fecal coliform levels is 2.2/100 ml or less

(B) Surface irrigation with greywater that has been treated by disinfection may be used for irrigation of land and vegetation.

(C) Greywater that has been treated by disinfection shall not be used to irrigate any food crops for human consumption.

(iii) Set Backs

(A) A 30 foot buffer zone is required between the greywater application site and adjacent property lines and any public right-of-way.

(B) A 30 foot separation distance is required between greywater application sites and all surface waters.

(C) A 100 foot separation distance is required between greywater application sites and all potable water supply wells.

(D) Drip irrigation systems. The buffer zone requirements above may be met by the use of drip irrigation systems.

(c) Greywater Components and Configurations

(i) Flow Diversion

(A) All greywater systems shall have a flow diverter which directs greywater to either the blackwater system or the greywater system.

(B) Diverter valves shall not have the potential to allow backflow from the blackwater system into the greywater system.

(C) Pipe elbows with rotatable compression fittings or equivalent components may be used to connect greywater sources with the greywater system or blackwater system as long as the pipe can only be connected to one system at a time. A capping device such as a rubber slip cap with band clamp must be used to seal the plumbing of the system that is not in use.

(D) The rubber discharge hose from a laundry washing machine may be moved between a vertical blackwater riser pipe and a vertical greywater riser pipe without the need for a diverter valve.

(ii) Greywater Collection Tank

(A) Shall be covered to prevent access by flying insects, rodents, domestic animals and people.

(B) Shall have an overflow to the blackwater system.

(C) Shall not hold greywater for more than 24 hours

(I) Outside collection tank shall meet the requirements of a septic tank

(II) Inside collection tank shall be install in accordance with the International Building Code for internal plumbing for black water.

(D) All greywater collection tanks shall be vented with a suitable screen.

(E) Filters

(I) All discharges from the greywater collection tank shall have suitable filters to retain solids in the greywater collection tank and to prevent clogging of the irrigation system.

(II) Shall be accessible for cleaning and maintenance.

(III) Shall be selected based upon expected loading, flow, and pressure.

(iii) Pumps

(A) Shall be accessible for cleaning and maintenance.

(B) Shall be selected based upon expected flow, pressure and anticipated solids handling according to the overall design.

(C) Shall have a check valve on the discharge of the pump.

(D) Pressurized irrigation systems that are connection to the domestic water system shall have an anti-siphon vacuum breaker installed on the connection to the domestic water system.

(iv) Piping

(A) Greywater conveyance pipes shall be permanently labeled for Greywater or shall be colored purple. Non-paint marking pens are not acceptable as permanent labeling.

(B) Gravity flow pipes shall be constructed to allow complete draining of the pipe.

(C) Pressurized pipe systems shall be constructed and design to be drained or the water be evacuated by compressed air for winterization.

(v) Irrigation

(A) Subsurface Irrigation

(I) Mulch Basin

1. A Mulch basin is an excavated area that has been refilled with a highly permeable media, organic and inorganic materials intended to distribute greywater to irrigate vegetation.

2. Shall be sized to contain 3 times the peak hourly flow anticipated at the discharge point.

3. Mulch does not need to be covered or may be covered with no more than 3 inches of topsoil

4. Shall not be deeper than the root zone of the plants to be irrigated.

5. Free flow outlets

a. Greywater is applied at the top of the mulch.

b. Application point(s) are protected from access by flying insects, rodents, domestic animals and people. Protections are constructed in such a manner as to allow easy access for cleaning and maintenance.

c. Inlet piping to the mulch basin shall be no less than 1 inch higher than the surface to which it is applied to allow for a free fall of water.

6. Sub-mulch outlets

a. Greywater is applied below the surface of the mulch into one or more distribution chambers constructed of perforated material.

b. Inlet piping to distribution chamber of the mulch basin shall be no less than 2 inches higher than the surface to which it is applied to allow for a free fall of water.

c. Distribution chamber shall be constructed for easy cleaning and maintenance.

7. A compost pile is considered a mulch pile.

(II) Drip systems

1. Shall be filtered according to Section (4) (a) (iii) prior to point of application or be designed in such a manner as to prevent frequent clogging.

2. Discharge nozzles shall be specifically designed for the application of greywater without clogging.

3. Drilled pipe drip system holes shall be no smaller than ¼" in diameter.

4. Point of application flow shall be low enough to prevent any surface flow of greywater.

(III) Permeable pipe systems, designed for greywater, shall be installed according to manufacturer's recommendations.

(B) Surface Irrigation

(I) Flood irrigation

1. Shall not cause channeling or erosion of the application site.

2. Shall use a distribution system to evenly distribute flows across the site

3. Shall not pond exceed ¼ inch in depth.

4. Shall not remain on the ground surface for more than 15 minutes after source flow has stopped.

(II) Spray Irrigation

1. Spray irrigation of greywater is not permited.

(v) Disinfection

All greywater to be used for surface irrigation shall be disinfected.

(A) The greywater shall be disinfected in the greywater collection tank.

(I) Chlorine

1. The disinfection system shall be adequately size to maintain a residual free chlorine concentration shall be 5mg/L.

(II) Bromine

1. The disinfection system shall be adequately size to maintain a residual free bromine concentration shall be 5mg/L.

(III) Ozonation.

1. Ozonation system for disinfection shall provide a range of chemical feed of 5-10 mg/L.

2. Ozone disinfection systems shall be designed and installed according to manufacturer's recommendations.

(IV) Ultraviolet

1. Ultraviolet (UV) disinfection systems shall be designed and installed according to the manufacture's recommendations.

2. The greywater into the UV disinfection until shall have a UV transmittance less than the UV transmittance rated by the manufacture.

3. The max flow rate of the UV disinfection system shall not be exceeded.

(d) Greywater Operation and Requirements

(i) Restrictions

(A) The installation of a greywater system shall not reduce or alter the sizing requirements of the onsite wastewater system.

(B) Minimize human contact with greywater and soil irrigated with greywater.

(C) Greywater shall not leave the property on which it is generated.

(D) Water which has been used to wash diapers or similarly soiled or infectious garments shall not enter the greywater system.

(E) Water which contains hazardous materials such paint, solvents, petroleum products, oil, gasoline, antifreeze, solvents, pesticides and herbicides shall not enter the greywater system.

(F) Greywater systems shall not be installed in a delineated floodplain.

(G) The volume of greywater shall not exceed an average of 2000 gallons per day.

(H) Greywater shall not come in direct contact with or adversely impact surface or groundwater.

(ii) Odor Control

(A) Odor control of the greywater system shall meet the requirement of Wyoming DEQ Air Quality Regulations Chapter 2, Section 11.

(iii) Stormwater

(A) The greywater system shall not be located in a drainage way.

(B) The greywater system shall prevent storm runoff from carrying the greywater off the application site.

(iv) Winter Operation

(A) If the greywater system is to be used during the winter, the greywater system shall be designed to prevent freezing.

Section 17. Operation and Maintenan

(a) For small wastewater systems that are considered advanced treatment, permitted through delegated small wastewater progra he following conditions are required:

(i) A contract maintenance agreement with a service provider shall be a dition of the issued permit. A copy of the contract shall be maintained by the county issuing the permit.

(ii) The owner of the small wastewater system shall provide an easement for maintenance of the syste

(iii) If the owner of the small wastewater system fails to maintain the advanced treatment system according to the manufacturer's recommendations, it will constitute a violation of these regulations

(b) For any system that disposes of wastewater through land application or subsurface filtration, the owner shall not add any chemical or biochemical additive to the system that would adversely affect the quality of the groundwater as stated in the WDEQ Water Quality Rules & Regulations, Chapter VIII.

(c) Septic tanks shall be pumped as needed to prevent solids carryover into the drain field.

(d) Holding tanks and sealed vaults shall be pumped prior to reaching their maximum capacity. It is preferable that these types of tanks be pumped before the wastewater volume exceeds 75% of the tank's capacity.

(e) Any service provider that pumps septic tanks, holding tanks, or sealed vaults, shall dispose of the wastewater contents at a permitted wastewater treatment facility or in a manner approved by the Division or delegated authority.

(f) Damaged fittings and broken, crushed or plugged piping associated with any small wastewater system shall be replaced in a timely manner.

(g) Composting or non-discharging toilets where permitted shall have their waste disposed of at a permitted wastewater treatment facility or landfill, or in a manner approved by the Division or delegated authority.

APPENDIX A
Percolation Test Procedure

Properly conducted percolation tests are used to determine absorption system site suitability and to size the absorption system. Percolation tests shall not be conducted in test holes which extend into groundwater, bedrock, or frozen ground. The percolation test should be conducted only after the soil exploration pit has been dug and examined by the delegated health department or county for suitable soils and groundwater table information. This percolation test procedure applies to each percolation test hole.

(a) The percolation test holes shall be spaced uniformly over the proposed drain field site. The delegated health department of the county shall establish the required number of test holes.

(b) A 6 inch to 10 inch diameter hole shall be dug or bored to the proposed depth of the drain field.

(i) The walls shall be vertical.

(ii) To expose a natural soil surface, the sides and bottom shall be scarified with a sharp pointed instrument and the loose material shall be removed from the hole.

(iii) Two (2) inches of gravel or coarse sand shall be placed in the bottom of the hole to prevent it from scouring and sealing during water addition.

(c) Presoaking

The purpose of presoaking is to have the water conditions in the soil reach a stable condition similar to that which exists during continual wastewater application. The minimum time of presoaking varies with soil conditions but must be sufficiently long so that the water seeps away at a constant rate.
The following presoaking instructions are usually sufficient to obtain a constant rate.

(i) Fill each hole with clear water to a level at least 12 inches above the gravel or coarse sand. If the 12 inches of water seeps away in 60 minutes or less, add 12 inches of water a second time.

(ii) If the first and second fillings of 12 inches of water seeps away in 60 minutes or less or the soil is sandy, the percolation test should be started immediately after presoaking. If both the first and second fillings have percolation rates faster than 5 minutes per inch, the test may be stopped.

(iii) If either the first or second fillings of 12 inches of water does not seep away in 60 minutes or other soils, 12 inches of water must be maintained in the hole for at least 4 hours to presoak the hole.

(d) Percolation rate measurement

(i) Remove any loose material on top of gravel and adjust the water level to six inches above the gravel or coarse sand.

(ii) Establish a fixed reference point and measure the drop in water level at constant time intervals. The water level drop should be measured to the nearest 1/8 of an inch.

(iii) Refill the water level to 6-inches after each measurement. Do not exceed the 6-inch depth of water.

(iv) The test may be terminated when the water drop level stabilizes and is consistent for three consecutive measurements.

(v) The percolation rate is calculated for each hole using the following formula:

$$\frac{\text{Time Interval (Minutes)}}{\text{Final Water Level Drop (inches)}} = \text{Percolation Rate (minutes/inch)}$$

(e) The following information must be recorded:

(i) Date(s) of test(s),

(ii) Location, diameter, and depth of each test hole,

(iii) Duration of presoak,

(iv) Time of day for beginning and end of each water-level drop interval,

(v) Each water-level drop measurement,

(vi) Calculated percolation rate,

(v) Name and signature of person performing test,

(vi) Name of owner or project name, and

(vii) Certify that the percolation test was done in accordance with Wyoming Water Quality Rules and Regulations Chapter 25 Appendix A.

APPENDIX B
Land Application of Domestic Septage in Remote Areas

To qualify for the land application of domestic septage in remote areas, the following conditions must be met.

(a) Location restrictions shall adhere to the following:

(i) Domestic septage generated on a specific property may be land applied on said property, and shall not be transported to another location for land application.

(ii) No land application of domestic septage shall occur within 1,000 feet of all adjacent properties.

(iii) No land application of domestic septage shall occur within 300 feet of a public road, permanent surface water body, or intermittent stream.

(b) Site restrictions shall adhere to the following:

(i) The land application of domestic septage shall only occur on those sites with established vegetation such as rangeland, pasture or hay meadows.

(ii) No more than 5,000 gallons of domestic septage per acre per year shall be land applied.

(iii) No land application of domestic septage shall occur where the site's slope exceeds five percent (5%) or where the depth to groundwater is less than four (4) feet.

(iv) The land application of domestic septage shall not occur between November 1 and May 1, or any other time when frozen or saturated ground conditions exits.

(v) No public access shall be allowed for one (1) year to any site where domestic septage has been applied.

(vi) No grazing animals shall be allowed access for 30 days to any site where domestic septage has been land applied.

(c) Crop restrictions shall adhere to the following:

(i) No root crops shall be harvested for 38 months from soils where domestic septage has been land applied.

(ii) No truck crops (harvested parts touch land surface) shall be harvested for 14 months from soils where domestic septage has been land applied.

(iii) No commodity crops (other food, feed, and fiber crops whose harvested parts do not touch land surface) shall be harvested for 30 days from soils where domestic septage has been land applied.

(iv) No turf shall be harvested for one (1) year from soils where domestic septage has been land applied.

(d) Reporting requirements:

(i) The property owner shall notify the appropriate Department of Environmental Quality, Water Quality Division (DEQ/WQD) District Engineer prior to the land application of domestic septage to confirm the requirements and to arrange a possible DEQ/WQD inspection of the land application.

(ii) All records concerned with each septage application will be maintained for at least five (5) years.

(iii) There is a worksheet online that must be completed, signed and returned to the DEQ/WQD or the appropriate delegated local permitting authority within 15 days of the land application.

Ch 25 Stakeholder Comments 182

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Chapte r 25 Staff Re view

1 message

William Tillman <william.tillman@wyo.gov> Thu, Feb 28, 2013 at 8:41 AM
To: Gina Johnson <gina.johnson@wyo.gov>

add to the pile.

---------- Forwarded message ----------
From: James Brough <james.brough@wyo.gov>
Date: Thu, Feb 28, 2013 at 8:23 AM
Subject: Chapter 25 Staff Review
To: William Tillman <william.tillman@wyo.gov>
Cc: Rich Cripe <rich.cripe@wyo.gov>, Frank Strong <frank.strong@wyo.gov>

Bill,

Below are some review comments from Bob Norton, a consultant in Teton County. He has reviewed at least two of the Chapter 25 drafts. You may or may not be aware that several individuals were asked to be stake holders for a one-day workshop in Casper in August 2011 for the Chapter 25 regulations.

- Section 2 – It should be noted that these regulations do not apply to systems larger than 2000 gpd. Some DEQ personnel have referred to Chapter 25 for larger systems.

- Table 1 – Is for average design flow where as Section 9. (a) (iii) (B) talks about 48 hour retention time a peak flow, how does the layman convert from average day to peak (day?) or (hour?).

- Section 6 (a) –not allowing small wastewater systems under parking lots, roadway, driveways is a good recommendation, but I question not allowing systems under irrigated lawns.

- Figure 1 -6: Since these regulations are intended for use by non professionals, I think you should define “saturated thickness”.

- Table 4. Minimum horizontal setbacks from public water supply wells of 500 feet for septic tank and 1000 feet for absorption system could be impossible for some transient public water supply systems, seems excessive for a system under 2000 gpd, doesn’t take into account the vertical unsaturated separation, nor the treatment level that could be provided by an advanced system.

- Section 7 (d); requires reduction of loading rate for high strength wastewater why not allow an increase for low strength wastewater, e.g. advance treatment, or grey water. Also requires pressure distribution, seems that requirement is just adding more mechanical equipment for the homeowner to maintain.

- Section 8. (e); The IPC requires cleanouts every 100 feet and change in direction greater than 45 degrees or, where more than one change of direction occurs in a run of piping, only one cleanout shall be required for each 40 feet of developed length. The old plumbing code required a cleanout for every 135 degrees of bends. It is not uncommon to have two or three 45 degree bends between the house and septic tank, particularly in rebuild systems, having a cleanout at every bend seems excessive.

- Section 9. (d) Grease Interceptors: The IPC has requirements for grease interceptors and automatic grease removal devices

that conform to PDI G101, which last time I checked were tested to remove grease down to 100 mg/l, requiring treatment down to 25 mg/l may preclude most commercially available grease interceptors and cause the owner to install a unit as specified by this section that would not meet the 25 mg/l requirement. Testing that has been done on several grease interceptors at Teton Village indicates to me that 100 mg/l is only possible if the grease interceptors are cleaned on a very regular basis, and that 25 mg/l would be very difficult to meet even right after cleaning of the interceptor.

- Section 11. (vii) (A) is very restrictive. Having the bed level does not necessarily mean that the surface is “relatively flat”, it is advantageous to have surface drainage across the surface of the bed.

- Section 16. (a) (ii): I question the wording of this sentence; “This section does is not applicable if the intent is to provide treatment wastewater”

treatment wastewater".

- Section 16. (b) (iii) (D). I question the intent and how to apply this sentence; "The buffer zone requirements above may be met by the use of drip irrigation systems".

I hope some of these comments are useful in your review.

Robert Norton, PE&LS

Project Manager

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"Live like there's no tomorrow. One day you'll be right"

E-Mail to and from me, in connection with the transaction
of public business, is subject to the Wyoming Public Records
Act and may be disclosed to third parties.

Ch 25 Stakeholder Comments 184

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Water Quality Rules and Regulations Chapter 25

1 message

William Tillman <william.tillman@wyo.gov> Mon, Mar 4, 2013 at 7:36 AM
To: Gina Johnson <gina.johnson@wyo.gov>

And more.

---------- Forwarded message ----------
From: Roy Kroeger <roykehs@laramiecounty.com>
Date: Fri, Mar 1, 2013 at 11:59 AM
Subject: Water Quality Rules and Regulations Chapter 25
To: "william.tillman@wyo.gov" <william.tillman@wyo.gov>
Cc: "frank.strong@wyo.gov" <frank.strong@wyo.gov>

Good Morning William

I have attached comments for the proposed regulation for the Water Quality Rules and Regulations Chapter 25. If you or anyone have any questions about our comments please feel free to contact me.

Also, as stated in the comments, if you hold any meetings concerning the rules and regulations we would love to be invited to participate.

Thank You

Roy Kroeger, REHS

Environmental Health Supervisor

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Ch 25 Stakeholder Comments 185

"Live like there's no tomorrow. One day you'll be right"

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2 attachments

20130301113441552.pdf
312K

Laramie County Comments for SWW Regulations.docx
20K

CHEYENNE-
LARAMIE COUNTY
HEALTH
DEPARTMENT

2/26/2013

William Tillman
WY DEQ Water Quality Division
Water and Wastewater Section
122 W 25th St
Cheyenne, WY 82002

Dear William

The Small Wastewater System Program in Cheyenne and Laramie County has had a successful program that has permitted small wastewater systems since 1969 and has written nearly 8600 permits. During our 40 plus years of experience in permitting small wastewater systems we have continually improved the program to create the best possible balance between the need of the client and the protection of the water that we have been entrusted with. Throughout our history, Laramie County has had a low failure rate in the permitted installations. After our review of the proposed Water Quality Rules and Regulations Chapter 25, Small Wastewater Systems, we have the following comments.

1. Laramie County (LC) is concerned with the large decrease in the flow rate that has been proposed. We believe the current system has been working well and has been instrumental in the low failure rate for small wastewater systems. The county is also concerned with the effects the reduction will have on our mortgage inspections that evaluate small wastewater systems for property transfers in the future.

2. The proposed change for unfinished basements is encouraged by this office as it often becomes a problem when the basement is finished in the future.

3. LC is concerned with the large flow rate decrease for commercial properties especially in relationship to childcare facilities in homes.

4. While we agree that no system should be located under irrigated grass/gardens we are concerned with future enforcement of this regulation. Keeping track of future irrigation systems, especially for our mortgage inspection program will be a huge problem.

5. While the county agrees that no system should be located within the path of roof runoff. How do you envision enforcement of this; engineered water flow on each property based on proposed final grading plan?

6. Public well setbacks may cause concerns with existing facilities and also leads to the question of the difference in regulations. Shouldn't setback be based on conditions rather than use of well.

7. Cistern setbacks should be included in list of setbacks, currently LC uses 20'

8. Larger setbacks to foundation walls may cause problems on existing small lots during repairs.

9. LC is in agreement with the requirement of a site hole on every lot along with the perc test.

10. LC does not like the standard trench system max rock depth below pipe being 12", our standard has been 18" and it has worked very well. Past research has shown systems work better when narrow with more sidewall.

11. Sizing for chamber type systems appear to eliminate all reduction is sizing for gravelless systems.

12. LC encourages the requirement of a minimum of 12" cover on tank.

13. Engineering approval of tank and lids when installed in driveways and parking lots will add a large expense to the homeowners on small lots.

14. LC does not want to see risers buried as it hides the tank from view, makes maintenance more difficult and is not needed if systems are not allowed in irrigated lawns.

15. LC does not fell locks are needed if the internal tank lid is left in place below the riser manway lid.

16. LC feels that flow equalizers are not practical and may cause more problems than they fix.

17. LC feels that a 4' maximum depth to BOTTOM of trench is too restrictive. Recommend maximum of five foot of cover over the system. System will work better than current deep systems and allow inspectors to meet OSHA requirements when inspecting the system.

18. Are vents really needed on all distribution lines into the gravelless chambers? If you want to allow tank lids to be buried out of site why would you want to extend pipes out of the ground in numerous locations to be broken off, removed or hidden in the future.

19. LC is encouraged with the grey water system regulations. The previous use by right policy was a concern to public health and could not be used where the majority of the population resides in our county due to water management areas. The proposed rules allow for permitting and oversight of these systems.

Cheyenne-Laramie County would like to request that we be notified of and invited to any meeting pertaining to the change to or adoption of these regulations.

Sincerely

Roy Kroeger

Roy Kroeger, REHS, Supervisor
Cheyenne-Laramie County Environmental Health

2/26/2013

William Tillman
WY DEQ Water Quality Division
Water and Wastewater Section
122 W 25th St
Cheyenne, WY 82002

Dear William

The Small Wastewater System Program in Cheyenne and Laramie County has had a successful program that has permitted small wastewater systems since 1969 and has written nearly 8600 permits. During our 40 plus years of experience in permitting small wastewater systems we have continually improved the program to create the best possible balance between the need of the client and the protection of the water that we have been entrusted with. Throughout our history, Laramie County has had a low failure rate in the permitted installations. After our review of the proposed Water Quality Rules and Regulations Chapter 25, Small Wastewater Systems, we have the following comments.

1. Laramie County (LC) is concerned with the large decrease in the flow rate that has been proposed. We believe the current system has been working well and has been instrumental in the low failure rate for small wastewater systems. The county is also concerned with the effects the reduction will have on our mortgage inspections that evaluate small wastewater systems for property transfers in the future.

2. The proposed change for unfinished basements is encouraged by this office as it often becomes a problem when the basement is finished in the future.

3. LC is concerned with the large flow rate decrease for commercial properties especially in relationship to childcare facilities in homes.

4. While we agree that no system should be located under irrigated grass/gardens we are concerned with future enforcement of this regulation. Keeping track of future irrigation systems, especially for our mortgage inspection program will be a huge problem.

5. While the county agrees that no system should be located within the path of roof runoff. How do you envision enforcement of this; engineered water flow on each property based on proposed final grading plan?

6. Public well setbacks may cause concerns with existing facilities and also leads to the question of the difference in regulations. Shouldn't setback be based on conditions rather than use of well.

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Cheyenne-Laramie County would like to request that we be notified of and invited to any meeting pertaining to the change to or adoption of these regulations.

Sincerely

Roy Kroeger, REHS, Supervisor
Cheyenne-Laramie County Environmental Health

Ch 25 Stakeholder Comments 190

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Chapter 25 Stakeholder Comments

1 message

William Tillman <william.tillman@wyo.gov> Mon, Mar 4, 2013 at 7:35 AM
To: Gina Johnson <gina.johnson@wyo.gov>

Some more.

---------- Forwarded message ----------
From: John Woodward <jwoodward@lcwy.org>
Date: Fri, Mar 1, 2013 at 1:44 PM
Subject: Chapter 25 Stakeholder Comments
To: william.tillman@wyo.gov

Dear William,

I hope you get this email in time to be included in your Ch. 25 review.

Thank you,

John Woodward

--
William Tillman, P. E.
Water and Wastewater Section
Regulatory and Enforcement
Herschler Building, 4-W
122 West 25th Street
Cheyenne, WY 82002
(307) 777-6941
(307) 777-6779 (FAX)
william.tillman@wyo.gov

"Live like there's no tomorrow. One day you'll be right"

Ch. 25 comment letter.pdf
500K

Office of Planning and Engineering
Lincoln County, Wyoming

March 1, 2013

William Tillman
Water Quality Division
Water and Wastewater Section
Herschler Building 4W
122 W 25th St.
Cheyenne, WY 82002
william.tillman@wyo.gov

Subject: Stakeholder comments on proposed Water Quality Rules and Regulations Chapter 25, Small Wastewater Systems.

William,

Overall, I favor the proposed changes. Updating regulations is a thankless task and a great deal of work and research has gone into this endeavor. I don't see too many changes that are overbearing and some could have gone further. When all of the commenters are equally frustrated then you will know the sausage making is done.

Section 4. Design Flows
Table 1. Decreasing flow for more than one bedroom along with adding a bedroom for an unfinished basement. This will result in a virtual non-change in my jurisdiction where 80% of applications involve three bedroom homes on unfinished basements. The current formula results in 450 gpd while the proposed formula will mean 470 gpd. I favor the change for what it will mean for 1,2, 4, 5 & 6 bedroom situations.

Section 6. Site Suitability
Table 4. New setback distances for foundation wall to tank. Current distance of 5 ft. goes to 15 ft. This will impact some small lots and cause more careful planning. However the change should alleviate the impacts of decks, patios and additions than can later cover the tank. Typically these additions are installed by subsequent owners. The distance for foundation wall to absorption system goes from 10 ft. to 25 ft. Again, this can affect small lots and cause more careful planning. However this will keep foundation drains and water lines, that are often installed by subsequent owners, from being much too close to the absorption field. These changes may cause issue with the replacement of failed systems on tight lots., mainly the replacement of the field since old tanks are usually repairable. We may see failed fields that require removal combined with soil replacement. I would recommend that these setbacks be the same at 15 ft. It just makes it easier for installers to remember.

Office of Planning and Engineering
Lincoln County, Wyoming

2.

Section 6. Site Suitability

(g.) (ii) soil exploration pit requirement. This will be a great way to verify groundwater levels and percolation data integrity. It will require more staff resources but it is needed.

Section 7. Drain Field Sizing

These new requirements will cause fields to be approximately 25% to 30% longer for trenches and 60% to 80% larger in areas for bed systems. About half of the systems in this jurisdiction use gravel and pipe with sidewall depths of 3 to 5 ft. This change is a throwback to pre-1984 design standards with the 12" maximum sidewall for trenches and 6" maximum sidewall for beds. I have not seen any difference in the failure rates for those older systems versus newer ones. Occasionally the deeper systems get too close to unanticipated groundwater levels. This issue should however be addressed with the proposed requirement for a soil exploration pit along with the proposed requirement for a maximum to the bottom of the absorption surface of 4 ft. If it helps engineers feel better about hypothetically improved water distribution to have shallower sidewalls then so be it.

Section 9. Septic Tanks and Other Treatment Tanks

(a) (vi) Riser requirement for each tank compartment. This is a good move. It will facilitate tank servicing. It will also remind current and future landowners about the location of their tanks.

Section 11. Standard Drain Field Systems

(a) (iv) Maximum depth to the bottom absorption surface is 4 ft. I think that a maximum depth of 6 ft. would be more practical given the non-flat earth we must deal with.

Section 17. Operation and Maintenance

(a) Advanced Treatment Systems

My jurisdiction has over 80 of these systems installed. Ongoing maintenance is a challenge especially with subsequent homeowners. The service providers sometimes want to use the county as a bill collector. The issue really is about resource protection through proper maintenance and performance. I fully support the language in this paragraph and subparagraphs (i), (ii) and (iii).

Thank you for the opportunity to comment.

Sincerely,

John Woodward
Director

Tel. 307 885 3106 Fax 307 885 3774 Physical Address: 61 E. 5th Avenue Afton, Wyoming
Mailing Address: 421 Jefferson Suite 701 Afton, WY 83110

Gina Johnson <gina.johnson@wyo.gov>

Fwd: Comments Chap 25 proposed WW regs

1 message

William Tillman <william.tillman@wyo.gov> Thu, Mar 7, 2013 at 3:54 PM
To: Gina Johnson <gina.johnson@wyo.gov>

Natrona county comments.

---------- Forwarded message ----------
From: Frank Strong <frank.strong@wyo.gov>
Date: Thu, Mar 7, 2013 at 1:44 PM
Subject: Fwd: Comments Chap 25 proposed WW regs
To: Rich Cripe <rich.cripe@wyo.gov>, William Tillman <william.tillman@wyo.gov>

---------- Forwarded message ----------
From: April Gindulis <aprilg@cnchd.org>
Date: Thu, Mar 7, 2013 at 12:28 PM
Subject: Comments Chap 25 proposed WW regs
To: frank.strong@wyo.gov

Frank,

Sorry this is delayed. Attached are our comments

April Gindulis, REHS

Casper/Natrona County Health Department

475 S. Spruce

Casper, WY 82601

307-577-9745

aprilg@cnchd.org

--
Frank A Strong IV, P.E.
SRF, Regulation and Enforcement
Principal Engineer
Wyoming DEQ - Water Quality Division
307.777.6371

--

William Tillman, P. E.
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122 West 25th Street
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"Live like there's no tomorrow. One day you'll be right"

Comments on Chapter 25 DEQ ww regs..docx
14K

March 6, 2013

Comments on WyDEQ Chapter 25 Small Wastewater Systems

Pg. 25-3. Design Flows-What is the rational for reducing incrementally on design flow rates per bedroom. Concerned this reduction and the reduction already in place for chambers will lead to undersized systems.

Pg. 25-12 Minimum Horizontal Setbacks Section. Proposed 15 ft between the house and septic tank and 25 ft from drain field to foundation walls. Is there a possibility for a variance request on this? Several lots developed years ago may not have the space needed to meet these setbacks without compromising on distances from wells, property lines, etc. Setback to springs-50'. Our regulations call for 100' separation. Some residents use springs as a source for drinking water, from a public health perspective, greater distance is preferred.

Pg. 25-13 Drain Field Sizing. As mentioned above, chambers allow for a reduction is size for drain fields already. We have seen numerous failures in our county where chambers have been used. It is not clear if failures are occurring due to reduction in drain field size or a problem with the design of the chamber.

Pg. 25-16 Septic Tanks. Section 9 (iv) Configuration. "Septic tanks shall not have less than 2 compartments." Does this mean that single compartment tanks will no longer be permitted? Several of the concrete tank manufactures make single compartment tanks and utilize an effluent filter on the outlet. If the intent is to only allow for 2 compartment tanks, manufacturers of concrete tanks will have to redo their forms and they will incur additional costs putting a partition in the center. Concrete tanks are preferred in certain installations when the cover may exceed those of the manufactured poly tanks. (i.e. repair situations where the sewer line is already deep, it would not be reasonable to ask home owners to redo their plumbing). Section 9 (vi) A and B. Riser of 20" diameter is required over both inlet and outlet and it either must terminate 6" below grade or have a locking device if it extends above grade. 6" risers for accessing the tank too pump it out has been used for a long time. A smaller riser is preferred for pre-cast tanks with 6" knockouts already in place.

Pg. 25-18 (ii) Holding tanks. Will holding tanks be approved for seasonal dwelling with interior plumbing?

Pg. 25-23 (D) Reducing the side wall sq footage by only requiring 6" of gravel beneath the perforated pipe. Is this a minimum, assuming 12" would be permitted?

Pg. 25-23 (vi) (F) This rule is a contradiction. In one sentence it states "spacing shall be increased to nine (9) feet when the area between each trench is considered as reserve area for clay loam soils that have percolation rates slower than 60 mpi. For clay loam soils, the nine (9) food spacing **SHALL NOT** be considered as reserve area". This contradiction is also on Pg. 25-34 (vii) (F).

Pg. 25-23. (viii) (C) “Vents shall be installed at all inlet and outlet effluent sewer pipes”. Are your referring to inspection ports? Currently chambers do not have effluent sewer pipes as the pipe ends at the inlet of the first chamber.

Pg.25-25 (iv) (A). Pressure Distribution Systems. Bringing the pipe to finish grade and placing a cap etc on it to access and flushing the lateral. Concerned that caps or plugs will get damaged by lawn mowers or other object and the system will lose pressure. We have not seen any problems that would require this stipulation.

Pg. 25-25 Sand Mound Systems. (b) (i). “A minimum of 1 foot of vertical separation of the native soil is required between the bottom of the sand fill and the top of the high groundwater level, any restrictive layer, or any highly permeable material.” Does this still take into account the needed 4’ separation and estimated rise in the water table? This does not leave room for wicking or fluctuating groundwater elevations.

Pg. 25-26. Sand Mound Systems. (ii) (B) “The aggregate bed depth shall not be less than nine (9) inches with a minimum of six (6) inches of clean aggregate placed below the distribution pipe.” Traditionally the depth below the distribution pipe is 12” to meet proper sizing requirements. Less aggregate below the distribution lines will decrease the size of the drain field.

Pg. 25-29. Privies (b) “For unsealed privies pit privies the following conditions must be met.” It would seem that this is taking a step backwards. There is no realistic application for pit privies. Containment is always preferred for groundwater protection and servicing (i.e. removal of wastes).

Appendix B -Land Application of Domestic Septage in Remote Areas. This section appears to be in violation of W.S. 35-10-101. This statute prohibits the dumping/surfacing of sewage within ½ mile (2640ft) of any inhabited dwelling and public roadway.

Chapter 25 Comments
Due 3/1/13

Seth Tourney

Section 4 Table 2	Should include all of the flows from the previous version
Section 5	Have a PE requirement here?
Section 6	Missing from previous version; Soil Exploration, Soil Evaluation (Perculation Test, Soil Texture), and Excessive Permeable conditions (1 min)
Section 9 (a)(i)	Not subject to excessive corrosion or decay.
Section 9 (a)(iv)	We currently allow one (1) compartment septic tanks at a 2:1 (L:W) ratio.
Section 9 (a)(vi)(A)	Previous regulations require a manway into each compartment.
Section 9 (c)	Original Regulations missing – Each holding tank shal be provided with a two inch minimum diameter vent ending in a return elbow above final grade. The vent shall terminate at least 30 feet from any door, window, or fresh air inlet. The vent should be screened.
Section14	It should be clarified that these small wastewater lagoons shall be non-discharging
Section 14 (c)	Suggestion to delete this section from the regulation. While this is a helpful tool, it is more of an advertisement for tools available and not applicable to any enforcement through the regulations. If this is important, I suggest application forms provided by the Water Quality Division prepared by a Wyoming Professional Engineer exempt the applicant from obtaining a design signed and sealed by a Wyoming Professional Engineer for the specific location.
Section 15	Do we want to allow privies to be permitted by rule? (See first paragraph)
Section 15 (a)	Suggestion – Add the requirement for privies shall not be located within any floodplain or subject to stormwater events. Adequate drainage shall be provided to direct stormwater away from the privy site.
Section 15	Will only sealed privies will be permitted by rule, or will unsealed privies by permitted by rule as well?
Section 15 (a)(iii)	The previous capacity requirements was 500 gallons per riser and shall be a minimum of 4.5 feet deep. The new requirements reduce minimum requirement to 200 gallons and no minimum depth requirement. Why the change here?
Section 15	The construction requirements of the privy were removed from the Chapter.
Section 15	The vault additives regulations was removed from the regulation.
Lost Section	The previous Section 14 on Chemical Toilets were removed from the regulations.
Lost Section	The previous Section 16 on Commercial/Industrial Wastes was removed from the regulations.
APPENDIX A	Suggestion to delete – "The percolation test should be donducted only after the soil exploration pit has been dug and examined by the delegated health department or county for suitable soils and groundwater table information."
APPENDIX A(a)	Suggestion to delete – "The delegated health department of the county shall establish the required number of test holes." Add "A minimum of three test holes are required."

Chapter 25 Comments
Due 3/1/13

Seth Tourney

APPENDIX A(d)(v)	Original language lost – Suggest adding it back in: If only three to five percolation tests are performed, the design percolation rate for the absorption system is the slowest rate from all the holes tested. If six or more percolation tests are performed, the design percolation rate for the absorption system is the average of all the holes tested as determined by the above formula.
Suggested APPENDIX	Suggestion to add the procedure for Soil Texturing to the regulations in APPENDIX C.
VARIANCES	Should we add language to Chapter 25 allowing the District Engineer to have the authority to grant variances from Chapter25?

Greywater Comments

Section 3 (q)	Greywater means untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. "Greywater" includes but is not limited to wastewater from bathtubs, showers, bathroom, washbasins, clothes washing machines (unless soiled diapers are serviced), and laundry tubs, but does not include wastewater from kitchen sinks or dishwaters.
Section 3	Clothes Washer System means a greywater system utilizing only a single domestic clothes washing machine in a one- or two-family dwelling.
Section 16 (a)(iii)	Suggested wording: A city, county, or other local government may, after a public hearing and enactment of an ordinance or resolution, further restrict or prohibit the use of greywater systems.
Section 16 Suggestion for new (b)	Permit Requirements (i) A clothes washer system, in compliance with all of the restrictions and requirements in these regulations, is exempt from obtaining a permit to construct. (ii) All other greywater systems not classified as a clothes washer system are required to obtain a permit to construct in accordance with these regulations.
Section 16 Suggestion for new (c)	Procedure for Estimating Greywater Discharge (i) The greywater discharge for single family and multi-family dwellings shall be calculated by estimates of greywater use based on water use records, or the following procedure: (A) The number of occupants of each dwelling unit shall be calculated as follows: First Bedroom - 2 occupants Second Bedroom - 1 occupant (B) The estimated greywater flows of each occupant shall be calculated as follows: Showers, bathtubs and wash basins – 25 GPD (95LPD)/occupant Laundry – 15 GPD (57 LPD)/occupant (C) The total number of occupants shall be multiplied by the applicable estimated greywater discharge as provided above and

<table>
<tr><td></td><td>the type of fixtures connected to the greywater system.</td></tr>
<tr><td>Section 16
Suggestion for new (d)</td><td>Determination of Maximum Absorption Capacity
(i) Where practicable, irrigation or disposal field size shall be computed from the following table:
<table>
<tr><th>Type of Soil</th><th>Square Feet
Minimum square feet of irrigation/leaching area per 100 gallons of estimated greywater discharge per day</th><th>Gallons
Maximum absorption capacity in gallons per square foot of irrigation/leaching area for a 24-hour period</th></tr>
<tr><td>Coarse sand or gravel</td><td>20</td><td>5.0</td></tr>
<tr><td>Fine Sand</td><td>25</td><td>4.0</td></tr>
<tr><td>Sandy loam</td><td>40</td><td>2.5</td></tr>
<tr><td>Sandy clay</td><td>60</td><td>1.7</td></tr>
<tr><td>Clay with considerable sand or gravel</td><td>90</td><td>1.1</td></tr>
<tr><td>Clay with small amounts of sand or gravel</td><td>120</td><td>0.8</td></tr>
</table>
(ii) In order to determine the absorption quantities of questionable soils other than those listed in the table above, the proposed site may be subjected to percolation tests.
(iii) When a percolation test is required, no greywater system shall be permitted if the test shows the absorption capacity of the soil is unable to accommodate the intended discharge of the proposed greywater system.</td></tr>
<tr><td>Section 16
(c)(ii)
Suggested additional wording</td><td>(ii) Greywater Collection Tank
(A) When system design includes a tank, specifications for the tank shall be submitted to the Enforcing Agency for approval. Such plans shall show all dimensions and other pertinent data.
(B) Tanks shall be constructed of solid, durable materials not subject to excessive corrosion or decay and shall be water-tight.
(C) Each tank shall be structurally designed to withstand all anticipated earth or other loads. Tank covers shall be capable of supporting an earth load of not less than three hundred (300) pounds per square foot when the tank is used for underground installation.
(D) Overflow Requirements.
(I) Each tank shall have an overflow drain. The overflow drain shall have a permanent connection to the building drain or building sewer, upstream of septic tanks, if any. The overflow drain shall not be equipped with a shutoff valve.
(II) The overflow drain shall not be less in size than the inlet</td></tr>
</table>

	pipe. (III) The overflow system must be designed so that the tank overflow will gravity drain to the existing sewer line or septic tank. The tank shall be protected against sewer line backflow by a backwater valve. (IV) An overflow drain and backwater valve is not required on a clothes washer system. (E) Each tank shall have its rated capacity permanently marked on the unit. In addition, a sign stating "GREYWATER IRRIGATION SYSTEM, CAUTION – UNSAFE WATER" shall be permanently marked on the holding tank.
Section 16 (c)(ii)(E)	Suggestion- Should be make this requirement applicable to the irrigation system section? Additional wording: The filter backwash and flush discharge shall be contained and disposed of into the building sewer system, septic tank or, with approval of the Enforcing Agency, a separate mini-leachfield sized to accept all the backwash and flush discharge water. Filter backwash water and flush water shall not be used for any purpose. Sanitary procedures shall be followed when handling filter backwash and flush discharge or greywater.
Section 16 (c)(v)	Suggestion for a new (A) General (i) Irrigation or disposal fields may have one or more valved zones. Each zone must be of adequate size to receive the greywater anticipated in that zone. No irrigation or disposal field shall extend within three (3) vertical feet of the highest known seasonal groundwater, or to a depth where greywater contaminates the groundwater or surface water. The applicant shall supply evidence of groundwater depth to the satisfaction of the Enforcing Agency. (ii) The total irrigation and/or mulch basin area required, which is the sum of all valved zones, must be equal to the maximum absorption capacity divided by the estimated greywater discharge.
Section 16 (c)(v)(A)(I)	Suggest delete the wording "Shall be sized to contain 3 times the peak hourly flow." Suggest delete the wording "Mulch does not need to be covered or may be covered with no more than 3 inches of topsoil." Suggested wording: Mulch basins shall be sized in accordance with proposed Section d above and of sufficient depth, length and width to prevent ponding or runoff during the greywater surge of a clothes washer, bathtub or shower. Mulch must be replenished as required due to decomposition of organic matter. Mulch basins will require periodic maintenance, reshaping or removal of dirt to maintain surge capacity and to accommodate plant growth and prevent ponding or runoff.
Section 16	This section is really not a subsurface irrigation system anymore. Or is it?

Chapter 25 Comments
Due 3/1/13

(c)(v)(A)(I)(5)	
Section 16 (b) Suggestion a new (i)	(i) General (A) Greywater shall be contained on the site where it is generated. (B) Greywater shall be directed to and contained within an irrigation or disposal field. (C) Ponding or runoff is prohibited and shall be considered a nuisance. (D) Greywater systems shall be designed to minimize contact with humans and domestic pets. (E) Water used to wash diapers or similarly soiled or infectious garments shall not be used and shall be diverted to the building sewer. (F) Greywater shall not contain hazardous chemicals derived from activities such as cleaning car parts, washing greasy or oily rags, or disposing of wastewater solutions from home photo labs or similar hobbyist or home occupational activities.
Section 16 (b)(i)(B)	Suggestion to delete this restriction of irrigating edible crops.
Section 16 (b)(ii)(C)	Suggestion to delete this restriction of irrigating edible crops.
Section 16 (c)(ii)(C)(I)	Suggestion to revise this description to require septic tanks to meet required structural and access requirements of the septic tank only.
Section 16 (c)(ii)(D)	All greywater collection tanks shall be vented with a suitable screen to keep animals and insects out of the system.
Suggestion	Do we want to require an on-site operation and Owner's manual for the system?

Sheridan County Public Works

Ken Muller, P.E., County Engineer

MAR 04 2013

February 28, 2013

William Tillman
Water Quality Division
Water and Wastewater Section
Herschler Building 4W
122 W. 25th Street
Cheyenne, Wyoming 82001

Re: Comment for proposed Chapter 25

Dear Mr. Tillman,

Please find in this letter some comments on the new proposed Water Quality Rules and Regulations Chapter 25.

Section 4. Table 1: Reducing the Residential Average Design Flow is probably more realistic to actual flows however the current Design Flow allows for some extra capacity and a "factor of safety" somewhat. It is assumed a Delegated Program will be allowed to keep the higher average flow if elected.

Section 4. Table 2: Restaurant – Unit Per meal. Is this the same as per seat?

Section 6. Site Suitability (b): Many previously platted lots in unincorporated areas are very small and designating a replacement field area is physically impossible. Has any regulations or ideas how best to address this issue been developed?

Section 6. Site Suitability (g) (iii): Soil texture evaluation to "confirm" a percolation rate or "assign" a percolation rate? This reads as if a test was conducted then confirmed by texture classification. Is this the intent?

Section 7. Drain Field Sizing (b) (ii) & (iii): It appears the credit for not having soil masking by the rock will not be allowed with chamber units in these regulations. This will offset the reduce flows proposed some and increase the field size. Calculating some examples it appears that using chambers in a trench configuration the number of units will be similar. However, chambers used in a bed configuration will require significantly more chambers. Is it the intent to eliminate the model Pre-Approval and the Equivalent Areas table for chamber units?

224 South Main Street ¤ Suite B8 ¤ Sheridan, WY 82801
Phone: (307) 674-2920 ¤ Fax: (307) 674-2927 ¤ E-mail: kmuller@sheridancounty.com

Section 8. (e): Providing clean-outs at all alignment changes upstream of the tank is good practice. Providing clean-outs at every alignment change seems excessive on minor alignment changes downstream of the tank.

Section 9. Tanks

Appears the pre-approval tank list no longer be applicable?

(iv) Configuration (A) & (B)

(A) reads that a 2 compartment tank is required then (B) reads that if the dimensional requirements are meet then a single non-partitioned tank is allowed.

Should (A) read if a two compartment tank is used the first compartment shall not if less than ½ the total capacity?

Section 10. (iv) Many models of distribution boxes on the market do not lend well for accessibility.

Section 11. (vii) (C): 25 feet limit width for gravity distribution may be challenging in certain situations. Where did the 25 feet limit come from?

Section 13. (ii) (C): Why the change from 25 feet to 15 feet limiting width for a sand mound system? If possible, consistency of dimensional regulations items is always good.

Thank you for the opportunity to comment of the proposed Chapter 25. If you have any questions on my comments, please give me a call at 674-2920.

Respectfully,

Ken Muller, P.E.
County Engineer

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