

## Chapter 7080 QUICK REFERENCE GUIDE - ISTS

Per 2011 Purple code book. For complete official language visit [www.revisor.leg.state.mn.us](http://www.revisor.leg.state.mn.us) vers. 15.2  
Chp 7080 regulates Subsurface Sewage Treatment Systems <= 5000 gpd (ISTS).

Hi-lighting: any mention of "other establishment" and pressure distribution / sandy soils

### Definitions:

Alarm device	visual or audible, onsite or remotely located.
Bedroom	Sleeping room or 70 ft <sup>2</sup> & access to the main living area.
BOD	Biochemical Oxygen Demand. The amount of oxygen consumed by the 'bugs' during decomposition of the organics in the effluent.
Deep well	a well with >50' of water tight casing or >10' of confining matl's (10' of clay)
Design flow	Typically 'peak' flow is used for tank sizing to ensure proper retention time during the highest flow periods, and the 'average' flow is used for drainfield sizing to ensure the long term acceptance rate (LTAR) of the soil. MN chp.7080 uses 'design flow' (peak) to size the entire system. 7080 limits the flow to 150 gpd/bedroom. The average flow must not exceed 66% of design flow or the life expectancy of the system will be compromised.
Design Guidance	Per state statute this document must be used for dealing with high strength waste and when there are "gaps" in the prescriptive code. (The design guidance can be found on the MPCA website.)
Designer/Inspector License	
Basic-	Required for Type I-III systems <=2500 gpd (residential strength waste)
Intermediate-	Required for Type IV-V systems <= 2500 gpd (residential strength waste)
Advanced-	Required for Type I-V systems > 2500 gpd. Also req'd when dealing with high strength waste, collection systems or nutrient removal. (must follow "design guidance" as well as 7080-81)
Flood plain	area covered by 100 year flood. Contains the floodway and flood fringe.
FOG	Fats-Oil-Grease. The amounts in the effluent are typically measured by a lab.
High Strength Waste	Anything exceeding residential strength limits as listed below. High strength must be reduced to residential strength which req's pre-treatment and an adv designer using a registered pre-treatment product or the Design Guidance. Typical restaurant average: 1500 BOD / 600 TSS / 200 FOG
ISTS	"Individual subsurface treatment system" with a maximum design flow <= 5000 GPD, or holding tanks <= 10,000 gpd. To include affiliated collection systems and related tanks. Does not include bldg sewers or "plumbing".
Maintainer	Able to perform tank pumping and general repairs on all SSTS's.
Medicines	Unused medications must NOT be disposed of in the septic system.

Nitrogen	An <b>ISTS 2501-5000</b> gpd impacting an aquifer must use Best Management Practices (design guidance <b>III.H</b> ). Impact assessment is a desktop and field boring approach. (Adv designer to use DG II.F.2 & appendix I worksheet).	
<b>Other Establishment</b> :	Sewage from anything other than a typical residential dwelling. Most should be assessed for high strength waste. Yearly sampling is recommended to verify waste strength and treatment as intended. Class V injection well which req's 'basic inv form' if: system serves more than a single family home, has the capacity to serve 20+ people a day, or receives non-domestic waste. (per design guidance II.A.2 & II.A.3)	
Original soil	Soil which has not been cut, filled, smeared or compacted as to alter the soil acceptance rate. "Rough up" of the soil for mound preparation is still 'original' as this is simply breaking up the root layer that may impede absorption.	
Periodically saturated soil (seasonal high water table - SHWT)	As determined by the presence of redoximorphic features ( <b>7080.1720 sub 5 E</b> ). "black to gray" rule - 7080.1720 sub 5, E, 3.	
Plastic limit	A soil moisture level, of which any wetter will cause smearing during excavation.	
Registered product	A pre-treatment device or other product that has been determined to reliably perform as intended when properly installed and operated. Visit the MPCA website for a current list of "registered products".	
Residential strength waste:	Raw sewage to tanks <300 BOD, <200 TSS, <50 FOG. To soil treatment area <170 BOD, <60 TSS, <25 FOG (treatment level C).	
Rock Fragments	>2mm in size (receives no credit for soil treatment) (mound sand is roughly .4 - 2.0 mm, so basically anything coarser than your average mound sand)	
Seepage bed	a dispersal area 3-25 feet wide. (>12' requires pressure distribution).	
Service Provider	Req'd for operation or maintenance of any SSTS with a pre-treatment device. Also able to perform maintainer duties with the exception of pumping.	
SWF	Shoreland Wellhead Food-beverage-lodging.	(within 1000' of lake or 300' of river) , ( <a href="http://www.health.state.mn.us/divs/eh/water/swp">www.health.state.mn.us/divs/eh/water/swp</a> ), (including mobile home parks, campsites, etc. that are required to obtain a license)
Structure	A building intended for human occupancy, or that which interferes with the construction, operation or maintenance of an SSTS.	
Treatment level A/B	A level of sewage treatment above and beyond standard septic/drainfield treatment. These improved levels of treatment qualify for a reduction in drainfield sqr footage and/or vertical separation requirements. Level A: 15 mg/l CBOD 15 mg/l TSS 1,000 ppm Fecal Level B: 25 mg/l CBOD 30 mg/l TSS 10,000 ppm Fecal	
TSS	Total Suspended Solids. The levels in the effluent are typically measured by a lab.	

- 7080.1200 ADMINISTRATION.  
LUG's shall not give variances to separation or IPHT (Imminent Public Health Threat) regulations.
- 7080.1500 SSTS COMPLIANCE CRITERIA.  
Newly constructed systems are considered compliant if designed & installed to code requirements.  
Existing systems must:
- 1) not be an Imminent Public Health Threat
  - 2) be protective of ground water
  - 3) must meet performance standards or operating permit limits.
- IPHT:
- Must not discharge to the surface or reoccurringly backup into the home, etc.
  - No electrical hazards or unsafe conditions (weak riser lids, etc.)
  - Or "other" as deemed by the inspector
- Protective of groundwater:
- No seepage pits, cesspools, tank leakage below the operating level, etc.
  - Must have required vertical separation:
    - 1996 or newer, or in SWF, must have 3' separation, with up to 15% allowance (36->31")(with LUG approval)
    - OR permitted reduced separation (treatment level A/B), with no allowance.
    - 1995 or older, and not SWF, must have 2' separation with no allowance.
  - all unused systems must be properly abandoned.
  - Or "other as deemed by the inspector.
- If system has an Operating Permit or monitoring requirements:  
System must meet performance limits and/or operated/managed accordingly.
- Systems with a flow of 2501-5000 GPD, adversely impacting an aquifer (DG II.F.2) must use Best Management Practices (BMP) for nitrogen reduction.  
BMP: remove blackwater, mound on loamy soil, registered Nitrogen product, RSF.
- Replacement components for a failing system must be installed to new install standards, and the remaining components must result in the system passing an existing compliance inspection.
- 7080.1700 DESIGN PHASE I: SITE EVALUATION (preliminary & field evaluations)
- 7080.1710 PRELIMINARY evaluations of :
- design flow & Waste strength
  - existing or proposed water wells within 100 feet
  - business water wells within 200 feet (transient, campground, etc.) if ALS is in effect.
  - water supply management area (community, schools, etc.) if ALS is in effect.
  - well head protection areas
  - existing and proposed buildings
  - buried water supply pipes within 50 feet
  - high water levels of adjacent lakes/rivers & floodplain areas
  - property lines, setbacks & easements
  - soil characteristics and soil survey data
  - lot / block, PID, or other property identifier
  - names of property owners
- 7080.1720 FIELD evaluations of:
- lot lines, setbacks, easements
  - surface features: slope & percent, vegetation, cut/fill, run on potential, geomorphic desc.
  - SHWT** via 3+ soil observations (borings or pits)(utilities must be located prior to digging)  
soil boring log / descriptions (moist and unfrozen) (redox definitions in 7080.1720 sub 5 E)
  - Soil Loading Rate** as determined by borings, pits or perc test of the most restrictive soil layer within 36" of rock or media. (less if a separation credit is given)

- 7080.1730 Site evaluation written report including:  
 -evaluation results with dates  
 -map drawn to scale with all major components listed, and maintenance access route  
 -depth to SHWT  
 -proposed elevation of drainfield, or more simply - max depth from grade to bottom of rock.  
 -designer name, phone number & address  
 -unique site situations noted if any
- 7080.1750 DESIGN PHASE II: DESIGN
- 7080.1860 Design Flow class 1 (reductions for class 2,3,4 depending on total home sqr footage per bedroom)
- |              |         |
|--------------|---------|
| <=2 bedrooms | 300 gpd |
| =3           | 450 gpd |
| =4           | 600 gpd |
| =5           | 750 gpd |
- Other establishment** design flows <5000 gpd are determined by 7081.0130 tables, OR by averaging the daily measured flows of a peak week for the establishment.  
 If there is a collection system, part 7081.0140 'infiltration' applies.
- Other establishment** waste strength must be estimated or measured and treated appropriately.
- 7080.1850 Cluster/Multiple dwelling flow = 10 highest flow homes + (.45 \* the total of the rest)  
 If there is a collection system, part 7081.0140 'infiltration' applies.
- 7080.1920 Tanks must have a liquid depth of 30-84". There must be 6' between inlet & outlet. Inlet must be 2"+ above outlet. Tanks w/compartiment wall usually have baffled hole at inlet height.  
 For all practical purposes, top of baffles must be 8" + above normal water level, and 1"+ below lid.
- 7080.1930 Septic Tank Capacity. (50% larger)
- |              |          |      |
|--------------|----------|------|
| <=3 bedrooms | 1000 gal | 1500 |
| 4-5          | 1500 gal | 2250 |
| 6-7          | 2000 gal | 3000 |
- If there is a garbage disposal AND/OR the sewage is pumped to the septic tank, then:  
 Tank size must be 50% greater with multiple compartments or tanks.  
 Cluster/Multiple dwelling tankage (2-10 homes) = sum of individual tankage.  
 Cluster/Multiple dwelling tankage (11+ homes) or **'other' establishments** shall be:  
 3-day retention for gravity fed septic,  
 4-day retention if pumped to septic,  
 or per mfg req's when using other treatment devices.  
 STEP tankage (cluster with tank at each house) per design guidance.  
 Exterior Oil & Grease tank req'd if effluent exceeds Residential strength limits.
- 7080.1940 Multiple tanks: Each tank or compartment must have at least 25% of total required volume.
- 7080.1950 Compartmenting of tanks.  
 Flow between compartments by:  
 Transfer hole (mole hole) in clear zone of wall (40% below water level) of at least 50 sqr in. (this style can NOT be used as septic/pump tank combo)  
 or standard baffle with 4" pipe or greater at water level.  
 Air venting must be provided between compartments. If sewage is pumped to septic tank, tank must be vented by an alternative method, due to lack of venting through sewer line & vent stack.
- 7080.1960 Tank Baffles.  
 Inlet: 8"+ above and 6" to 20% below liquid level.  
 Outlet: 8"+ above and 40% below liquid level.  
 At least 1" between top of baffle and bottom of tank lid.  
 The outlet of a baffled compartment wall is at the same height as tank outlet.  
 Compartmented tanks do not need an inlet baffle on the 2<sup>nd</sup> compartment.  
 End of sewer pipe must be at least 6" from baffle.

- 7080.1970 Tank access.  
 Each tank shall have a minimum of 2 risers (1 for pump tanks) to grade >20" in diameter, 1 over the inlet baffle OR centered on tank, AND one over the outlet baffle/filter. Any remaining baffles without a riser, must have a 6"+ inspection pipe. Same intent for 2 compartment tanks, but it varies depending on use as septic or pump tank. More risers may be required on larger tanks, to not exceed 6' maximum reach to all walls. Riser lids must be secured, and leak resistant.
- 7080.2000 Tank location and installation.  
 Top of tank no deeper than 4' from finished grade on new dwellings, without ordinance approval. Riser lids must be insulated to R-10. If tank is buried <2', then top of tank must be insulated to R-10 (2" rigid), with minimum 6" cover. Tanks, risers and pipe connections must be watertight! Anti-flotation methods must be used when placed below SHWT.
- 7080.2050 Supply pipe: (from tank to dispersal area)  
 Sch 40 pipe from tank to undisturbed soil for gravity, all Sch 40 if pressurized (or similar capable of 40 psi ( note: HDPE sdr11 rated to 160 psi but must stay 50' from well, no reduction for pressure testing – 4725.4450 )). Pipes shall be buried at least 6" and insulated where necessary. 1% or 1/8" per foot slope minimum, no maximum (gravity systems). (Same slope for drainback of pressure systems.) Pump rate to drop box must not exceed acceptance rate of drop box. Supply pipe needs a cleanout (achieved by a Cam lock disconnect at pump) (for jetting access purposes do not use any "hard 90" fittings)
- Gravity Distribution:  
 Pipes at least 4" in diameter  
 Holes at least 1/2", spaced less than 40" (3.33') apart  
 Bed laterals no more than 5' apart and less than 30" (2.5') from sides of bed.  
 --> ( maximum of 16.6 sq ft. per hole)
- Drop box: inlet 3" above outlet to current trench, next trench 2" above outlet of current trench.  
 At least 6" of cover over drop box and inspection cap access above grade, at-grade or buried no more than 6" below grade.
- Pressure Distribution:  
 Any Type I-V system may need pressurization if req'd by the respective distribution method.  
**Generally you must use pressure distribution for:**
- mounds & at-grades, (or whenever laterals are above original grade, as it causes seepage)
  - beds wider than 12 feet,
  - pre-treated or level A/B effluent,
  - or as an option for dealing with trenches & beds in sandy soil,
- Lateral perforations must be designed for <10% variation between perforations. (max perfs/lateral)  
 Lateral clean outs must be provided and accessible from final grade.  
 Laterals spaced no more than 3' apart, and 1-2' from side/end of bed.  
 Perforations spaced no more than 3' apart.  
 Perforations can vary from 1/8" to 1/4".  
 To allow air to enter lateral system for drainback, must have perforation near end of lateral at top of pipe (but still in the rock on a cleanout sweep 90) OR the last perforation on top of pipe with an orifice shield.  
 Existing gravity systems that are retrofitted and now receive Level A/B effluent must be monitored for even distribution, and if not even, a method of even distribution must be applied.

Pipe volume:

Pipe diameter	1"	1.25"	1.5"	2"	3"
Gal / ft	.045	.078	.11	.17	.38

Maximum # of perforations per lateral

Perf flow rates (gpm)

min HEAD pressure at perf residential / 'other' / MSTS

Pipe diameter 1" 1.25" 1.5" 2"

1' 2' 3' 5' head

1/4" holes: (8/32) .74 1.04 1.28 1.65 1' 2' 2'

Perf spacing

2' 10 13 18 30

2.5' 8 12 16 28

3' 8 12 16 25

7/32" holes: (7/32) .56 .80 .98 1.26 1' 2' 2'

Perf spacing

2' 11 16 21 34

2.5' 10 14 20 32

3' 9 14 19 30

3/16" holes: (6/32) .42 .59 .72 .94 1' 2' 2'

Perf spacing

2' 12 18 26 46

2.5' 12 17 24 40

3' 12 16 22 37

1/8" holes: (4/32) n/a .26 .32 .41 2' 5' 5'

Perf spacing

2' 21 33 44 74

2.5' 20 30 41 69

3' 20 29 38 64

7080.2100 Dosing.

Pump, floats, and discharge line must be installed so that repair/replacement does not require entering the tank.

Inlet of Pumps must be elevated at least 4" off bottom of tank, or use a pump vault.

All systems with a pump must have a High Level Alarm.

Dose tank must have reserve precautions of:

-Dual pumps OR

-500 gallon tank minimum (systems with <=600 gpd (4 bedroom)) or

-100% of design flow (systems with >600 gpd (5+ bedrooms)).

Pump to gravity distribution must be capable of, and restricted to, 10-45 gpm.

Pump residual head pressure must be at least: 1'+ head for 1/4" 7/32" & 3/16" holes,  
2'+ head for 1/8" holes.

See chart above for Other establishments and MSTs.

Each dose must deliver **no more than** 25% of design flow, plus supply pipe drainback volume, AND **no less than** 4 times the lateral volume, plus supply pipe drainback volume (ignore manifold)

Note: as a general rule of thumb, systems with 3' x 3' perf spacing will require 2" laterals in sand, 1.5" laterals in loam and 1.25" laterals in clay loam, in order to satisfy these requirements.

- 7080.2150 Treatment and Dispersal - Setbacks:
- tanks -
    - 10' to structures, buildings or property lines
    - 50/75/100/150 to rivers and lakes, 50' protected wetland (chp 6105/6120)
    - 50' to deep or shallow well.
  - absorption area-
    - 20' to structures or buildings
    - 10' to property line
    - 50/75/100/150 to rivers and lakes (chp 6105/6120)
    - 50' to deep well, 100' to shallow well.
  - Sewer line as close as 20' to well if pressure tested. (5 psi for 15 min)
  - Sump pumps/baskets <100 gal treat as a sewer line, >100 treat as a tank (chp 4725.4450) (4715.2440 airtight & vented, 2" discharge, 18 gal minimum)

Registered treatment/dispersal components must be installed and operated according to the limits and conditions placed on registration.

Vertical separation requirement must value any soil with more than 50% rock fragments at 0%.

Vertical separation requirement must value "sands" with 35-50% rock fragments at 50% credit.

Rock / distribution media must not come in contact with any sands having more than 35% rock

Fragments. (future code may change for this to only apply to gravity dist.)

Adv designers may use "in ground mound/bed" with 1'+ sand liner when rock/media is in contact with any soils exceeding the rock fragment rule (design guidance III.F.1).

\*\*\* Contour loading rate for all soil systems is between 1 and 12 gals/foot/day.

Entire treatment area must be within 7' of final grade (lack of oxygen if system is buried deeper).

Absorption area must be original soil. (to be a type I-II)

Must use geotextile fabric over rock.

Mounds: rough up the absorption area topsoil to the bottom of the root zone.

Excavation of trenches-bed/rough up in such a manner as to not smear or compact the soil.

Soil must be below the plastic limit and not frozen or freezing.

If rough up is exposed to rain, it must be allowed to dry and then be reworked.

A minimum of 6" of topsoil (black dirt) must be placed over the finished system

(1'+ total cover when you include the 6" loamy cap over rock)

A vegetative cover must be established as soon as possible (no deep rooted plants).

Systems **over 2500 GPD** that impact a sensitive aquifer (4725.0100 subpart 21) must use BMP to reduce nitrogen. Work by an Adv designer and BMP per design guidance.

7083.4030 Treatment levels (levels in dose tank, or coming out of septic)

	<u>CBOD</u>	<u>TSS</u>	<u>FOG</u>	<u>FECAL</u>	<u>NUTRIENT</u>
Treatment level A	15	15	-	1000	-
level A-2	15	15	-	-	-
level B	25	30	-	10,000	-
level B-2	25	30	-	-	-
level C	120 (170 BOD)	60	25	-	-
nitrogen	-	-	-	-	20
phosphorus	-	-	-	-	5

7080.2350 Reduction in Vertical Separation.

minimum 12"	treatment level A	all soil textures	w/uniform dist & timed dosing
minimum 18"	level B	sands & loams	w/uniform dist & timed dosing
	level B	clay loams	w/uniform dist
minimum 36"	level A-2,B-2	all soil textures	w/uniform dist
	level C	all soil textures	no additional requirements.

<u>M.P.I.</u>	level C		level A/B		
	<u>gpd/sqr ft</u>	<u>mound ratio</u>	<u>gpd/sqr ft</u>	<u>mound ratio</u>	
<.1	0	1	0	1	
.1-5	1.2	1	1.6	1	
.1-5*	.6	2	1	1.6	*fine sand
6-15	.78	1.5	1	1.6	
16-30	.6	2	.78	2	
31-45	.5	2.4	.78	2	
46-60	.45	2.6	.6	2.6	
61-120	.24**	5	.3	5.3	

(\*\*mounds only @ .24)

## Soil loading rates: TABLE IX (textures from borings or pits)

<u>Texture</u>	<u>rock fragments</u>	<u>Level C gpd/sqr ft</u>	<u>mound ratio</u>	<u>Level A/B gpd/sqr ft</u>	<u>mound ratio**</u>
All soils	>50% (given 0% soil separation credit)	0	1	0	1
All Sands	35% - 50% (given 50% soil separation credit)	per perk	1	per perk	1
<b>SANDS:</b>					
crse sand med sand loamy sand	<35%	1.2	1	1.6	1
fine sand loamy fine sand	<35%	.6	2	1	1.6
<b>LOAMS:</b>					
sandy loam	<50%	.78	1.5	1	1.6
sandy loam (platy)	<50%	.68	1.8	.87	1.8
loam	<50%	.6	2	.78	2.1
loam (platy)	<50%	.52	2.3	.68	2.4
silt loam, silt	<50%	.5	2.4	.78	2.1
silt loam, silt(platy)	<50%	.42	2.9	.65	2.5
<b>CLAY LOAMS:</b>					
clay loams	<50%	.45	2.6	.6	2.7
<b>CLAYS:</b>					
clays	<50%	per perk	per perk	per perk	per perk

\*\* with mound sand loading rate (for Treatment Level A/B) of 1.6 gpd/ft<sup>2</sup>

NOTE: Use common sense and possibly a lower Soil Loading Rate when dealing with:

- Platy or massive shapes - Firm or rigid consistence - Weak grade clays

Effluent to Soil must never exceed 170 BOD, 60 TSS, 25 FOG.

Contour Loading Rate must be &lt;12 gpd/ft for mounds and "stacked" at-grades.



7080.2200 TYPE I SYSTEMS. (Std. trenches, beds, at-grades & mounds) (adequate separation & natural soil)  
<= 2500 gpd requires basic designer/ inspector license. (Adv designer when > 2500 gpd)  
Management plan req'd (7082.0600). Licensed Maintainer for maintenance and repairs.

#### 7080.2210 Trenches and Beds.

Beds are limited to slopes of less than 6%.

Beds & Trenches must be placed in soil with a loading rate of at least .45 gpd/ft<sup>2</sup>,  
SLR less than .45 gpd/ft<sup>2</sup> will require a mound or pretreatment.

Flow measurement required if pump is used. (time dosing, ETM, CT, water meter, etc.)

Trench or Bed bottom area calculated as: 'design flow/soil loading rate'.  
(times 1.5 for gravity distribution beds)

Minimum 6" rock below pipe, (standard for beds, trenches and mounds).

Trench footprint reduction for deeper rock:

12" rock	20% reduction in footprint
18"	34%
24"	40% (not allowed in 1.2 SLR sand applications)

Trenches no wider than 36".

Gravity beds no wider than 12'.

Pressurized beds no wider than 25'.

Multiple beds spaced at 1/2 bed width.

4" inspection pipe to bottom of rock w/ 3/8"+ holes, SECURED, at far end of bed/ trench.

Top and bottom of rock must be level and follow contour.

12" minimum cover over rock plus crown.

No beds in flood plain.

If rock/media is in contact with "sand" soils, must use : pressure distribution, or  
(also must be < 50% rock fragments) 15% pieces, (7+ trenches) or  
5' separation

#### 7080.2220 Mounds.

Provide flow measurement (time dosing meets requirement), and pressurized distribution.

Must have a minimum of 12" of original soil above SHWT (to be a Type I).

Mound rock bed area calculated by: 'design flow / 1.2 for standard, or 1.6 for Level A/B'.

Mound rock bed width 10' maximum. (controlled by contour loading rate <= 12 gpd/ft)

Mound absorption area is calculated by:

'rock bed area \* mound absorption ratio' from table IX or IXa.

Absorption area centered under rock bed for slopes <=1%, and downslope for slopes >1%.

Setbacks measured from the absorption area. (all sides on <=1%, just downslope on >1%).

Final grade slopes of mound no greater than 3:1.

Vegetation over absorption area must be cut to 2" and dead organics/leaf mats removed.

Trees cut flush and leave stumps in place.

Rough up absorption area topsoil to the bottom of the root zone in a manner as to not smear  
the soil, and only when the soil is drier than the plastic limit.

Do not move soil more than 1' from its original location.

Minimum of 1' clean sand under rock bed, and tapered to cover entire absorption area,  
without compacting. (use track type skid loader or other similar method)

4" inspection pipe to bottom of rock. 3/8"+ holes, 2 holes in the rock. SECURED

For slopes =>1%, upslope edge of absorption area/rock bed must be along contour.

Minimum of 12" of cover over rock bed, plus crowning (6" sandy/loamy + 6" topsoil).

7080.2230 At-Grade.

At-grades are limited to slopes of  $\leq 25\%$ .

The upper 12" of absorption area must be original soil with a SLR  $\geq .45$  gpd/ft<sup>2</sup>.

Setbacks measured from absorption area. (pipe to downslope edge of rock/media).

Absorption area measured downslope from pipe for slopes of  $\geq 1\%$ .

Absorption area: Length = design flow / contour loading rate.

width = (req'd ft<sup>2</sup> / length) or (CLR / SLR). Width  $\leq 15$  feet.

Must use pressure distribution and flow measurement. (multiple pipes allowed)

Upslope edge installed along contour.

12" of cover (6" of loam/sand & 6" of topsoil), final grade not steeper than 4:1.

One 4" inspection pipe from bottom of rock w/ 3/8"+ holes spaced  $< 6$ " apart near lateral. SECURED.

Total CLR  $\leq 12$  for an at-grade, or "stacked" at-grade systems.

(7080 does not give a contour loading rate table, the following is a suggested one)

<u>perc rate</u>	<u>texture</u>	<u>other</u>	<u>CLR gpd/ft</u>
<.1	coarse sand		6
		bedrock <4'	5
.1 - 5	sand, loamy sand, fine sand.		8
		texture layers	7
		bedrock < 4'	5
6-15	sandy loam	strong structure	7
		weak structure	6
		bedrock < 4'	5
16-60	loam, silt loam silt, clay loams	strong structure	6
		weak structure	5
		bedrock < 4'	4
61-120	sandy clay	strong structure	3
>120	clays		2

7080.2240 Graywater Systems

Flow is calculated as 60% of normal and does not contain toilet waste.

Tankage:

$\leq 3$ bedrooms	750 gallons
4-5	1000
6-7	1250

7080.2250 TYPE II SYSTEMS. (Flood plain, Privies(outhouse), Holding tanks)  
<= 2500 gpd requires basic designer/inspector license. (Adv designer when >2500 gpd)  
Management plan (7082.0600). Licensed Maintainer for maintenance and repairs.

7080.2270 Floodplain areas

floodplain = flood fringe + floodway + flood fringe.

Never place ISTS in floodway, and only when no alternative exists should you place it  
in the flood fringe.

There should be no inspection pipe or other opening from the rock media to the surface.  
The BOTTOM OF THE ROCK should be at least as high as the 10-year flood elevation.

When a mound is required for separation purposes:

The BOTTOM OF THE ROCK should be 6" above 10 yr flood elev.

No inspection pipes unless the top of mound is above the 100 yr flood elev.

A shut-off device must be provided to prevent backflow into the home when flooded.

If a holding tank is used:

The tank capacity must equal:

(100 gallons \* #bedrooms \* #days flooded on 10 year stage)

or 1000 gallons, whichever is greater.

If the flood rises above the top of the tank, it must be pumped after the water  
recedes and before resuming use.

7080.2280 Privies/outhouse.

Must be a pit (minimum 25 ft<sup>3</sup>) with proper vertical separation, or  
use a watertight tank, or  
employ a toilet treatment device.

All privies must be insect proof, well vented, with auto closing door and seat.

7080.2290 Holding Tanks.

Must have 6" of cover, less than 2' of cover will require insulation.

Must have a 6"+ cleanout pipe to grade or higher, capped.

A 20"+ riser within 12" of grade.

Capacity of (400 gallons \* #bedrooms) or 1000 gallons, whichever is greater.

For **'other' establishments**, minimum capacity shall be 5 \* design flow.

Must employ an alarm (elec or mechanical), preferably set at 75% capacity.

Holding tanks are required to be tested for watertightness.

7080.2300 TYPE III SYSTEMS. (Disturbed soils, less than 12" to SHWT, downsized systems and  
"mild" hi-strength waste systems).

<= 2500 gpd requires basic designer/inspector license. (Adv dsgr when >2500 gpd or HSW)  
Management plan (7082.0600). Licensed Maintainer for maintenance and repairs.  
NO monitoring plan req'd by code, but sometimes requested by LUG.

Must provide flow measurement. (time dosing fulfills requirement)

A downsized system may be installed if timed dosing or similar restriction device is used to  
prevent exceeding the soil hydraulic loading rate of the existing dispersal area.

Hi strength waste drainfield sized by, and must not exceed, organic loading rates (see D.G.)

#### 7080.2350 TYPE IV SYSTEMS.

(Use of Registered products for pre-treatment of residential strength waste to level A or B, including sand filters. Or pre-treatment of high strength waste to treatment level C.)  
Residential strength waste pre-treatment to Level A/B allows a separation and/or footprint credit.  
<= 2500 gpd requires an Intermediate design/inspector license.  
>2500 gpd or High strength waste requires an Advanced designer/inspector license.  
Requires operating permit & management plan (7082.0600).  
Licensed Maintainer for basic maintenance and repairs.  
Service provider req'd to maintain pre-treatment device and affiliated controls and testing.  
Use registered products for treatment.  
Level A/B treatment allows for reduction in vertical separation  
and/or drainfield ft<sup>2</sup> reduction.  
( no additional reduction in ft<sup>2</sup> for trenches with increased rock depth)  
All pretreated effluent must be “uniformly” distributed, (pressure distribution, etc.) and all  
treatment to level “A” must be “time dosed”.  
Treatment level A/B  
Reduced separation table – 7080.2350  
Increased Soil Loading Rate table – 7080.2150  
A/B/C limits table – 7083.4030

#### 7080.2400 TYPE V SYSTEMS.

(Any system exceeding 7080 specifications, or use of an “unregistered device”, as long as “end of pipe” sampling meets minimum requirements & 7080 soil loading rates are not exceeded)  
<=2500 gpd requires an Intermediate design/inspector license.  
>2500 gpd or High strength waste requires an Advanced designer/inspector license.  
Also req'd: PE/PSS sign off, Licensed maintainer and Service Provider,  
Operating permit and management plan (7082.0600).

#### 7080.2430 REPORTING.

Design reports must include:  
detailed drawings  
design flows  
component sizing and calculations  
hydraulic and organic loading rates (gpd/sqr ft & lb per day/sqr ft)  
setbacks, site location and elevations  
management plans : (types I-III) (7082.0600)  
operating permit: (types IV-V, MSTs)

#### 7080.2440 COLLECTION SYSTEMS.

Systems with a design flow > 2500 gpd from multiple sources must follow the design guidance or use a P.E.

#### 7080.2450 MAINTENANCE.

Every 3 years must evaluate water tightness of tank below operating level, assess other major water leaks, and measure scum/sludge and/or pump tank.

Total scum and sludge must be less than 25% of septic tank capacity, and scum > 3" from bottom of outlet baffle, and sludge > 12" from bottom of outlet baffle.

Pumping must be done through the tank riser.

Lift tanks must be pumped when sludge is within 1" of pump intake.

Holding tanks can be pumped through inspection pipe.

Monitoring & Operating requirements:

    maintenance has been performed,

    meets flow and treatment limits,

    no surfacing, toe leaking, improper ponding etc,

    record flow meter, and/or verify timed dose settings.

Maintenance requirements & frequency:

    Verify no tank or riser leakage,

    measure scum/sludge & pump when necessary,

    clean effluent filter, flush laterals,

    adjust timers, verify alarms are functional.

#### 7080.2500 SYSTEM ABANDONMENT.

Tanks pumped (licensed pumper), electrical devices disposed of properly.

Tanks removed, or crushed and filled.

Supply pipe disconnected.

Business/person abandoning the system must complete a 'record of abandonment' and send to the LUG with in 90 days.

LUG inspection recommended if work not done by licensed septic professional.

#### 7080.2550 SEEPAGE PITS. (Seepage pits, drywells, leaching pits.)

These 'pits' must be preceded by a watertight septic tank,

the seepage pit bottom must have 3' of separation and be >5' diameter.

The GPD is limited to the soil loading rate and surface area surrounding the pit.

(not allowed in sandy soils)