	Sutter County Administrative Policies & Procedures
POLICY:1101	TITLE: Sutter County On-Site Manual

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PURPOSE:

The purpose of this policy is to establish guidelines and technical standards for the installation of On-site Sewage Disposal Systems. The County recognizes the need to develop clear and consistent guidelines governing the installation, repair, monitoring and state mandated reporting of on-site sewage disposal systems.

AUTHORITY:

The Sutter County Board of Supervisors

APPLICABILITY:

All areas of Sutter County including the portions of the incorporated cities that are served by On-Site Sewage Disposal Systems.

GENERAL POLICY:

To govern the process, materials, system requirements, environmental monitoring and reporting requirements of on-site sewage disposal systems. Ensure the effective and efficient achievement of County objectives of the protection of public health, preservation of the environment and compliance with state mandates as they relate to On-Site Sewage Disposal Systems.

POLICY GUIDELINES: Attached

Sutter County On-Site Manual

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Part One: Process

Chapter 1. Site Evaluation

Site evaluations are required for approval of all lot line adjustments, parcel and subdivision maps and for construction of on-site wastewater systems except as exempted in section 700-130. Site evaluations are not required for on-site wastewater system modification or replacement (with adequate soils information), although elements contained in this section, such as soil analysis, may be incorporated into the process for permitting the construction of said modifications or replacements.

A. Site Preparation and Application

1. LA parcel files are accessible to the public and customers are encouraged to review their property file before applying for a Site Evaluation.
2. Site Evaluation applications will only be accepted when determined by the LA to be complete, including the following information:
   a. All portions of the application form are completed and legible
   b. Dimensional site plan that includes location of soil test holes in relationship to property boundaries, landmarks as necessary and drawn to an engineered scale
   c. Signature of the applicant
   d. Fees as specified in county code

3 The trenches should be excavated in the presence of the LA.

B. Soil Test Hole (Trenches) Excavation

1. Number and Location of Test Holes

   Unless otherwise approved by the LA, a minimum of 2 test holes will be required for each parcel, with one hole excavated in the primary and one hole excavated in the replacement drainfield areas. At the discretion of the LA, additional holes may be needed to adequately characterize site conditions or fewer test holes may be allowed based on considerations such as space limitations on smaller parcels or uniformity of area soil characteristics.

   For legally created parcels the LA may accept soil data recorded at the time of parcel creation in lieu of excavating and evaluating new test holes at the time of site evaluation if the soil data is well documented, undisturbed and the area is able to meet current standards for the proposed development.

2. Dimensions of Test holes
   a. The holes are generally excavated by a backhoe. Test holes only need to be dug into the restrictive layer. When a restrictive layer is not identified during test hole excavation, test holes must be dug a minimum of 7 feet deep. The reason for this depth is to verify that

the site can accommodate a 2 foot deep drainfield with an additional 5 foot of vertical separation for a gravity system.

b. Excavator requests for test holes shallower than 5 feet (without encountering a restrictive layer) due to site specific concerns such as soil sloughing characteristics and access to the site by children or animals, will be considered on a case-by-case basis. The LA will work to identify ways to meet the excavator's concerns other than digging shallow test holes, such as arranging to meet the excavator on site so the holes can be immediately covered.

c. All trenches should be excavated to Cal-OSHA standards, and a minimum of 2 feet wide.

d. In some cases hand dug test holes may be preferred by the applicant or designer. Hand dug test holes might be preferable for sites that have a shallow restrictive layers or sites where construction equipment could damage the usable soil. Nevertheless, in all cases, trenches must be dug to the specifications listed above.

C. Site Inspection and Evaluation

1. Review

a. LA staff will inspect the site, log the soil test holes, and make an initial determination of whether site conditions are suitable for a standard, gravity system, based on the following factors:

(1) 2 ft. of native effective soil and 5 ft. separation to groundwater

(2) Slope less than 30%

(3) Soils in Soil Types 1-6, as identified in Table II

b. Site Evaluations will provide the applicant with soil profiles, the depth of effective soil, the application rate, a statement of whether the wastewater system would be conventional gravity or require consultant review and possible supplemental treatment.

c. The LA may request joint site evaluation without initially evaluating the site in cases where site conditions are known to be outside of the range described as suitable for standard, gravity systems as identified in Table II.

D. Expiration

Site Evaluations shall be valid for a period of three (3) years, except for when there is a change in site conditions adversely affecting the drainfield area or when there has been a change in regulatory requirements. Exceptions may be made when the LA is confident that no adverse changes have occurred to the site.

E. Groundwater Monitoring

1. Purpose

   a. The LA requires groundwater monitoring information for projects in groundwater concern areas to determine if on-site wastewater and/or subdivision ordinance requirements can be met.

   b. Unusual situations may require additional groundwater review of a specific site completed by a professional such as a California Professional Geologist, Hydrogeologist, or Civil Engineer.

2. Area Identification

   Parcels with suspected seasonal groundwater issues requiring rainy season monitoring include:

   a. Valleys, Ravines, Swales

   b. Waterways

   c. Confined and Unconfined Sand and Gravel Strata

   d. Shallow Topsoil Areas

   e. Springs or other indications, such as swampy/marshy appearance or presence of water-loving vegetation such as cattails, willows, perennial grasses

   f. History of seasonal groundwater in the vicinity of the project

   g. Visual indication of seasonal groundwater, such as mottling or gleying in soil profiles

3. Application and Coordination

   Groundwater monitoring may be conducted in the following circumstances:

   a. As part of a pre-application review for a land use project.

   b. As a condition for preliminary map approval for land use applications, where the owner has signed a disclosure document for concurrent review.

   c. As a condition for site evaluation approval or as a stand-alone review, where the applicant has agreed to payment of the LA's hourly rate.

   d. In all cases, the designer will discuss the monitoring plan ahead of time with the LA, and provide the LA with a map showing the number and location of monitoring wells.

4. Groundwater Observation Period

   a. The groundwater observation period is November through April.

   b. The LA may allow the designer to install and initiate observation of monitoring wells after November, on a case-by-case basis, provided there is reasonable likelihood that maximum groundwater elevations may still be observed during the remainder of the groundwater observation period.

5. Collection of Rainfall Data

   a. Observation data shall be collected by the designer at least every two weeks during the monitoring period;

   b. Additional readings shall be taken by the designer within 2 days following a significant rain, such as when there has been 1 or more inches of rainfall within a 24-hour period;

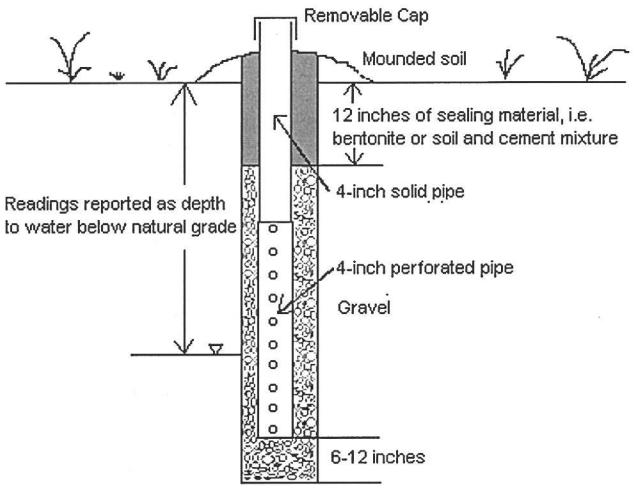
   c. Daily observations by the designer may be necessary during elevated groundwater periods to identify maximum groundwater levels;

   d. Confirmatory observations will be made periodically by the LA.

6. Monitoring Well Design

   a. Monitoring well depth should be equal to or greater than the required depth to groundwater necessary for project approval. The usual depth is eight (8) feet.

   b. Monitoring well design should generally be as shown in this diagram. Holes will be constructed using an auger and 4-inch diameter pipe shall be used. However, approval of alternate designs will be considered on a case-by-case basis by LA staff.



   c. Monitoring wells must be staked and flagged so that they can be readily located by LA staff.

7. Certification Criteria

   a. Rainfall Data Source

   Unless the designer justifies another source of rainfall data acceptable to the LA, the following site will be used for tracking daily and monthly rainfall and for determining average rainfall:

   http://www.cimis.water.ca.gov/cimis/info.jsp

Note: The California Irrigation Management Information System (CIMIS) is a program in the Office of Water Use Efficiency (OWUE), California Department of Water Resources (DWR) that manages a network of over 120 automated weather stations in the state of California. CIMIS was developed in 1982 by the California Department of Water Resource and the University of California at Davis to assist California's irrigators manage their water resources efficiently.

b. Minimum Rainfall for Certification

(1) Minimum rainfall shall be 80% of average for the observation months of November through April for sites where, based on geographical location, absence of restrictive layer, and absence of visual evidence of seasonal water table, there appears to be 24 inches or more of effective soil.

(2) Low Rainfall Years

(i) Lower rainfall years will normally not be certified. However, during multiple years of low rainfall, a secondary data source may be considered. After completion of at least one groundwater observation period (normally November through April) that does not reach the average rainfall requirement for certification, an applicant may submit, for consideration by the Regional Board and the LA, a complete groundwater report prepared by a certified engineering geologist or by a certified hydrogeologist.

(ii) The report should contain supporting data for groundwater elevation conclusions and include an analysis of expected maximum groundwater elevations for the proposed dispersal site. Elements of the report will include:

- Topographical and geographical characteristics of the site, including slope of the land, that could affect surface and subsurface drainage characteristics;
- Soil classification and hydraulic conductivity of the soil;
- Presence of restrictive layers in the soil profile;
- Presence of visual indication of seasonal groundwater (e.g. soil mottling) within the soil profile;

- Historical rainfall patterns and relationship to groundwater monitoring observations; and
- Depth of observed groundwater in relationship to minimum soil depth requirements and proposed depth of trenches.

(iii) The Regional Board, in consultation with the LA, must approve groundwater reports in order to determine that groundwater monitoring requirements have been met.

8. Determination of Maximum Seasonal Water table Elevation

a. Maximum seasonal water table is the highest level of groundwater determined to be the characteristic level for the groundwater monitoring well, based on a series of observations recorded by the certified designer and verified by representative quality control observations of the LA. To assure consistent correlation of LA and certified designer measurements, the designer will notify the LA within 24 hours of observing high seasonal water table in monitoring wells.

b. Seasonal groundwater levels are known to temporarily spike in some monitoring wells after periods of heavy rainfall. This will be allowed to occur in a limited manner (within tolerance limits) without affecting the groundwater level determined to be the characteristic level for the monitoring well, provided the following conditions are met:

(1) The groundwater level spikes must not occur at any time above the depth proposed for the dispersal field (with the exception as noted in the table, below; and

(2) The number of days in which the groundwater is above the characteristic level must not exceed that which is shown on the following table:

Rainfall as % of Average Annual Rainfall	Tolerance for Groundwater Exceeding Characteristic Level (# days within 30 day period)	
	< 5% Slope	5%+ Slope
80% - 110%	2	2
110% - <130%	7	2
130% - <200%	14	2
200%+	21(*)	2

(*) Special Exception: Groundwater may rise to a level above the proposed bottom of the dispersal field for up to 2 days.

c. Groundwater monitoring results will be determined to be unsatisfactory when the characteristic level of the seasonal water

table does not meet minimum Sutter County soil depth requirements.

F. Percolation Testing

Percolation tests may be performed by an authorized professional to provide additional information on appropriate effluent application rate during the site evaluation process at the discretion of either the LA or the designer and when soil conditions warrant. When percolation tests are utilized the following requirements will apply:

1. Test hole preparation requirements
   a. Unless otherwise indicated by the LA, there shall be a minimum of 3 percolation test holes within the initial disposal area and 3 percolation test holes in the replacement area. Additional test holes may be required by the LA to completely identify a suitable area.
   b. Percolation test holes shall be 6 inches in diameter.
   c. Unless otherwise approved by the LA, the test hole bottom depth shall be 18" deeper than the proposed drainfield trench bottom depth and within the most restrictive strata of useable soil beneath the dispersal field.
   d. The percolation test hole sidewall in the test section should be roughened to remove any smearing or compaction caused by the hole excavation process. All loose soil shall be removed and 2 inches of pea gravel or other material approved by the LA shall be placed in the bottom of the hole.
2. Presoak requirement

   The hole shall be filled with clean water to a minimum depth of 12 inches above the base of the hole. The presoak shall be maintained for a minimum of 24 hours.
3. Test measurement requirements
   a. Percolation tests shall be measured to the nearest 1/16-inch from a fixed point.
   b. The percolation test shall begin within 4 hours following completion of the presoak. Adjust the water level to 6 inches over the pea gravel bottom and begin the test. This may require adding or removing water to adjust the level.
   c. Readings shall be taken at 30-minute intervals. Refill as necessary to maintain 6 inches of water over the pea gravel bottom at each interval. The last 30 minute interval is used to compute the percolation rate. If 4 inches or more of water seeps from the hole during the 30 minute interval, readings may be taken at 10 minute intervals. Readings shall be taken until 2 consecutive readings do not vary by more than ten percent per reading with a minimum of 3 readings. The last 10 minute interval is used to compute the percolation rate.

Chapter 2. Construction Permit

A. Application

1. Construction Permit applications will only be accepted when determined by the LA to be complete, including the following information:
   a. All portions of application form completed and legible
   b. Complete system design attached, including site plan
   c. Payment of all applicable fees
2. The LA will refer to the Public Works division, any site where it is noted by the applicant that more than one acre of soil disturbance and/or more than 1,000 cubic yards of grading will take place.

B. System Design

1. LA application form must be used to facilitate design review
2. All required drawings and sketches must be included
3. This portion of the design requires three items that show sufficient detail to allow the design to be reviewed and the system to be installed. Plot plans, design details, and cross-sections may be combined on one or more design sheets, provided there is sufficient detail and clarity to specify components, dimensions, spacing, and setbacks as outlined in the design checklists.
   a. Scaled Plot Plan

      This drawing shows the placement of the septic system in relationship to the overall development plan for the property. The plot plan must match the building permit plot plan (the same sketch is accepted by the building department for their application), and should verify that the system can be installed in conformance with setbacks and site limitations.

   b. Scaled Layout Sketch Detail

      This item shows the detail of the drainfield layout and details of the system design. The layout detail is intended to be a close-up of the portion of the plot plan where the septic system is located.

   c. Cross-Section Detail

      This item shows the depth from original grade of the septic system components. The cross-section is intended to be used both as a guide for system construction and as verification that vertical separation and component depths meet code.
4. All plans must be signed and dated by the designer for pressure distribution or supplemental treatment systems.
5. A project may be referred by the LA to the Central Valley Regional Water Quality Control Board for consultation or for regulatory oversight if the Health Officer determines that additional technical assistance or regulatory oversight is warranted due to the unique characteristics of the project or site characteristics.

C. Notification, Inspection, and Final Approval

1. The installer must contact the LA and system designer to make arrangements for an inspection of the system construction. The system must then be left open for a maximum of two working days, allowing the installation to be inspected by the designer and the LA.

2. The installer will leave a signed as-built drawing at the site in a sealed, zip lock plastic bag. The LA will use the checklist on the as-built form for their inspection and approve or deny cover of the system based on the LA's assessment of the installation.

3. The system installation will be verified as complete and within current code, and will be given final approval by the LA, when all the following actions have taken place:

   a. An as-built drawing signed by the installer and provided to the LA.

   b. The designer (if one was used) verifies that the system was constructed in substantial conformance with the design.

   c. If Supplemental Treatment is required:

      (1) The designer has provided the homeowner with a system Operation, Monitoring, and Maintenance Manual.

      (2) The homeowner has recorded the ongoing need for periodic monitoring and inspections on the property deed.

D. System Repairs, Replacement, Modifications, Expansions, and Septic Tank Destruction

1. When Construction Permit Required

   a. Construction Permits are required to repair or significantly modify existing on-site wastewater systems, or to destroy a septic tank. However, these permits are not required for servicing or replacing installed mechanical or electrical parts of the systems, including:

      (1) Float switches

      (2) Pumps

      (3) Electrical boxes

      (4) Sanitary tees in the septic tanks

      (5) Minor structural corrections to the tank

      (6) Repair/replacement of the distribution box, or repair/replacement of the sewer line from the tank to the distribution box.

   b. Other than replacement of septic tank inlet and outlet T's or replacement of septic tank access lids, LA Notification and Plan Review must take place BEFORE the service is performed.

2. When Elements of Site Evaluation Required

   Unless sufficient site information is available to the LA, supplemental site information, such as soil analysis data will typically be required for on-site wastewater system expansion, relocation, repair or replacement.

3. Special Considerations for System Repairs

   a. A failing system must be repaired as soon as reasonably possible.

   b. If an immediate repair cannot be accomplished, the LA may allow a delay in making the repair. In this case, an enforcement order will be issued and the LA will specify temporary measures required to eliminate any immediate public health hazard or pollution of ground or surface waters.

Chapter 3. Testing Septic Tanks to Assure Watertight Construction

A. New Construction or Tank Replacement

1. All new tanks must be certified by the manufacturer to be watertight, allowing no more than 1% liquid volume loss over a 24 hour period.
2. All tanks must be tested after installation to be watertight by the following process:
   a. Install risers
   b. Install and cap inlet and outlet fittings
   c. 24 hour pre-soak for concrete tanks
   d. Fill tank a minimum of 2 inches into the riser and mark water surface level on the riser
   e. Return after 24 hours. If there has been no measurable drop of the liquid volume of the tank, then the tank has passed the inspection.

Part Two: Materials

Chapter 1. Building Sewer

The building sewer must be constructed with materials in conformance to building sewer standards identified in the California Plumbing Code. The building sewer pipe must have a minimum diameter of three (3) inches.

Chapter 2. Septic Tank

A. General criteria for septic tanks

1. Tanks must be constructed of precast reinforced concrete or other material approved by the LA. Wood and metal tanks are prohibited. Cast-in-place and fiberglass may be considered on a case-by-case basis provided there is adequate engineering justification and provided they meet the requirements outlined in this Manual. Polyethylene and polypropylene tanks that meet the International Association of Plumbing and Mechanical Officials (IAPMO) standard IAPMO/ANSI Z1000 (standard for design, material, performance testing, and marking) are approved by the LA, unless otherwise noted.
2. Tanks must have the manufacturer's name and tank capacity in gallons permanently displayed on the uppermost portion of the tank. If the tank is constructed of fiberglass, polyethylene, or polypropylene then the model number must also be displayed.
3. Tanks must be protected against flotation under high ground water conditions.
4. Tanks must be approved by the International Association of Plumbing and Mechanical Officials (IAPMO) or meet IAPMO minimum standards as demonstrated to the LA by a certification program equivalent to that provided by IAPMO with the following program elements:
   a. Evaluation and certification by an engineering firm, approved by the LA, with expertise and experience related to septic tank design and construction, to verify substantial equivalency with IAPMO standards and compliance with the requirements of this Manual as pertaining to:
      (1) Structural design of the tank;
      (2) Quality of materials used in construction of the tank;
      (3) Acceptable construction methods and practices;
      (4) Quality control and quality assurance plan proposed by the manufacturer;
   b. Unannounced inspection of manufacturer's facilities and observation of construction methodology by a qualified third party approved by the LA to assure compliance with the items listed above;

c. Reciprocity:

(1) A certification program of tanks by another oversight agency in a manner substantially equivalent to that which is outlined in this Manual may be accepted by reciprocity;

(2) Reports generated from unannounced inspections conducted by a qualified independent third party on behalf of another oversight agency may be accepted by the LA provided the certification requirements of the other oversight agency are substantially equivalent to that which is specified in this Manual.

d. All associated costs shall be borne by the manufacturer requesting the alternative certification process.

5. Tanks must be covered by a Manufacturer's Guarantee for a minimum period of five years and be installed in strict accordance with the manufacturer's instructions.

6. Tanks must be constructed and installed so as to be watertight. Septic tanks for new construction must be verified as watertight through manufacturer certification and in situ testing. Testing methods are described in Part 1 of this Manual.

B. Configuration

1. The tank must be designed to ensure removal of settleable solids. To accomplish this, the tank must provide:

a. Liquid volume as specified in Part 3 of this Manual. This is to allow sufficient retention time for treatment and sufficient sludge storage space to prevent the discharge of sludge or scum into the drainfield.

b. Inlet and outlet sanitary "T"s to prevent the discharge of sludge or scum in the effluent.

c. Venting provisions to allow for the escape of accumulated methane and hydrogen sulfide gases.

d. Inlet sanitary "T" must be extended to penetrate at least 12 inches into the liquid from the inlet flow line. If the submerged scum depth is expected to be greater than 12 inches, the inlet fixture should be extended into the liquid two inches below the expected lowest scum depth.

2. Septic tanks must have a minimum of two compartments. Installation of multiple single compartment tanks in a series is not acceptable, unless approved by the LA prior to installation. The first compartment must have a liquid capacity of two-thirds (2/3) of the total required liquid capacity, as measured from the invert of the outlet fitting.

3. Each compartment must have access provided by a manhole having not less than eighteen (18) inches across its shortest dimension unless otherwise approved by the LA.

4. At least ten (10) percent of the inside volume of the tank must be above liquid level to provide scum storage.

C. Structural Integrity

All treatment units and tanks, regardless of material or method of construction shall:

1. Be designed and constructed to withstand all potential lateral earth pressures under saturated soil conditions with the tank empty.
2. Pass Top Load = 300 psf (the tank shall be capable of supporting long-term unsaturated soil loading in addition to the lateral hydrostatic load.)
3. Pass Lateral Load = 62.5 pcf (the tank shall be capable of withstanding long term hydrostatic loading with the water table maintained at ground surface.)
4. Have a minimum live load at the surface of 300 pounds per square foot with twelve (12) inches of cover unless heavier loads are expected. For heavier loads, (i.e. vehicles), proof of traffic rating is required.
5. Successfully withstand an above ground static hydraulic test if the tank is 2,000 gallons or smaller.
6. Precast concrete tanks must have a minimum wall, compartment and bottom thickness of three (3) inches, and must be adequately reinforced. The top must be at least four (4) inches thick.
7. Tanks must be built such that all construction joints are sealed watertight and bonded together in a structurally sufficient manner to prevent separation as certified by the manufacturer's registered engineer.

D. Risers

1. Each compartment must be provided with a concrete (or other material approved by the LA) watertight riser, extending to the finished grade or above, with a minimum inside horizontal measurement 24".
2. All joints must be properly sealed with a sealant and/or an interlocking mechanism approved by the LA. Cement grout sealing alone is not an acceptable method of sealing joints.
3. Surface water must be diverted away from the riser cover by creating a sloping surface away from the riser, or extending the riser two (2) inches above finished grade.
4. The cover must be securely fastened with stainless steel or other corrosion resistant fasteners to make the riser vandal, tamper, and child resistant. No cover may exceed seventy-five (75) pounds.

Chapter 3. Fittings

A. The inlet and outlet fittings must be of Schedule 40 PVC, Schedule 40 ABS, or other materials approved by the LA, with a minimum diameter of three (3) inches.

B. All fittings must be secured with a sealant approved by the LA and must be constructed so as to be watertight. Tank fitting locations must be properly engineered to ensure the structural integrity of the tank.

C. The inlet fitting must be a sanitary "T" with minimum pipe diameter not less than the connecting building sewer or less than three (3) inches. It must extend at least four (4) inches above and twelve (12) inches below the liquid level.

D. The outlet fitting must be a sanitary "T" with minimum pipe diameter no less than the connecting influent sewer pipe and not less than four (4) inches in order to accommodate an effluent filter. The outlet fitting must extend at least four (4) inches above liquid level and below liquid level a distance approximately equal to the flow level through the baffle separating the two compartments of the tank. The diameter of the vertical leg extending below the liquid level must not be less in size than the building sewer nor less than four (4) inches.

E. An effluent filter prior to discharge of the effluent to the effluent sewer. It must be commercially designed and manufactured, intended for effluent filtration, and be readily accessible for inspection and cleaning.

F. The invert of the inlet fitting must not be less than one (1) inch and preferably three (3) inches above the invert of the outlet fitting.

G. Sanitary "T"s must be accessible and directly below the manhole access riser.

H. Baffles must be a three (3) inch or larger diameter "T" fitting or baffle slot (with the same opening area as the fitting) that is located in the shared compartment wall, using the same material specifications as required for the outlet fitting. The invert of the "T" fitting or baffle slot must be located approximately at fifty (50) percent of the liquid depth. There must be a minimum two-inch vent opening in the baffle above the liquid level. The baffle must be constructed of the same material as the tank and extend a minimum of four (4) inches above the liquid level.

Chapter 4. Distribution Box

A. Distribution boxes must be constructed of concrete or other materials acceptable to the LA.

B. Distribution boxes must be designed to accommodate the necessary distribution laterals and expected flows. The top, walls, and bottom of concrete distribution boxes must be at least one and one-half (1-1/2) inches thick.

C. Distribution boxes must be installed for equal distribution to the drainfield trenches.

D. Each distribution box must be provided with a means of adjustment for equal distribution.

E. For initial use of a manufacturer's distribution box design proposed for use in Sutter County, or when a revised box design is proposed for same, the commercial manufacturer of the prefabricated box must provide the LA with written documentation that the box design, materials and construction comply with all requirements of the California Plumbing Code.

F. All distribution boxes must be installed level on LA-approved bedding material and as described in Part 3 of this Manual.

Chapter 5. Diversion Valve

A. Diversion valves must be constructed of durable material and be of a design approved by the LA. They must be corrosion resistant, watertight, and designed to accommodate the inlet and outlet pipes.

B. Each diversion valve must have a positive stop.

C. For initial use of a manufacturer's diversion valve design proposed for use in Sutter County, or when a revised valve design is proposed for same, the commercial manufacturer of the prefabricated valves must provide the LA with written documentation verifying that the valve design, materials and construction comply with all requirements of the California Plumbing Code.

Chapter 6. Dosing and Pump Tanks

A. The tank may be:

1. A separate tank meeting the requirements specified in this manual.
2. The second compartment of a two compartment septic tank when approved by the LA provided:
   a. The septic tank is a minimum of 1,000 gallons;
   b. The wall separating the two compartments of the tank is equipped with a properly placed sanitary "T" to prevent the discharge of sludge or scum into the second compartment that is utilized as the pump chamber, or with a flow-through port. If a sanitary "T" is utilized, the tank must have an access lid over the "T" to allow servicing;
   c. The wall separating the two compartments has the structural integrity to allow the first compartment to remain full while the second compartment is empty.

B. Each dosing tank employing one (1) or more pumps must have a liquid capacity sufficient to deliver the design dose, and have a minimum additional capacity of one half day's design flow between the high level alarm and the tank's inlet.

C. Each dosing tank must be marked on the uppermost surface with the liquid capacity and manufacturer's business name, or a number assigned by the LA.

D. When a revised tank design is proposed, the manufacturer of the tank must provide the LA with written documentation that the tank design, materials and construction comply with all requirements of the California Plumbing Code. The manufacturer must provide a set of plans and specifications prepared by a registered professional engineer for each tank design and a set reflecting any subsequent revisions. The appropriate fee must accompany plans.

E. Any pump tank transporting effluent or solids to a septic tank must have its own penetration into the tank with a 3-inch minimum diameter sanitary "T." Because effluent entering the septic tanks should not do so under pressure that could cause turbulence in the septic tank, the pressure line from the dosing/pump tank needs to connect to the larger diameter pipe at least 10 feet before entering the septic tank.

Chapter 7. Pumps, Controls, and Alarms

Electrical components used in systems must comply with the Uniform Electrical Code, and the following provisions:

A. Motors must be continuous-duty, with overload protection.

B. Pumps must have durable impellers of bronze, cast iron, or other materials approved by the LA.

C. Submersible pumps must be provided with an easy, readily accessible means of electrical and plumbing disconnect, and a noncorrosive lifting device as a means of removal for servicing.

D. Pumps must be automatically controlled with mechanical switches designed for use with pumps and control panels.

E. Pumps must have automatically resetting audible and visual high water level alarm with manual silence switch that is located in or near the building served by the pump. Only the audible alarm may be user cancelable. The electrical box for the pump and alarm system must not be located in an environment that may damage the components.

F. Wiring must be of proper construction and gauge and permanently fixed to a supporting structure under permit from the local Administrative Authority.

G. The pump and alarm must be connected to separate circuits at the electrical supply panel.

H. There must be a non-resettable digital pump cycle counter or time in the control box.

I. There must be a manual override switch in the control box to facilitate dosing control during inspections.

Chapter 8. Pipe

A. All pipe throughout the wastewater system must be clearly labeled and installed so that the labeling can be readily identified by LA inspectors. Labeling, consisting of durable ink, must cover at least 50% of the length of the pipe. Labeling may consist of a solid line, letters, or a combination of the two. Intervals between markings must not exceed 12 inches.

B. Schedule 40 ABS or equivalent must be used from the house to the septic tank

C. Schedule 40 ABS or SDR 35 (ASTM D 3034) must be used as follows:

1. From the septic tank to the distribution box (if applicable)
2. From the distribution box outlet for a minimum of 5 feet
3. From the septic tank to the pump chamber (if applicable)

D. Gravity Distribution (leachline) Dispersal

1. One of the following grades of 4-inch perforated pipe must be used:
   a. SDR 35 (ASTM D 3034) 4-inch diameter
   b. Triple Wall ASTM F810
2. Gravelless chambers may be used provided the products meet IAPMO standard PS-63.
3. The pipe described in subsection D.1. of this section must have 2 rows of holes spaced 120 degrees apart and 60 degrees on either side of a centerline. The holes of each row must not be more than 5 inches on-center and must have a minimum diameter of one-half inch.

E. Pressure transport pipe, pressure distribution manifolds, and pressure distribution laterals (piping and fittings), must meet the most current requirements for schedule 40 PVC pressure pipe as identified in ASTM Specifications D-1785, or other material approved by the LA. All pressure distribution laterals and all

pressure transport and manifold piping must be adequately sized for the design flow.

F. Curtain drain pipe must meet the requirements specified in the Manual for gravity drainfield pipe. Other types of pipe may be approved by the LA, provided it can be demonstrated that the selected pipe has the structural strength for the application proposed.

Chapter 9. Drainrock

A. Gravel used for drainrock must be ½ inch to 2½ inches in diameter. Uniformly graded material is recommended to maximize pore space. Drainrock must be clean, washed, non-deteriorating gravel, with the percent by weight passing the U.S. No. 200 sieve no greater than 0.5%. Alternatives to drainrock, as described in this Chapter, may be accepted on a case-by-case basis.

B. Gravelless systems are allowed provided the requirements for such systems as described in Part Three of this Manual are followed.

Chapter 10. Barrier Material

A. Untreated building paper (40-60 lbs.) or two inches of compacted straw may be used for standard gravity systems.

B. Filter fabric must be used for non-standard gravity systems and must meet or exceed the specifications described in the following table:

Property	Requirement	Test Method
Grab Strength	80 lbs.	ASTM D4632
Puncture Strength	25 lbs.	ASTM D4833
Trapezoid Tear	25 lbs.	ASTM D4533
Apparent Opening	AOS < 0.297 mm, or > #50 US Standard Sieve	ASTM D4751
Size	> #50 US Standard Sieve	
Permeability	0.4 cm/sec for Soil Types 1,2 0.004 cm/sec for Soil Types >2	ASTM D4491

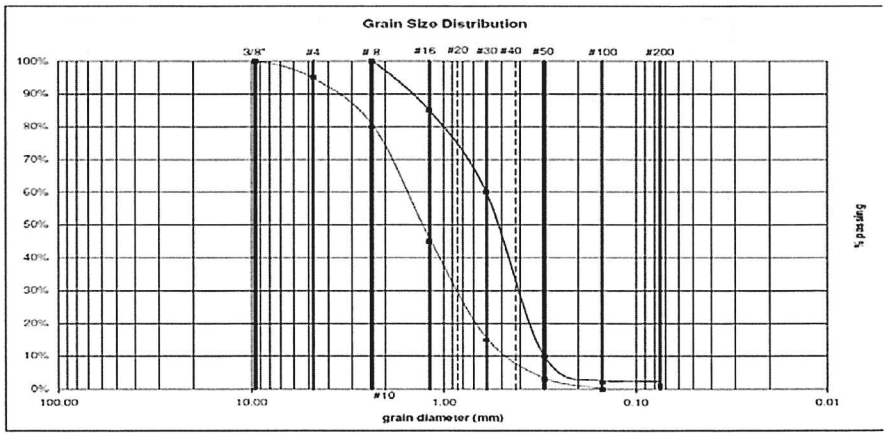
[1] Examples of filter fabrics meeting this specification include: Mirafi 140 NSL.

Chapter 11. Bundled EPS Synthetic Aggregate

A. As substitute for pipe, drainrock, and barrier material, Bundled Expanded Polystyrene (EPS) Synthetic aggregate meeting IAPMO standard IGC 276 may be used for wastewater dispersal. Units are cylindrically shaped; having a seamless external permeable netting that contains EPS synthetic aggregate. A geotextile is pre-inserted between the EPS synthetic aggregate and netting as a barrier material to overlying soil. At least one bundled EPS synthetic aggregate unit in the configuration shall include an internal 4-inch pipe. The internal pipe shall comply with ASTM F405.

B. Bundled EPS synthetic aggregate shall be H-10 rated. Units may contain a plastic pipe for longitudinal conveyance of water.

C. EPS synthetic aggregate participles shall be relatively



uniform in shape and size. The aggregate particle size may range from 0.5 inches to 2.0 inches along any axis. EPS synthetic aggregate must provide a minimum porosity of 30%.

Chapter 12. Single-Pass Sand Filter and Mound System Filter Material

A. All filter materials used in single-pass sand filters and mound systems must fall within the limits of the specifications shown in the following graph for the amounts of material retained/passing (by weight). This specification closely follows the ASTM C-133 concrete sand specification.

B. The material must also have a uniformity coefficient of 4 or less. The uniformity coefficient is calculated by dividing D60 (the size of screen opening where 60 percent of a sample passes and 40 percent is retained) by D10 (the size of screen opening where 10 percent of a sample passes and 90 percent is retained). For sands with a D10 less than 0.3 mm, the designer should consider a loading of no greater than 1.0 gallon/square foot-day, and specify frequent dosing. A sieve analysis, (done in accordance with ASTM D 136 for dry product, or ASTM C-117 for wet product), of the material is required prior to transport to the construction site.

C. A report of the sieve analysis and on-site analysis results must be available for the LA prior to system approval and for inclusion in the system's permanent file.

Chapter 13. Containment Vessel for Intermittent Sand Filter

A. Lined Pit: when a sand filter is constructed in an excavated pit the following criteria are to be met.

B. Unsupported polyvinyl chloride (PVC) shall have the following properties:

Property	Test Method	
Thickness	ASTM D1593 Para 9.1.3	30 mil minimum
Specific Gravity (Minimum)	ASTM D792 Method A	
Minimum Tensile Properties (each direction)	ASTM D882	
(A) Breaking Factor (pounds/inch width)	Method A or B (1 inch wide)	69
(B) Elongation at Break (percent)	Method A or B	300
(C) Modulus (force) at 100% Elongation (pounds/inch width)	Method A or B	27
Tear Resistance (pounds, minimum)	ASTM D1004 Die C	8
Low Temperature	ASTM D1790	-20°F
Dimensional Stability (each direction, percent change maximum)	ASTM D1204 212°F, 15 min.	± 5
Water Extraction	ASTM D1239	-0.35% max.
Volatile Loss	ASTM D1203 Method A	0.7% max.
Resistance to Soil Burial (percent change maximum in original value)	ASTM D3083	
(A) Breaking Factor		-5
(B) Elongation at Break		-20
(C) Modulus at 100% Elongation		±10
Bonded Seam Strength (factory seam, breaking factor, ppi width)	ASTM D3083	55.2
Hydrostatic Resistance	ASTM D751 Method A	82

C. Concrete Containment Vessel: to be designed and/or approved by a qualified professional engineer if the following conditions are not met.

1. Above ground tank

   a. Walls

      (1) At least 6 inches thick

      (2) 4 feet or less in height

      (3) Rebar reinforcement: 3/8 inch diameter rebar on 2-foot centers horizontally and vertically, with continuous lengths wrapped around the corners.

   b. Floor

      (1) At least 3 1/2 inches thick

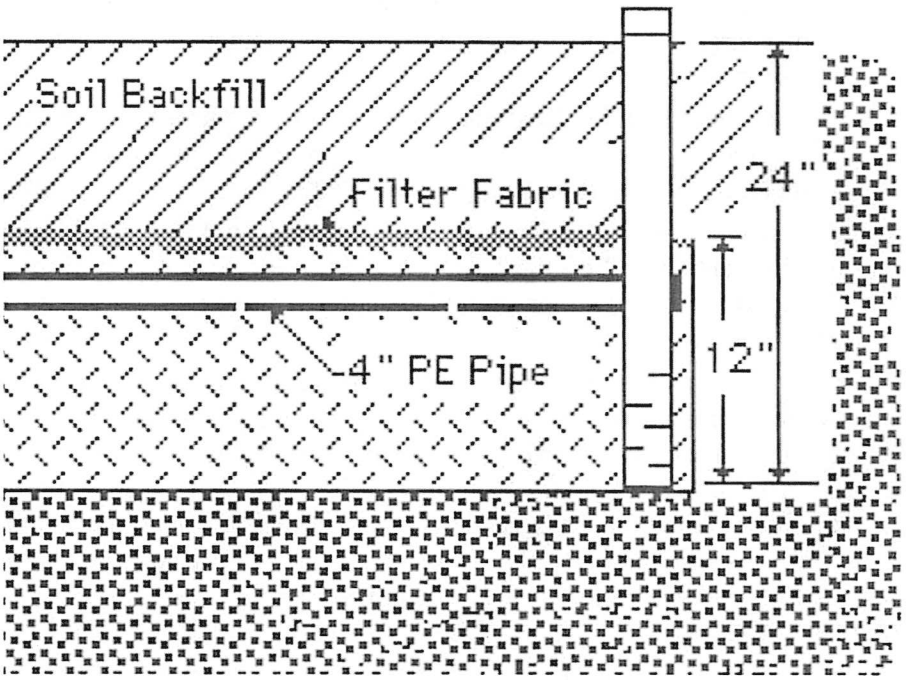
      (2) Reinforced with steel mesh (CRSI standard #6-1010) to prevent cracking and to maintain water-tightness

   c. Tank is to be designed, constructed, and sealed to be water-tight.

2. Below ground tank

   Any below ground concrete tank must be watertight. The design of any such tank is to be approved by a qualified professional engineer and meet the specifications of this Manual.

Chapter 14. Observation Port Design



Part Three: System Requirements

Chapter 1. General Requirements

These general requirements apply to all onsite wastewater systems, unless otherwise specified within this Manual.

A. Wastewater Strength

1. Domestic strength wastewater, for the purpose of this Manual, is wastewater with the following characteristics:
   a. Total suspended solids (TSS) <150 mg/L
   b. Five-day Biochemical Oxygen Demand (BOD) <230 mg/L
   c. Fats, Oils, and Greases (FOG) <25mg/L
2. Unless otherwise demonstrated by an Authorized Professional, significant amounts of recreational vehicle holding tank wastes, when discharged in a concentrated and undiluted volume, such as at a commercial RV dump station, shall be considered high strength waste and is prohibited. Significant amounts mean amounts greater than incidental dumping such that the volume, frequency, overall strength or chemical additives preclude definition as residential sewage.
3. Wastewater strength exceeding the characteristics noted above must receive pretreatment sufficient to lower the waste strength to the level of that commonly found in domestic residential septic tank effluent before discharge into a standard gravity or supplemental treatment wastewater system.
4. The Central Valley Regional Water Quality Control Board will be notified by the LA whenever the LA approves a pretreatment system or methodology for high strength wastewater.

B. Table V provides minimum vertical separation and Table IV provides application rate requirements based on the USDA soil texture classification system in Table II. Soil textural classification should be considered the primary data source for system sizing.

C. Seasonal groundwater monitoring will be required by the LA for on-site wastewater systems whenever soil coloration (redoximorphic features) indicates the seasonal groundwater level may be elevated to within twenty four inches of the required vertical separation, or where other factors, including but not limited to soil maps, historical observations, vegetation, or topography indicate that elevated seasonal groundwater may be present. Further information about seasonal groundwater monitoring is found in Section 700-120 and Part 1 of this Manual.

D. Percolation testing and Particle size analysis should be considered a source of supplemental information for system sizing.

E. Soils that percolate at a rate of 1-10 mpi require at a minimum pressure distribution and are not to be permitted by the LA unless there is demonstration of adequate filtration capacity by utilizing design features including, but not limited to:

1. Use of supplemental treatment systems, including the single-pass sand filter;
2. Use of pressure distribution or subsurface drip irrigation for dispersal;
3. Reduction in application rate of wastewater to the dispersal field, beyond that which is specified in the Manual;
4. Increase in vertical separation, beyond that which is specified in the Manual; and
5. Increase in horizontal setback distances to wells and/or surface water to that which is specified in this Manual.

F. When sizing by soil group and more than one soil group is encountered within a soil profile, drainfield trench sizing must be based on the most restrictive soil group encountered within 24 inches from the bottom of the drainfield trench. When calculating the required lineal feet of the dispersal field, only the trench bottom area may be considered.

G. When a soil group has been determined by particle size analysis and the result places the determination closely on the border of two soils types, as determined by the USDA Soil Conservation Services soil classification system, an alternative application rate between the soils types may be proposed for systems designed by an authorized professional.

H. The LA may allow up to a 20% reduction in drainfield sizing based on inclusion of a portion of the trench sidewall area for determining absorptive area when pressurized distribution is utilized. The base from which the reduction would be made is the size of the system calculated from trench bottom only utilizing the application rates associated with soil classifications in Table IV.

I. Reserve Area. A reserve area with suitable site conditions for a new dispersal system installation must be set aside. The reserve area must be:

1. Equal to 100 percent of the capacity required for a replacement dispersal system
2. Totally separate from the initial dispersal system area,
3. Able to meet all current design requirements for the type of replacement system proposed, including soil depth, soil type, slope restrictions, and setbacks, etc.
4. Fully protected to prevent damage to soil and any adverse impact on the immediate surroundings that may affect the installation of the replacement dispersal system or its function

J. Systems must be designed to disperse effluent to subsurface soils in a manner that provides unsaturated zone treatment and aerobic decomposition of the effluent. The base of the dispersal system must be designed and installed at the shallowest practicable depth at or below the original elevation of the soil surface to maximize elements critical to effective treatment of effluent in the soil. Elements critical to effective treatment includes oxygen transfer, biological treatment, and vegetative uptake of nutrients.

K. The minimum liquid capacity of any septic tank installed must be as specified in Section 700-150 F (2) (3).

L. Where the site evaluation reveals the probable existence of slope instabilities within 50 feet of the primary or repair dispersal field areas, the LA will require a Registered Geotechnical Engineer or Registered Civil Engineer inspect the site

and recommend mitigation measures to prevent slope instabilities form impacting the on-site wastewater system. Such measures may include, but are not limited to, the following:

1. Altering the proposed system location to avoid steep slopes and/or slope instabilities;
2. Establishing specified recommended setbacks from identified slope instabilities or from steep slopes; and
3. Incorporating wastewater system design measures to minimize the creation of localized saturated flow conditions, such as pressure distribution or subsurface drip irrigation instead of gravity flow.

M. For on-site wastewater systems located within a 100-year flood zone, the LA will require the authorized professional to include a special design analysis and design features to prevent caused by inundation with water. The analysis and design features must include:

1. Protection of supplemental treatment, pressure distribution, and subsurface drip irrigation components; and
2. Prevention of discharge of wastewater into flooded dispersal areas from pumps or dosing siphons where the distribution piping is less than 12 inches below ground surface.
3. The horizontal setbacks shown in Table I will apply to all new on-site waste water systems unless otherwise specified in this manual.

Chapter 2. Design Flow

A. Projected daily sewage flow from single family residences must be calculated at 130 gallons per bedroom.

B. Projected daily flows for other than single-family dwellings shall be estimated using section 700-150 B (2) unless, on a case-by-case basis, the LA approves metered water use data, or other supporting data in lieu of the estimated sewage flows set forth in the table. However, in no case shall a system be designed for a flow of less than 130 gpd. Existing data may be used, provided the following specifications are met:

1. The design flow may be calculated by actual potable water meter readings, or facility wastewater influent or effluent meter readings if water records are from billing records of the service provider or from water meters certified to be within 2% by the water purveyor or, in the case of wastewater metering, the meter read values are certified as "correct" by a certified designer.
2. The average daily flows shall be adjusted for peak flow days as follows:
    a. If the water meter records are recorded on a daily basis, the highest ten day flows can be averaged and used for the design flow.
    b. If the water meter records are recorded on a weekly basis, the design flow shall be calculated by dividing the number of days the facility was in use into the highest weekly flow, and multiplying by 1.2
    c. If the water meter records are recorded on a monthly basis, the design flow shall be calculated by dividing the number of days the

facility was in use into the highest monthly flow, and multiplying by 1.5.

d. If the water meter records are recorded on a quarterly basis, the design flow shall be calculated by dividing the number of days the facility was in use into the highest quarterly flow and multiplying by 2.0.

3. Design Flows

a. Most current adopted version of the Plumbing code or other recognized source approved by the LA.

Chapter 3. Installation

A. Septic tanks must be installed on a level, stable base of either pea-gravel or sand.

B. Septic tanks located in high groundwater areas must be accompanied with engineered anti-buoyancy calculations to prevent flotation.

C. All septic tanks must be installed with watertight risers extending to finished grade, with surrounding grading to facilitate drainage away from the riser.

D. Septic tanks must be installed in a location that provides access for servicing and pumping.

E. Systems will not be installed when moist or wet conditions cause trench sidewall or bottom area degradation of soil structure and porosity (which frequently appears as smearing and compaction).

F. Each drainfield trench will have distribution piping that is centered horizontally in the trench.

G. Drainfield trenches must be installed on contour.

H. Prior to backfilling the trench, the drain rock must be covered with filter fabric, a minimum of 2 inches of compacted straw or with untreated building paper.

I. Backfill must be carefully placed to prevent damage to the system.

J. Backfill must be approved soil free of large stones, frozen clumps of earth, masonry, stumps, waste construction materials, or other materials that could damage the system.

K. All distribution boxes must be bedded on level pea gravel or sand base.

L. Observation ports, of a design approved by the LA, must be installed at the end of each drainfield trench.

M. Adequate erosion control measures must be utilized at all times in conformance with applicable county regulations and per the consultant's design.

N. Slope of Lines

1. Tight line From House

Maintain 1/8 to 1/4 inch, depending on the size of the pipe as allowed by the most recent adopted Plumbing Code, drop per running foot (1% to 2% slope). Use two 45 degree fittings and a cleanout when a step-down is necessary. Locate step-down as close to house and as far from septic tank as possible to avoid unnecessary turbulence in septic tank.

2. Tight line From Septic Tank

Maintain minimum of 6 inch drop per 100 feet (0.5% slope) to perforated

drain lateral.

3. Perforated Lateral

   Level each lateral; maximum allowed tolerance will be ± 1 inch with a maximum grade of two (2) inches per one hundred (100) feet. Place an end cap on each lateral. Rotate each section of lateral pipe so holes are at 5:00 and 7:00 position

O. Whenever a trench excavation could act as a conduit for groundwater movement between system components, the trench must be back-filled with a minimum of 5 lineal feet of sufficiently restrictive material, such as clay, to prevent the flow.

Chapter 4. Septic Tank Destruction

A. Application

1. The application for a Destruction Permit may be obtained through the LA (Sutter County Environmental Health). The completed application needs to be submitted along with the required fee and a scaled site plan indicating the location of the existing septic tank(s) and current or known future structures.

B. Issuance

1. The Destruction Permit will be issued by the LA. The LA strongly recommends that all work be performed by a Licensed Contractor, although some work may be done by do-it-yourself property owners with prior LA authorization. All work must meet LA and Building Division requirements and pass inspection.
2. Obtaining the permit gives the LA oversight of the abandonment process to ensure that all structural requirements are met and that the Declaration of Septic Tank Destruction is submitted at the time of inspection.

C. Process

1. The septic tank must be pumped and certified empty by a Registered Septage Pumper.
2. If the tank is to be destroyed in place and is greater than 5' from any existing or future proposed structures, the person performing the work must ensure that the bottom of the tank is broken such that it is unable to hold water, and then filled with self-compacting soil, sand, or pea gravel. Should the person performing the work choose to fill the empty tank with 2-sack slurry, breaking the bottom of the tank is not required. Should the person performing the work choose to remove the tank, the excavation must be backfilled with clean self-compacting soil, sand, or pea-gravel.
3. If the tank is less than 5' from any existing or future proposed structures, a two-sack slurry mixture must be used to fill the tank; otherwise, a Professional Engineer must certify the destruction methodology utilized.
4. Arrangements for inspection of the system destruction must be made with the LA. In some instances, the Licensed Contractor may be able to submit electronic documentation of the destruction process in place of an on-site inspection.
5. The person performing the work must submit the Declaration of Destruction form provided.

Chapter 5. Standard Gravity Systems

Standard gravity systems are on-site wastewater systems consisting of a septic tank and a gravity distribution drainfield. Standard gravity systems, as used in this Manual, include those that utilize shallow trench depth, standard trench depth, or deep trench depth gravity drainfields. (Note: Deep trench drainfields requiring pressurized rather than gravity distribution may be found under other applicable requirements of this Manual.)

A. Site Requirements

1. Soils in the primary and replacement drainfield area will allow a vertical separation as required by Table V.
2. The site has not been filled or the soil has not been modified in a way that would adversely affect functioning of the system.
3. The site will not be on an unstable landform, where operation of the system may be adversely affected.
4. The site of the drainfield and replacement areas must not be covered by asphalt or concrete unless site constraints allow no other feasible alternative.
5. The site of the drainfield and replacement areas must not be subject to the activity associated with vehicular traffic, corrals, pens, arenas or other concentrations of livestock, or other activity which would adversely affect the soil or integrity of the system.

B. The slope of the ground in the drainfield and replacement areas will not exceed 30%.

C. Drainfield Excavation Requirements

1. Drainfield trenches must be constructed in accordance with the following standards, unless otherwise specified:
   a. Length maximum: 100 feet
   b. Bottom width minimum: 12 inches
   c. Bottom width maximum: 36 inches
   d. Depth: 6-24 inches
      (1) > 24 may be considered by the LA on a case by case basis
2. Minimum distance of undisturbed soil between drainfield trenches (inner sidewall-to-inner sidewall) must be 7 feet unless otherwise approved in 700-150 K.
3. There must be a minimum of 9 inches of backfill over the drain rock.
4. Drain rock will extend the full width and length of the drainfield trench. There must be at least 6 inches of drain rock under the distribution pipe and at least 2 inches over the distribution pipe.
5. A soil barrier must be placed on top of the drain rock to exclude fines from the drain rock. The barrier will consist of filter fabric meeting the minimum specifications outlined in this Manual, straw, or untreated building paper.
6. Inspection ports must be installed at the end of each drainfield trench as follows:

a. Each inspection port must extend to the finished grade or within an approve vault.

b. The ground surrounding the inspection port must be graded so that surface water does not accumulate adjacent to the port.

c. The inspection port must be capped to prevent vandalism and tampering.

d. Inspection ports must have a minimum diameter of four (4) inches.

D. Distribution

1. Level Sites

a. For two or more laterals use a distribution box.

b. Tie in the ends of the laterals to create a closed loop system when site conditions allow.

c. Level distribution boxes with water to assure even flow. Flow equalization devices are required.

2. Sloped Sites

a. Use a distribution box at the uppermost lateral and tight line from the distribution box to the beginning of the down slope laterals

E. Shallow Trench Systems

When the drainfield trench (measured at down slope sidewall) is excavated less than 24 inches into the original grade, the following additional requirements will apply:

1. Soil used for cover shall be a loamy material with less than thirty (30) percent clay content.

2. The drainfield area will have the vegetation removed and must be scarified, parallel to contours, no deeper than 2 inches at the time of construction.

3. Soil cap will extend a minimum of 5 feet beyond the exterior trench sidewall on the upslope side and 10 feet elsewhere.

4. The site must be contoured and seeded or landscaped in accordance with the approved construction plan and permit requirements in order to shed water, control erosion and to prevent surface drainage onto the system.

5. The site must be protected from the activity of vehicular traffic, corrals, horse arenas, stables, or other activities that could damage the system or the integrity of the soil.

F. Pump Systems

When a pump is utilized to enable gravity drainfield trenches upslope of the structure to be served, the following additional requirements will apply:

1. The pump chamber, pump tank, and/or dosing tank must meet the requirements specified in Section 700-150 G and Part Two of this Manual.

2. The pump intake must be provided with a screen.

3. The pump tank will have capacity sufficient to deliver the design dose and have a minimum additional storage capacity above the high level alarm of one-half the daily design flow so that, in the case of pump failure or power outage the tank has the capacity to accept a limited amount of wastewater from the residence or commercial establishment.

4. Each tank must be installed on a stable level base, generally consisting of 3 inches of pea gravel or sand.

5. Each pump tank must be provided with a watertight riser extending to the ground surface or above, with a minimum inside horizontal measurement of 24". Provision must be made for securely fastening the manhole cover.

6. Pump tanks in high groundwater areas must be weighted or provided with an anti-buoyancy device to prevent flotation as per the manufacturer's recommendation and as required in Section 700-150 G(5) and Part 2 of this manual.

7. Specialized Use of Pump with Pump Basin

   A specialized purpose for use of a pump and pump basin is to address the issue of plumbing elevation for a portion of a residence, or a remote bathroom for outbuildings, being too low in elevation relative to the septic tank to allow gravity flow to the septic tank. In these cases,

   a. A pump basin with pump may be utilized when any toilet being serviced, in the case of residential application, is not the sole toilet utilized by the residence.

   b. A solids handling pump, rather than a grinder pump, must be used and must pump directly into the septic tank through a 4 inch connection 10 ft. from the tank inlet.

G. Gravelless Chamber and Bundled Expanded Polystyrene (EPS) Synthetic Aggregate Systems

1. With 100% of the area required for a gravel-filled drainfield established and dedicated (for initial and replacement fields) reduced-size gravelless chamber bundled EPS synthetic aggregate drainfields may be designed and installed.

2. System design, layout, and installation must be done in a manner easily facilitating the installation of additional gravelless chamber or bundled EPS synthetic aggregate drainfield if future conditions necessitate such action.

3. Except for those serving seasonal dwellings, the drainfield size using gravelless chambers or bundled EPS synthetic aggregate products may be reduced by 30%, provided no additional sizing reductions (such as would otherwise be allowed for use of pressurized distribution or supplemental treatment) are utilized in the design of the drainfield system.

4. Wastewater from residential sources must receive pre-treatment at least equal to that provided in a conventional two-compartment septic tank, before discharge to a gravelless drainfield.

5. Drainfields using gravelless distribution products must be installed according to the manufacturer's instructions, in a manner that is consistent with these standards and with state and local rules.

Chapter 6. Pressurized Distribution Systems

A. Pipe, Valves, and Fittings

1. All pressure distribution pipes and fittings, including transport lines, manifolds, laterals and fittings, must be adequately sized for the design flow.
2. Pressure transport piping must be uniformly supported along the trench bottom, and at the discretion of the LA, it must be bedded in sand or other material approved by the LA.
3. The ends of lateral piping will have 90 degree long sweeps and ball valves or threaded caps housed in valve boxes that accommodate threaded plugs or caps.
4. All joints in the pressure distribution manifold, lateral piping, transport pipe, must meet ASTM Specification D-1785.
5. A gate valve or ball valve must be placed on the pressure transport pipe inside or outside of the pump riser, in or near the dosing tank.
6. A check valve must be placed between the pump and the gate valve, when required. A check valve is not required if the pump has an internal check valve. All check valves and gate valves must be in an accessible and protected location for maintenance and repair.
7. An anti-siphon valve must be placed between the pump and leach field when the leach field is down slope of the pump.
8. All required valves must be placed in boxes accessible for maintenance from the surface.

B. Dosing Tanks

1. The pump chamber, pump tank, and/or dosing tank must meet the requirements specified in Part Two of this Manual.
2. Duplex alternating pumps may be required by the LA for some installations (e.g. large systems approved for commercial facilities).
3. The dose volume must be sufficient to fully pressurize the lines, assuring equal distribution through the system. The dose volume must be sufficient to refill any part of the pressure distribution system (including supply line and lateral lines) that has been designed to drain following a dose (for example, where necessary to prevent freezing in cold weather), and then deliver sufficient additional volume to disperse the daily design flow in an appropriate number of doses per day. Drainfield performance is enhanced when the daily flow is dispersed in smaller, more frequent doses throughout the day. In most applications, between 12 and 24 doses per day per zone, is appropriate, although a number outside of that range may be appropriate in some cases where it is not practical to design the system to deliver twelve or more doses, or where it is otherwise undesirable to design the system within that range of doses.
4. Dispersal Trenches or Beds
5. The top of the drain rock must be covered with filter fabric.
6. A minimum of 9 inches of backfill is required over the filter material within the drainfield trench.

C. Hydraulic Design

1. Orifices will have a minimum diameter of 1/8 inch and be evenly spaced at a distance between 2 and 6 feet. Orifices larger than 1/8 inch shall be evaluated on a case by case basis due to design constraints related to dose volume, effluent quality, and dispersal field size.
2. There must be a minimum 5 foot head at the orifice farthest from the manifold and no more than 10% head variation within a drainfield trench.
3. The effect of back drainage of the pressure distribution system must be evaluated for its impact upon the dosing tank and system operation.

D. Installation

1. All orifices of pressure distribution laterals must be covered with orifice shields to prevent soil washout.
2. Lateral piping must be laid in the horizontal center of the trench and level to within 2 inches in 100 feet.
3. Inspection ports must be placed at the end of the pressure distribution lateral within the drainfield trench.
4. Each dosing tank must be installed on a stable level base.
5. Each dosing tank must be provided risers as described in Part 2 of this Manual.
6. Dosing tanks located in high groundwater areas must be weighted or provided with an anti-buoyancy device to prevent flotation as per the manufacturer's recommendation and as required in Part 2 of this manual.

E. Sloping Sites

1. Ball or gate valves or flow restrictors must be installed on each pressure distribution lateral to facilitate regulation of flow within each lateral.
2. The LA will inspect the pressure distribution system for verification of hydraulic head over the pressure distribution laterals ("squirt height test").
   a. Water and a source of generated electricity must be available for this inspection.
   b. Photographic documentation of the pressure test may be accepted by the LA on a case-by-case basis.
   c. Where site conditions preclude the entire drainfield being left open for the pressure test, the LA may allow a portion of the trenches to be covered prior to the test and observe the pressurized flow at the distal end of each lateral.

Chapter 7. Subsurface Drip Irrigation

Subsurface Drip Irrigation is a method of dispersing wastewater uniformly over a large area by using numerous emitters installed at a shallow depth and very small doses.

A. Supplemental treatment is required prior to dispersal utilizing subsurface drip irrigation.

B. Minimum depth of drip line must be 6 inches.

C. Subsurface drip dispersal systems must be designed, installed and managed to provide even distribution and unsaturated subsurface flow.

D. All subsurface drip dispersal system materials must be warranted by the manufacturer for use with wastewater and resistant to clogging from solids, bacterial slime and roots.

E. Fittings used to join drip line to the distribution and flush manifolds must be in accordance with the manufacturer's recommendations.

F. All emitters in the drip tubing installed on sloping sites must be pressure compensating.

G. The subsurface drip dispersal system must be designed in the configuration that would minimize the flowing of effluent to the lowest area of the field when the pump shuts off or when the flow depressurizes.

H. A minimum velocity of 0.5 ft./sec or greater velocity if recommended by the manufacturer for field flushing of the laterals is required.

I. All subsurface drip dispersal systems must be designed with a dosing controller with automatic field flushing, for zone alternating, for dose frequency, for dose volume and for flushing of the filters.

J. All subsurface drip dispersal systems must be designed with a bypass line to facilitate field flushing.

K. All subsurface drip dispersal systems must be designed with filters to remove particles 100 microns or larger.

L. All subsurface drip dispersal systems must be designed with air relief valves placed at the highest point on both supply and return manifolds.

M. All the drip dispersal systems must be designed to accept flows that have residential-wastewater quality.

N. Sizing criteria must be based application rates shown in Table IV of the Ordinance or as determined by the designer.

O. All subsurface drip dispersal systems must be installed by certified installers with specific training in the installation of subsurface drip dispersal systems. Proof of the specified training by way of certification or a letter from an approved trainer is required.

P. Installation of the subsurface drip dispersal system must be per the manufacturer's instructions.

Chapter 8. Supplemental Treatment Systems

Supplemental treatment systems are NSF certified on-site wastewater systems that provide a specified level of treatment prior to dispersal into the drainfield.

A. Supplemental Treatment Components

1. Supplemental treatment components must be designed to meet the following BOD and TSS concentrations and, where nitrogen is identified in the RWQCB basin plan as a water quality concern, the following nitrogen effluent concentration:

   a. 30-day average BOD concentration will not exceed 30 milligrams per liter (mg/L), or alternately, a carbonaceous BOD (CBOD) in excess of 25 mg/L

   b. 30-day average TSS concentration will not exceed 30 mg/L

c. 30-day average TN concentration will not exceed 10 mg/L as nitrogen

2. Testing to comply with these performance levels must be conducted based on effluent analysis with the following minimum detection limits:

Parameter	Detection Limit
BOD	2 mg/L
TSS	5 mg/L
Total Nitrogen	1 mg/L

B. Disinfection Components

1. Add-on components performing disinfection must be designed to achieve an effluent total coliform bacteria concentration, at the 95th percentile, of not greater than the following:

a. 10 MPN per 100 ml prior to discharge into the dispersal field where the soils exhibit percolation rates of 1-10 minutes per inch or where the soil texture is sand; or

b. 1,000 MPN per 100 ml prior to discharge into the dispersal field where the soils exhibit percolation rates greater than 10 minutes per inch or consist of a soil texture other than sand.

2. Testing of supplemental treatment components that perform disinfection must be evaluated quarterly based on analysis of total coliform with a minimum detection limit of 2.2 MPN. Such systems must be maintained to comply with the performance requirements at all times.

C. Where feasible, as determined by the LA, supplemental treatment components must be equipped with a telemetric alarm that notifies the owner and O&M Specialist in the event of system malfunction.

D. All supplemental treatment systems must be followed by pressurized distribution or subsurface drip irrigation for dispersal.

E. All supplemental treatment systems must be designed by certified designers and installed by certified installers with specific training in the installation of the type of system utilized. Proof of the specified training by way of certification or a letter from an approved trainer is required.

F. All supplemental treatment systems must maintain a current Operating Permit and be periodically inspected and monitored by a certified Operation and Maintenance Specialist as required in the On-Site Wastewater Ordinance and Part 4 of this Manual.

G. Supplemental Treatment Systems in Lieu of Standard gravity systems

1. When a drainfield site is utilized that meets the criteria described above, nothing will preclude the applicant from opting to use a supplemental treatment system in lieu of a standard gravity system.

Chapter 9. Proprietary Systems

When siting an on-site wastewater system, the drainfield must be located, whenever possible, on that portion of the parcel with a minimum vertical separation of 24 inches.

A. A proprietary supplemental treatment system provides treatment of wastewater by exposing the effluent to a contact medium under diverse environmental conditions in a self-contained enclosure.

B. Proprietary supplemental treatment systems must be designed to meet the level of treatment specified in Chapter 8 of this Manual.

C. All proprietary supplemental treatment systems must be designed by certified designers and installed by certified installers with specific training in the installation of the type of system utilized. Proof of the specified training by way of certification or letter from an approved trainer is required.

D. All owners of proprietary treatment systems must maintain current Operating Permits and be periodically inspected and monitored by certified Operation and Maintenance Specialist.

E. Where feasible, as determined by the LA, supplemental treatment components must be equipped with telemetric alarms that notify the owner and O&M Specialist in the event of system malfunction.

F. All proprietary supplemental treatment systems must have appropriate certification. NSF/ANSI (National Sanitation Foundation/ American National Standards Institute), Standard 40.

G. NSF approved proprietary components may not be used independently. Proprietary components may be used as part of the overall wastewater treatment system as tested and approved by NSF.

H. Manufacturers of proprietary systems must provide homeowners with Operation and Maintenance Manuals.

Chapter 10. Single-Pass Sand Filters

A. Influent Wastewater Strength

1. Single-pass sand filters are designed for treating residential strength wastewater. The wastewater applied to the single-pass sand filter must not be higher in strength than 220 mg/l BOD_5 or 145 mg/l TSS). Lower wastewater strengths, without increased flow rates are preferable for assuring long term operation of a single-pass sand filter system. High strength wastewater shall require pretreatment in order to reduce its strength prior to introduction into a single-pass sand filter and the soil dispersal component.

B. Daily Wastewater Flow - Design Estimates

The minimum wastewater design flow shall be as specified in Chapter 3 of this part of the Manual.

C. Location Requirements

1. The minimum setback requirements for closed bottom single-pass sandfilters will be the same as those for septic tanks.

2. The minimum setback requirements for open bottom single-pass sandfilters will be the same as those for a standard gravity drainfield or leach bed.

D. Design Standards

1. Filter media must meet the specifications outlined in Part 2 of this Manual.

2. Filter Bed Sizing

   a. The loading rate to the sand filter must not exceed 1.0 gallon/day/square foot, using appropriate daily wastewater flow design estimates.

   b. The media depth must be a minimum of 24 inches.

3. The filter bed is contained either in a flexible membrane lined excavation as specified in Part 1 of this Manual, or in another containment vessel approved by the LA.

4. Wastewater Distribution

   a. Pressure distribution is required within the sandfilter and pressure distribution of subsurface drip irrigation is required for dispersal of sandfilter-treated effluent and must comply with the requirements specified in Chapters 7 and 8 of this Manual.

   b. The wastewater must be applied to the layer of drain rock atop the filter media as specified in Chapters 7, or sprayed upward against the top of gravelless chambers.

E. Timed dosing system is required and the dosing frequency or dose volume is dependent on the media specification used with the sand filter. To assure that appropriate dose volumes are delivered to the sand filter, the timer must be set to dose a minimum of 12 times daily.

F. Installation

1. Containment must be structurally sound and have sufficient geometric and dimensional integrity to protect the liner.

2. In order to prevent differential settling when the sand filter is put into service, the filter media must have a uniform density throughout.

3. A geotextile filter fabric must be placed on top of the gravel bed.

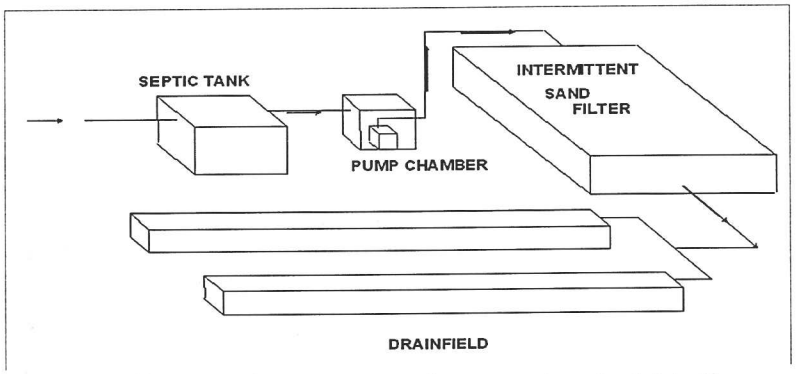
4. The cover must consist of no more than one foot of soil. The cover soil must be capable of maintaining vegetative growth while not impeding the passage of air (sandy loam or coarser) and be contoured and landscaped in accordance with the approved construction plan and permit requirements in order to shed water, control erosion and to prevent surface drainage onto the sand filter. Plant cover must be shallow root vegetation as generally described in the system design and operation and maintenance manual.

5. Two observation and monitoring ports must be installed in the sand filter. One observation and monitoring port must be installed to the interface between the bottom of the drainrock and the top of the media. A second observation and monitoring port must be installed to the bottom of the under drain. The pumpwell may be used as the second observation port.

6. Liner patches, repairs and seams shall have the same physical properties as the parent material.

7. Site considerations and preparation:

   a. The supporting surface slopes and foundation to accept the liner shall be stable and structurally sound including appropriate compaction. Particular attention shall be paid to the potential of sink hole development and differential settlement.



b. Soil stabilizers such as cementations or chemical binding agents shall not adversely affect the membrane; cementations and chemical binding agents may be potentially

c. Every effort shall be made to minimize the strain (or elongation) anywhere in the flexible membrane liner.

8. Construction and installation:

a. For contained-design sand filter, grade the bottom of the excavation to provide a sloping liner surface, from the outer edge of the filter toward the point of under drain collection. Slope shall equal 8 inches fall overall or one inch of fall per foot of run, whichever is the greatest.

b. Sides of the excavation shall be smooth, free of possible puncture points.

c. Boots shall be bedded in sand and installed in accordance with manufacturer's specifications.

d. Liner placement

(1) Liners shall be installed in accordance with manufacturer's specifications, including those for:

(i) Temperature, precipitation

(ii) Sand bedding

(iii) Sealant type and procedure for use

(iv) Liner size

(v) Transport, handling, and storage

(vi) Deployment of panels

(vii) Anchoring of liner edges

(viii) Field seaming when necessary

(ix) Field repairs

(2) A site inspection shall be carried out by the LA or by the designer and the installer prior to liner installation to verify surface conditions and adherence to manufacturer's and designer's specifications

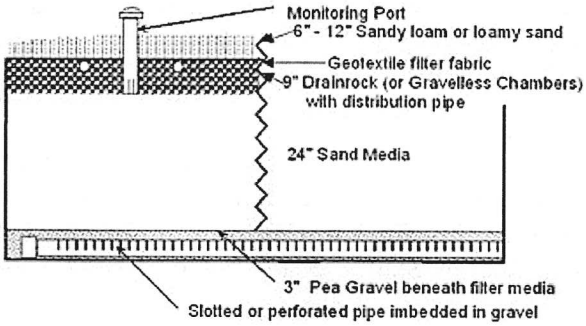
(3) Completed liner installations shall be visually checked for punctures, rips, tears and seam discontinuities before placement of any backfill. At this time the installer shall also manually check all factory and field seams with an appropriate tool. In lieu of, or in addition to, manual checking of seams by the installer, either of the following tests may be performed;

(i) Wet Test: The lined basin shall be flooded with water to within 6 inches of the bottom of the liner after inlets and outlets have been plugged. There shall not be any loss of water in a 24-hour test period.

(ii) Air Lance Test: Check all bonded seams using a minimum 50 PSI (gauge) air supply directed through a 3/16 inch (typical) nozzle held not more than 2 inches from the seam edge and directed at the seam edge. Riffles indicate unbonded areas within the seam, or other undesirable seam construction.

(iii) If the boot may be submerged in a seasonal high water table, performance testing of the sand filter/boot for leakage must be conducted by blocking the outlet pipe, and flooding the liner with a sufficient depth of water to submerge the boot seams. There shall not be any loss of water in a 24-hour test period.

G. System Drawings



Chapter 11. Mound Systems

A. Influent Wastewater Strength

Mound systems are designed for treating residential strength wastewater. The wastewater applied to the mound system must not be higher in strength than 230 mg/l BOD_5 or 150 mg/l TSS). Lower wastewater strengths, without increased flow rates are preferable for assuring long term operation of a mound system. High-strength wastewater shall require pretreatment in order to reduce its strength prior to introduction into a mound system.

B. Daily Wastewater Flow - Design Estimates

The minimum wastewater design flow shall be as specified in Chapter 6 of this Part of the Manual.

C. Locational Requirements

The minimum setback requirements for mound systems will be the same as those for a standard gravity drainfield or leach bed.

D. Design Standards

1. Media Specifications. Filter media must meet the requirements outlined in Part 2 of this Manual.

2. Minimum Effective Soil Depth

   A minimum of 24 inches of undisturbed, unsaturated, original soil as measured from the original ground surface is required for placement of a mound after all clearing; leveling and other site disturbance during lot development is complete.

3. Media Specifications.

   a. Filter media must meet the specifications outlined in Part 2 of this Manual.

   b. In order to prevent differential settling when the mound is put into service, the filter media must have a uniform density throughout.

4. Application Rates.

   a. The application rate for the mound infiltration area (gravel bed) must not exceed 1.0 gpd/ft^2.

   b. The application rate for basal area will be based on soil type.

5. Minimum Dosing Frequency

   Timed dosing system is required. The dosing frequency or dose volume is dependent on the media specification used as the filter material. To assure that appropriate dose volumes are delivered to the mound system, the timer must be set to dose a minimum of 12 times daily.

E. Installation

Unless otherwise specified in this Manual, mound systems shall be installed following the procedures and specifications delineated in the "Recommended Standards and Guidance for Performance, Application, Design, and Operation & Maintenance Mound Systems" (Washington State Department of Health, July 2012).

1. Cap and Topsoil Depth

   a. The cover soil must be capable of maintaining vegetative growth while not impeding the passage of air (sandy loam or coarser) and be contoured and landscaped in accordance with the approved construction plan and permit requirements in order to shed water, control erosion and to prevent surface drainage onto the sand filter.

   b. The final settled depth of the cap and topsoil should be no less than 12 inches above the center and 6 inches above the outer edge of the bed. Additional depth of topsoil may be needed during final construction activities to assure that the minimum depths are achieved following natural settling of the soil.

   c. The mound must not be left without a vegetative cover or allowed to be covered with weeds. Mowed turf grass and turf sod are the best vegetative covers for mounds.

F. Mound Placement

1. On sloping sites, the mound must be aligned with its longest dimension parallel to the site contours so as not to concentrate the effluent into a small area as it moves laterally down slope.
2. The mound must not be aligned, by design or construction, perpendicular to the contours.
3. On all sites the infiltration bed must be as long and narrow as possible to limit the linear loading rate of effluent to assure that all the effluent infiltrates into the natural soil before it reaches the toe of the filter media.
4. If the site does not permit the design of a "long and narrow" mound along the contours of the site, other on-site sewage treatment and dispersal technology must be selected. Mound systems are only suitable for sites where all of the design and siting criteria can be satisfactorily met.
5. Two or more beds on the same downhill plane.

G. Effluent Dispersal within Mound

A method providing uniform distribution with timed dosing throughout the bed in the filter media is required, either through use of pressure distribution as specified in Chapter 6 of this part of the Manual, or through use of subsurface drip irrigation, as specified in Chapter 7 of this part of the Manual.

H. Monitoring and Observation Ports

Each mound should have a minimum of two monitoring and observation ports, one placed in the infiltration bed down to the gravel-sand, and one down slope from the bed down to the sand-native soil interface. Unless otherwise specified in this Manual, down gradient observation and monitoring ports shall be installed as specified in the Mound System Manual (State Water Resources Control Board) in its current final draft or as hereafter adopted and updated by the State Water Resources Control Board.

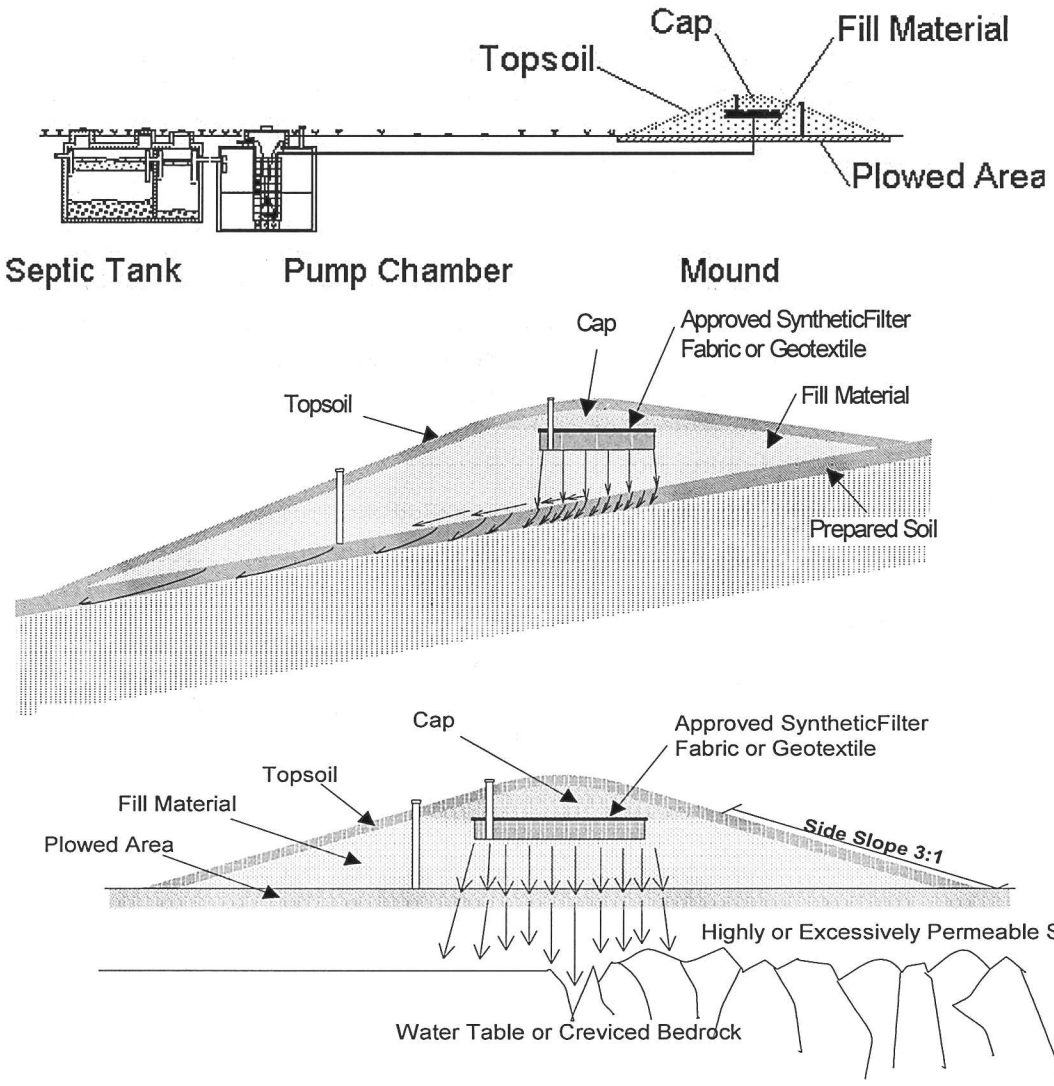
I. Protection of mound system placement area

The designer will be responsible for the adequacy of, and the installer's substantial compliance with, the installer's construction plan. The construction plan must include provisions addressing:

1. Type of excavation equipment that will be used
2. Routes of ingress and egress of construction vehicles to assure maximum protection of the mound placement area

3. Means to assure that the area reserved for system replacement is not disturbed during the mound construction process including as necessary, instructions for erecting a temporary construction fence to protect the primary and reserve mound areas and adjacent area down slope of the mound placement area
4. Method to assure that soil moisture content is sufficient to allow construction of the mound without soil compaction or smearing
5. Method for preparing the native soil-filter material interface
6. Method for removing native vegetation

J. System Drawings



Part Four: Environmental Monitoring and Reporting

Chapter 1. Reporting Requirements

A. Annual Report

1. The LA will prepare and submit an annual report to the Central Valley Regional Water Quality Control Board no later than February 1 for the preceding year beginning one year after Regional Board approves the LAMP.

1. The annual report will include:

   a. A statement that all on-site wastewater systems referenced in the report are classified as Tier 2.

   b. Certified Septage Pumpers: Applications and registrations issued as part of the local cleaning registration pursuant to California Health and Safety Code §117400 et seq.

   c. New and Repaired or Replaced On-site Wastewater Systems: Numbers and locations of permits.

   d. Complaints: Numbers and locations of complaints, related investigations, and means of resolution.

   e. Variances: Number and description of variances to the On-Site Wastewater Manual, the rationale for the variation, and the mitigating measures to assure the variance will be as protective of public health as the requirement in the Manual.

   f. Summary of any changes adopted by the Board of Supervisors to either the Ordinance or the Manual

2. Sutter County Environmental Health will maintain a water quality assessment program that consists of obtaining nitrate concentration from water quality data from the following sources:

   a. Regulated small water systems (SWS)

   b. Wells within Sutter County that are monitored as part of the Statewide Groundwater Ambient Monitoring and Assessment (GAMA) program

B. Five-Year Report

Every fifth year an evaluation report will be included that:

1. Evaluates of trends in nitrates found in the monitored wells

C. Report Format

1. Groundwater monitoring data will be submitted in Electronic Delivery Format (EDF) for Geotracker.

2. All surface water data will be submitted to California Environmental Data Exchange Network (CEDEN).

Chapter 2. Record Retention and Availability

A. All our records are maintained with other Assessor Parcel Number records indefinitely. They will be made available to Central Valley Water Board staff within 10 working days of a written request.

Chapter 3. Water Supplier Notification

A. The LA will notify public well and water intake owners if the OWTS is within 1,200 feet of an intake point for a surface water treatment plant for drinking water, is in the drainage area catchment in which the intake point is located, and is located such that it may impact water quality at the intake point such as upstream of the intake point for a flowing water body, and the California Department of Public Health as soon as practicable, but no later than 72 hours upon discovery of a failing OWTS within the setbacks specified in the On-Site Wastewater Ordinance section 700-080, Table 1.

B. The LA will notify public water services of pending on-site wastewater system installations and repairs within prescribed set-backs specified in the On-Site Wastewater Ordinance section 700-080 Table 1.

C. The above notifications shall be made in writing and by telephone to persons identified in a call out list maintained by Sutter County Environmental Health