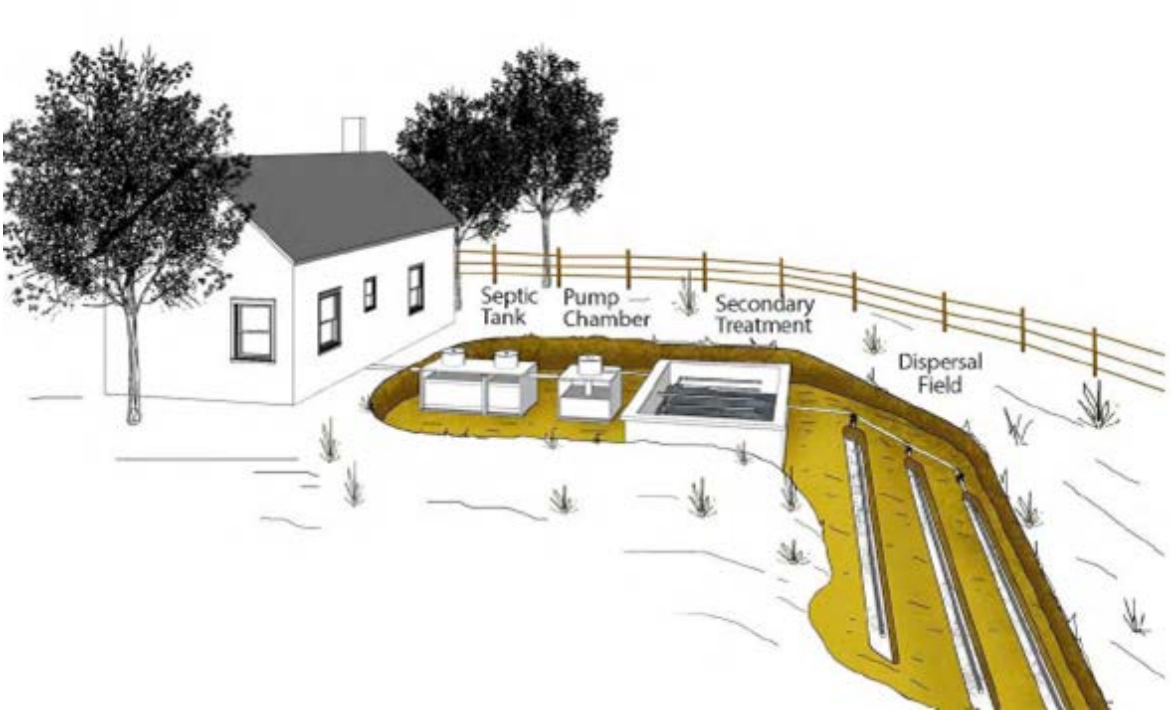
Yolo County

Onsite Wastewater Treatment Systems Manual



Yolo County Department of Community Services
Environmental Health Division
(530) 666-8646

TABLE OF CONTENTS

BACKGROUND

The Yolo County Onsite Wastewater Treatment Systems Manual (hereafter, "Manual") is the culmination of the actions required by Assembly Bill 885 (AB 885). AB 885 was introduced to the California State Assembly in February 1999 and approved in September 2000. This legislation directed the State Water Resources Control Board (SWRCB) to develop regulations or standards for Onsite Wastewater Treatment Systems (OWTS, but hereafter, "Systems") to be implemented by responsible local agencies. The SWRCB adopted the Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (OWTS Policy) in June 2012. The policy was subsequently approved by the Office of Administrative Law in November 2012 and became effective in May 2013.

The OWTS Policy allows local agencies to approve Systems within their jurisdiction, based on a local ordinance, after approval of a Local Agency Management Program (LAMP) by the Regional Water Quality Control Board (RWQCB). The LAMP includes all elements of the local program, including the local ordinance, manuals, guidelines, forms and operating procedures, etc. The purpose of the LAMP is to provide a policy framework tailored to local needs for the continued use of Systems within Yolo County as well as to expand the local program to permit and regulate a wide variety of alternatives to Standard Systems while protecting water quality and public health.

INTRODUCTION TO THE MANUAL

This Manual provides the policy, procedural, and technical requirements for the implementation of the provisions of the Yolo County Onsite Wastewater Treatment Systems Ordinance, codified in Chapter 19 of the Yolo County Code of Ordinances. The Yolo County Division of Environmental Health (hereafter, "DEH") is the agency responsible for the enforcement of Yolo County Onsite Wastewater Treatment Systems Ordinance and the application of this Manual. This Manual incorporates new and updated information regarding design details and guidelines related to both Standard and Alternative Onsite Wastewater Treatment Systems operation, maintenance, and monitoring requirements; and related procedural matters. It is intended to provide guidance for homeowners, designers, Installers, Contractors and Service Providers of Systems.

The provisions within this Manual are designed to protect the public health, Groundwater sources and surface water bodies from Contamination, and provide safely operating Systems through the proper design, siting, installation, maintenance, and monitoring of Systems. This Manual does not include the following which require individual waste discharge requirements or a waiver of individual waste discharge requirements issued by the RWQCB.

- Any System with a projected Wastewater flow of over 10,000 gallons per day.
- Any System that receives High Strength Wastewater, unless the waste stream is from a commercial food service facility.
- Any System that receives High Strength Wastewater from a commercial food service facility with a BOD higher than 900 mg/l or that does not have a properly sized and functioning oil/grease interceptor.
- Any system that receives a significant portion of Recreation Vehicle (RV) Holding Tank Wastewater such as RV dump stations.

The California Regional Water Quality Control Boards (the Central Valley Region, Region 5, for Yolo County, CVRWQCB) are the state agencies responsible for the protection of ground and surface water quality. While DEH administers the local program, the Regional Boards retain the authority to issue Permits for any discharge of Wastewater that may affect water quality, including discharges from Individual Systems.

This Manual was adopted by Yolo County Board of Supervisors Resolution [16-28, April 5, 2016]. This Manual will be regularly reviewed and updated as needed by DEH, with review and approval by the CVRWQCB and adoption by Resolution of the Yolo County Board of Supervisors.

The regular review and update of the Manual is necessary to keep pace with new regulations, policies, procedures, and technologies affecting the use and management of the Systems. As changes are made to this Manual, cross references throughout this Manual are also subject to change. Failure of a cross-reference to indicate the appropriate chapter of requirements due to these changes does not void the applicability of the requirements.

Defined terms in this Manual are capitalized to indicate the meaning is provided in the definitions section.

SECTION 1: PERMIT REQUIREMENTS

A. GENERAL PROCESS OVERVIEW

The first step to obtaining a permit to install, construct, enlarge, replace, Repair, or modify an Onsite Wastewater Treatment System (hereafter, "System"), is to complete a Site Evaluation as provided in Section 2 of this Manual. The Site Evaluation is conducted by a Qualified Professional and will assess the surface features, site characteristics, Soil and Groundwater conditions to determine suitability for the work that is proposed on the property. The Site Evaluation ensures that the System will be designed, installed, constructed, enlarged, replaced, modified or repaired with minimal impact to public health and the environment.

The Site Evaluation will provide valuable information in determining the type of System and design that will work best on the property. The System Design and Site Evaluation information will be required when applying for an Installation Permit as described in Section 1B, below.

The Installation Permit, if approved may, require specific conditions of installation and/or operation. All conditions must be met prior to completion or Final Approval on the Installation Permit.

Owner care of the System is essential for the long term life of the System. In all cases the Owner should conduct regular monitoring, maintenance and repair of their System as provided in this Manual.

In some cases, for special designs or sensitive sites, an Operating Permit is required with the continued use of the System. In this case the System Final Approval will require annual monitoring, maintenance, and reporting of System performance according to Operating Permit conditions. This is described in more detail in Section 10 of this Manual.

B. INSTALLATION PERMIT

A System Installation Permit (hereafter, "Permit" or "Installation Permit" when clarification is required) is required in order for any Person to install, construct, enlarge, replace, modify, Repair, abandon or destroy a System. This applies whether you are an Owner, Contractor, company, or public agency. A Permit will only be issued to an Owner or the Owner's Authorized Representative.

1. Application: Installation Permit applications will only be accepted when determined to be complete. The application must include all of the following:
   a. Completed Septic System Installation Permit application forms
   b. All items listed on the application and design checklists.
   c. Complete System Design, including scaled Plot Plan, test results, study reports and all drawings as required per Site Evaluation Report.
   d. Payment of all applicable fees
   e. Grading plan (when required by DEH)
   f. Easement agreement or acknowledgement letter from neighbors if applicable
   g. Any additional information as required by DEH (e.g. slope stability report or Geotechnical Report)

2. Site Evaluation Report and System Design: The System Design shall show enough detail to allow the design to be reviewed and the System to be installed. The System Design shall include but not be limited to the following:
   a. Scaled Plot Plan: The Plot Plan is a legible drawing that shows the proposed placement or the existing location of the System on the Lot in relationship to other site features. The Plot Plan must verify that the System, including the Replacement Area can be installed in compliance with all setback requirements described in this Manual. The Plot Plan submitted with the Installation Permit must be identical to the Plot Plan submitted to the authority issuing the Building Permit. Information obtained from the Site Evaluation shall be included on the final Plot Plan and supporting submittal with the Installation Permit application. Information required on the Plot Plan is listed in Section 2 of this Manual and on applicable DEH forms.
   b. Scaled System Layout: This is a close up detail of the Plot Plan showing the System layout.
   c. Cross Section Detail: The cross-section detail shows the depth from the original grade of the System components. The cross-section is intended to be used both as a guide for System construction and as verification that the vertical separation and component depths meet code. When proposing a new connection to a building the cross section must show the elevation of the building sewer as it exits the structure to demonstrate adequate fall to the septic tank or other appurtenance; and the effluent piping from the tank; and the proposed fall through the distribution lines as per the System design.

3. System Design Forms: Design forms must be completed, signed and dated by the Contractor for Standard Systems or by the Qualified System Designer for Alternative Systems.

4. Special design analysis when required and described in Sections 2, 3 and 5 of this Manual for:
   a. Large Systems
   b. Systems in areas subject to flooding
   c. Systems requiring a Cumulative Impact Assessment
   d. Systems within an area with potential for groundwater pollution.
   e. Cluster Systems
   f. Community Systems

C. PERMIT ISSUANCE, PERMIT CONDITIONS, AND PREPARATION FOR INSPECTIONS

1. Application Review: A complete Permit application will be approved or rejected within ten (10) working days after receipt by DEH. A Large System or System requiring special consideration due to complicated local situations may take longer. If additional time is required it will be communicated to the Applicant in writing.

2. Permit Issuance: The Permit may be issued with certain conditions in addition to requirements outlined in this Manual. These conditions will be tailored to the specific parcel conditions and type of System. It is important that the Person working on the System has a copy of the approved Installation Permit and System Design on Site.

3. Design Stakeout: Prior to any work being conducted on the property, the existing or proposed System and the Replacement Area must be staked out and construction ribbon tied on the stakes. This will alert the Owner and any persons conducting construction activities on the Site that the area must be protected from compaction or disturbance. During all construction phases, the

System must be protected from damage caused by weather, earth-moving, vehicular traffic, or other causes. Failure to protect the Dispersal Field could result in revocation of the permit if the primary or Replacement System area is damaged.

4. Notification and Inspections: The Installer shall notify DEH 48 hours prior to starting construction and 48 hours prior to any requested inspections. Inspection requirements are provided in detail in Section 8 of the Manual.

D. PERMITS TRANSFERABLE AND TERM

1. Permits Transferable: Permit transfers can occur with sale of property. A new Owner must make a written request with the approval from the original fee-payer for transfer of the Permit upon the change of ownership, provided all other information on the application remains unchanged. Expired Permits are non-transferable.

2. Permit Term: A Permit is valid for twelve (12) months from the date it is issued. To renew a Permit, it will require the proposed System Design meet all of the requirements of the current Ordinance and Manual, and will require a new application and associated fee(s). The renewal request must be made prior to the expiration of the Permit.

3. Renewing the Permit: A Permit may be renewed for an additional twelve (12) months, for a maximum of two (2) years from the original date of Permit issuance. The Permit considered for renewal may require review to ensure that there have not been significant changes in technology, knowledge or regulation; or changes to the property that may affect the design of the System. The Director of Environmental Health may deny a Permit renewal or request additional information if in the opinion of the Director of Environmental Health, the Site Evaluation did not adequately assess the suitability of System Design or installation, or there have been substantive changes to the property that would affect the System Design. In some cases, the Contractor or Qualified System Designer, Qualified Professional may be required to review the initial design.

E. REVISIONS OR CHANGES

If revisions or changes are proposed to the approved System Design prior to or during construction (e.g., adding Bedrooms or Potential Sleeping Rooms, different type of System, new System location, etc.), they must be approved by DEH prior to performing the work. Any changes in the approved System Design are subject to the following:

1. Minor revisions: A minor change in tank location, a change in Distribution Box location or line location adjustments for contour or obstructions within the approved Wastewater disposal area shall be considered minor revisions. Minor revisions shall be drawn clearly and to-scale on the original approved System Design and shown on the As-Built Drawing of the System.

2. Major revisions: Changes in depth, width or location of the System shall be considered major revisions. A revised System Design shall be submitted to DEH showing these major revisions, and shall be reviewed and approved by DEH prior to any work being performed.

All revisions are subject to an additional review fee and new Permit conditions may be required.

F. PROPERTIES NEAR A PUBLIC SEWER SYSTEM

1. A System should only be permitted and installed where a Public Sewer System is not available. The Public Sewer System is considered available under the following circumstances:
   a. A single Lot or parcel being served is located 200 feet or less from a suitable connection point to a Public Sewer System.
   b. A Lot shown on a proposed parcel map is located 500 feet or less from a suitable connection point to a Public Sewer System.
   c. A Lot shown on a proposed tentative or final map is located 1000 feet or less from a suitable connection point to a Public Sewer System.
   d. Connection to the Public Sewer System is allowed by the Public Sewer System governing body and/or other governing bodies, such as Local Agency Formation Commission

2. If a property is located within the minimum distance from a Public Sewer System as provided above and the sewer system connection is allowed by the governing body or bodies, a System permit shall not be issued. However in the case of a single Lot or parcel, these provisions do not apply for a System Repair, Expansion or replacement where the connection fees associated with the connection of the Public Sewer System are greater than twice the total cost of the proposed work and the System can meet the minimum requirements of Yolo County Code and this Manual. If any boundary of the single Lot or parcel upon which the System is proposed is within 200 feet of a Public Sewer System, the following information must be submitted with the System permit application:
   a. A written statement from the sewer provider and/or Local Agency Formation Commission (LAFCO) denying access to the sewer system; or
   b. A detailed statement of the total cost of connecting to the Public Sewer System and a detailed cost estimate of the Onsite Wastewater Treatment System work to be performed.

3. The System permit will be denied if the sewer is legally and physically available as described above and if the cost of the onsite System work is less than 200% of the cost of connection to the sewer. The property will be required to connect to the Public Sewer System, and the existing onsite System will then be required to be destroyed under Permit from DEH.

G. OPERATING PERMIT

Proper maintenance will extend the life of all Systems, however due to the complex nature of certain Alternative Systems an Operating Permit may be required to assure ongoing maintenance, and System performance. In many cases the Operating Permit will require a maintenance agreement with an approved Service Provider, required monitoring and data reporting. In addition to Alternative Systems, in some cases an Operating Permit will be required for Large Systems, Non-Discharging Wastewater Disposal Units, and non-residential Graywater Systems. Operating Permit requirements are explained in greater detail in Section 10 of this Manual and within the guidelines for each type of System or unit.

H. MODIFICATIONS, ABANDONMENT, AND REPAIR

1. Permits are required for the following activities:

a. Minor Repair: Permits are required for Minor Repairs, including but not limited to, replacement of the Septic Tank or replacement of a broken Distribution Pipe. Unless classified as a Major Repair or major maintenance, any replacement of a part of a System with a part that meets the original design specifications is a Minor Repair requiring a Permit, except those activities listed in Section 1I, below.
b. Major Repair: Major Repair includes replacement of or addition to the Dispersal Field, Treatment unit, or any part thereof.
c. Modification: Modification includes the increase to the projected or actual Wastewater flow, including additions of Bedrooms or Potential Sleeping Rooms, increases in restaurant seating capacity or changes to a business use or occupancy.
d. System Abandonment: System abandonment is necessary when a new System is to be installed, or connecting to Public Sewer System; or if the structure that it was serving is to be demolished. Procedures for Abandonments and destructions are found in Section 8.

2. A Site Evaluation is required prior to the approval of Installation Permits for System Modifications and most Major Repairs.

I. ACTIVITIES THAT DO NOT REQUIRE PERMITS

Permits are NOT required for any of the following:

1. Clearing stoppages in pipes, provided the System is undisturbed

2. Cleaning of each individual Septic Tank, Dosing Tank, Holding Tank, or other Wastewater receptacle that is pumped or cleaned by a pumping service having a valid Yolo County Permit to conduct such activities from DEH.

3. To replace the following components to an approved System provided the property Owner or Contractor notifies DEH in writing that the Modification was made:
   a. Risers and or lids to a Septic Tank if the tank is not located in an area that is subject to vehicular traffic. Risers may be added to an existing tank without a permit provided the work is performed by a licensed contractor. Risers shall be sealed so as to be water tight.
   b. Effluent filters
   c. Sanitary tees and joints
   d. Solid pipe, including the building sewer
   e. Distribution Boxes
   f. Mechanical components of proprietary treatment systems, that are like-for-like, such as pumps and blower, provided EHD is notified of the work performed.

4. To replace the following components to an approved System provided that the replacement is like for like:
   a. Float switches
   b. Pumps
   c. Electrical Boxes

5. To expose a portion of the System for purposes of evaluating its performance or operation provided the System is not damaged, altered, or modified as part of the evaluation.

Nothing in this Section shall provide an exemption from the material, structural, and installation requirements of this Manual, or the requirements of other enforcement agencies.

SECTION 2: SITE EVALUATION REQUIREMENTS

A. GENERAL

A Site Evaluation is an assessment of the characteristics of a Lot sufficient to determine its suitability for the installation and sustainability of a System meeting the requirements of this Manual and Yolo County Code. The Site Evaluation takes into consideration anticipated Wastewater flow, anticipated Wastewater strength, soil texture, soil percolation rate (when determined), depth to Groundwater, distance from natural land features and structures, site topography, and Usable Space for the installation and Repair of the System. A Site Evaluation is performed by a Qualified Professional in coordination with DEH so that DEH personnel may be present for any facet of the process.

The final product is a Site Evaluation Report prepared by a Qualified Professional, containing required information obtained from Site evaluation. The Site Evaluation Report shall be submitted to DEH within 45 days of the completion of field work and remain in the county file. The Site Evaluation Report shall be submitted to DEH prior to the application for an Installation Permit.

A Site Evaluation is also required for review and approval of a Land Use Project involving an Existing System or proposed new System unless waived by the Director of Environmental Health.

A new Site Evaluation will not be necessary if a Site Evaluation Report is on file with DEH, and the proposed System or System change is located in the area that was assessed in the Site Evaluation Report.

A Site Evaluation may not be required for proposed work on the lot which will not affect the System. However DEH will need to conduct a Site Assessment to verify the proposed work will not affect the System, the System Replacement Area, and the proposed work is outside of the minimum setbacks.

B. APPLICATION FOR SITE EVALUATION

Prior to conducting the Site Evaluation, an onsite Wastewater site evaluation request must be completed on forms provided by DEH. The appropriate fee and the following information shall be submitted with the request for Site Evaluation:

1. Parcel number and address
2. Name, address, and telephone number of property Owner
3. Name, address, and telephone number of the Person preparing the application package
4. Vicinity map and directions to the Site
5. North Arrow
6. Copy of current assessor’s parcel map
7. Proposed areas of soil test pit(s) (if known).

C. SITE ASSESSMENT OF SURFACE FEATURES AND SETBACKS

A Site Assessment of surface features and setbacks is a preliminary review of the physical features of the Site based on the Plot Plan that may limit the available dispersal area for the proposed System or may limit the area of proposed work associated with a Building Permit or other work, when considering the potential impact to the existing System including the 100% Replacement Area.

A Site Assessment is required when DEH receives a request to review work associated with a Building Permit on a property served by a System. The purpose is to assure that the proposed work will not impact the existing System or Replacement Area and all setbacks can be met.

The following information shall be provided when requesting a Site Assessment:

1. Accurate, scaled and legible Plot Plan
2. Description of proposed work (e.g. building permit, scope of work)

No improvements of a Lot shall be approved if the improvement will impact any part of an Existing System, including the designated or probable 100% Replacement Area, in a manner that cannot be corrected in conformance with the Yolo County Ordinance and with this Manual.

D. HORIZONTAL SETBACKS

1. The System Design and installation shall meet the following minimum horizontal setback distances provided in Table 2-1:

Table 2-1. Minimum Horizontal Setback Distances

Site Feature	Minimum Setback Distance (feet)	
	To Dispersal Field	To Septic Tank and Supplemental Treatment Unit
Wells, inactive wells and springs	100	50
Public water supply wells[1]	150	150
Watercourses: - General (from top of bank) - Between 1,200 to 2,500 feet from a Public Water System intake [2] - Within 1,200 feet from a Public Water System intake[2]	 100 200 400	 100 100 100
Cuts or steep Embankments (from top of cut)	4 X h[3,4]	10 feet
Steep Slopes (from break of Slope)[5]	4 X h[3,4]	10 feet
Unstable Land Mass	100[4]	100[4]
Drainage way, Drainage Swale (from edge of flow path) , unlined irrigation ditch, unlined irrigation canals or unlined culverts, or Ephemeral Stream	50	25

Lined ditches, lined canals, lined watertight culverts, or conduits	15	15
Foundation	10	5
Property line[6]	50	25
Septic Tank and Supplemental Treatment Unit	6	N/A
Swimming pool, line pond or basin	10	10
Road easement, pavement, driveway, or areas subjected to vehicular traffic	5	5
Edge of utility easement	0	0
Solid Waterline	10	10
Trees	10	10

[1] The setback shall be 200 feet if a System is proposed with a dispersal area deeper than 10 feet. If any System with a dispersal area deeper than twenty feet is proposed within 600 feet of a public water well a microbiological study is required to determine the appropriate setback based upon a two-year travel time for microbiological contaminants. The study shall be performed by a Qualified Professional. However in no case shall the setback be less than 200 feet.

[2]For areas tributary to and upstream of water supply intake; setback distance measured from high-water mark. Exceptions allowed per SWRCB OWTS Policy, as follows: (a) for replacement systems, comply to the maximum extent practicable and incorporate Supplemental Treatment unless DEH finds no impact or significant threat to water source; (b) for new systems on pre-Existing Lot of record (pre-May 2018), comply to maximum extent practicable and incorporate Supplemental Treatment for pathogens reduction, and where warranted, nitrogen reduction per sections 10.8 and 10.10 of SWRCB OWTS Policy.

[3]h equals the height of cut or Embankment, in feet. The required setback distance shall not be less than twenty five feet nor more than one hundred feet.

[4]Setback distance may be reduced in accordance with recommendations provided in a Geotechnical Report prepared by a CA registered civil engineer or CA certified engineering geologist consistent with Section 2 of this Manual.

[5]Steep Slope is considered to be land with a Slope of >50% and distinctly steeper (at least 20% steeper) than the Slope of the adjacent tank or Dispersal Field area.

[6]The setback to the property line may be reduced to 10 feet for the Dispersal Field and 10 feet for the Septic Tank and Supplemental Treatment Unit when it can be demonstrated that the placement of the Dispersal Field and/or Septic Tank and/or Supplemental Treatment Unit will not cause undue hardship to a neighboring parcel due to the required setback to a well or possible well location on a neighboring parcel. Written authorization from owner(s) of neighboring parcels may be required.

2. Grading and drainage system drawings will be reviewed by DEH along with System Design plans to ensure that the grading and site drainage system can be installed on the property without adversely affecting any existing or proposed Systems.

3. Yolo County Code, Title 8, Chapter 2, Sections 8.2.306 and 8.2.402 require a setback of 500 feet from the toe of a flood control levee if the System is installed below grade; and may require other setbacks according to certain zoning considerations in the same referenced Chapter. Incorporated cities may also have their own requirements for setbacks that are not included in this Manual. Applicants are encouraged to check with the local jurisdiction Planning and Building Departments. Agencies responsible for levee oversight may have additional setback requirements

E. VERTICAL SETBACKS

The vertical setback is the distance measured from the bottom of dispersal trench to the seasonal High Seasonal Groundwater level, fractured rock, or other Limiting Layer. Soil textural classification should be considered the primary data source for System sizing. Percolation tests may be allowed or required to supplement Soil textural classification. When determining Soil textural classification, the least permeable layer below the point of dispersal shall be used in determining the vertical setback.

Table 2-2 provides the minimum Vertical Separation (also referred to as vertical setback) for Standard Systems and Alternative Systems utilizing Supplemental Treatment with Pressure Distribution. Refer to Section 3 for more information and options for vertical setbacks for Standard Systems and Section 5 for Alternative Systems.

Table 2-2: Minimum Vertical Setback Requirements

USDA Soil Classification[4]	Percolation Rate (minutes per inch)	Minimum Vertical Separation		
		Standard System	Standard Tank to Pressure Distribution	Supplemental Treatment Required
Coarse sand[1]	<1	Prohibited	Prohibited	5 feet
Coarse to medium sand	1-5	Prohibited	Prohibited	3 feet
Fine sand, loamy sand	>5-15	8 feet	5 feet	2 feet
Sandy loam, loam, sandy clay loam, silt loam	>15-60	5 feet	3 feet	2 feet
Clay loam, silty clay loam, sandy clay	>60-120	5 feet	2.5 feet	2 feet
Clay[1, 2]	>120[3]	Prohibited	2 feet	Not required

[1]*Not allowed for lot creation.*
[2]*Clays must be non-expansive; clay content shall not exceed 60 percent.*
[3]*Installation Permits will be denied where percolation rates exceed 240 minutes per inch*
[4]*Least permeable Soil Horizon below the point of dispersal and within the minimum separation to Limiting Layer or Groundwater*

F. LOCATION

Except for Community Systems, the System shall be located on the same Lot as the building(s) being served is located. The Director of Environmental Health has the authority to make an exception to this requirement in special situations where due to necessary System Repair or replacement, an existing Dwelling lacks available space on the Lot to accommodate a System. In this case a legal easement may be obtained on an adjoining property for purposes of accommodating the replacement System. Except for situations of common or open spaces created in conjunction with planned developments, an off-site easement may not be considered when creating new Lots or parcels.

Whenever a System crosses a property line separating properties under different ownership, a recorded easement and covenant against conflicting uses shall be provided. For properties under common ownership a recorded deed restriction shall be provided.

Exhibits and legal descriptions of easements and deed restrictions shall be prepared by a licensed

land surveyor.

G. SOIL PROFILES STUDY

Soil conditions in the area(s) identified for the Dispersal Field and 100% Replacement Area require evaluation through Soil Profiles study. A Soil Profiles study usually consists of a backhoe excavation or Soil boring to a depth extending below the anticipated Dispersal Trench bottom.

Because the Systems rely on the natural Soil to biologically treat and filter Wastewater, their performance is directly affected by Soil properties. Soil Texture and structure, as well as mineralogy.

The purpose of the Soil Profiles Study is to ensure that proper Soil conditions exist to allow appropriate Effluent retention, Treatment and filtration of the Effluent; and also prevent Wastewater from discharging to the ground surface or contaminating ground or surface water resources. Identifying Soil types will determine the Soil suitability for absorption of Wastewater in the area proposed for the System's placement, and observing Soil characteristics will verify that there will be adequate Vertical Separation between the bottom of the Dispersal Trench and Bedrock, Groundwater, or Impermeable Soil strata. With adequate Soil analysis, an appropriate System can be designed which will assure a long-lasting and properly functioning System.

The Applicant shall hire a Qualified Professional, as defined in this Manual to perform the Soil Profile Study as provided below. For the most efficient DEH inspection, it is required that DEH is informed 48 hours prior to any Soil Profile Study and it is requested that all Soil Test Pits are dug prior to the field inspection appointment time. If the Soil Profile Study is proposed to occur after normal business hours of DEH, then notice must be given and the time of the evaluation arranged through mutual consent with DEH at least 48 hours prior to the evaluation.

A minimum of two (2) excavations are required: one (1) in the primary proposed System area and one (1) in the proposed Replacement Area. Additional excavations may be required if the initial two profiles show conditions which are dissimilar to the extent that they do not provide sufficient information for design and/or determination of compliance to Yolo County Ordinance and this Manual.

1. Dimensions of Soil Profiles Pit Excavations and Test Holes
   a. Pit Excavations: Soil Profiles excavations shall be made to a depth of at least eight (8) feet, or five (5) feet below the bottom of the proposed Dispersal Field trench, whichever is greater, and be at least two (2) feet wide. Exception: on sites where a Limiting Layer is close to the surface, the Qualified Professional has the option of excavating to a depth that is one (1) foot greater than the depth of the limitation. The employer must comply with the Trenching and Excavation Safety requirements of 29 CFR 1926.651 and 1926.652 or comparable OSHA-approved state plan requirements.
   b. Test Holes: Auger test holes may be an acceptable alternative to backhoe or hand-dug test holes upon written approval from DEH, where DEH determines one of the following:
      (1) The use of a backhoe or similar excavating machinery is impractical because of access or because of the fragile nature of the Soils; or
      (2) It is necessary only to verify conditions expected on the basis of prior Soils investigations; or

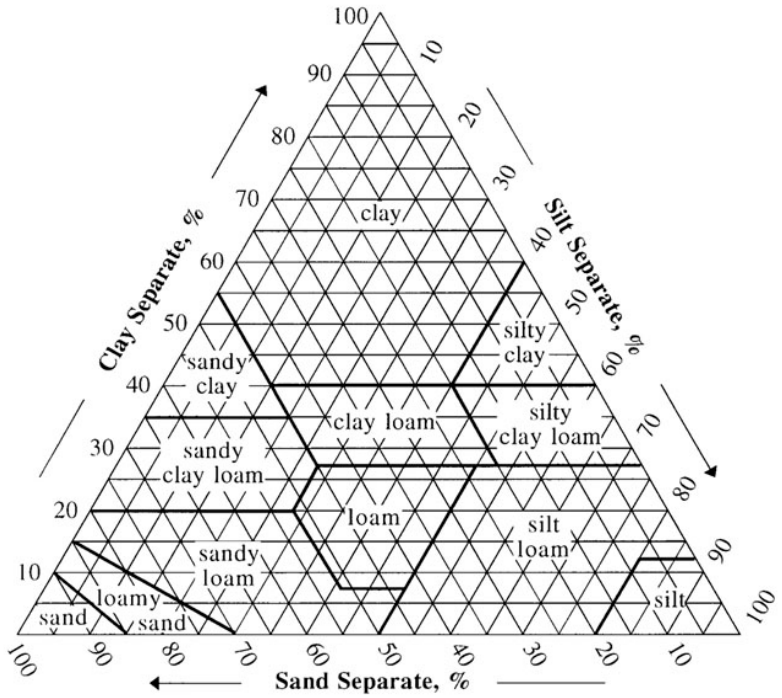
(3) Soil Profiles are required to be no greater than three (3) feet deep (e.g., for mounds or drip dispersal); or
(4) It is done in connection with geologic investigations.

Where Groundwater separation of more than five (5) feet is required (e.g., for Standard Systems in areas of rapid percolation rates), additional (deeper) subsurface exploration may be required for Groundwater determination; and this can be done with an auger boring rather than backhoe excavation.

2. Soil Classification

Soils will be described using the United States Department of Agriculture (USDA) Soil classification system. The USDA Soil Texture Triangle is described in Figure 2-1. All limiting conditions and soil attributes including Texture, Structure, grade, Color, Consistency, Plasticity, Stickiness, Roots, Pores, Redoximorphic Features, Horizon boundary, depth and observed Groundwater will be included for each test pit. Compacted soil and fill are unsuitable unless both Qualified Professional and DEH agree that the conditions will allow development of a System that complies with the intent of the Ordinance and the Manual.

Figure 2-1: USDA Soil Classification System



The following factors should be observed and reported from ground surface to the bottom of Soil Profiles:

a. Horizon Thickness, Munsell Coloring, Soil Structure, and Texture according to the USDA classification.

b. Depth to a limiting condition such as Hardpan, rock strata, Impermeable Soil or Limiting Layer, saturated Soil conditions, or level of high seasonal Groundwater.
c. Depth to observed Groundwater.
d. Depth to and description of Mottled Soil (redoximorphic features), indicating seasonal Groundwater.
e. Other prominent Soil features which may affect Site suitability, such as coarse fragments, Consistence, Roots and Pores, and moisture content.

Systems cannot be installed in areas where impervious formations, fractured rock, 50% or more rock, or high Groundwater (permanent, fluctuating, seasonal, or perched) is closer than two (2) feet below the Dispersal Field.

H. GROUNDWATER DETERMINATION

Some locations in Yolo County are subject to high Groundwater levels which can have an adverse impact on the performance of the System by eliminating or minimizing the zone of aeration in Soils that is critical for optimal Wastewater Treatment. It may also result in introducing untreated Wastewater to the Groundwater which could affect area water wells, water quality and public health. The highest anticipated level of Groundwater is estimated by the highest extent of Soil Mottling and/or gleying (a sticky, blue-gray subsurface layer of clay that is an indication of water-logged soils) to natural grade observed in a Soil Profiles study, data from nearby Soils evaluations or Groundwater observations, or by direct observation of stabilized Groundwater levels. Some Soils, such as sandy river Soils, will not exhibit Redoximorphic Feature. In cases where the Soil lacks the necessary iron compounds to exhibit Redoximorphic Features, direct observation during Wet Weather conditions may be exclusively required. Direct observations, if used or required, occur during Wet Weather conditions as provided below.

I. GROUNDWATER MONITORING

Direct observation of seasonal high Groundwater shall utilize monitoring ports or piezometers. At least one port or piezometer is constructed in each initial and Replacement Area. A workplan for groundwater monitoring shall be developed and submitted to DEH for review and approval. Where a conflict exists between the depth of Groundwater observed through direct observation during Wet Weather conditions and the depth at which Soil mottles are observed, the direct observation of actual Groundwater levels shall govern.

1. Collection of Rainfall Data:
   a. Seasonal Wet Weather Groundwater testing shall be conducted at least every two weeks between the months of November and April, inclusive when rainfall has reached 75% of the average annual rainfall for the testing period.
   b. If there is significant rainfall event, such as when there have been one (1) or more inches of rainfall within a 24-hour period, additional readings shall be taken by the Qualified Professional within two (2) days following a significant rain,
   c. Daily observations by the Qualified Professional may be necessary during elevated groundwater period to identify maximum groundwater levels.
   d. Confirmatory observations will be made periodically by the DEH.
   e. During years of low rainfall, such as drought conditions, a secondary source of seasonal high Groundwater determination may be considered.

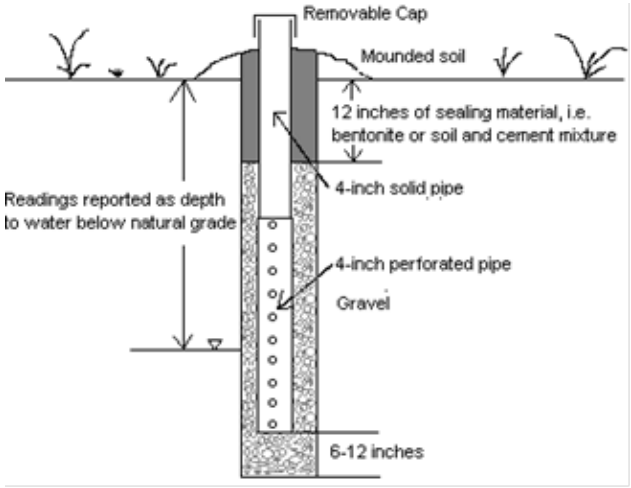
2. Rainfall Data Source:

The average rainfall for the period shall be determined by consulting the California Irrigation Management Information System (CIMIS) at http://wwwcimis.water.ca.gov/. The Wet Weather period may be extended earlier or later depending on weather patterns and with approval of DEH. The Qualified Professional may propose a different source of historical data or different seasonal Wet Weather Groundwater monitoring plan provided the seasonal high Groundwater elevation will be captured in the proposed initial and Replacement Area.

3. Monitoring Port Design:

a. Monitoring Port depth should be equal to or greater than the required depth to groundwater necessary for project approval. The usual depth is eight (8) feet. For larger flow systems, deeper wells may be required to assess Groundwater mounding.
b. Monitoring Port 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 DEH staff.
c. Monitoring Port must be staked and flagged so that they can be readily located by DEH staff.

Figure 2-2: Groundwater Monitoring Port Design



J. HYDROMETER ANALYSIS

A Hydrometer analysis is a laboratory test that measures the percentage of sand, silt and Clay in the Soil. The data can then be plotted on an USDA Soil textural triangle to confirm the field classification of the Soil if necessary. A Hydrometer analysis may be used when the Qualified Professional and DEH representative disagree on the Soil classification using Soil Texturing in the field. The Hydrometer analysis cannot be used exclusively since the Hydrometer test will not show presence of highly compacted Soil or Soil Structures that limit infiltrative properties. The sample for the Hydrometer analysis is taken from the least permeable leaching layer within the Soil Profiles. The depth of this layer will be dependent upon the type of System chosen by the Qualified Professional giving review of the Soil Profiles. If the Hydrometer analysis demonstrates suitable

Soils, but DEH determines the Soil was excavated from an impermeable or limiting Soil layer then a Percolation Test shall be required.

K. PERCOLATION TESTING

A Percolation Test may be performed by or under the supervision of a Qualified Professional or Contractor to provide additional or supplemental information required to determine the potential absorption rate of Soil in the area of the proposed System location. Percolation Testing does not replace the need or requirement for soil profile study, soil textural determination, and determination of evidence of High Seasonal Groundwater.

Prior to conducting Percolation Tests, test plans shall be submitted to DEH for review and approval. DEH will review and approve the number of percolation holes, their depths, and locations; and may elect to witness the installation of the percolation holes, verify presoaking, and be present during all or part of the testing. DEH shall be notified 48 hours in advance of performing Percolation Tests. If the Percolation Test will be performed after normal business hours of DEH, then notice must be given and the time of the evaluation arranged through mutual consent with DEH at least 48 hours prior to the evaluation.

The location of the Percolation Test holes should be evenly distributed horizontally and vertically in the proposed Dispersal Field and Replacement Area. The minimum number of test holes to be dug is four (4), unless indicated by DEH.

Procedure of Conducting a Percolation Test:

1. Dig test holes: Dig or bore the test holes six (6) inches in diameter. The sides are to be kept as straight as possible. The depth of each hole shall be deeper than the proposed depth of the Dispersal Trench, within the least permeable strata of useable soil beneath the Dispersal Field, and maintain a 5 foot separation from Groundwater.

2. Prepare the test holes: Carefully scarify the bottom and sides of the hole with a blunt edged instrument to remove smeared Soil particles and remove all loose Soil material. The native Soil Structure shall be visible on the bottom 10-12 inches of the side wall. Add two (2) inches of pea-size gravel to the bottom of the hole. In order to prevent silting of the bottom of the hole and sidewall cave-in, a 1-inch sidewall gravel pack shall be used. The gravel pack shall be perforated plastic pipe in 12 inch (or longer) sections.

3. Presoak the test holes: Presoak the hole 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 four (4) hours, refilling as necessary. Areas of high Clay content may require presoak twelve (12) hours or longer.

4. Conduct Percolation Test: Add clean water to bring depth of water in the test hole to approximately six (6) inches above the bottom of the hole after the minimum four (4) hour saturation period. Maintain approximately six (6) inches of water in the hole throughout the test.

5. Determine stabilized Percolation Rate: Measure the drop in water level over thirty (30) minute intervals until the rate of drop stabilizes from a fixed reference point. A stabilized rate is when three (3) successive readings do not vary to by more than 10%.

6. Calculate Percolate Rate: Individual test hole Percolation Rate shall be determined by averaging three successive readings vary by no more than 10%.

   The following correction factor shall be used to determine the corrected percolation rate:

Hole Diameter	Gravel Pack Thickness	Correction Factor
6 inches	1 Inch	1.59

   Calculation:
   Standard percolation value (minutes per inch (mpi)) = Test percolation value (mpi) x correction factor
   Example: A six (6) inch hole is used with one (1) inch gravel pack. The test percolation value is 25 mpi. The standard percolation rate = 25 x 1.59 = 40 mpi.

   The mean percolation rate shall be determined by averaging the results of the standard percolation value using the calculation above for all percolation test holes.

7. Report Percolate Rate: Worksheet showing all measurements and calculations shall be submitted with the Site Evaluation Report.

Alternate methods of measuring the Percolation Rate may be approved by DEH if the proposed procedures can be shown to produce a stabilized rate as defined above.

L. GEOTECHNICAL REPORT/SLOPE STABILITY ANALYSIS

For any Site where the ground Slope in the proposed Dispersal Field area exceeds 30%, and for recommended reduction in horizontal setbacks from cuts, Embankments, steep Slopes or an Unstable Land Mass, additional geotechnical evaluation of Slope stability, drainage, and other factors shall be required to verify that the proposed Dispersal System will not degrade water quality, create a nuisance, affect Soil stability or present a threat to the public health or safety. See Section 5 for further requirements.

M. AREAS OF FLOODING

To the extent possible, Systems shall not be located in areas subject to flooding unless it is designed per provisions described in Section 3. Areas subject to flooding shall be shown on the Site Evaluation Plot Plan and the location of the System shall be outside of the area subject to flooding to the greatest extent practicable. Determination of areas subject to flooding shall be site specific and based upon historical knowledge of the parcel or area or visual evidence.

N. CUMULATIVE IMPACT ASSESSMENT

For certain projects, typically multi-residential and Large Systems, the completion of additional technical studies, termed “Cumulative Impact Assessment”, may be required. This is to address the Cumulative Impact issues (mainly Groundwater Mounding and Nitrogen Loading) from Systems that can result from such factors as the constituent levels in the Wastewater (e.g., nitrogen content), the volume of Wastewater flow, the density of System discharges in a given area, and/or the

sensitivity and Beneficial Uses of water resources in a particular location. These issues are not necessarily addressed by conformance with Standard Systems siting and design criteria.

Cumulative Impact Assessment is not required for an individual residential System, regardless of the type of System (Standard or Alternative), except as may otherwise be designated by DEH.

The requirements and guidelines pertaining Cumulative Impact Assessments are detailed below:

1. Cumulative Impact Issues: The primary issues to be addressed in Cumulative Impact assessments will normally include the following:
   a. Groundwater Mounding. A rise in the Water Table, referred to as "Groundwater Mounding", may occur beneath or down-gradient of System or Systems as a result of the concentrated or high volume of hydraulic loading from one or more Systems in a limited area.
   b. Groundwater Nitrogen Loading: Discharges from System contain high concentrations of nitrogen that may contribute to rises in the nitrate level of local and regional aquifers.
   c. Other: For individual projects, the Director of Environmental Health may identify and require analysis of Cumulative Impact issues, other than those listed above which, in his/her judgment, could pose potential water quality, public health, or safety risks.

2. Qualifications: The licensed professional assuming responsibility for the Cumulative Impact assessment should have education, training and experience in the fields of water quality and hydrology, such as a hydrogeologist.

3. Projects Requiring Cumulative Impact Assessment**:** Projects where Cumulative Impact Assessments shall be required are listed in Table 2-3. Additionally, the Director of Environmental Health reserves the right to require the completion of a Cumulative Impact Assessment in any case where, in his/her opinion, special circumstances related to the size, type, or location of the System warrant such analysis.

Table 2-3: Projects Requiring Cumulative Impact Assessment[1]

Type of Project	Average Lot Size (acres)	Design Wastewater Flow (gpd)	Groundwater Mounding Analysis	Nitrogen Loading Analysis
Individual Residence	-	-	No	No
Residence with Second Unit	-	-	No	No
Multiunit and Non-residential	< 1	-	No	Yes
	-	1,500+	Yes	No
	-	2,500+	Yes	Yes
	1[2]	-	No	No

Subdivisions	< 1[2]	-	No	Yes

[1] *The hydrological and water quality analysis requirements may be modified depending on Site specific conditions and the extent to which the System discharge contributes flow to any catchment area.*
[2] *This is an average gross Lot size for the Subdivision.*

4. Methods
   a. Groundwater Mounding Analysis
      (1) Analysis of Groundwater mounding effects shall be conducted using accepted principles of Groundwater hydraulics. The specific methodology shall be described and supported with accompanying literature references, as appropriate.
      (2) Assumptions and data used for the Groundwater mounding analysis shall be stated along with supporting information. A map of the project Site showing the location and dimensions of the proposed system(s) and the location of other nearby System, wells and relevant hydrogeological features (e.g., Site topography, streams, drainage channels, subsurface drains, etc.) shall be provided.
      (3) The Wastewater flow used for Groundwater Mounding analyses shall be the Design Daily Sewage Flow, unless supported adequately by other documentation or rationale.
      (4) Groundwater Mounding analyses shall be used to predict the highest rise of the Water Table and shall account for background Groundwater conditions during the Wet Weather season.
      (5) All relevant calculations necessary for reviewing the Groundwater Mounding analysis shall accompany the submittal.
      (6) Any measures proposed to mitigate or reduce the Groundwater Mounding effects shall be presented and described as to their documented effectiveness elsewhere, special maintenance or monitoring requirements or other relevant factors.
      (7) For System located <200 feet from and within the catchment area of surface water, an annual water balance analysis will also ordinarily be required to assess the extent of potential System impacts on hydrology of a sensitive habitat.

   b. Nitrogen Loading
      (1) Analysis of nitrogen loading effects shall, at a minimum, be based upon construction of an annual chemical-water mass balance. The specific methodology shall be described and supported with accompanied literature references as appropriate.
      (2) Assumptions and data for the mass balance analysis shall be stated, along with supporting information. Such supporting information should include, at a minimum:
         i. Climatic data (e.g., precipitation, evapotranspiration rates);
         ii. Groundwater occurrence, depth and flow direction(s);
         iii. Background Groundwater quality data, if available;
         iv. Soils conditions and runoff factors;
         v. Wastewater characteristics (i.e., flow and nitrogen content); and,
         vi. Other significant nitrogen sources in the impact area (e.g., livestock, other waste discharges, etc.).
      (3) A map of the project siting showing the location and dimensions of the proposed system(s) and the location of other nearby System, wells and relevant hydrogeological features (e.g., Site topography, streams, drainage channels, subsurface drains, etc.) shall

be provided.

(4) The Wastewater flow (average) used for Nitrogen Loading analyses shall be submitted with adequate backup documentation to support estimated average flows.

(5) Minimum values used for the total nitrogen concentration of Septic Tank Effluent shall be as follows, unless supported adequately by other documentation or rationale:

i. Residential Wastewater: 50 mg/l

ii. Non-residential Wastewater: as determined from sampling of comparable system(s) or from literature values.

The Director of Environmental Health may require the use of more conservative values than cited above if, in his/her opinion; the values are not likely to be representative of the proposed System(s).

(6) All relevant calculations necessary for reviewing the Nitrogen Loading analysis shall accompany the submittal.

(7) Any measures proposed to mitigate or reduce the Nitrogen Loading effects shall be presented and described as to their documented effectiveness elsewhere, special maintenance or monitoring requirements or other relevant factors.

5. Evaluation Criteria

a. Groundwater Mounding**.** The maximum acceptable rise of the Water Table for short periods of time (e.g., one to two weeks) during the Wet Weather season, as estimated from Groundwater Mounding analyses, shall be such that, that minimum two (2) feet separation to the Groundwater is maintained for all Systems.

b. Nitrogen Loading. Minimum criteria for evaluating the cumulative Nitrogen Loading from proposed System shall be as follows:

(1) For Areas Served By Individual Water Wells.

i. Existing Lots of Record: New System on Existing Lots of record shall not cause the Groundwater nitrate-nitrogen concentration to exceed 7.5 mg- N/L at the nearest existing or potential point of Groundwater withdrawal (e.g., water well location); and

ii. New Subdivisions: The total loading of nitrate from new subdivisions shall not result in an average Groundwater nitrate-nitrogen concentration over the geographical extent of the subdivision that exceeds 7.5 mg-N/L.

(2) For Areas Not Served by Individual Water Wells.

i. Existing Lots of Record: System installed on Existing Lots of record shall not cause the Groundwater nitrate-nitrogen concentration to exceed 10 mg-N/L at the nearest existing or potential point of Groundwater withdrawal (e.g., water well location), and

ii. New Subdivisions. The total loading of nitrate from new subdivisions shall not result in an average Groundwater nitrate-nitrogen concentration over the geographical extent of the subdivision that exceeds 10 mg-N/L.

The Director of Environmental Health reserves the right to require, in any individual case, more stringent nitrate-nitrogen compliance criteria where deemed necessary for protection of public health, or based upon specific requirements or recommendations of the Central Valley Regional Water Quality Control Board.

Criteria for assessing hydrological impacts for Groundwater Mounding or Nitrogen Loading will

be considered on a case-by-case basis. The Director of Environmental Health may rely upon Regional Water Quality Control Board staff or a third-party consultant to assist in the review. Costs for retaining a third-party consultant are the responsibility of the project Applicant.

O. PLOT PLAN AND SITE EVALUATION REPORT

1. Plot plan

All Plot Plan shall be drawn to scale and be submitted as part of the Site Evaluation Report package. All information obtained from the Site Evaluation shall be included in the Site Evaluation Report, even if the information determines the site is unsuitable for System installation. The scaled Plot Plan shall include, but not limited to, to the following information:

a. Parcel number and address
b. Name, address, and telephone number of property Owner.
c. Name, address, and telephone number of the Person preparing the application package
d. Vicinity map and directions to the Site
e. The scale and north arrow
f. Copy of current assessor's parcel map.
g. Lot dimensions including all property lines, setback, easements, right-of-ways, etc.
h. Vehicle traffic areas whether paved or unpaved
i. Structures including pools, Dwellings, sheds, barns and auxiliary buildings
j. Paved areas, such as pool deck and walkways
k. Any hazardous materials storage including fuel tank
l. Animal enclosures
m. Plumbing including existing and proposed stub outs and water lines
n. Existing and proposed wells, abandoned wells, springs, neighboring wells, streams, ditches, canals, ponds, and any other body of water located within 400' of the property lines
o. Areas subject to flooding, ravines, bluffs, cut banks
p. Seasonal drainage swales, ditches, and unlined Watercourses.
q. Public Sewer System lines within 200 feet of any corner of the subject lot, if it exists
r. Existing System, abandoned septic tank(s), cesspools, holding tanks, etc.
s. Trees and utilities with 10 feet of the actual or proposed System
t. Soil test hole locations
u. Exact location of exiting, proposed primary and Replacement System
v. Surface water flow

2. Site Evaluation Report

In addition to the scaled Plot Plan, the following results and reports shall be submitted as part of the Site Evaluation Report package.

a. Soil Profiles results, with a scaled Plot Plan (1" = 50' minimum) of conducted profiles and written document attesting to the validity that the tests were set up and conducted in accordance with County Code and this Manual for both primary and replacement dispersal areas
b. Depth to Groundwater or Limiting Layer

c. Ground Slope reported in percent, direction of drainage (a contour map may be required). Percolation test results (when percolation tests are performed)
d. Hydrometer test results if needed
e. Groundwater monitoring results if needed
f. Geotechnical report if needed
g. Grading plan if needed.

The Site Evaluation Report does not expire and it stays with the land, except for when there is a change in Site conditions adversely affecting the proposed System area or when there has been a change in regulatory requirements. The report must be signed by the Qualified Professional responsible for the Site Evaluation and include their license/registration number. DEH will review the report and may require additional information including a follow up technical report to address Soil limitations and/or Slope instability.

A proposed System Design may be submitted as part of the Site Evaluation to demonstrate the type of System that would be suitable for the site. However, the final System Design will not receive approval until the Installation Permit has been approved.

SECTION 3: DESIGNING A SYSTEM

A. GENERAL

The following System design criteria apply to all Systems unless otherwise specified. Additional or different requirements which apply to Alternative Systems can be found in Section 5 of this Manual.

A Contractor may submit an installation plan for a Standard System based on the Site Evaluation Report prepared by a Qualified Professional and design criteria provided in this Manual for a Standard System. An Alternative System shall be designed by an approved Qualified System Designer based on the Site Evaluation Report and the design criteria provided in this Manual. However nothing in this Manual or in Yolo County Code of Ordinances shall authorize anyone other than a California Registered Civil Engineer or Registered Environmental Health Specialist to design a System that constitutes a “fixed work” as defined in Section 6731 of the Business and Professions Code (Secondary reference: Section 106620 of the California Health and Safety Code).

B. TYPES OF SYSTEMS

1. Standard System: A Standard System is an Onsite Wastewater Treatment System (OWTS) consisting of a Septic Tank, Effluent distribution by gravity flow to Dispersal Field. A Standard System design may include a Pump Tank to provide lift to a gravity-flow Dispersal Field.

2. Alternative System: An Alternative System is a type of System that utilizes a method of Wastewater Treatment other than a standard Septic Tank and/or a method of Wastewater dispersal other than a standard leach Dispersal Field in native Soil. See Section 5 for types of Alternative System requirements.

3. Unacceptable System**:** The following types of sewage disposal method are prohibited: Evapotranspiration Systems, Leach Pits, Seepage Pits and Cesspools.

a. Exception: Evapotranspiration Systems installed prior to August 1, 2015 will be allowed provided that they are being maintained and monitored properly.

C. VERTICAL SETBACK AND APPLICATION RATE FOR STANDARD SYSTEMS

The vertical setback is the distance measured from the bottom of dispersal trench to the High Seasonal Groundwater level, fractured rock, or other limiting layer. Soil textural classification should be considered the primary data source for System sizing. Percolation tests may be allowed or required to supplement Soil textural classification. When determining Soil textural classification, the least permeable layer below the point of dispersal shall be used in determining the vertical setback.

Standard Systems may be used only if Soil textural classification results or Percolation Tests show Soil percolations are between 6 and 120 minutes per inch (mpi) inclusive. Pressure Distribution is recommended at percolation rates slower than 60 mpi and required if percolation rate is slower than 120 mpi.

1. The following table shall be used to determine the minimum Effective Soil Depth for a Standard System. Section 5 provides application rates for Alternative Systems.

Table 3-1: Minimum Vertical Setback for Standard Systems

USDA TEXTURAL CLASSIFICATION[3]	PERC RATE (MPI)	MINIMUM VERTICAL DISTANCE TO GROUNDWATER or LIMITING LAYER	
		SEPTIC TANK TO STANDARD TRENCH	SEPTIC TANK TO PRESSURE DISTRIBUTION
Coarse to medium sand	<1-5	Prohibited for Standard Systems. See Section 5 for Alternative System requirements	
Fine sand, loamy sand[2]	>5-15	8 feet	5 feet
Sandy loam, loam, sandy clay loam, silt loam	>15-60	5 feet	3 feet
Clay loam, silty clay loam, sandy clay[1]	>60-120[4]	5 feet	2.5 feet
Clay	>120	Prohibited	2 feet

[1] *Clays must be non-expansive; maximum Clay content is 60%.*
[2] *Subject to Percolation Test in addition to Soil textural determination if 35 % or more (by volume) coarse fragments (defined as > 2 mm in size)*
[3] *Least permeable Soil Horizon below the point of dispersal and within the minimum separation to Limiting Layer or Groundwater*
[4] *Pressure Distribution is recommended and may be required where percolation rates are slower than 90 mpi.*

2. The following tables shall be used to determine maximum soil application rates based on USDA Soil Texture classification as determined during the Soil Profile Study.

Table 3-2: Application Rates (gallons/square foot/day) Based on Soil Profile

USDA Soil Texture Class	Single Grain	Granular	Strong: Angular, Subangular Blocky	Moderate: Angular, Subangular Blocky	Weak: Angular, Subangular Blocky	Structureless, Massive, Friable, Very Friable	Structureless, Massive, Compact, Firm, Very Firm
Sand	1.2	N/A	N/A	N/A	N/A	N/A	N/A
Loamy Sand	1.2	0.90	N/A	N/A	0.90	N/A	N/A
Sandy Loam	N/A	0.90	N/A	0.64	0.64	0.64	N/A
Sandy Clay Loam	N/A	0.55	0.55	0.49	0.49	0.49	0.0
Loam	N/A	0.55	0.55	0.49	0.45	0.45	
Silt Loam	N/A	0.49	0.49	0.45	0.32	0.32	0.0
Silty Clay Loam, Clay Loam	N/A	0.45	0.45	0.45	0.32	0.32	0.0
Sandy Clay, Silty Clay	N/A	0.32	0.32	0.32	0.32	0.0	0.0
Clay	N/A	0.26	0.26	0.26	0.26	0.0	0.0

3. If Percolation Tests are performed to supplement the Soil classification and Texture evaluation, the following tables may be used to determine the application rate, upon DEH's approval.

Table 3-3: Wastewater Application Rates as Determined from Stabilized Percolation Rate

Percolation Rate (minutes per Inch)	Application Rate (gallons per day per square foot)		Percolation Rate (minutes per Inch)	Application Rate (gallons per day per square foot)		Percolation Rate (minutes per Inch)	Application Rate (gallons per day per square foot)
<1	Prohibited for Standard Systems		31	0.63		61	0.38
1			32	0.62		62	0.38
2			33	0.61		63	0.38
3			34	0.60		64	0.38
4			35	0.59		65	0.37
5			36	0.58		66	0.37
6	1.2		37	0.58		67	0.37
7	1.2		38	0.57		68	0.36
8	1.2		39	0.56		69	0.36
9	1.17		40	0.55		70	0.36
10	1.11		41	0.55		71	0.36
11	1.06		42	0.54		72	0.35
12	1.01		43	0.53		73	0.35
13	0.97		44	0.53		74	0.35
14	0.94		45	0.52		75	0.35
15	0.90		46	0.52		76	0.34
16	0.88		47	0.51		77	0.34

17	0.85		48	0.51		78	0.34
18	0.82		49	0.50		79	0.34
19	0.80		50	0.49		80	0.34
20	0.78		51	0.49		81	0.33
21	0.76		52	0.49		82	0.33
22	0.75		53	0.48		83	0.33
23	0.73		54	0.48		84	0.33
24	0.71		55	0.47		85	0.33
25	0.70		56	0.47		86	0.32
26	0.69		57	0.46		87	0.32
27	0.67		58	0.46		88	0.32
28	0.66		59	0.46		89	0.32
29	0.65		60	0.45		90	0.32
30	0.64					>90 - 120	0.26

D. DOMESTIC WASTEWATER STRENGTH

Wastewater that is High Strength Wastewater must receive Supplemental Treatment to lower the waste strength to the level commonly found in domestic residential Septic Tank Effluent before discharge into Dispersal Field. Domestic strength Wastewater, for the purposes of this Manual, is Wastewater with the following characteristics:

1. 30-day average concentration of Total Suspended Solids (TSS) less than or equal to 330 mg/L
2. 30-day average concentration of Biochemical Oxygen Demand (BOD) less than 300 mg/L
3. Total Nitrogen less than or equal to 75 ppm
4. Fats, Oil and Grease (FOG) less than 100 mg/L

E. WASTEWATER FLOW CALCULATIONS

System Sizing is based on the maximum daily flow rate. The daily flow rate shall be determined using the following tables (Table 3-4 and Table 3-5). For non-residential Systems, the Applicant may be requested to provide additional information to determine an accurate daily flow rate. An undersized System will result in System failure, therefore, it is highly recommended to include a safety factor when properly sizing a System. For some non-residential units where flow rate is questionable, an Effluent flow meter may be required.

DEH will accept applications for Systems with a projected flow of up to 10,000 gallons per day (gpd). Systems with Design Flows that exceed 10,000 gpd must be reviewed by the RWQCB, Region 5, for approval and regulation.

1. Single Family Residences and Second Units: Wastewater flows used for design shall be based on a factor of 150 gal/day/Bedroom and Potential Sleeping Room for each of the first three (3) Bedrooms and Potential Sleeping Rooms, plus 75 gal/day for each additional Bedroom and Potential Sleeping Room as indicated in Table 3-4 below:

Table 3-4: Minimum Design Flow per Bedroom and Potential Sleeping Room (PSR)

Number of Bedrooms and Potential Sleeping Rooms	Design Flow (gal/day)
1	150
2	300
3	450
4+	+75 per additional Bedroom or PSR

2. Multi-Unit Residences and Non-Residential Facilities: Wastewater flows used for the design of these systems can be found in Table 3-5 below:

Table 3-5 Design Flow for Multi-Unit Residences and Non-Residential Facilities*

Type of Business or Facility	Design Flow (gal/day)
Assisted living/ residential care home	
- Per resident bed space, ambulatory residents	100
- Per resident bed space, non-ambulatory residents	125
- Live-in caregiver	75
- Per employee (day use)	15
Camps (per person)	
- Day use	10
- Overnight use, with flush toilets, no showers	25
- Overnight use, with flush toilet and showers	35
Churches and assembly halls (per seat)	
- Without kitchen	5
- With kitchen	15
Country Clubs	
- Per resident member or caretaker	75
- Per guest	25
- Per employee	15
Day Care (per patron, employee)	15
Detention center	
- Per resident bed space	100
- Per employee	15
Factories and industrial buildings (toilet wastes only)	
- Without showers (per employee)	15
- With showers (per employee)	35
Hotels or Motels	
- Per guest	50
- Per employee	15
- Additional for restaurant, spa or other facilities	Case-by-case
Laundromat, with self-service washing machines	
- Per machine -or-	500
- Per customer	50
Mobile home parks (per space)	250
Multiunit residential housing	

- Apartments, per Bedroom (includes Potential Sleeping Rooms)	150
- Boarding house and farm labor housing, per bed	50
Offices and stores (per employee)	15
Parks with picnic areas (per person)	
- With flush toilets	5
- With flush toilets and showers	10
Recreational vehicle parks	
- Without individual sewer hook-ups (per space)	50
- With individual sewer hook-ups (per space)	100
Restaurants and Food Service	
- Toilet and kitchen wastes (per patron)	10
- Kitchen wastes only (per meal served)	5
- Additional for bars (per patron)	2
- Per employee	15
Service Station	
- Per vehicle served	10
- Per employee	15
Schools, boarding	
- Student and live-in staff (per person)	75
- Daily staff (per person)	15
Schools, day	
- Without cafeteria or showers (per student)	15
- With cafeteria (per student)	20
- With cafeteria and showers (per student)	25
- Staff (per person)	15
Swimming Pools	
- Per patron	10
- Per employee	15
Theaters	
- per seat	5
- per employee	15
Wineries (sanitary waste only)	
- tasting room, per visitor	2.5
- per employee	15
- special events	case-by-case

** The Qualified System Designer may propose differing design flow based on the adequate evidence and justification.*

F. SYSTEM SIZING

1. Effective Infiltrative Area: The Effective Infiltrative Area is the surface area measured in square feet per one lineal foot of trench length that is allowed to be considered for receiving the Wastewater effluent dispersal in the Dispersal Field.

a. Standard Dispersal Field Requirement. For Dispersal Field sizing, the "Effective Infiltrative Area" shall be a maximum of three square feet per lineal foot of trench except as provided in Section 3, F 1(b).
b. Pressure Distribution: DEH may allow up to a 25% reduction in Dispersal Field sizing based on allowance of four square feet of Effective Infiltrative Area per lineal foot of trench.
c. Supplemental Treatment: By reducing the Biological Oxygen Demand (BOD), an increased application rate may be allowed. An increased application rate would result in a smaller Dispersal Field. However in no case shall the combination of Pressure Distribution and Supplemental Treatment result in a reduction in Dispersal Field size greater than 30%. More information can be found in Section 5.
d. Graywater Systems Prohibited for Reduction in System Sizing**:** Graywater Dispersal Systems shall not be used as a method to reduce estimated daily flow and System sizing because Graywater Systems cannot be used during saturated conditions.

2. Standard Trench Length Calculation**:** Required trench length for the Dispersal Field shall be calculated as follows:

L = Q / (R*A)

L = Trench length
Q = Design Wastewater Flow, in gpd
R = Wastewater application rate, in gpd/ft^2
A = Total infiltrative area per lineal foot of trench, in ft^2 (3 feet standard)

Example: A 3-bedroom single family dwelling.
Q = 3(150 gpd) = 450 gpd
R = determined at site evaluation/perc test (let's use 0.4 gpd/ft^2)
A = 3 ft^2
L = 450 / (0.4)(3) = 375 total lineal feet of leach lines

G. REPLACEMENT AREA

A Replacement Area with suitable Site conditions for a new System installation must be preserved for future use. The Replacement Area must be:

1. Equal to 100% of the size required for the primary (installed) System, except in circumstances where DEH requires an area that is equal to 200 % of the size of the installed System; and

2. Totally separate from the primary System area; and

3. Able to meet all current design requirements for the type of replacement System proposed; and

4. Fully protected to prevent damage to Soil and any adverse impact on the immediate surrounding that may affect the installation of the Replacement System and its function.

H. SEPTIC TANK SIZING

1. Minimum Capacity. Septic Tanks must have a minimum capacity of twelve hundred (1,200) gallons and shall be determined by the number of Bedrooms and Potential Sleeping Rooms based on the following table (Table 3-6). For non-residential systems, the tank shall have a minimum capacity of twelve hundred (1,200) gallons and must be at least three (3) times the estimated maximum daily flow:

Table 3-6: Minimum Tank Sizing

Number of Bedrooms and Potential Sleeping Rooms (PSR)	Minimum Tank Capacity
1-3	1200 gals
4-5	1500 gals
>5	additional 200 gallons for each additional bedroom and PSR

I. FLOW EQUALIZATION SYSTEM

1. General: Flow Equalization may be used for non-residential and mixed use facilities that experience significant, regular and predictable fluctuations in Wastewater flows. Examples of applicable facilities include, but are not limited to churches, schools, and special-event venues.

   Flow Equalization is the process of controlling the rate of Wastewater flow through a System by providing surge capacity storage and timed-dosing of the incoming flow. Installed following the Septic Tank, it allows peak surges in Wastewater flow (e.g., from a weekend event) to be temporarily stored and metered into the Treatment system and/or Dispersal Field at a relatively even ("average") rate over an extended number of days (e.g., during the subsequent week).This generally aids better System performance.

2. Flow Equalization Requirements: Where Flow Equalization is proposed to be incorporated in a System, the following would apply:
   a. The Septic Tank capacity shall be sized based on the peak daily flow for the facility;
   b. The Design Flow used for sizing Supplemental Treatment unit(s) and/or the Dispersal Field may be based on the equalized ("average") flow rate rather than the peak daily flow rate for the facility;
   c. Design calculations and specifications must be submitted to substantiate the proposed design and operation of the Flow Equalization System; and
   d. Depending on the size and complexity of the System, an Operating Permit may be required.

J. AREAS OF FLOODING

For Systems located in areas subject to flooding as determined by site specific historical knowledge of the area or visual evidence, DEH will require the Qualified System Designer to include design features to prevent inundation with water. The analysis and design features must include:

1. Protecting System components from flood damage using structural tie-downs and/or elevating critical components above areas of potential flooding; and

2. Preventing discharge of Wastewater into flooded Dispersal Areas from pump systems (e.g., using flood-activated float switches to override/disable pump operation during high water conditions); and
3. Providing additional emergency storage capacity for flood periods.

K. GROUNDWATER PROTECTION

Nitrogen reducing Supplement Treatment is required in the following circumstances:

1. New Systems proposed within areas that are determined to have a potential for nitrogen contamination in the groundwater due to:

    a. Dense development greater than one (1) dwelling unit (or equivalent) per gross acre, on average: and
    b. Soils with a percolation rate of five (5) minutes per inch or faster (coarse to medium sand); and
    c. Groundwater levels less than 8 (eight) feet below the bottom of the proposed dispersal field; and
    d. Where individual water wells are the source of water supply.

2. New or replacement Systems where there are known elevated levels of nitrogen in the groundwater that exceed 75% of the maximum contaminant level for drinking water as established by the California Department of Public Health, and where the known source of nitrogen contamination is determined to be substantially due to septic system effluent; and where individual water wells are the source of water supply.

SECTION 4: INSTALLING A SYSTEM

A. GENERAL INSTALLATION REQUIREMENTS

This section includes general requirements for Standard System Installation. Refer to Section 5 for additional specific requirements for installing an Alternative System.

1. Standard Systems are gravity Systems consisting of a Septic Tank for primary Treatment followed by a System of gravity-fed distribution through Dispersal Field for subsurface dispersal of Effluent into the Soil. Standard Systems include those that utilize shallow trench depth, or standard trench depth.

    A Standard System may use gravity flow or a Pump Tank to convey Effluent from the Septic Tank to the Dispersal Field.

2. General Requirements:
    a. The approved System Design must be available at the job Site.
    b. The property Owner or a Contractor with appropriate Contractor's license can install a Standard System based on the approved System Design. Additional inspections may be necessary, at Owner's expense if the property Owner installs his/her own System. If the

property Owner is the Installer, DEH cannot serve as the consultant to the System installation. An appropriate licensed septic Contractor is highly recommended. See Section 4, subheading L: "Requirements for Owner-Installer."

c. DEH shall be notified at least 48-hours prior to starting construction.
d. The jurisdiction of DEH begins at the Building sewer Cleanout before the Septic Tank. The Building sewer pipe is within the jurisdiction of the local Building Official and shall be constructed with materials in conformance to that Division's standards.
e. No part of the Septic Tank or Dispersal Field may be covered without approval from DEH.
f. At completion of construction and prior to receiving final approval by DEH, the Contractor, Qualified System Designer, or Qualified Professional shall provide to DEH and the property Owner a set of "As-Built" drawings of the completed System installation.

B. PIPES AND TANKS - CONSTRUCTION MATERIALS AND INSTALLATION

Unless otherwise specified, tanks and piping shall consist of materials and be constructed in conformance with the standards outlined below. All connection of pipes of different diameters shall be made with the proper fittings.

1. Pipe Requirements:
   a. Solid pipe, joints and connections: Solid (non-perforated) pipe for Systems must conform to the standards of the most recent edition of the Uniform Plumbing Code, which is adopted by reference into the county's building ordinances. Pipe diameter must be four (4) inches. All solid pipe joints and connections must be glued, cemented or made with an elastomeric seal so as to be watertight.
   b. Tightlines under Residential Driveway.: Tightlines in residential traffic areas must be installed with schedule 40 Polyvinyl Chloride (PVC). An alternative is to sleeve (i.e., double pipe) the thin wall tightline pipe within an outer pipe consisting of schedule 40 PVC, Acrylonitrile-Butadiene-Styrene (ABS) or suitable alternative and rated by the Uniform Plumbing Code.
   c. Distribution Pipe: Perforated pipe for standard Dispersal Systems must conform to the most recent edition of the Uniform Plumbing Code, which is adopted by reference into the county's building ordinances. The pipe diameter must be four (4) inches.
   d. Effluent Sewer Pipe, Header Pipe, and Fittings: The Header Pipe shall extend a minimum of five (5) feet out to the Distribution Box. Effluent Sewer, Header Pipe and fittings shall be a minimum of three (3) inch diameter, watertight, and one of the following:
      (1) Schedule 40 PVC that meets the most current ASTM D-1785 for three (3) inch pipe and D-2672 for minimum four (4) inch pipe.
      (2) Schedule 40 ABS that meets the most current ASTM Specification D-2468.
      (3) ASTM SDR 35 with solvent-welded joints.
      (4) Other material approved by DEH.

2. Building Sewer requirements: The Building sewer pipe extends from the house to the Septic Tank, and shall meet the following criteria:
   a. Supported by sand or compacted Soil along entire length.
   b. Sloped ¼" per foot for 3" diameter pipe; 1/8" per foot for 4" diameter pipe.
   c. No horizontal bends greater than 45 degrees.
   d. Two-way clean-out extended to grade (Building Division inspects this)

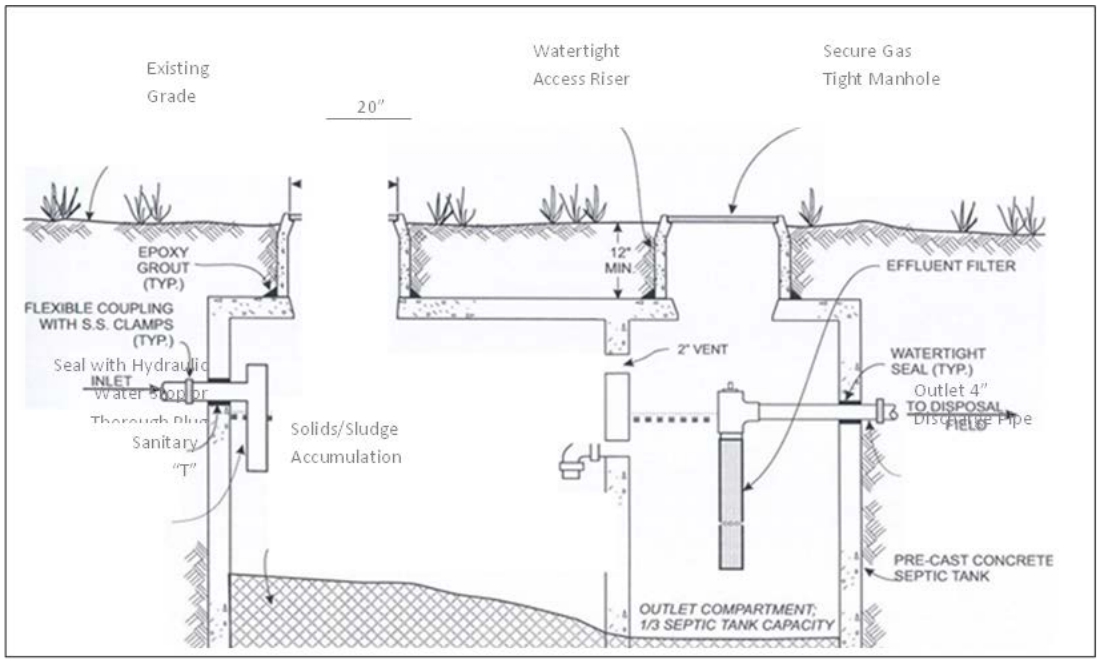
e. Special installation and materials required under vehicle crossings.

3. Septic Tank Requirements:
   a. Minimum Capacity: See Section 3H, Table 3-6.
   b. Two Compartments. Septic Tanks must be of minimum two-compartment construction, with the first compartment equal to two-thirds the total tank volume. The compartments must be separated by a baffle or equivalent arrangement.
   c. Materials: Septic Tanks must be pre-made, watertight, properly vented and constructed of reinforced concrete, fiberglass or other durable, non-corrodible materials as approved by the Director of Environmental Health. Septic Tanks shall be designed to withstand any anticipated weight placed above it. All Septic Tanks shall be listed and approved by the International Association of Plumbing and Mechanical Officials (IAPMO) or an (American National Standard Institute (ANSI) accredited testing organization. Exception to this requirement may be granted where structural design calculations for the Septic Tank are provided by a Qualified System Designer, stamped and certified by a California Registered Civil Engineer as meeting the industry standards, and their installation shall be according to the manufacturer's instructions.
      - On rare occasions, septic tank lid can be replaced if the tank was proved to be in good condition and supported by a statement from a California Registered Civil Engineer. In addition, the replacing lid has to be structural sound as proved by an engineering report.

   d. Access Openings: Access to each Septic Tank compartment must be provided by a manhole opening at least twenty inches in diameter.
   e. Access Risers: A riser must extend from each manhole opening to or above the surface of the ground. The riser must be of a size larger than the manhole opening, be both gas and water-tight, be constructed of durable material and equipped with a secure cover.
   f. Effluent Filter: The outlet of the Septic Tank shall be fitted with an Effluent filter capable of screening solids in excess three-sixteenths (3/16) of an inch in diameter and conforming to (National Sanitation Foundation (NSF)/ANSI Standard 46 or as otherwise approved by DEH.
   g. Water-tightness Testing: All new Septic Tank installations and modifications to existing Septic Tanks, or major Repairs to a System shall demonstrate the Septic Tank is water-tight as follows:
      (1) New Tanks. For new tank installations, the testing shall be done with the risers in place and the inlet and outlet pipes plugged. The tank shall be filled with water to a level extending a minimum of two (2) inches into the risers, and monitored for one (1) hour period, with no measurable drop in the water level.
      (2) Existing Tanks. For existing tanks, the tank shall be filled with water to a level even with the Invert of the outlet pipe, and monitored for one (1) hour period, with no measurable drop in water level. However, in cases where the Groundwater level is known or estimated to rise above the level of the outlet pipe during any time of the year, the water-tightness test shall be conducted following the procedure for new tank installations; i.e., by filling the tank with water into the risers.

      If the Septic Tank is not water-tight it shall be repaired or replaced.

Figure 4-1: A Typical Septic Tank Layout



C. DISPERSAL TRENCH REQUIREMENTS

1. General Consideration:
   a. Trenches must be placed in undisturbed earth, in an accessible area, and shall not be covered by paving or other impermeable or compacted surface. Natural topography shall not be graded to modify Slope.
   b. Trenches must be installed on contour.
   c. The bottom of a trench must be level, with a variation of no more than one (1) inches per 100 lineal feet of trench; trenches shall be aligned parallel to the ground surface contours to the greatest extent practicable.
   d. Adjacent trenches on Slopes must be connected with a watertight overflow line ("relief line") in a manner that allows each trench to be filled with Wastewater Effluent to the depth of the rock before the Wastewater flows to the next lower trench. Alternatively, a Distribution Box (D-box) may be used to equally divide the flow amongst the trenches.
   e. Trenches must not be excavated when the Soil is so wet that smearing or compaction occurs
   f. In Clay Soils when glazing occurs, the trench surfaces must be scarified to the depth of the glazing and the loose material removed.
   g. Rock material in the trench must be washed and free of fines.
   h. Two (2) inches of rock must be placed over the drain pipe.
   i. Prior to backfilling the trench, the Drain Rock must be covered with geotextile filter fabric.
   j. Backfill must be carefully placed to prevent damage to the System.
   k. Backfill must be native Soil. Backfill must be free of large stones, frozen clumps of earth, masonry, stumps, waste construction materials, or other materials that could damage the System.

l. A capped inspection port shall be installed within each trench to provide a means of observing the Effluent level in the trench.

m. The Slope shall not exceed 25% in the Dispersal Area and Replacement Area.

n. For purposes of determining Effective Soil Depth and Vertical Separation, the depth of Limiting Layer shall be measured from the upslope side of the Dispersal Trench bottom

o. Erosion control measures shall be implemented following installation.

2. Serial and Parallel Distribution

There is no preference between serial or parallel distribution of gravity flow Systems. Serial Distribution may be used for gravity flow Systems however it must not create a pressure head on trenches at lower depths.

3. Trench Specifications**:** A standard subsurface Dispersal System must consist of a series of trenches meeting the specifications in Table 4-1.

Table 4-1. Standard System Dispersal Trench Design

	Minimum	**Maximum**
Leach Lines per field	1	No limit
Trench Length	25 feet	100 feet
Trench Bottom Width	18 inches	36 inches
Trench Depth[1]	2.5 feet[2]	3 feet[3]
Cover over rock	12 inches	18 inches
Depth of rock under pipe	18 inches	24 inches[4]
Depth of rock over pipe	2 inches	3 inches
Size of rock	¾ inches	2½ inches
Spacing of trenches, sidewall to sidewall	5 feet	No limit

[1]*As measured on the upslope side of the trench.*
[2]*Shallower trenches are allowed as per requirements in Section 4D*
[3]*Trenches greater than 36 inches deep may be allowed up to 8 feet deep in special circumstances and shall comply with the requirements of a Deep Trench Dispersal Field, provided in Section 4E.*
[4]*Up to 78 inches of rock under the pipe is allowed for a Deep Trench Dispersal Field.*

D. SHALLOW TRENCH

1. Description

A Shallow Trench Dispersal Field is a Standard System where the Dispersal Trench effective sidewall is installed a minimum of twelve (12) inches into native soil. The shallow construction of the System allows for installation where a Limiting Layer or Groundwater is closer to ground surface.

2. Siting Criteria

   A Site must meet all of the following criteria to be considered for a Shallow Trench Dispersal Field:

   a. The Slope shall not exceed 25% in the Dispersal Area and Replacement Area.
   b. Effective Soil Depth shall meet the requirements of this Manual for Standard Systems.

3. Design Criteria

   Unless otherwise specified, the System shall be designed in accordance with the provisions of this Manual

   a. Dispersal Trench depth shall be 12 inches minimum and 18 inches maximum
   b. Dispersal Trench width shall be 24 inches minimum and 36 inches maximum
   c. Cap depth shall be 12 inches after settling.

4. Installation Requirements

   Unless otherwise required by DEH, the installation shall meet the installation and construction requirements of this Manual and the following:

   a. The soil to be used for the cap may be examined and shall be approved by the Division and Qualified System Designer prior to placement.
   b. The Dispersal Area shall have the vegetation removed and shall be scarified, parallel to contours, no deeper than six (6) inches.
   c. The Soil cap shall extend a minimum of five (5) feet beyond the exterior trench sidewall on the uphill side and ten (10) feet elsewhere.
   d. The site shall be landscaped for erosion control in accordance with the approved construction/ design plan and Permit requirements. Additionally, the Site shall 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.

5. Required Inspections

   Inspection criteria and issuance of Final Approval shall be in conformance with this Manual. The following additional inspections shall be required:

   a. The Dispersal Area and fill material shall be inspected for scarification, soil texture, and moisture content.
   b. Prior to backfill of the Dispersal Trenches
   c. Final placement of the soil cap.

6. Management Requirements

   Recommended minimum procedures and frequency for inspection, maintenance, monitoring and reporting activities for Shallow Trench Dispersal Fields are the same as for Standard Systems, except for the following:

   a. Conduct routine visual observations of soil cap area and downslope area and surroundings for wet areas, pipe leaks or damage, Soil erosion, drainage issues, abnormal vegetation, gophers or other problems every 6 to 12 months.
   b. Maintain cap area landscape vegetation, as required

c. Investigate and repair erosion, drainage or other disposal field problems, as needed.

E. DEEP TRENCH

1. A Deep Trench Dispersal Field is a Standard System where the Dispersal Trench effective sidewall is installed greater than thirty-six (36) inches deep into native soil. Trench depth should be kept as shallow as possible to take advantage of those soil horizons that best provide oxygen and promote microbiological activity; and within the root zone of plants to take advantage of nitrogen uptake in plants. DEH may allow installation of a System with Dispersal trenches deeper than 36 inches in order to mitigate for a shallow limiting layer such as hardpan or claypan, providing the minimum Vertical Separation requirement can be met.

2. Criteria for Approval

   A Deep Trench Dispersal Field will not be approved to mitigate for a mistake in placement of the building sewer at depths greater than acceptable for a Standard System. A Deep Trench Dispersal Field will only be permitted under the following conditions:

   a. The Lot is inadequate to accommodate a Standard or Pressure Dosed System for the development purpose; and
   b. Minimum Effective Soil depth is met.

3. Design Criteria
   a. Unless otherwise approved by the Division the disposal trench shall have a minimum depth of thirty-seven (37) inches, and a maximum width of thirty-six (36) inches.
   b. System sizing shall be the same as for a Standard System, unless using Pressure Distribution, or a Supplemental Treatment Unit where the System sizing for Alternative Systems would apply.
   c. The minimum Dispersal Trench spacing (sidewall-to-sidewall) within a Dispersal field shall be at least two (2) times the depth of the filter material.
   d. The maximum Slope for a Deep Trench Dispersal Field is 25%
4. Management Requirements
   There are no special management requirements for the Deep Trench Dispersal Field.

F. DISTRIBUTION BOX REQUIREMENTS

1. General Requirements: Distribution Boxes shall meet the following requirement:
   a. Installed level on undisturbed Soil
   b. Constructed of concrete, or other materials acceptable to DEH
   c. Be watertight and designed to accommodate the necessary distribution laterals and expected flows.

G. EFFLUENT PUMP

1. An Effluent pump may be considered when necessary for System design. Due to the problems inherent in mechanical devices, Effluent pumps are to be considered only after gravity feed options have been explored and shown to be infeasible.

2. Design requirements:
   a. The pump system must be designed by a Qualified System Designer.
   b. Upon installation the designer must inspect and test the pump system in the presences of DEH inspector.
   c. Float switches must be used and installed such that the float switches or wires do not become entangled. Clamps must be of non-corrosive material.
   d. A Check valve is required at the pump.

   e. There shall be sufficient distance from the tank bottom to pump inlet to allow space for any solids to settle without interfering with the pump operation

3. Required Materials and Details:
   a. Provide specification sheets for the pump tank, tank risers, and pump, including the pump performance curve.
   b. State the elevation of the pump and drain field pipe at the highest elevation.
   c. Show the calculations for total dynamic head through the effluent piping and valve.
   d. Provide specification sheets and show the placement of float switches indicating the storage capacity, audio/visual alarms and any other materials proposed for use.

4. Pump Sizing: The proposed pump must be able to provide the required gpm at the designed head.

H. DOSING AND PUMPING TANK

1. The tank shall be a separate tank meeting the requirements specified in this Manual.
2. Sizing Criteria: As a general rule, the pump tank volume will be the same as the septic tank volume. The pump tank must have sufficient capacity to hold the following:
   a. The dosing volume and deliver the design dose.
   b. 1½ days storage capacity above the "on" switch
   c. Minimum additional capacity of one day's Design Flow between the high level alarm and the tank's "soffit" (inner ceiling).

3. 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 DEH.

4. 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 ten (10) feet before entering the Septic Tank.

I. PUMPS, CONTROLS, AND ALARMS

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

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

2. Pumps must have durable impellers of bronze, cast iron, or other materials approved by DEH.

3. 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.

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

5. 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.

6. Wiring must be of proper construction and gauge and permanently fixed to a supporting structure and may require a separate permit from the local building permitting authority.

7. The pump and alarm must be connected to separate circuits.

8. There must be a non-resettable digital pump cycle counter in the electrical box.

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

J. CURTAIN DRAIN - DESIGN, MATERIALS AND CONSTRUCTION

Sometimes, a Curtain Drain is necessary up-Slope from a Dispersal Field to divert ground water. A Curtain Drain is a gravel-filled trench installed uphill of a System and designed to intercept shallow perched Groundwater flow and divert it away from or around the Dispersal Field. Unless otherwise approved, a Curtain Drain shall meet the minimum requirements as follows:

1. All Curtain Drains shall be designed by a Qualified System Designer.

2. Curtain Drains are only to be used on Sites with a Slope of greater than 5%. The use of Curtain Drains to de-water a Site with 0-5% Slope will not be allowed.

3. The Curtain Drain trench shall be installed a minimum of fifteen (15) feet up Slope of the dispersal area and the outflow must be fifty (50) feet from the dispersal and Replacement Area.

4. The trench shall be a minimum of twelve (12) inches wide. For a Curtain Drain, it shall extend from ground surface at least 6 inches into a Limiting Layer.

5. All other requirements for System approval, except depth to Groundwater, can be met. However, after the drain is installed, the Groundwater level shall conform to the requirements for Vertical Separation to Groundwater for the proposed System.

6. The Site will allow discharge from the Curtain Drain to the ground surface.

7. The curtain drain shall be situated so that captured water drains by gravity-flow out of outlet pipes. Trench bottoms shall maintain a minimum of 1% Slope throughout the drainage trench. In areas where the outlet pipe will be subject to damage, the pipe shall be adequately protected.

8. In the event that the discharge outflow from a Curtain Drain will impact a neighboring property, the trench outlet from a Curtain Drain shall only discharge into a drainage channel or other conveyance designed for the transport of water, unless otherwise approved by DEH.

9. The bottom and the downhill side of the trench may be lined with a waterproof barrier. Material utilized must be a minimum of two layers of six mil plastic waterproof barrier. The waterproof barrier is to be placed along the downhill side of the trench wall and at the bottom of the trench.

10. A four (4) inch minimum PVC or Polyethylene (PE) perforated pipe shall be laid the entire length of the trench with two (2) inches of gravel underneath the pipe.

11. The drain shall be filled with Drain Rock. Prior to backfilling the trench, the Drain Rock shall be covered with filter fabric. A minimum of six (6) inches of Soil cover shall be placed over each trench.

DEH has the discretion of requiring demonstration that a proposed Curtain Drain is effective prior to issuing an Installation Permit.

K. SLOPE OF LINES

1. Tightline from House: Maintain 1/8 to 1/4 inch 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. Tightline from Septic Tank: Maintain minimum of 6 inch drop per 100 feet (0.5% Slope) to perforated drain lateral.

3. Perforated Lateral: Attempt to keep each lateral level; no more than one (1) inches drop in 100 feet of trench. Place an end cap on each lateral. Rotate each section of Lateral Pipe so holes are at 5:00 and 7:00 clock position.

L. REQUIREMENTS FOR OWNER-INSTALLER

A property Owner may install or Repair a Standard System on their own property provided an installation or Repair Permit is obtained. If the Owner hires someone to assist in the installation, the Person must be a Contractor as defined in this Manual, or the Person hired must be an employee of the Owner and the Owner must provide worker's compensation insurance. Installing a System requires skills and knowledge; therefore it is highly recommended that a Contractor be hired to do the work. Poor workmanship will affect and may impede the System performance. DEH cannot serve as the consultant to aid or provide advice to the homeowner with regard to design or installation. Therefore for new construction or major Repair design plans shall be prepared and stamped by Qualified System Designer. The design plans shall provide construction detail and instruction for the benefit of the Owner and for DEH to verify the System will be installed as per the requirements of this Manual.

SECTION 5: GUIDELINES FOR ALTERNATIVE SYSTEMS

A. INTRODUCTION

1. Alternative System is a type of System that utilizes a method of Wastewater Treatment other than a standard Septic Tank and/or a method of Wastewater dispersal other than a standard Dispersal Field in native Soil. Alternative Systems include the following:
   a. Supplemental Treatment Systems which are designed to produce a higher quality Wastewater Effluent and improved performance of and siting options for Effluent dispersal where a Standard System is not suitable.
   b. Dispersal Fields that disperse Effluent by means other than gravity distribution. This includes Pressure Distribution Systems and Subsurface Drip Dispersal.
   c. Other Systems that due to their size, complexity or require a more involved level of review and approval; and which may require an Operating Permit to assure the viability of its continued use.

   Due to the complex nature of Alternative Systems an Operating Permit may be required to assure ongoing maintenance, and System performance. Systems utilizing Supplemental Treatment are required to obtain an Operating Permit which will requires a maintenance agreement with an approved Service Provider, required monitoring and data reporting. In some cases an Operating Permit will be required for Large Systems, Non-Discharging Wastewater Disposal Units, and non-residential Graywater Systems. Operating Permit requirements are explained in greater detail in Section 10 of this Manual and within the guidelines for each type of System or unit.

   These guidelines provide the technical criteria and standards for the use of Alternative Systems and are intended to be followed for new development, Modifications and Repairs. Schematic and cross-section diagrams are included to illustrate the key design features of each type of System (See Appendices).

2. Siting Criteria
   All requirements specified for Standard Systems also apply to Alternative Systems, with the following clarifications and exceptions.
   a. Horizontal Setbacks: Horizontal setback requirements for Supplemental Treatment Unit are the same as those specified in Table 2-1 for Septic Tanks. Horizontal setback requirements for Alternative System Dispersal Field are the same as those specified in Section 2, Table 2-1 for Standard System Dispersal Field.
   b. Ground Slope: Maximum ground Slope for different types of alternative Wastewater Dispersal Systems are as follows:

Table 5-1: Maximum Ground Slope for Alternative Wastewater Dispersal Systems[1]

Type of Dispersal System	20%	30%	40%
Mound	X		
Pressure Distribution		X	
Subsurface Drip			X[1]

[1] *Related Requirements: Any Dispersal System located on a Slope greater than 30 percent (30%) shall require the completion and approval of a Geotechnical Report. No parcel shall be created where*

Slope of area designated for the onsite Wastewater dispersal area is greater than 30%.

c. Application Rates: The Wastewater application rate for Alternative Systems shall be the same as for Standard Systems (see Table 3-2 and 3-3). However the System Dispersal Field may be reduced in size by up to 25% as compared to the size of a Standard System Dispersal Field when Pressure Distribution or Subsurface Drip is used. The Dispersal Field may be reduced in size by an additional 10% when Supplemental Treatment is used in conjunction with Pressure Distribution or Subsurface Drip. The total reduction in size shall not exceed 30%

d. Vertical Separation to Limiting Layer: Where Supplemental System is utilized, minimum Vertical Separation distance, measured from the bottom of the Dispersal Trench system to the High Seasonal Groundwater level, Fractured Bedrock, or Limiting Layer, may be reduced from the requirements that apply to Standard Systems as specified in Table 5-2 below. See specific requirements for the type of Supplemental Treatment System and type of Alternative Dispersal System for additional restrictions on Vertical Separation distances that may apply based on System size (i.e., volume of Wastewater flow) or for particular Site conditions or geographic areas.

Table 5-2: Minimum Vertical Setback for Supplemental Treatment System

USDA SOIL TEXTURAL CLASSIFICATION[1]	PERCOLATION RATE (MPI)	MINIMUM VERTICAL DISTANCE TO GROUNDWATER or LIMITING LAYER[2]			REQUIRED SUPPLEMENTAL TREATMENT
		2'	3'	5'	
Coarse Sand[3, 6]	<1			X[5]	Requires Supplemental Treatment for BOD, TSS, and nitrogen reduction with Disinfection; and Pressure Distribution
Coarse to Medium Sand[3, 6]	>1-5		X		Requires Supplemental Treatment for BOD, TSS, and Pressure Distribution[5]
Fine sand, loamy sand	>5-15	X			Supplemental Treatment for BOD, and TSS with Pressure Distribution or Subsurface Drip Distribution
Sandy loam, loam, sandy clay loam, silt loam	>15-60	X			
Clay loam, silty clay loam, sandy clay [3, 4]	>60-120	X			
Clay [3, 4, 6]	120+	X			None required

[1] *Least permeable Soil Horizon below the point of dispersal and within the zone of separation.*
[2] *Measured from the bottom of the Dispersal System to the seasonal high Groundwater or Limiting Layer*
[3] *Not allowed for Lot creation*
[4] *Clays must be non-expansive. Soils with Clay content exceeding 60 percent (60%) are not suitable for Systems.*
[5] *Nitrogen reduction may be required in areas with an average parcel size of 1 acre or less and where individual water wells are the source of drinking water.*
[6] *Percolation Test will be required.*

3. Site Evaluation, Design and Construction Requirements:
Site Evaluation, design plans, operation and maintenance guidelines, and other permitting

requirements for Alternative Systems shall conform to all requirements for Standard Systems as well as any additional requirements specified in this Manual for the type of Alternative System proposed. Unless otherwise indicated in a specific section of this Manual, all Alternative Systems shall be designed and installed under the inspection and approval of a Qualified System Designer and DEH.

B. SUPPLEMENTAL TREATMENT UNITS

1. Supplemental Treatment Units are a System component that uses an advanced method of Effluent Treatment. A System utilizing Supplemental Treatment is designed to mitigate Soil and/or Groundwater conditions which render a parcel inappropriate for a Standard System. Supplemental Treatment Units may be proprietary Treatment units and/or engineered filter systems, such as Sand Filter Systems that provide a specified level of Treatment prior to dispersal into the Dispersal Field. Supplemental Treatment Systems/Units include, but not limited to the following:
   a. Intermittent and Recirculated Sand Filter Systems
   b. Raised Sand Filter Systems
   c. Proprietary Treatment Units

2. Performance Requirements

   Supplemental Treatment Units must be designed to meet the following Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS) concentrations and, where nitrogen is identified as a water quality concern, the following nitrogen reducing performance:

   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 Total Nitrogen concentration will not exceed 10 mg/L as nitrogen; or as an alternative, the reduction in total nitrogen shall meet or exceed a 50% reduction as measured between the influent prior to Supplemental Treatment and Effluent after Supplemental Treatment.

3. Effluent Quality Standards:

   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

4. Remote Notification: Where feasible, as determined by DEH, Supplemental Treatment components must be equipped with a remote notification mechanism that notifies the Owner and Service Provider in the event of System malfunction.

5. Qualified System Designer and Installation Contractor: All Supplemental Treatment Systems must be designed by Qualified System Designer and installed by a Contractor, as defined, with

specific training in the installation of the type of System utilized.

6. Operating Permit Required: All Supplemental Treatment Systems must maintain a current Operating Permit. The permit shall require the System to be periodically inspected and monitored by an approved Service Provider.

7. Nothing will preclude the Applicant from opting to use a Supplemental Treatment System in lieu of a Standard System.

8. Disinfection**:**
   Disinfection may be required when the Soil Texture indicates coarse sand or Percolation Rate is 5 minutes per inch (5 mpi) or faster and seasonal high Groundwater is within eight (8) feet of the bottom of the Dispersal Field, or other situations as determined by the Director of Environmental Health. Add-on components performing disinfection must be designed to achieve an Effluent total coliform bacteria concentration, at the 95th percentile, if not greater than the following:
   a. 10 Most Probably Number (MPN) per 100 ml prior to discharge into the Dispersal Field where the Soils exhibit percolation rates of 1-10 minutes per inch (mpi) 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 (mpi) or consist of a Soil Texture other than sand.

9. System Performance: System performance shall be demonstrated through the Operation, Maintenance and Monitoring (OM & M) Program as described in Section 10 of this Manual.

C. INTERMITTENT AND RECIRCULATING SAND FILTER SYSTEMS

1. Description
   Intermittent Sand Filters (ISF) and Recirculating Sand Filters (RSF) are used to provide Supplemental Treatment of Septic Tank Effluent prior to discharge to the Dispersal System. They are used to improve or restore the capacity of the Dispersal Field, reduce pathogenic bacteria loading and can provide additional nitrogen removal.

   An ISF consists of a packed-bed filter of medium- grained sand, designed for single pass-through Treatment of Septic Tank Effluent; it is sometimes referred to as a “single pass filter”.

   An RSF utilizes coarse-grained sand and a recirculation system, usually controlled by a timer that causes the Effluent to pass through the sand media several times prior to final dispersal. RSFs have the ability to produce Effluent quality similar to ISFs, except that they are less effective in bacteria removal. However, RSFs typically provide greater nitrogen removal than ISFs, on the order of 50% reduction as compared with standard Septic Tank Effluent.

   Sand Filter Systems are designed for treating residential strength Wastewater. The Wastewater applied to the sand filter (influent) must not be higher in strength than 220 mg/L BOD_5 or 145 mg/LTSS. Lower Wastewater strengths, without increased flow rates are preferable for assuring long term operation of Sand Filter System. High Strength Wastewater shall require Treatment in order to reduce its strength prior to introduction into the sand filter.

Effluent from sand filters may be discharged to standard Dispersal Fields and to any type of alternative Dispersal System identified in this Manual. Effluent from an ISF or RSF designed and operated in accordance with these guidelines will be considered to meet the criteria for Supplemental Treatment.

2. Constraints Addressed
   Sand filters can be applied to address the following onsite Wastewater constraints when used in combination with the appropriate type of Dispersal System:
   a. High Groundwater;
   b. Shallow Soil over fractured rock or coarse alluvium;
   c. Shallow Soil over Impermeable Soil or Bedrock;
   d. Slow percolation at standard Dispersal Trench depths;
   e. Steep Slopes;
   f. Limited dispersal area; and
   g. Nitrogen limitations (RSFs)

3. Siting Criteria : Dispersal Fields Receiving Sand Filter Effluent. Dispersal fields receiving sand filter Effluent are subject to all siting criteria for Standard System, except as modified in accordance with adopted requirements for the specific type of alternative dispersal method proposed, including any allowances for the incorporation of Supplemental Treatment. Allowances for Supplemental Treatment may include reduced Vertical Separation distances or increased Wastewater application rates.

4. Design Criteria
   a. Intermittent and Recirculating Sand Filters shall be designed by a California Registered Civil Engineer.
   b. Septic Tank Pretreatment: Sand Filter Treatment units shall be preceded by a Septic Tank.
   c. Pressure Dosing: Septic Tank Effluent shall be applied to the Sand Filter Treatment unit by Pressure Dosing, utilizing either an automatic dosing siphon (intermittent filter only) or pump. The Pressure Distribution System shall be designed in accordance with accepted industry practices to achieve the following, at a minimum:
      (1) Uniform dosing of Effluent over the surface application area of the sand filter distribution bed;
      (2) Adequate flow rate, screening of Effluent and suitable piping network to preclude solids accumulation in the pipes or clogging of discharge orifices;
      (3) Suitable access provisions for inspection, testing and adjustment of the Pressure Distribution System;
      (4) A 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 the appropriate dose volumes are delivered to the sand filter, the timer must be set to dose a minimum of 12 times a day.
      (5) At least one distribution lateral for every 36 inches of bed width.
   d. Design Flow: Determining Design Flow shall be the same as determined for Standard Systems
   e. Wastewater Application Rate: The Wastewater application rate used for sizing the surface area of the sand filter shall be as follows:
      (1) Intermittent Sand Filters:

i. Maximum 1.2 gpd/ft^2 for individual residential Systems

(2) Recirculating Sand Filters

i. Maximum of 5.0 gpd/ft^2 for individual residential Systems

ii. Maximum of 4.0 gpd/ft^2 for all commercial, industrial, institutional, and multi-residential Systems

f. Containment Liner. The sand filter shall be provided with an impermeable containment liner to prevent leakage out of or into the filter. The liner shall consist of either:

(1) minimum 30 mil plastic;

(2) reinforced poured-in-placed concrete; or

(3) an equivalent impermeable structure or barrier.

g. Finished Grade. The finished grade of the sand filter shall be at or above the surrounding ground elevation. Above-ground installation shall be structurally supported with retaining wall(s), as required.

h. Shape. The sand filter shall not be restricted as to its shape in plan view.

i. Multiple Units. The sand filter may be divided into compartments or multiple units.

j. Sand Filter Media

(1) Sand Specification. The sand media shall be a medium to coarse sand that meets the gradation specifications in Table 5-3:

(2) Sand Depth. The minimum sand depth below the gravel distribution bed shall be 24 inches.

Table 5-3. Sand Specifications for Designing ISF or RSF System

Sieve Size	Percent Passing	
	Intermittent Sand Filter	**Recirculating Sand Filter***
3/8	100	100
#4	90-100	70-100
#10	62-100	5-78
#16	45-62	0-4
#30	25-55	0-2
#50	5-20	0-1
#60	0-10	0-1
#100	0-4	0-1
#200	0-2	0-1

**Additional sand specifications for RSF:*

- *Effective size of sand/gravel, D10:1.5 to 2.0 mm*
- *Uniformity coefficient, U_C:<2.5*

Documentation of laboratory sieve analysis results for the proposed sand fill material shall be supplied to DEH to verify conformance with the above specifications, as applicable.

k. Gravel Distribution Bed

(1) Material. The distribution bed shall consist of 3/8-inch double-washed pea gravel, substantially free of fines.

(2) Depth. Pea gravel shall extend a minimum of 6 inches below the Invert and 2 inches above the top of the distribution piping. If the distribution piping is installed with chambers, the pea gravel depth below the Distribution Pipe may be reduced from 6

inches to 4 inches, and the 2-inch pea gravel cover may be eliminated.

l. Silt Barrier: For an Intermittent Sand Filter, the gravel distribution bed shall be covered in its entirety with a geotextile ("filter fabric") silt barrier. Filter fabric shall be either polyester, nylon or polypropylene, or any combination thereof, and shall be suitable for underdrain applications. Filter fabric shall be non-woven, shall not act as a wicking agent and shall be permeable. Recirculating Sand Filters do not require a silt barrier.

m. Cover
   (1) Intermittent Sand Filters:
      i. Material. A Soil cover shall be placed over the distribution bed, consisting of a medium, loamy-textured Soil.
      ii. Depth. Soil cover depth shall be a minimum of 12 inches and a maximum of 18 inches over the top of the distribution bed. Soil cover shall be crowned or Sloped to promote rainfall runoff.
   (2) Recirculating Sand Filters:
      i. Material. A granular media cover shall be placed over the distribution bed, consisting of clean gravel that may range in size from 3/8-inch pea gravel to 2 ½ –inch rounded rock.
      ii. Depth. Cover depth shall be a minimum of 12 inches and a maximum of 18 inches over the top of the distribution bed.

n. Underdrain
   (1) Material: The underdrain beneath the sand media shall consist of 3/8" washed pea gravel with 4-inch diameter perforated drain pipe, installed with perforations oriented down.
   (2) Depth: The pea gravel underdrain shall have a minimum depth of 9 inches.
   (3) Grade: The underdrain shall be constructed and the drain pipe set with a minimum grade of 1% toward the outlet point.
   (4) Watertight Outlet "Boot": The sand filter underdrain shall be equipped with a watertight outlet "boot" for connection of piping to the dosing tank. An exception to this is for intermittent sand filters that are equipped with an internal pump system for direct dosing to the disposal field.
   (5) Clean-out Riser. For clean-out and inspection purposes the upslope end of the perforated drain pipe in the underdrain shall be equipped with a vertical riser constructed of non-perforated pipe of equal diameter. The riser shall extend to finished grade of the sand filter.

o. Air Manifold. An air manifold shall be installed within the pea gravel underdrain for the purpose of introducing forced air to into the sand filter media, as needed, for maintenance or drainage rehabilitation. The air manifold shall consist of small diameter PVC piping, with drilled perforations (pointed down), and positioned above the perforated underdrain pipe. The manifold shall be connected to a vertical leader pipe that extends to the surface of the sand filter, fitted with a threaded pipe cap or plug at the top where a portable air line can be connected.

p. Inspection Ports. An inspection port shall be installed in the gravel distribution bed of each sand filter compartment. The inspection port shall extend from finished grade to the pea gravel-sand interface of the distribution bed and shall be perforated in the pea gravel zone only. Inspection ports shall be 2-inch to 4-inch diameter plastic pipe and fitted with a wrench-tight cap or pipe plug. Perforations shall consist of hacksaw slots at nominal 1"

spacing; alternatively, commercially slotted pipe may be used. For intermittent sand filters, inspection ports shall be sealed against surface infiltration with a bentonite or concrete annular seal through the Soil backfill zone.

q. Internal Pump System (ISF only). In lieu of gravity flow from the sand filter to the dispersal field (or Dispersal Field dosing system), an internal pump system may be installed within the intermittent sand filter for dosing directly to the Dispersal Field. In such applications:
   (1) pump chamber shall be seated at or below the bottom of the underdrain;
   (2) pump operating depth shall be entirely within the depth of the underdrain; and,
   (3) storage volume equal to at least 50 % of the disposal field dose volume shall be provided in the network of perforated drain pipe within the underdrain.

5. Plans and Construction

a. Reference Guidelines: In addition to the requirements set forth herein, design and construction of Sand Filter Systems shall utilize applicable guidelines contained in the following references:
   (1) "Onsite Wastewater Treatment Systems Manual", U.S. Environmental Protection Agency, February 2002 and as amended.
   (2) “Design Manual – Onsite Wastewater Treatment and Disposal Systems”, U.S. Environmental Protection Agency, October 1980.

b. Plans. Design plans for Sand Filter Systems shall include:
   (1) All relevant elevation data and hydraulic calculations;
   (2) Specific step-by-step construction guidelines and notes for use by the installation Contractor;
   (3) Make and model of all components;
   (4) Pump system components, with cut-sheet depicting float settings;
   (5) Control panel programming; and
   (6) An inspection schedule listing critical control points.

c. Construction Inspection. At a minimum, inspection of the Sand Filter System installation should include the items listed below. Joint inspection by the designing California Registered Civil Engineer, installation Contractor, and DEH may be required.
   (1) Pre-construction inspection where the construction staking or marking of the sand filter is provided and construction procedures discussed;
   (2) Water tightness of Septic Tank and dosing (pump) tank;
   (3) Sand filter dimensions, structure and liner;
   (4) Underdrain piping and filter rock;
   (5) Sand quality and placement;
   (6) Piping installation and hydraulic (“squirt”) test of the distribution system;
   (7) Functioning and setting of all control devices; and
   (8) Final Inspection to verify that all construction elements are in conformance with the approved plans and specifications, all inspection ports are installed; and erosion control has been completed.
   (9) The Service Provider shall be present at the Final Inspection.

6. Management Requirements

Recommended minimum procedures and frequency for inspection, maintenance, monitoring

and reporting activities for intermittent and recirculating Sand Filter Systems are outlined in Table 5-4.

Table 5-4. Intermittent and Recirculating Sand Filter System Management Requirements

	Work	Frequency
Inspection	• Observe surface conditions on and around filter for Effluent leakage, ponding, drainage/infiltration, erosion or other problems. • Area verified free from road, structures, vehicular traffic, surface drainage properly diverted, etc. • Inspection ports are accessible • Check/measure water level in inspection ports in filter bed. • Check for equal distribution by measuring distal end orifice residual pressure head. • Condition of orifices and verification of hydroflush • Perform all inspection work as recommended by Qualified System Designer or equipment manufacturer. • Perform inspection protocol for pump systems • Record observations.	According to Permit conditions, typically: • First 3 months, and • As recommended by the System Designer or Service Provider, but at least once every 12 months, depending on system size, usage, and history.
Maintenance	• Purge laterals. • Perform squirt and balance laterals. Exercise valves to ensure functionality. • Perform all maintenance work as recommended by Qualified System Designer or equipment manufacturer. • Record work done.	• As recommended by the System Designer or Service Provider, but at least once every 12 months, depending on system size, usage, and history. • Responsive maintenance as necessary.
Water Monitoring & Sampling	• Report observation findings and maintenance actions, including notation of problems and corrective actions. • Record dose counter and elapsed time meter readings from control panel.	• Annually or as per Permit conditions

Reporting	• Report findings to DEH per Permit requirements. • Standard report to describe findings, analyze performance, and detail actions taken. • Report emergency or failure conditions to DEH immediately.	• Annually or as per permit conditions

D. RAISED SAND FILTER BED

1. A Raised Sand Filter Bed, sometimes referred to as a bottomless sand filter, combines features of an Intermittent Sand Filter and a Mound System. It consists of a raised or terraced sand bed, commonly supported by a low retaining wall or bulkhead, where the bottom surface is even with or slightly below ground surface and forms the absorption surface. This alternative is intended to be used only for Repair or replacement System where Site specific conditions limit Treatment and dispersal option. Raised Sand Filter Beds are not intended to be used for new construction. The System may be designed with Supplemental Treatment ahead of the raised sand bed when required for very shallow Soil or very highly permeable Soils. The Raised Sand Filter Bed provides additional polishing Treatment and final dispersal of Wastewater into the ground.

2. Constraints Addressed
   a. High Groundwater;
   b. Shallow Soil over fractured rock or coarse alluvium
   c. Shallow Soil over Impermeable Soil or Bedrock;
   d. Slow percolation at standard Dispersal Trench depths;
   e. Moderately Steep Slopes; and
   f. Limited dispersal area.

3. Siting Criteria
   a. Vertical Separation Requirements: Minimum depth to High Seasonal Groundwater or any Limiting Layer shall be two (2) feet below ground surface such that the depth of the raised Sand Filter Bed plus effective natural soil depth is equal to or greater than the minimum Vertical Separation provided in Table 3-1. For Soils that are classified as coarse to medium sand or Percolation Rates (when performed) faster than 5 mpi, depth to Groundwater shall be five (5) feet. This Soil depth requirement shall apply within the Dispersal Field and in the adjacent area extending a distance of 25 feet downslope of the Raised Sand Filter Bed.
   b. Permeable Soil Requirements: Raised Sand Filter Beds are suitable for permeable Soils in USDA Soil textural Classifications of coarse sand, medium sand, fine sand, loamy sand, sandy loam, loam, sandy clay loam, and silt loam; or a Percolation Rate faster than 60 mpi. Raised Sand Filter Beds are not suitable for less permeable Soils.

4. Design Criteria
   a. The Raised Sand Filter Bed System shall be designed by a California Registered Civil Engineer.
   b. Design Flow: Determining Design Flow shall be the same as determined for Standard Systems as provided in Section 3.
   c. Treatment**:** The following Treatment requirements shall apply in connection with the

use of Raised Sand Filter Bed systems:

(1) Primary (Septic Tank) Treatment shall be the minimum level of Treatment, and shall be acceptable where the design includes sand fill depth of 24 inches.
(2) Supplemental Treatment, using an approved Supplemental Treatment Unit may be used to reduce the sand fill depth to 12 inches.

d. Pressure Dosing. Wastewater Effluent from the Supplemental Treatment system shall be applied to the Raised Sand Filter Bed system by Pressure Dosing, utilizing a pump system. The Pressure Distribution System shall be designed in accordance with accepted industry practices to achieve, at a minimum:
   (1) Uniform dosing of Effluent over the surface application area of the Raised Sand Filter Bed;
   (2) Adequate flow rate, screening of Effluent and suitable piping network to preclude solids accumulation in the pipes or clogging of discharge Orifices;
   (3) Suitable access provisions for inspection, testing and adjustment of the Pressure Distribution System;
   (4) Dosing volume to achieve a minimum of 3 to 5 doses per day at Design Flow conditions; and
   (5) At least one distribution lateral for every 36 inches of distribution bed width. Additional requirements for design and construction of Pressure Distribution piping systems contained in Pressure Distribution Systems shall also apply.
e. The pump system shall be:
   (1) appropriate for Wastewater applications;
   (2) of the size and type to meet the hydraulic design requirements; and
   (3) designed and constructed in accordance with pump system requirements per Section 4 of this Manual.
f. Containment Liner**.** The Raised Sand Filter Bed shall be provided with an impermeable containment liner along all sides of the filter bed to prevent lateral leakage out of or into the filter. The liner shall extend a minimum of 12 inches below native grade. The liner shall consist of either:
   (1) 30 mil plastic;
   (2) reinforced poured-in-placed concrete; or
   (3) an equivalent impermeable structure.
g. The finished grade of the Raised Sand Filter Bed shall be above the surrounding ground elevation. Above-ground installation shall be structurally supported with retaining wall(s), as required.
h. Maximum width of the sand bed shall be 10 feet.
i. Shape. The Raised Sand Filter Bed shall not be restricted as to its shape in plan view.
j. Multiple Units. The Raised Sand Filter Bed may be divided into compartments or multiple units
k. Sand Filter Media
   (1) Sand Specification: The sand media shall be medium to coarse sand that meets the same specifications as those for Intermittent Sand Filter (Table 5-3).
   (2) Sand Depth: The minimum depth of sand fill, below the gravel distribution bed, shall be 24 inches for Septic Tank Effluent, and 12 inches for Supplemental Treatment.
l. Minimum Basal area Sizing: Minimum size ($ft.^2$) of the basal area of the Raised Sand Filter Bed shall be determined by dividing the Design Flow (in gpd) by the applicable

Wastewater application rate (Table 3-2 and Table 3-3).

m. Gravel Distribution Bed
   (1) Material: The distribution bed shall consist of 3/8 inch double-washed pea gravel, substantially free of fines.
   (2) Depth: Pea gravel shall extend a minimum of six (6) inches below the Invert and two (2) inches above the top of the distribution piping. If the distribution piping is installed with chambers, the pea gravel depth below the Distribution Pipe may be reduced from six (6) inches to four (4) inches, and the two (2)-inch pea gravel cover may be eliminated.

n. Silt Barrier: The gravel distribution bed shall be either polyester, nylon or polypropylene, or any combination thereof, and shall be suitable for underdrain applications. Filter fabric shall be non-woven, shall not act as a wicking agent and shall be permeable.

o. Soil Cover
   (1) Material: A Soil cover shall be placed over the distribution bed, consisting of a medium, loamy-textured Soil.
   (2) Depth: Soil cover depth shall be a minimum of 12 inches and a maximum of 18 inches over the top of the distribution bed. Soil cover shall be crowned or Sloped to promote rainfall runoff.

p. Inspection Ports: A minimum of four (4) inspection ports shall be installed within and around the Raised Sand Filter Bed as follows:
   (1) One shall be located near the center of the raised bed, extending from the fill surface to the bottom of the gravel distribution bed.
   (2) One shall be located near the center of the raised bed, extending from the fill surface to the sand-Soil interface.
   (3) One shall be located five (5) to 10 feet up Slope of the raised bed system, midway along the length of the at-grade, extending from the ground surface to a depth of five (5) feet or to contact with impermeable materials, whichever is less.
   (4) One shall be located midway along the down Slope length of the raised bed, within 10 to 15 feet from the edge of the bed, extending from ground surface to a depth of five (5) feet or to the depth of impermeable materials, whichever is less.
   (5) Inspection ports shall be constructed of two (2) inches to four (4) inches diameter pipe (or equivalent), equipped with a wrench-tight cap or pipe plug and a bottom cap. All ports shall be perforated beginning at a depth of 18 inches below grade and extending to the bottom of the pipe. Perforations shall consist of hacksaw slots at nominal one (1) inch spacing or commercially-slotted pipe. Inspection ports shall be sealed with a bentonite or concrete annular seal (or equivalent) to prevent surface infiltration.

5. Plans and Construction
   a. Design plans for Raised Sand Filter Bed systems shall include:
      (1) All relevant elevation data and hydraulic calculations;
      (2) Design layout and details for sand filter bed construction;
      (3) Specific step-by-step construction guidelines and notes for use by the Installer;
      (4) Erosion control plan;
      (5) Make and model of all components;
      (6) Pump system components with cut-sheet depicting float settings;
      (7) Control panel programming; and
      (8) An inspection schedule listing critical control points.

b. Construction Inspection: At a minimum, inspection of the Raised Sand Filter Bed system installation should include the following. This is in addition to inspection work required for a Supplemental Treatment system, if used. Joint inspection by the Designer, Contractor, and DEH may be required.
   (1) Pre-construction inspection where the construction staking or marking of the Raised Sand Filter Bed System is provided and construction procedures discussed;
   (2) Water tightness of dosing (pump) tank;
   (3) Raised sand bed dimensions, structure and liner;
   (4) Sand material and placement;
   (5) Piping installation and hydraulic ("squirt") test of the distribution system;
   (6) Function and setting of control devices
   (7) Final inspection to verify that all construction elements are in conformance with the approved plans and specifications, all inspection ports are installed, and erosion control has been completed.
   (8) The Service Provider shall be present at the Final Inspection.

6. Management Requirements

Recommended minimum procedures and frequency for inspection, maintenance, monitoring and reporting activities for Raised Sand Filter Bed Systems are outlined below in Table 5-5:

Table 5-5. Raised Sand Filter Bed System Management Requirements

	Work	**Frequency**
Inspection	• Conduct routine visual observations of sand filter bed system and perimeter area and surroundings for wet areas, pipe leaks or damage, structural condition of filter bed, Soil erosion, drainage issues, abnormal vegetation, gophers or other absorption field problems. • Upkeep and accessibility of observation ports • Perform all inspections of pump and appurtenances • Perform inspection of pump system as required. • Record observations.	According to Permit conditions, typically: • First 3 months, and • Once every 3 years or after a major storm event or earthquake

Maintenance	• Purge laterals, squirt and balance. Exercise valves to ensure functionality. • Perform all maintenance work as recommended by equipment manufacturer for any special valves or other components. • Maintain sand filter bed surface landscape vegetation, as required • Investigate and repair erosion, drainage, structural problems or other problems, as needed. • Investigate and perform distribution system corrective work, as required • Record work done.	• Typically at least once every three years • Distribution maintenance as recommended by equipment manufacturer or System Designer.
Water Monitoring & Sampling	• Measure and record water levels in observation ports in distribution bed, sand fill and around System perimeter. • Obtain and analyze water samples from Monitoring Ports, as applicable, per Permit requirements.	• Measure water levels at least once every three years. • Effluent monitoring not required unless System utilizes supplemental Treatment
Reporting	• Report findings to DEH per Permit requirements. • Standard report to include dates, monitoring port and Monitoring Port readings and other data collected, work performed, corrective actions taken, and performance summary. • Report emergency or failure conditions to DEH immediately.	• None required

E. PROPRIETARY TREATMENT UNITS

1. Propriety Treatment units cover a category of manufactured or "package" Supplemental Treatment Units specifically developed for residential and other small-scale Wastewater Treatment applications. Most proprietary treatment units currently available fall into two general categories: (1) aerobic treatment units (ATUs); and (2) media filters.
   a. Aerobic Treatment Units (ATUs). ATUs utilize forced air to oxidize the Wastewater, promoting aerobic decomposition of the Wastewater solids. These systems provide Supplemental Treatment of Wastewater for improvement in Dispersal Field performance; they also provide varying degrees of nitrogen removal. In general, ATUs can be relied on to produce secondary quality Effluent, better than 30 mg/L BOD and TSS. ATUs are generally not as effective in reducing pathogen levels as are Systems that incorporate media filtration. However, some ATUs provide reduction in nitrogen levels equal to or greater than that provided by sand filters and other media filters.

b. Media Filters. This includes proprietary designs that function similar to sand filters. In these systems the sand is replaced with an alternate media; peat, gravel or textile are a few examples. Textile and other media filters have been found to produce Effluent quality reasonably similar to Recirculating Sand Filters, and provide similar capabilities in overcoming various Soil and Site constraints.

2. Constraints Addressed
   Used in combination with the appropriate type of Dispersal System, Proprietary Treatment Units can be applied to address the following onsite Wastewater constraints:
   a. High Groundwater;
   b. Shallow Soil over fractured rock or coarse alluvium;
   c. Shallow Soil over Impermeable Soil or Bedrock;
   d. Slow percolation at standard Dispersal Trench depths;
   e. Steep Slopes;
   f. Limited dispersal area; and
   g. Nitrogen limitations.

3. Siting Criteria: Dispersal Fields receiving Effluent from a Proprietary Treatment unit are subject to all siting criteria for Standard System except as modified in accordance with adopted requirements for the specific type of alternative Dispersal Field proposed, including any allowances for the incorporation of Supplemental Treatment. Allowances for Supplemental Treatment may include reduced Vertical Separation distances, increased Wastewater application rates or modified Slope restrictions. Refer to the adopted guidelines for the specific type of Dispersal Field for applicable requirements and Supplemental Treatment allowances.

4. Design and Construction Requirements
   a. System Certificate of Performance. The Proprietary Treatment Unit shall be certified and listed by the National Sanitation Foundation (NSF) as meeting the NSF Standard 40, (and/or NSF Standard 245 for Nitrogen reduction) or equivalent certification and listing from a third-party organization. The Treatment unit shall be manufactured and installed in accordance with the manufacturer's and listing agency's design used to determine compliance to NSF Standards. This specification is applicable to Treatment units for Wastewater flows of up to 1,500 gpd and is based on compliance with US EPA standards for secondary Treatment of municipal Wastewater, including 30-day average Effluent limits of 25 mg/L for CBOD5 and 30 mg/L for TSS. Treatment units for flows in excess of 1,500 gpd will require certification by a third-party listing agency of equivalent performance.
   b. Design Flow. Sizing and design of Proprietary Treatment Units shall be based on the projected Wastewater flow for the structure or facility being served, determined in accordance with Wastewater flow estimation guidelines in Table 3-4 and Table 3-5 of this Manual.
   c. All tanks housing a Proprietary Treatment Unit shall be structurally sound, watertight and capable of withstanding 1,000 pounds of weight.
   d. Controls. Control panels shall be designed and configured in such a manner that, in the event of a Treatment unit malfunction, an alarm system will be triggered and discharge from the Treatment system to the Dispersal Field will be interrupted until the Treatment unit malfunction is rectified. At a minimum, the alarm system shall include an audible and visual alarm located within the building served by the System.
   e. Compliance with Manufacturer Requirements. The Qualified System Designer and

installation Contractor shall follow the proprietary manufacturer's design, installation, construction, and operations procedures.

f. Design plans shall provide documentation of compliance with manufacturer requirements and sufficient design analysis to verify the appropriateness of the Treatment unit for the proposed application. Design plans shall contain specific step-by-step construction guidelines and notes for use by the installation Contractor, including any manufacturer instructions.

g. Installation Contractor Requirements. Anyone installing a Proprietary Treatment Unit shall be trained and certified by the system manufacturer. Documentation verifying conformance to this requirement shall be provided to DEH prior to System installation.

h. Maintenance Contract. The Applicant must demonstrate that a written maintenance agreement with a qualified Service Provider has been obtained for the proposed Proprietary Treatment Unit to ensure satisfactory post-construction operation and maintenance. A maintenance agreement must be maintained valid for the life of the Treatment unit.

i. Construction Inspection. The following minimum inspections prior to commencing construction or covering any elements of the system shall be required. Joint inspection by the Qualified System Designer, installation Contractor, and DEH may be required.

   (1) Pre-construction inspection where the construction staking or marking of the Treatment unit is to be placed and installation procedures are discussed;

   (2) Testing of the Treatment unit:
      i. Function and setting of all control devices and alarms.
      ii. Water-tightness of Septic Tank, Treatment tank(s), and dosing tank, as applicable.

   (3) Final Inspection:
      i. A letter or certification from the Qualified System Designer that designed the System that that the Treatment unit has been installed and is operating in conformance with design specifications shall be provided.
      ii. A valid, signed maintenance agreement between the Applicant/property Owner and Service Provider shall be provided.
      iii. The Service Provider shall be present at the Final Inspection

5. Recommended minimum procedures and frequency for inspection, maintenance, monitoring and reporting activities for Proprietary Treatment Systems are outlined in Table 5-6 below.

Table 5-6. Proprietary Treatment System Management Requirements

	Work	Frequency
Inspection	• Inspection to be in accordance with manufacturer specifications.	According to Permit conditions and manufacturer's specifications. Typically: • First three months, and • Every once every 12 months, depending on System size, usage, and history.

Maintenance	• Perform all maintenance as required and in accordance with equipment manufacturer specifications.	According to Permit conditions and manufacturer's specifications Typically: • First three months, and • Every 12 months, depending on System size, usage, and history.
Water Monitoring & Sampling	• Monitoring to be in accordance with manufacturer specifications.	According to Permit conditions, typically: • First three months, and • At least annually and according to Permit conditions depending on System size, usage, and history.
Reporting	• Report findings to DEH per Permit requirements. • Standard report to describe findings, analyze performance, and detail actions taken. • Report crisis or failure conditions to DEH immediately.	• Annually or according to Permit conditions.

F. PRESSURE DISTRIBUTION SYSTEMS

1. Pressure Distribution (PD) Systems are an alternative to a standard gravity leach field system that use a pump and small-diameter pressure piping to achieve broad, uniform distribution of Wastewater for improved Soil absorption and better Treatment of percolating Effluent. PD Systems may be installed in shallow depths or in standard trench depths.

2. Constraints Addressed
   a. High Groundwater;
   b. Shallow Soil over Impermeable Soil or Bedrock;
   c. Shallow Soil over fractured rock or coarse alluvium;
   d. Slow percolation at standard Dispersal Trench depths; and
   e. Steep terrain.

3. Siting Criteria
   a. Horizontal Setback Requirements for PD Dispersal Field is the same as for Standard Dispersal Field (See Table 2-1)
   b. Vertical Separation Requirements: Vertical Separation shall be measured from the bottom of the Dispersal Trench and shall be determine based on the Site characteristics and type of Treatment that is provided (see table 3-1 for Standard Systems and see table 5-2 for

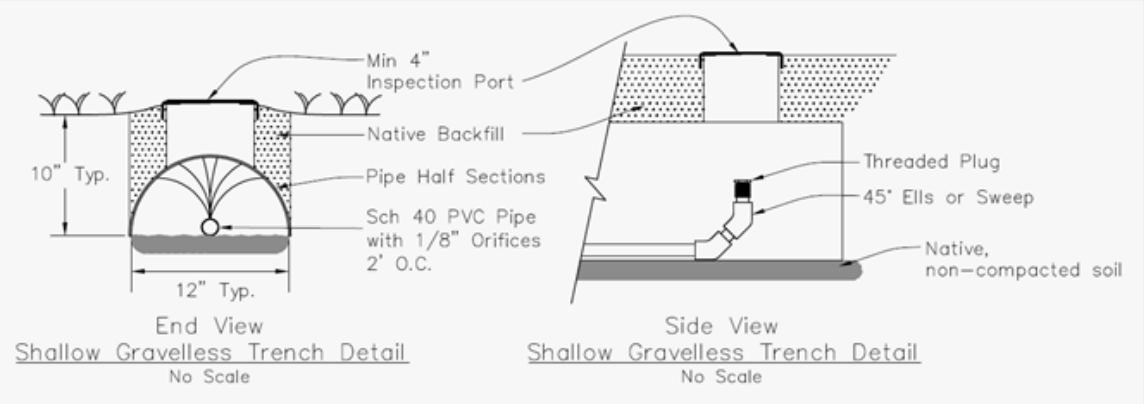
Supplemental Systems).

c. Ground Slope.
   (1) Maximum ground Slope in areas used for PD shall be 40 %.
   (2) Any PD System located on Slopes greater than 30% shall require the completion of a Geotechnical Report and Slope stability analysis

4. Design Criteria
   a. Treatment: The following Treatment requirements shall apply in connection with the use of PD systems:
      (1) Primary (Septic Tank) Treatment shall be the minimum level of Treatment, and shall be acceptable where applicable Vertical Separation distances are met per Table 3-1 of this Manual.
      (2) Supplemental Treatment may be used to allow compliance with reduced Vertical Separation distances as provided in Table 5-2 of this Manual.
   b. Design Flow: PD Systems shall be designed on the basis of the projected Wastewater flow for the structure or facility being served, determined in accordance with Wastewater flow estimation guidelines in Table 3-4 and Table 3-5 of this Manual.
   c. Pressure Dosing: A PD System shall be hydraulically designed. There shall be a minimum of five (5) foot of head at the orifice farthest from the manifold and no more than 10% head variation within a Dispersal Trench. Effluent shall be applied to the PD System by pressure dosing, utilizing either an automatic dosing siphon or pump system. The PD System shall be designed in accordance with accepted industry practices to achieve, at a minimum:
      (1) Orifices will have a minimum diameter of 1/8 inch and be evenly spaced at a distance between two (2) and six (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) Uniform dosing of Septic Tank Effluent throughout the System of PD trenches;
      (3) Adequate flow rate, screening of Effluent and suitable piping network to preclude solids accumulation in the pipes or clogging of discharge Orifices;
      (4) 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 PD system including supply line and lateral lines that has been designed to drain following a dose and then deliver sufficient additional volume to disperse the daily Design Flow in an appropriate number of doses per day.
      (5) Dispersal Field performance is enhanced when the daily flow is dispersed in smaller, more frequent does throughout the day. In most applications, between 12 and 24 doses per day per zone is appropriate, although a number outside that range may be appropriate in some cases.

   d. Dispersal Trenches. PD trenches shall conform to the same design and construction requirements as standard trenches. The depth of the trench shall be between 12 inches and 60 inches.

Figure 5-1: Shallow Gravelless PD Trench Detail



e. Pressure Distribution Pipe, Valves and Fittings.
   (1) All pipe, fittings and valves shall be pressure- rated PVC pipe, minimum 150 psi.
   (2) All joints in the Pressure Distribution Manifold, lateral piping, and transport pipe, must meet ASTM Specification D-1785.
   (3) Joints in the pressure piping system shall be solvent welded.
   (4) All Pressure Distribution Pipes and fittings, including transport lines, manifolds, laterals and valves, must be adequately sized for the Design Flow, and shall be designed to minimize frictional losses to the maximum extent practicable.
   (5) Pressure Transport Piping must be uniformly supported along the trench bottom, and at the discretion of DEH, it must be bedded in sand or other material approved by DEH.
   (6) Concrete thrust blocks, or equivalent restraint, shall be provided at sharp changes in piping directions.
   (7) The distribution lateral for each trench shall be fitted with a shut-off valve to adjust or terminate the flow to individual trenches. This valve may be either a ball or gate valve, and shall be located in a utility/valve box.
   (8) 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 doing tank.
   (9) 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.
   (10) An anti-siphon valve must be placed between the pump and leach field when the Dispersal Field is down Slope of the pump
   (11) All valves must be placed in boxes accessible for maintenance from the surface.
   (12) The end of each lateral shall be fitted with a 90 degree long sweep to facilitate line cleaning and hydraulic testing. The end riser pipe shall also be fitted with a ball valve and/or threaded end cap or plug, housed in a valve box.

f. Installation
   (1) All Orifices of PD 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

two (2) inches in 100 feet.

(3) Each Dosing Tank must be installed on a stable level base.

(4) Each Dosing Tank must be provided with risers as described in Section 4.

(5) Dosing tanks located in high Groundwater areas must be weighted or provided with an anti-buoyancy device to prevent floatation as per the manufacturer's recommendation and as required in Section 4.

g. Pump System. The pump system shall be:

(1) appropriate for Wastewater applications;

(2) of the size and type to meet the hydraulic design requirements; and

(3) designed and constructed in accordance with pump system requirements provided in Section 4 of this Manual.

h. Wastewater Application Rates. The Wastewater application rates used for sizing the infiltrative surface, shall be the same as provided in Section 3, Tables 3-2 and 3-3.

i. Effective Infiltrative Area: The Effective Infiltrative Area is the surface area measured in square feet per one lineal foot of trench length that is allowed to be considered for receiving the Wastewater effluent dispersal in the Dispersal Field. DEH may allow up to a 25% reduction in Dispersal Field sizing as compared to a Standard System based on allowance of four square feet of Effective Infiltrative Area per lineal foot of trench. However, reduction in the above Wastewater application rates or other provisions to insure the long- term integrity and performance of the PD trenches may be required for High Strength Waste flows, such as from restaurants.

j. Inspection Ports. A minimum of three (3) inspection ports shall be installed within and around PD Systems for the purpose of checking Groundwater levels, and may also be used for water quality sampling, as needed. Inspection ports shall extend to a depth of three (3) feet below the bottom of the PD trenches or to contact with impermeable materials, whichever is less. The inspection ports shall be located and constructed as follows:

(1) One shall be located upslope of the Dispersal Field, typically 10- to 15-feet away, to serve as a background or control port;

(2) One shall be located within the Dispersal Field, typically between trenches near the center of the field;

(3) One shall be located down-Slope of the Dispersal Field, typically 10 to 25 feet horizontally from the lowest trench(es), and positioned to provide a representative point for monitoring the area estimated to be in the probable flow path of percolating Wastewater;

(4) Inspection ports shall be constructed of two (2) inches to four (4) inches diameter pipe, equipped with a wrench-tight cap or pipe plug, and a bottom cap. All ports shall be perforated beginning at a depth of 18 inches below grade and extending to the bottom of the pipe. Perforations shall consist of hacksaw slots at nominal 1" spacing, or equivalent commercially-slotted pipe. To prevent surface water infiltration, inspection ports shall be sealed with a bentonite or concrete annular seal (or equivalent) to a depth of 12 inches, minimum.

5. Plans and Construction

a. Reference Guidelines. In addition to the requirements set forth herein, design and construction of PD Systems shall utilize applicable guidelines contained in the following

references:
(1) "Onsite Wastewater Treatment Systems Manual", U.S. Environmental Protection Agency, February 2002 and as amended.
(2) “Design Manual – Onsite Wastewater Treatment and Disposal Systems”, U.S. Environmental Protection Agency, October 1980.

b. Design Plans. Design plans for PD Systems shall include:
(1) All relevant elevation data and hydraulic calculations;
(2) Specific step-by-step construction guidelines and notes for use by the installation Contractor;
(3) Erosion control plan for any Site over 20% Slope, utilizing cover fill or with Design Flow >1,000 gpd;
(4) Make and model of all components;
(5) Pump system components, with cut-sheet depicting float settings;
(6) Control panel programming; and
(7) An inspection schedule listing critical control points.

c. Construction Inspection. At a minimum, inspection of the PD System installation should include the items listed below. This is in addition to inspection work required for a Supplemental Treatment System, if used. Joint inspection by the Qualified System Designer, installation Contractor and DEH will be required.
(1) A pre-construction meeting with the Qualified System Designer, installation Contractor and DEH is recommended.
(2) Pre-construction inspection where the construction staking or marking of the various system components is provided and construction procedures discussed;
(3) DEH will inspect the Pressure Distribution system for verification of hydraulic head over the Pressure Distribution Laterals (high squirt test). Water and a source of generated electricity must be available for this inspection.
(4) Water tightness of Septic Tank and dosing (pump) tank;
(5) Layout and excavation of Dispersal Trenches and piping;
(6) Drain Rock material and placement;
(5) Piping installation and hydraulic (“squirt”) test of the distribution system;
(6) Functioning and setting of all control devices; and
(7) Final Inspection to verify that all construction elements are in conformance with the approved plans and specifications, all performance ports are installed; and erosion control has been completed.
(8) The Service Provider shall be present at the Final Inspection.

6. Management Requirements
Recommended minimum procedures and frequency for inspection, maintenance, monitoring and reporting activities for PD System are outlined in Table 5-7.

Table 5-7. Pressure Distribution System Management Requirements

	Work	Frequency
Inspection	• Conduct routine visual observations of Dispersal Field and downslope area and surroundings for wet areas, pipe leaks or damage, Soil erosion, drainage issues, abnormal vegetation, or other problems. • Depth of Effluent ponding within trench • Indication of Effluent breakout or ponding • Area verified free from roads, structures, vehicular traffic, and surface water drainage is diverted. • Observation or Inspection ports in good condition and accessible. • Check for equal distribution by measuring distal end orifice residual pressure head • Condition of orifices and verification of hydroflush if necessary • Perform all inspections of pump and appurtenances	• Recommend first three months, and annually thereafter
Maintenance	• Purge laterals, squirt and balance. Exercise valves to ensure functionality. • Perform all maintenance work as recommended by equipment manufacturer for any special valves or other components. • Investigate and repair erosion, drainage or other disposal field problems, as needed. • Investigate and perform distribution system corrective work, as required. • Record work done.	• Recommend first three months and annually thereafter.
Water Monitoring & Sampling	• Measure and record water levels in trench inspection or observation ports. • Measure and record water levels in Dispersal Field Monitoring Ports, as applicable, per Permit requirements. •	• Recommend measure trench water levels annually. • Other monitoring according to Permit conditions, as applicable.

Reporting	• Report findings to DEH per Permit requirements. • Standard report to include dates, observation port or inspection port and Monitoring Port readings and other data collected, work performed, corrective actions taken, and performance summary. • Report public health/water quality emergency to DEH immediately.	• Typically none required

G. SUBSURFACE DRIP DISPERSAL SYSTEM

1. Subsurface Drip Dispersal is a method for dispersal of treated Wastewater that uses special drip tubing designed for use with Wastewater. The dripline is placed normally 8 to 12 inches below ground surface and makes use of the most biologically active Soil zone for distribution, nutrient uptake and evapotranspiration of the Wastewater. A Subsurface Drip Dispersal System is comprised of small-diameter (½" to 1") laterals ("driplines"), usually spaced about 24 inches apart, with small-diameter emitters (1/8") located at 12 to 24 inches on-center along the dripline. Effluent is conveyed under pressure to the laterals, normally with timed doses. Prior to dispersal, the Effluent requires Supplemental Treatment.

   Drip dispersal has several advantages, including:
   a. It can be effective in very shallow Soil conditions since it distributes the Wastewater very uniformly to substantially all of the available Soil in the field;
   b. It can be installed in multiple small discontinuous "zones", allowing the hydraulic load to be spread widely rather than concentrated in one main area;
   c. Installation on steeper Slopes causes less Soil disturbance and erosion or Slope stability hazards; and
   d. Water movement away from the drip emitters is substantially by unsaturated/capillary flow, which maximizes contact with and Treatment by the Soil.

2. Constraints Addressed
   a. High Groundwater;
   b. Shallow Soil over Impermeable Soil or Bedrock;
   c. Shallow Soil over fractured rock or coarse alluvium;
   d. Slow percolation at standard Dispersal Trench depths;
   e. Steep Slopes;
   f. Limited dispersal area; and
   g. Large and/or dense tree cover.

3. Siting Criteria
   a. Horizontal Setbacks are the same as for a Standard Dispersal Field (see Table 2-1)
   b. Vertical Separation Requirements: See Table 5-2

c. Application Rates: See Section 3 and Tables 3-2 and 3-3
d. Ground Slope.
   (1) Maximum ground Slope in areas used for Subsurface Drip Dispersal Systems shall be 40%.
   (2) Any Subsurface Drip Dispersal Systems located on Slopes greater than 30% shall require the completion of a Geotechnical Report and Slope stability analysis as specified in Section 2 of this Manual.

4. Design Criteria
   a. Treatment: The following Treatment requirements shall apply in connection with the use of Subsurface Drip Dispersal Systems:
      (1) Wastewater Effluent discharged to any drip Dispersal System shall be treated to at least a secondary level through an approved Supplemental Treatment system, in accordance with applicable guidelines provided in this Manual.
      (2) All Subsurface Drip Dispersal Systems shall include a filtering device capable of filtering particles larger than 100 microns; this device shall be located downstream of the Supplemental Treatment System.
   b. Design Flow: Subsurface Drip Dispersal Systems shall be designed on the basis of the projected Wastewater flow for the structure or facility being served, determined in accordance with Wastewater flow estimation guidelines in Table 3-4 and Table 3-5 of Section 3.
   c. Wastewater Application Rates: Wastewater application rates used for sizing drip Dispersal Fields shall be based on Soil Texture as specified in Section 3. In applying these criteria, the Wastewater application area refers to the ground surface area encompassed by the drip Dispersal Field.
   d. Dripfield Sizing: Minimum sizing of the dripfield area shall be equal to the Design Flow divided by the applicable Wastewater application rate from Table 3-2 and Table 3-3.
      (1) For sizing purposes, effective ground surface area used for drip field sizing calculations shall be limited to no more than 4.0 square feet per drip emitter. For example, 200 lineal feet of dripline with emitters at 2-foot spacing would provide a total of 100 emitters (200/2) and could be used for dispersal to an effective area of up to 400 ft^2 (100 emitters x 4 ft^2/emitter). Conversely, if Wastewater flow and design information indicate the need for an effective area of 1,000 ft^2, the dripline design and layout would have to be configured to provide a minimum of 250 emitters spaced over the required 1,000 ft^2 dispersal area.
      (2) Dripfields may be divided into multiple zones which may be located in different areas of a Site, as desired or needed to provide the required dripfield size. A single continuous dripfield area is not required. However, any areas proposed for drip dispersal shall be supported by field observations/measurements to verify conformance with Soil suitability and other Site requirements. Differences in Soil conditions and percolation characteristics from one zone to another may require the use of correspondingly different Wastewater application rates and dripfield sizing for each zone.
   e. Pressure Dosing. Effluent treated by Supplemental Treatment System/Unit shall be delivered to the dripfield by pressure, employing a pump system and timed dosing. The Pressure Distribution System shall be designed in accordance with accepted industry practices and manufacturer recommendations for Subsurface Drip Dispersal Systems to achieve, at a minimum:

(1) Uniform dosing of treated Effluent;
(2) An adequate dosing volume and pressure per manufacturer's guidelines;
(3) Adequate flow rate, final filtering of Effluent and suitable piping network to preclude solids accumulation in the pipes and driplines or clogging of discharge emitters;
(4) A means of automatically flushing the filter and driplines at regular intervals; and
(5) Suitable access provisions for inspection, testing and adjustment of the dripfield and components.

Additional requirements for design and construction of Pressure Distribution piping systems contained in Section 5 shall also apply.

f. Pump System: The pump system shall be:
(1) appropriate for Wastewater applications;
(2) of the size and type to meet the hydraulic design requirements; and
(3) designed and constructed in accordance with pump system requirements provided in Section 4.

g. Dripline Material: Dripline shall be manufactured and intended for use with secondary quality Wastewater, with minimum 45 mil tubing wall thickness, bacterial growth inhibitor(s), and means of protection against Root intrusion.

h. Dripfield Layout: The bottom of each dripline row shall be level and parallel to the Slope contour.

j. Dripline Depth: The dripline depth shall be installed at a depth between six and twelve inches below native grade. Deeper placement of driplines may be considered by DEH on a case-by-case basis. In no case shall the dripline depth be less than six inches.

i. Length of individual driplines: The maximum dripline length shall be designed in accordance with acceptable industry practices and in accordance with the manufacturer's criteria and recommendations.

j. Line and Emitter Spacing: Line and emitter spacing shall be designed as appropriate for Soil conditions, Slope, and contour. Emitters shall be located at no less than 12" from the supply and return manifolds.

k. Inspection Ports. A minimum of three (3) inspection ports, minimum three (3) feet in depth, shall be installed for the purpose of monitoring Groundwater levels or for water quality sampling within and around subsurface drip Dispersal Fields as follows:
(1) One port shall be located within the dripfield area.
(2) One port shall be located 10 to 15 feet up-gradient of the dripfield.
(3) One port shall be located 10 to 15 feet down-gradient of the dripfield.
(4) Inspection ports shall be constructed of two (2) inches to four (4) inches diameter pipe (or equivalent), equipped with a wrench-tight cap or pipe plug and a bottom cap. All ports shall be perforated beginning at a depth of 12 inches below grade and extending to the bottom of the pipe. Perforations shall consist of hacksaw slots at nominal one (1) inch spacing, or equivalent commercially-slotted pipe. Inspection ports shall be sealed with a bentonite or concrete annular seal (or equivalent) to prevent surface infiltration.

5. Plans and Construction

a. Reference Guidelines. Installation of Subsurface Drip Dispersal Systems shall be in accordance with applicable manufacturer guidelines and recommendations.

b. Plans. Design plans for Subsurface Drip Dispersal Systems shall include:
(1) All relevant elevation data and hydraulic calculations;

(2) Specific step-by-step construction guidelines and notes for use by the installation Contractor;
(3) Erosion control plan for any Site over 20%, utilizing cover fill or with Design Flow >1,000 gpd;
(4) Make and model of all components;
(5) Pump system components, with cut-sheet depicting float settings;
(6) Control panel programming; and
(7) An inspection schedule listing critical control points.

c. Construction Inspection. At a minimum, inspection of the Drip Dispersal System installation should include the following. This is in addition to inspection work required for the Treatment system. Joint inspection by the Qualified System Designer, installation Contractor, and DEH may be required.
(1) A preconstruction inspection with the designing Qualfied Professional, installation Contractor and DEH is required.
(2) Pre-construction inspection where the construction staking or marking of the drip lines, supply and return piping, pump system and appurtenances is provided and construction procedures discussed;
(3) Water tightness of Effluent dosing (pump) tank;
(4) Drip field layout, piping materials and installation, and all associated valves and connections;
(5) Hydraulic testing of the drip system;
(6) Functioning and setting of all control devices; and
(7) Final Inspection to verify that all construction elements are in conformance with the approved plans, specifications, and manufacture recommendations; all inspection ports are installed; and erosion control has been completed.

6. Management Requirements
Recommended minimum procedures and frequency for inspection, maintenance, monitoring and reporting activities for Subsurface Drip Dispersal Systems are outlined in Table 5-8.

Table 5-8. Subsurface Drip Dispersal System Management Requirements

	Work	Frequency
Inspection	• Conduct routine visual observations of drip field, downslope area and surroundings for wet areas, pipe leaks or damage, Soil erosion, drainage issues, abnormal vegetation, gophers or other problems. • Conduct routine physical inspections of system components, including valves, filters, and headworks box(es). • Indication of Effluent breakout or ponding • Area verified free from roads, structures, vehicular traffic, and surface water drainage is diverted. • Observation or Inspection ports in good condition and accessible. • Perform all inspections of pump and appurtenances • Perform special inspections of drip field at time of any landscaping work or other digging in drip field area. • Perform inspections of dosing pump(s) and appurtenances	• Inspection should be conducted at the same time as the Supplemental Treatment System
Maintenance	• Manually remove and clean filter. • Clean and check operation of pressure reducing valves. Clean flush valves and vacuum release valves.	Recommend • Clean filter every 6 months. • Other maintenance annually.
Water Monitoring & Sampling	• Measure and record water levels in Dispersal Field Monitoring Ports, as applicable, per Permit requirements. • Obtain and analyze water samples from Dispersal Field Monitoring Ports, as applicable, per Permit requirements.	• Water monitoring and sampling will take place with the associated Supplemental Treatment System
Reporting	• Report findings to DEH per Permit requirements. • Standard report to include dates, Monitoring Port and other data collected, work performed, corrective actions taken, and performance summary. • Report public health/water quality emergency to DEH immediately.	• Reporting should be conducted at the same time as associated the Supplemental Treatment System

H. MOUND SYSTEMS

1. A Mound System consists of an elevated sand bed with a gravel distribution bed covered by Soil fill. Mound Systems are intended to raise the Soil absorption system above grade and provide further Treatment (sand filtration) of Effluent before it reaches native Soils. It utilizes the shallow surface Soils for broad distribution of Effluent, and is used to mitigate high Water Table and shallow Soil conditions on flat or gently sloping terrain.

2. Constraints Addressed
   a. High Groundwater;
   b. Shallow Soil over fractured rock or coarse alluvium;
   c. Shallow Soil over Impermeable Soil or Bedrock;
   d. Slow percolation at standard Dispersal Trench depths; and
   e. Limited disposal area.

3. Siting Criteria
   a. Minimum Effective Soil Depth: A minimum of 24 inches of undisturbed, unsaturated Soil as measured from the ground surface to Impermeable Soil, rock, or high seasonal Groundwater is required for placement of a mound after all clearing, leveling and other Site disturbance during the development is complete. This Soil depth requirement shall apply within the mound fill area and in the adjacent area extending a distance of 25 feet down-Slope of the Mound System.
   b. Wastewater Strength: Mound Systems are designed for treating residential strength Wastewater. The Wastewater applied to the Mound Systems must meet the definition of residential-strength Wastewater (or less). High-strength Wastewater shall require Supplemental Treatment in order to reduce its strength to residential waste strength or less prior to introduction into a Mound System.
   c. Ground Slope: Maximum ground Slope for Mound Systems shall be 20%.
   d. Replacement Area: A Replacement Area having suitable Site conditions and sufficient area for full, 100% replacement of the primary mound shall be provided. In determining the necessary space for the replacement mound, the required basal area of the primary and replacement mound shall not overlap. The surplus sand run-out and Soil fill may also not overlap.

4. Design Criteria
   a. Design Flow. The Mound Systems shall be designed on the basis of the projected Wastewater flow for the structure or facility being served, determined in accordance with Wastewater flow estimation guidelines in Table 3-4 and Table 3-5 of this Manual.
   b. Pressure Dosing. Effluent shall be applied to the Mound Systems by Pressure Dosing, utilizing a pump and timed dosing system. The Pressure Distribution system shall be designed and constructed according to the Pressure Distribution Systems (Section 5F) or "Subsurface Drip Dispersal Systems" (Section 5G). The dosing system shall achieve, at a minimum:
      (1) Uniform dosing of Septic Tank Effluent over the surface application area of the mound distribution bed;

(2) Adequate flow rate, screening of Effluent and suitable piping network to preclude solids accumulation in the pipes or clogging of discharge orifices;
(3) Dosing volume to achieve a minimum of 12 doses per day at Design Flow conditions; and
(4) At least one distribution lateral for every 36 inches of bed width.

c. Pump System. The pump system shall be:
(1) appropriate for sewage applications;
(2) of the size and type to meet the hydraulic design requirements; and
(3) designed and constructed in accordance with pump system requirements provided in Section 4 of this Manual.

d. 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 onsite Wastewater Treatment and Dispersal System technology must be selected. Mound Systems are only suitable for Sites where all of the design and siting criteria can be satisfactorily met.
(5) Site drainage shall be provided so that rainfall and runoff is directed away from or around the disposal Site. On Sloped Sites Curtain Drains may be required to divert runoff away from the mound.

e. Sand Fill:
(1) Sand Specifications. The sand media shall be a medium to coarse sand which meets the following gradation specifications:

Table 5-9: Sand Specification for Designing a Mound System

Sieve Size	Percent
3/8	100
#4	90 – 100
#10	62 – 100
#16	45 – 82
#30	25 – 55
#50	5 – 20
#60	0 – 10
#100	0 – 4
#200	0 – 2

Documentation of laboratory sieve analysis results for the proposed sand fill material shall be supplied to DEH to verify conformance with the above specifications.
(2) Sand Depth: The minimum depth of sand fill, below the gravel distribution bed, shall be 24 inches. The minimum depth of sand fill below the gravel distribution bed may be

reduced to 12 inches when there is at least 24 inches of undisturbed native Soil beneath the mound and Supplemental Treatment is used prior to dispersal to the Mound System.

(3) Lateral Dimensions: The sand shall be placed as a continuous fill extending in lateral dimensions as necessary to meet the following minimum requirements:

i. Top of the sand fill shall extend horizontally beyond the gravel distribution bed:
   - One (1) foot in the upslope direction
   - Two (2) feet in the down-Slope direction
   - Two (2) feet in the longitudinal (side) direction

ii. Maximum Slope of the top of the sand surface shall be three (3) horizontal to one (1) vertical.

iii. Bottom of the sand fill shall be large enough to meet minimum mound sizing requirements based Design Flow and applicable Wastewater application Table 3-2 and Table 3-3.

f. Gravel Distribution Bed
   (1) Material: The distribution bed shall consist of 3/8-inch double-washed pea gravel, substantially free of fines.
   (2) Depth: Pea gravel shall extend a minimum of six (6) inches below the Invert and two (2) inches above the top of the distribution piping.
   (3) Width: Maximum width of the distribution bed shall be 10 feet.
   (4) Level: The bottom of the distribution bed shall be level; and the down-Slope side shall be parallel to the Slope contour.

g. Filter Fabric Barrier: The gravel distribution bed shall be covered in its entirety with a geotextile ("filter fabric") silt barrier. Filter fabric shall either be polyester, nylon or polypropylene, or any combination thereof, and shall be suitable for underdrain applications. Filter fabric shall be non-woven, shall not act as a wicking agent and shall be permeable.

h. Soil Cover: The Soil cover must be capable of maintaining vegetative growth while not impeding the passage of air and be contoured and appropriately landscaped in order to shed water, control erosion and to prevent surface drainage onto the sand filter.
   (1) Material. A continuous Soil cover shall be placed over the entire distribution bed and sand fill. The Soil cover shall consist of sandy loam or coarser.
   (2) Depth. The final settled depth of the Soil cover shall be a minimum of 12 inches and a maximum of 18 inches over the top of the distribution bed, and 12 inches minimum over the sand fill portion of the mound. Soil depth should be measured after all final construction activities and following natural settling to assure the minimum Soil depth. Soil cover over the distribution bed shall be crowned to promote rainfall runoff, and compacted by track-rolling, minimum two passes.
   (3) Lateral Extension. The Soil cover shall extend a minimum of four (4) feet beyond the perimeter edge of the sand fill in all directions.

i. Vegetative Cover: The mound shall have a vegetative cover. Mowed turf grass and sod are the best vegetative covers for mounds.

j. Wastewater Application Rate. The application rate for the mound infiltration area (gravel bed) must not exceed 1.0 gpd/ft^2. The application rate for the basal area will be based on the Soil type.

k. Inspection Ports. A minimum of six inspection ports shall be installed within and around Mound Systems as follows:

(1) One shall be located near the center of the mound, extending from the mound surface to the bottom of the gravel distribution bed.
(2) One shall be located within the effective basal area (outside of the distribution bed), extending from the mound surface to six (6) inches into the native Soil.
(3) Four shall be located, respectively, midway along each of the four sides of the mound, near the toe of the Slope, extending from ground surface to a depth of five (5) feet or to the depth of impermeable materials, whichever is less.
(4) Inspection ports shall be constructed of two (2) inches to four (4) inches diameter pipe, equipped with a wrench-tight cap or pipe plug and a bottom cap. All ports shall be perforated beginning at a depth of 18 inches below grade and extending to the bottom of the pipe. Perforations shall consist of hacksaw slots at nominal 1" spacing, or equivalent commercially-slotted pipe. To prevent surface water infiltration, inspection ports shall be sealed with a bentonite or concrete annular seal (or equivalent) to a depth of 12 inches, minimum.

5. Design and Construction
   a. Reference Guidelines. Construction of Mound Systems shall be in accordance with guidelines contained in the following references:
      (1) "Design and Construction Manual for Wisconsin Mounds", Small Scale Waste Management Project, University of Wisconsin, Madison, January 2000, including any amendments.
      (2) "Onsite Wastewater Treatment Systems Manual", U.S. Environmental Protection Agency, February 2002.
      (3) “Guidelines for Mound Systems”, CA State Water Resources Control Board, January 1980.
   b. Plans: The Mound Systems shall be designed by and constructed under the supervision of a California Registered Civil Engineer. The designing engineer shall be responsible for the adequacy of, and the installation Contractor’s substantial compliance with, the approved construction plan. The construction plan for Mound Systems shall include:
      (1) All relevant elevation data and hydraulic calculations;
      (2) Type of excavation equipment that will be used
      (3) Routes of ingress and egress of construction vehicles to assure maximum protection of mound placement area.
      (4) 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 downslope of the mound placement area.
      (5) Method to assure that the Soil Moisture content is sufficient to allow construction of the mound without Soil compaction or smearing.
      (6) Method of preparing the native Soil/ fill-material interface
      (7) Method of removing native vegetation.
      (8) Specific step-by-step construction guidelines and notes for use by the installation Contractor;
      (9) Erosion control plan;
      (10) Make and model of all components;
      (11) Pump system components, with cut-sheet depicting float settings;
      (12) Control panel programming; and

(13) An inspection and maintenance schedule listing critical control points.

c. Construction Inspection: At a minimum, inspection of the Mound Systems installation should include the following. Joint inspection by the designing California Registered Civil Engineer, installation Contractor, and DEH may be required.
   (1) Pre-construction inspection where the construction staking or marking of the Mound System is provided and construction procedures discussed;
   (2) Water tightness of Septic Tank and dosing (pump) tank;
   (3) Clearing and ripping/plowing of the mound basal area Soils;
   (4) Sand material and placement;
   (5) Pea gravel distribution bed and piping installation; Hydraulic ("squirt") test of the distribution system;
   (6) Functioning and setting of all control devices;
   (7) Placement of filter fabric silt barrier and Soil cover;
   (8) Final Inspection to verify that all construction elements are in conformance with the approved plans and specifications, all inspection ports are installed; and erosion control has been completed.
   (9) The Service Provider shall be present at the Final Inspection.

6. Management Requirements
   Recommended minimum procedures and frequency for inspection, maintenance, monitoring and reporting activities for Mound Systems are outlined in Table 5-10 below. Monitoring is the responsibility of the system Owner and must be performed by a Qualified Service Provider.

Table 5-10: Mound System Management Requirements

	Work	Frequency
Inspection	• Conduct routine visual observations of mound and downslope area and surroundings for wet areas, pipe leaks or damage, Soil erosion, drainage issues, abnormal vegetation, gophers or other problems. • Perform all inspections of pump and appurtenances (per Section 9 of this Manual). • Record observations.	According to Permit conditions, typically: • First 3 months, and • Once every 3 years or after a major storm event or earthquake

Maintenance	• Purge laterals, squirt and balance. • Exercise valves to ensure functionality. • Perform all maintenance work as recommended by equipment manufacturer for any special valves or other components. • Maintain mound area landscape vegetation, as required • Investigate and repair erosion, drainage or other disposal field problems, as needed. • Investigate and perform distribution system corrective work, as required • Record work done.	• Typically at least once every three years • Distribution maintenance as recommended by the equipment manufacturer or System Designer
Water Monitoring & Sampling	• Measure and record water levels in monitoring ports in distribution bed, sand fill and around mound perimeter. • Obtain and analyze water samples from monitoring wells, as applicable, per Permit requirements.	• Measure Mound System water levels at least once every three years • Effluent monitoring not required unless System utilizes supplemental Treatment
Reporting	• Report findings to DEH per Permit requirements. • Standard report to include dates, monitoring port and monitoring port readings and other data collected, work performed, corrective actions taken, and performance summary. • Report public health/water quality emergency to DEH immediately.	• None required

I. ENGINEERED FILL SYSTEMS

1. Description

Engineered Fill is a Soil bed that has been designed, placed and compacted in accordance to approved design criteria for purposes of elevating the Dispersal Field above natural grade. Engineered fill dispersal fields must be designed by a California Registered Civil Engineer. Engineered Fill dispersal fields do not have a high success rate and have a tendency to fail. Therefore these types of dispersal fields will only be considered in Repair or replacement situations where Site specific conditions limit dispersal options and where there is no other viable alternative.

2. Siting Criteria

a. Wastewater discharged into engineered fill will have Supplemental Treatment meeting Effluent specifications specified in this Manual for BOD and TSS.
b. Primary and Replacement Area will be analyzed by a California Registered Civil Engineer to assure that breakout of Wastewater will not occur outside the boundaries of the dispersal area.
c. Site preparation and placement of fill must be under the direct supervision of a California Registered Civil Engineer.
d. Engineered fill shall be evaluated after stabilization by a California Registered Civil Engineer for adequate permeability and percolation. DEH may be present during this evaluation.
e. At least three (3) Percolation Tests shall be performed within the consolidated fill Soil after placement and stabilization.
f. A minimum of two sieve analyses shall be conducted prior to placement to test for oversize material.
g. Native Soil depth shall be a minimum of 12 inches (after removal of the organic top Soil layer) in all areas of the proposed drainfield and Replacement Area.
h. If the Limiting Layer consists of material coarser than sand, or fractured material, the system designer shall demonstrate that there will be no saturated Soil conditions formed at the Soil/Limiting Layer inter-face due to capillary forces in the Soil.
i. Fill shall compensate for the lack of in-place Soil at a 1.5 to 1 ratio so that a one foot deficiency in Soil column depth shall require one and one half feet of fill. A minimum of 12 inches of compensating fill shall be required.
j. Fill will be engineered to the specifications of loamy sand with no more than 15% fines. At least 75% of fill material shall pass the 2 mm sieve. Any sieve analysis falling outside of a loamy sand specification shall be cause for rejection of all fill material. All organic material and material over 1" in diameter shall be re-moved from fill.
k. Engineered fill, after stabilization, must have a percolation rate between 5 and 60 mpi.

3. Dispersal

a. Pretreated Effluent application rate shall be applied by drip irrigation at a maximum application rate of 0.2 gallons/square foot/day.
b. The drip line layout design shall be reviewed by the approved sub-surface drip system manufacturer's factory trained designer.
c. The emitters will be placed at the top of the compensating fill layer, with an additional minimum 12 inches of cover material over the emitters.

4. Construction

a. The Slope in the area to be filled shall be no more than 10% Slope.
b. The organic top Soil layer shall be removed from the native Soil. Grubbed, native Soil shall be worked with a chisel or shank plow with crawler or tracked equipment (no rubber tired vehicles allowed) to scarify the top 4". All stumps and Roots in excess of ¼" diameter shall be removed from the native Soil.
c. If fill Soil must be transported to the fill site over long distances, care shall be taken to prevent excessive segregation of Soil Separates.
d. Fill shall be placed as dry as possible and when its moisture content will not cause excessive

compaction.

e. An initial fill Soil lift of 6” shall be blended into the scarified native Soil. Subsequent lifts of fill shall be no greater than 6". The top 2 to 3 inches of each subsequent lift shall be scarified prior to addition of subsequent lifts.
f. After placement, Soil shall be consolidated by a means chosen by the design engineer (e.g. light compaction by tracked equipment, by allowing the Soil to consolidate naturally over a rainy season, or by watering with at least the estimated pore volume of the fill).
g. Side Slopes of any Soil “mound” shall be a 3 to 1 Slope. For low transmissivity Soils a certified design consultant may design shallower Slopes. The side Slopes shall begin 48 inches from any dispersal line.
h. After fill is placed and approved, system shall be crowned with a loam or sandy loam Soil type to create a final cap. The bed cap shall be seeded with shallow Rooted grass. Seeded areas shall be watered as necessary to establish and maintain vegetation over the life of the unit.
j. "Toes" of built areas shall remain accessible and visible with no vegetation taller than two inches high.
k. Each system shall be provided with one up gradient and two down gradient shallow monitoring ports finished into the Limiting Layer.

5. Management Requirements

Recommended minimum procedures and frequency for inspection, maintenance, monitoring and reporting activities for Systems in Engineered Fill are outlined in Table 5-12 below. Monitoring is the responsibility of the system Owner and must be performed by a Qualified Service Provider.

Table 5-11: Engineered Fill Management Requirements

	Work	**Frequency**
Inspection	• Conduct routine visual observations of fill area and downslope area and surroundings for wet areas, pipe leaks or damage, Soil erosion, drainage issues, abnormal vegetation, gophers or other problems. • Perform all inspections of pump and appurtenances (per O&M manual) • Record observations.	• Every 3 months

Maintenance	• Purge laterals, squirt and balance. • Exercise valves to ensure functionality. • Perform all maintenance work as recommended by equipment manufacturer for any special valves or other components. • Maintain fill area landscape vegetation, as required • Investigate and repair erosion, drainage or other disposal field problems, as needed. • Investigate and perform distribution system corrective work, as required • Record work done.	• Distribution system maintenance annually. • Other maintenance as required.
Water Monitoring & Sampling	• Measure and record water levels in observation wells in distribution bed, sand fill and around fill area perimeter. • Obtain and analyze water samples from monitoring wells, as applicable, per Permit requirements.	• Measure Dispersal Field water levels quarterly. • Other monitoring according to Permit conditions, as applicable.
Reporting	• Report findings to DEH per Permit requirements. • Standard report to include dates, observation well and monitoring well readings and other data collected, work performed, corrective actions taken, and performance summary. • Report public health/water quality emergency to DEH immediately.	• Every 3 months (quarterly)

J. SYSTEMS ON STEEP SLOPE

1. A Steep Slope System is a Dispersal System installed on Sites with Slopes greater than 30%. Sites with Slopes greater than 30% are not suitable for Lot creation. However for Existing Lots special designs may be approved according to these standards for Slopes up to 40%. In no case shall a System be installed on Slopes greater than 40%.

2. Siting Criteria
   a. Pressure Distribution of Subsurface Drip shall be used for the Dispersal Field. Refer to each of the respective guidelines in Section 5 for siting and design requirements.
   b. The California Registered Civil Engineer should consider slope stability when determining appropriate application rates. Justification in the form of design calculations shall be provided when enhanced application rates are proposed.

3. Design Criteria

a. Slope stability report required: A Geotechnical Report prepared by an engineering geologist or geotechnical engineer is required where the Slope exceeds 30%, or where there are indications of Soil instability. The report shall discuss Soil stability within the proposed disposal area and Replacement Area of the system and on the Soil's stability with respect to the building foundation, surrounding terrain and adjacent properties. The report shall include, at a minimum:
   (1) A site plan drawn to scale, showing topography, locations of the proposed house, driveway or other structures;
   (2) Soil Profiles information as they relate to Soil stability;
   (3) Discussion of the presence of Groundwater, its seasonal variation (if any) and influence on the Soil stability after disposal field construction;
   (4) Statement concerning the stability of the Soil and Bedrock that may specifically include an evaluation of Soil creep and landslide potential at the disposal area and Replacement Area location and surrounding terrain due to the hydraulic load imposed by the system;
   (5) Recommendation for Curtain Drains (if needed) that may render Soil stable and prevent flooding of the disposal area and Replacement Area;
   (6) Recommendation of the best field location relationship as it relates to Soil stability; and
   (7) Recommendation of installation methods and procedures.

b. For purposes of determining the Effective Soil Depth and Vertical Separation, the depth of the Limiting Layer beneath the bottom of the trench must be measured from the upslope side of the drain field trench bottom.

4. Installation Requirements
   a. Unless otherwise indicated on the Permit, or in this Chapter, installation requirements shall be the same as found in the respective chapters for Deep Trench Dispersal Field, Pressure Distribution Systems or Subsurface Drip Dispersal Systems.
   b. Trenches shall be installed with a minimum of 12 inches of native Soil cover as measured from the downhill side of the trench.
   c. The maximum trench width shall not exceed 24 inches.

5. Management Requirements
   Recommended minimum procedures and frequency for inspection, maintenance, monitoring and reporting activities for Systems on Steep Slopes are outlined in Table 5-12 below. Monitoring is the responsibility of the system Owner and must be performed by a Qualified Service Provider.

Table 5-12: Steep Slope Management Requirements

	Work	**Frequency**

Inspection	• Conduct routine visual observations of slope, especially the downslope area for signs of wetness, pipe leaks or damage, Soil erosion, drainage issues, abnormal vegetation, gophers or other problems. • Perform all inspections of pump and appurtenances (per O&M manual) • Record observations.	According to Permit conditions, typically: • First 3 months, and • Once every 3 years or after a major storm event or earthquake
Maintenance	• Purge laterals, squirt and balance. • Exercise valves to ensure functionality. • Perform all maintenance work as recommended by equipment manufacturer for any special valves or other components. • Maintain slope area landscape vegetation, as required • Investigate and repair erosion, drainage or other disposal field problems, as needed. • Investigate and perform distribution system corrective work, as required • Record work done.	• Typically at least once every three years • Distribution maintenance as recommended by equipment manufacturer or System Designer
Water Monitoring & Sampling	• Measure and record water levels in monitoring ports in distribution bed, and around the Dispersal Field.	• Recommend measure water levels in monitoring ports at least once every three years or as per permit conditions
Reporting	• Report findings to DEH per Permit requirements. • Standard report to include dates, monitoring port and monitoring well readings and other data collected, work performed, corrective actions taken, and performance summary. • Report public health/water quality emergency to DEH immediately.	• None required

K. CLUSTER SYSTEMS

1. Description: A Cluster System is an Onsite Wastewater Treatment System serving at least two (2) but not more than four (4) Dwellings or other buildings that are sources of Wastewater discharge on the same Lot and under the same ownership.

2. All owners of Cluster Systems shall obtain an Operating Permit. The permit shall require the System to be periodically inspected and monitored by an approved Service Provider.

3. Cluster Systems are subject to local planning and zoning restrictions.

4. A Cluster System may require a dual Dispersal Field according to the System designer's specifications. Cluster Systems shall be required to reserve two Replacement Areas equaling 200% of the size required for an Individual System.

5. If the Cluster System is a Large System as defined in this Chapter, additional requirements for siting, design, operation and maintenance of Large Systems as specified in the Manual shall also apply.

L. COMMUNITY SYSTEMS

1. Description: A Community System is a System that accepts Wastewater discharges from two or more Lots, or a System shared by Dwellings under separate ownership whether or not they are on the same Lot. A Community System is not a Public Sewer System.

2. Community Systems shall be designed by a California Registered Civil Engineer.

3. Community Systems are subject to local planning and zoning restrictions.

4. Except for Community Systems, new Lots or parcels shall be created where the Lot or parcel relies on a System that cannot be sited within the boundaries of the proposed Lot or parcel

5. All Community Systems shall demonstrate financial viability and assurance to operate, maintain and replace the System at any and all times. The Owner may be required to bond or deposit restricted funds for purposes of demonstrating financial viability for System maintenance, repair or replacement.

6. Community Systems may be required to install dual Dispersal Fields according to the System designer's specifications.

7. Community Systems shall be required to reserve two or more Replacement Areas equaling 200% or more of the required area for replacing the Drainfield. The System shall be owned and managed by a homeowner's association or similar.

8. Prior to Final Approval documentation to the satisfaction of the Director of Environmental Health shall be provided that demonstrate legally recorded easements, agreements, established and funded common interest development (e.g. homeowners association), service provider agreements, Operating Permit and proof of financial assurances.

9. All Community Systems shall obtain an Operating Permit and be required to perform regular monitoring, maintenance, and reporting of System performance. If the Community System is a Large System as defined in this Chapter, additional requirements for siting, design, operation and maintenance of Large Systems as specified in the Manual shall also apply.

SECTION 6: NON-DISCHARGING WASTEWATER DISPOSAL UNITS

A Non-Discharging Wastewater Disposal Unit is a self-contained, watertight container designed to hold Wastewater until it is pumped and/or cleaned. A Non-Discharging Wastewater Disposal Unit includes but is not limited to a Holding Tank, Vault Privy, Portable Toilet, and Waterless Toilet. These methods may be subject to the requirements of an Operating Permit.

Setback requirements for Holding Tanks, Vault Toilets and Portable Toilets are the same as for Septic Tanks.

A. HOLDING TANK REQUIREMENTS

1. A Holding Tank is a watertight container designed to receive and store Wastewater for disposal at another location. When a Holding Tank is proposed, the following requirements shall apply.
2. Siting Criteria

   Holding Tanks may be permitted under the following conditions:

   a. The Site cannot be approved for the installation of a Standard System or Alternative System due to Site specific limiting conditions such as lack of Effective Soil, high ground water, etc.;
   b. No Public Sewer System is legally and physically available;
   c. The tank is intended to serve only non-residential or small occasional use industrial, commercial, or recreational facility;
   d. Unless otherwise approved by DEH, the projected daily sewage flow is not more than two hundred (200) gallons;
   e. The Holding Tank shall meet the same setback requirements as for a Septic Tank as specified in Section 2.

3. General Requirements
   a. The Holding Tank and piping shall be water tight.
   b. The Holding Tank must be designed and installed under the inspection and approval of a Qualified Professional.
   c. The Owner of the property shall record a deed restriction agreeing to be served by Public Sewer System if at any time a connection becomes legally available within two hundred (200) feet of the property; and
   d. The Owner shall provide DEH with:
      (1) A copy of a contract with a County licensed Septage Pumper that shows the tank shall be pumped at regular intervals or as needed to prevent use of greater than seventy-five (75) percent of the tank's capacity. The contents of the tank shall be disposed of at an approved Septage receiving facility, in an approved manner; and

(2) A record of pumping dates and amounts pumped shall be maintained by the property Owner and made available to DEH upon request.

e. No building may be served by more than one (1) Holding Tank.

f. A single parcel or Lot of record may be served by no more than one (1) Holding Tank.

g. Each tank shall have a minimum liquid capacity of fifteen hundred (1,500) gallons and shall be large enough to accommodate 200% of the estimated flow between anticipated pumping frequency.

h. The tank shall be located and designed to facilitate visual inspection and removal of contents by pumping;

i. The tank shall be equipped with both an audible and visual alarm, placed in a location acceptable to DEH, to indicate when the tank is seventy-five 75% full. Only the audible alarm may be user cancelable;

j. The tank shall have no overflow vent at an elevation lower than the overflow level of the lowest fixture served;

k. Holding Tanks shall not be used as a method for sewage disposal for creating Lots and parcels.

l. Holding Tanks shall not be used for accommodating home expansions or additions, or business expansion.

4. Permit Requirements

An Operating Permit shall be required prior to issuance of the Final Approval of the Installation Permit. Each Holding Tank, installed or put into use after the first adoption of this Manual is required to maintain an Operating Permit.

B. VAULT TOILET REQUIREMENTS

1. A Vault Privy is a structure used for disposal of human waste without the aid of water. It consists of a shelter built above a subsurface vault into which human waste falls. The Vault Privy has no water connection. When a Vault Privy is proposed, the following requirements shall apply:

2. Siting Criteria

a. The Vault Privy will only serve non-residential and non-commercial, limited use applications, such as primitive type picnic grounds, campsites, camps and recreation areas where Septic Tank and leach field systems are not practicable as determined by DEH. Approval to permit Vault Privies will be considered by DEH on a case-by-case basis.

b. Vault Privies shall not be used for seasonal Dwellings, commercial facilities, or single-family Dwellings.

3. General Requirements

a. The vault must be watertight and tested for water tightness at the time of installation using the same methods as found in Section 4 for Septic Tank water tightness.

b. The vault must be constructed in substantial compliance with the specifications for Septic Tanks (See Section 4) and designed to facilitate the removal of the wastes.

c. The vault must meet the same setbacks requirements as a Septic Tank found in Table 2-1, Section 2.
d. The capacity of the vaults shall be adequately sized to accommodate the proposed use.
e. Vault Privies shall not be located in a floodway or areas subject to seasonal flooding.
f. Structures must be free of hazardous surface features, such as exposed nail points, splinters, sharp edges, and rough or broken boards, and will provide privacy and protection from the elements.
g. Building ventilation must be equally divided between the bottom and top halves of the room. All vents must be screened with sixteen (16) mesh screen of durable material.
h. Buildings must be fly and rodent resistant, and will have self-closing doors with an inside latch.
i. Vaults must be vented to the outside atmosphere by a flue or vent stack having a minimum inside diameter of four (4) inches.
j. Interior floors, walls, ceilings, partitions, and doors must be finished with readily cleanable impervious material resistant to wastes, cleansers and chemicals. Floors and risers must be constructed of impervious material and in a manner that will prevent entry of vermin.
k. The seat opening must be covered with attached, open-front toilet seats with lids, both of which can be raised to allow use as a urinal.
l. A toilet tissue holder must be provided for each seat.
m. Vents must be sized to equal in area to a minimum of three (3) square feet.
n. A minimum clear space of twenty-four (24) inches between multiple unit installations and a clear space of twelve (12) inches from the seat opening to the side building wall in single and multiple units.
o. No water-carried sewage shall be piped to or be placed in vault privies.

4. Permit Requirements
   a. An Operating Permit shall be required.
   b. Inspections and enforcement shall take place on a complaint response basis.
   c. Vault Privies shall be maintained to prevent health hazards and Pollution of public waters.
   d. The Vault Privy shall not be allowed to become filled with excreta to a point within two (2) feet of the ground surface.
   e. The excreta in the vault shall be pumped out as necessary to fulfill these by a Septage Pumper that is permitted to perform such work in Yolo County requirements.
   f. The property Owner or Septage Pumper shall submit the Septage Pumper's receipt to DEH within thirty (30) days of its pumping.
   g. The privy shall be maintained in a sanitary condition and in good repair.
   h. A caustic shall be added routinely to vault chambers to control odors.
   i. Contents of Vault Privies shall not be discharged into storm sewers, on the surface of the ground or into public waters.
   j. Vault toilet shelters shall display the business name of the Owner, manager or licensed sewage disposal service that is responsible for servicing them.

k. Proof of regular maintenance may be required.

C. PORTABLE TOILET REQUIREMENTS

1. Description

   A Portable Toilet is any self-contained Chemical Toilet Facility that is housed within a Portable Toilet Shelter. The Portable Toilet has no direct water connection.

2. Siting Criteria
   a. No Permit is required for use of Portable Toilets.
   b. Portable Toilets may be allowed for temporary or limited use areas, such as construction Sites (for use by onsite employees), mobile or temporary agricultural uses, temporary campsites, and special events, provided the Portable Toilets meet the same setbacks requirements as a Septic Tank Table 2-1, Section 2.
   c. When associated with a Use Permit, a Plot Plan may be required which indicates the placement of the Portable Toilets relative to required setbacks.
   d. When associated with a Use Permit, the minimum number of Portable Toilets shall be determined based on estimated attendees and duration of event and relevant published industry guidance, such as the Portable Sanitation Association International Special Event Extended Chart Breakdown.
   e. Portable Toilets shall not be allowed for seasonal Dwellings, commercial facilities or single-family Dwellings.

3. General Requirements
   a. Portable Toilet Shelters shall display the business name and contact information of the Owner or licensed sewage disposal service that is responsible for servicing them
   b. All surfaces subject to Soiling shall be impervious, easily cleanable, and readily accessible.
   c. No water-carried sewage may be piped to or placed in Portable Toilets.
   d. Portable shelters shall provide screened ventilation to the outside atmosphere having a minimum area of one (1) square foot per seat;
   e. Portable Toilets shall provide separate compartments with doors and partitions or walls of sufficient height to ensure privacy.
   f. Toilets will have toilet bowls constructed of stainless steel, plastic, fiberglass, or ceramic or of other material approved by DEH.
   g. Waste passages will have smooth surfaces and be free of obstructions, recesses or cross braces that would restrict or interfere with flow of sewage.
   h. Chambers and receptacles will provide a minimum storage capacity of 50 gallons per seat.
   i. Portable Toilets shall be maintained to prevent health hazards and Pollution of protected waters.
   j. Contents of Portable Toilets will not be discharged into storm sewers, on the surface of the ground or into protected waters.
   k. Biocides and oxidants must be added to waste detention chambers at rates and intervals

recommended by the manufacturer.

l. Wastes shall be removed from the chamber as necessary to prevent overflow.4. Permit Requirements

An Operating Permit will not be required for temporary use of Portable Toilets and in agricultural field activities.

D. WATERLESS TOILET REQUIREMENTS

1. Description
   A Waterless Toilet includes a composting toilet, an incinerating toilet or similar device for the holding and processing of Wastewater from a toilet.

2. Prohibitions
   a. Minimum Lot size for the use of Waterless Toilets shall be two (2) acres.
   b. The excrement from Waterless Toilets shall not create a Public Nuisance
   c. The use of a Waterless Toilet shall not replace the requirement for a System that meets all of the requirements of Chapter 19 of the Yolo County Code and this Manual.

3. Health Concerns:
   Waterless Toilets have been showed to be capable of deactivating and/or killing pathogens through the internal processes that take place. Due to external conditions of operational irregularities, the conditions in the unit may not always be optimal for pathogen reduction and improper handling and disposal of the product could adversely impact public health.

4. Future Ownership
   Properties may change ownership. One family that is fully educated on how to operate and maintain their Waterless Toilet and is highly motivated to do so may be replaced by another family that does not share the previous owners' expertise and values. Therefore, the Onsite Wastewater Treatment System must be properly sized to accommodate 100% of the wastewater estimated for the structure served by the System regardless if Waterless Toilets are installed.

5. Requirements
   a. A Site Evaluation shall be conducted in the area of the proposed disposition of Waterless toilet wastes. The Site Evaluation shall verify at least 5 feet of separation to groundwater or other limiting layer from the bottom of the disposition pit.
   b. Waterless toilets should only be considered for owner occupied dwellings on Lots that are at least two (2) acres in size
   c. Waterless toilets may be considered agricultural field settings to replace the use of a Portable Toilet.
   d. The Lot to be served by the Waterless Toilet shall first be shown to be capable of supporting an Onsite Wastewater Treatment System meeting the requirements of Chapter 19 of the Yolo County Code and this Manual.
   e. The Waterless Toilet shall be installed, maintained, and replaced in accordance with the manufacture's recommendations.
   f. No material shall be placed in a Waterless Toilet other than the material for which it has

been designed.

g. Installation of the Waterless Toilet has been inspected by the Building Official having jurisdiction, or designee, in consultation with DEH.

h. The Waterless Toilet shall be specifically designed for holding and processing liquid and solid human waste, generally associated with toilet usage, and employs the process of biological degradation and/ or heat incineration in which organic material is converted to a compost-like substance.

i. The Waterless Toilet shall be certified and currently listed by the National Sanitation Foundation (NSF) under NSF/ ANSI Standard 41.

j. The model of the Waterless Toilet selected shall be appropriate for the number of users and intended demand. The assumed number of users of the Waterless Toilets shall be provided by the Applicant by estimating the maximum number of people living in the dwelling or if not a residential setting, then estimating the maximum number of people using the toilet on a daily basis. The manufacturer specification sheet shall be provided and shall demonstrate the toilet is appropriately sized for the planned use.

k. The product of the Waterless Toilet shall only be handled and disposed of after the digestion process is complete as specified in the manufacturer's instructions and in this Section.

l. Waterless Toilets have been shown to be capable of deactivating and/or killing pathogens through the internal processes that take place. Due to external conditions or operational irregularities, the conditions in the unit may not always be optimal for pathogen destruction and improper handling and disposal of the product could adversely impact public health by allowing transmission of a variety of enteric diseases and parasitic illnesses. The product of the Waterless Toilet digestion must, therefore, be transported and disposed of in a manner that does not create a public nuisance and is in accordance with the requirements of the Operating Permit and the Owner's operation and maintenance manual, and the following requirements:

   (1) Transportation needs to be by a licensed Septage Pumper to an approved solid waste disposal facility capable of accepting human waste; or
   (2) Disposition by the Owner of the property where the Waterless Toilet is located shall meet the following conditions:
   (3) Bury the waste under a minimum of six (6) inches of compacted soil; and
   (4) The location of the burial shall be shown on a site plan submitted to the DEH during the Site Assessment process; and
   (5) The waste shall not be buried in any present or planned food crop growing areas or dairy pasture; and
   (6) The waste should not be buried where there is less than 5 feet of native, undisturbed Soil between the bottom of the burial excavation and the seasonal High Groundwater table or in an area subject to runoff where the discharge could flow into surface or subsurface water.

m. A site plan and Site Assessment for the site proposed for the disposal of the Waterless Toilet product of composting digestion is required.

n. Setback requirements for the Waterless Toilet shall be the same as for Septic Tank in this Manual. And setback requirements for the burial site shall be the same as Dispersal Field as provided in this Manual.

o. Use of a Waterless Toilet shall require an Operating Permit issued by DEH.

p. A Person selling a parcel on which there is an approved Operating Permit for a Waterless Toilet shall notify DEH of the transfer and disclose to the prospective purchaser of the presence of the Waterless Toilet and the requirements to obtain an Operating Permit. The property seller as well as DEH shall notify the purchaser of the approved locations of the disposal of the Waterless Toilet waste product.

(1) Operating Permits are non-transferrable.

(2) An Operating Permit for a Waterless Toilet may be revoked under any of the following conditions:

i. An unsanitary condition has been caused by the Waterless Toilet or its use;
ii. The waste product of the Waterless Toilet digestion has been improperly transported, disposed of or used;
iii. The toilet is not operated or maintained as specified in the Operating Permit or the Operating and Maintenance Manual.
iv. Continued use of the toilet poses a public health threat.

6. Operating and Maintenance Manual

No person shall install, maintain, or replace a composting toilet unless an Operating and Maintenance Manual is maintained and available for reference on the premises. The Operating and Maintenance Manual shall at a minimum contain all of the following information:

a. Potential health risks from improper use or maintenance of the Waterless Toilet; and
b. Manufacturer's name and model number; and
c. Manufacturer's NSF listing and certification; and
d. Manufacturer's recommended operational capacity; and
e. Manufacturer's operation and maintenance guidance; and
f. Trouble-shooting information; and
g. Method of handling and site for disposal of the waste product of the Waterless Toilet; and
f. Contact information in case of the need of repair or replacement.

7. Record Disclosure Document:

The following disclosure is required: Notification recorded on the deed informing future property Owners of the following:

a. The potential health risks associated with the product of composting digestion; and
b. The property owner's responsibility to maintain an Operating Permit and operate the Waterless Toilet in compliance with permit conditions of installation and operation, and the Operating and Maintenance Manual.
c. Notification to DEH at time of property sale or transfer.

SECTION 7: OTHER SYSTEMS

A. GRAYWATER SYSTEMS

1. Description:

A Graywater System is designed to collect Graywater and transport it out of the structure for distribution in shallow soil or mulch. A Graywater System may include tanks, valves, filter, pumps, or other appurtenances along with piping and receiving landscape.

2. Adoption by Reference: The provisions for Graywater Systems specified in the Uniform Plumbing Code, California Code of regulations, Title 24, Part 5, Chapter 16A, Part 1 (Graywater Standards) are adopted by reference in Chapter 19 of the Yolo County Code, unless otherwise noted below.

3. No Graywater System shall be approved, designed, constructed, or maintained except for residences that are owner occupied, unless the Owner obtains an Operating Permit

4. No person shall construct or maintain a Graywater System unless the building is also served by an Onsite Wastewater Treatment System that is functioning properly, as verified by DEH.

5. Graywater Systems designed to receive Graywater from a single laundry waste discharge require prior plan approve from DEH, however an Installation Permit is not required.

6. Notwithstanding paragraph A5, unless otherwise authorized by DEH, all other Graywater Systems require plan review and an Installation Permit. Review of the Installation Permit will include:
   a. Unless waived, a Site Evaluation including Soil Profile Tests as provided in this Manual
   b. Design review
   c. Inspection of construction and installation.

7. Unless otherwise approved by DEH, the application rates for Graywater Systems are the same as the application rates for Standard Systems.

8. No person shall alter or replace an approved Graywater System's components without first notifying DEH.

9. A Graywater System cannot be used to reduce the size of the Onsite Wastewater Treatment System because proper use of a Graywater System prohibits discharging into the Graywater System during saturated conditions (wet season).

10. Graywater Systems do not require Operating Permits unless EH determines it is required because of the size or complexity of the System, or if the building served is non-owner occupied.

SECTION 8: ABANDONMENTS AND DESTRUCTIONS

1. General
   An Abandoned System is a System (including a Septic Tank, Holding Tank, vault, Cesspool, and Seepage Pit) that will no longer be used to receive Wastewater Effluent because the structure it served has been connected to an approved sewer system or another approved System, or DEH has issued a notice or order to destroy the System under Permit. Abandoned Systems or improperly destroyed Septic Tanks can pose hazards and create undesirable situations. Tanks that have collapsed pose safety hazards for people, pets and other animals. Tanks that are not

properly destroyed may fill with water over time and cause an entrapment or drowning hazard. Improperly destroyed tanks may not be able to support the weight of vehicular traffic, building foundations, or other structures built on the property. Therefore all Abandoned Systems must be properly destroyed under permit and inspection of DEH.

2. The Owner of the property shall destroy the System under Permit from DEH within thirty (30) days from the date of connecting any premises with the Public Sewer System, connection to another System, or building condemnation.

3. An Abandoned System shall be destroyed in the following manner:
   a. A Permit must be obtained before the System is destroyed. The application shall include:
      (1) A site plan showing where the Septic Tank and Dispersal Field are located.
      (2) A description of how the System will be destroyed.
   b. The Septic Tank, Cesspool, or Seepage Pit must be pumped by a permitted licensed Septage Pumper to remove all contents. A copy of the receipt shall be submitted to this DEH.
   c. The Septic Tank shall be destroyed as follows:
      (1) To destroy in place, the tank cover will be removed or collapsed. The bottom of the tank and one side will be crushed so as to prevent water collection in the tank.
      (2) The tank will be filled so that there is not a cave-in or other structural hazard, or,
      (3) The tank may be removed to an approved location and,
      (4) The tank or excavation hole must be filled with earth, sand, gravel or other material approved by DEH.
      (5) When the tank is to be destroyed and subsequently covered with a foundation or other structure, a structural engineer shall determine the method of destruction.
   d. The building Wastewater plumbing system, if not connected to an approved onsite septic or sewer system, must be permanently capped. If the building is not connected to any Wastewater disposal system, the building shall be posted as non-habitable. If the building is to continue to be used for as a non-habitable structure all plumbing fixtures and all water inlets shall be removed.
   e. Future construction in the area of the Abandoned System may require special construction considerations.
   f. Additional Permit requirements may be necessary in order to mitigate unique problems associated with the abandonment of the system.
   g. Subsequent connection to a new tank or Public Sewer System shall be inspected by the authority having jurisdiction.

SECTION 9: INSPECTION REQUIREMENTS

A. GENERAL

To ensure installation of a safe, effective System and conformance with the standards in this Manual, inspections of the System are required. The System must be ready for the type of inspection requested. If extra inspections are needed, an additional inspection fee will be charged.

No portion of the System shall be covered without inspection by this Division unless DEH has given specific authorization.

B. NOTIFICATION

Installers are required to provide at least 48 hours notification to DEH prior to beginning construction of a System, and at least 48 hours advance notice prior to reaching specified construction inspections (see below). Notification must include Applicant's name, Assessor's parcel number, street address, and Permit number. Failure to provide sufficient notice may result in delay of construction or duplication of work.

C. REQUIRED CONSTRUCTION INSPECTIONS

The inspection steps required for the installation of a System will vary with the type and complexity of the System installed. An approved copy of the Permit shall be available during each inspection. The following inspections shall be required unless the Applicant demonstrates good cause for not requiring a particular inspection:

1. Preconstruction meeting:
   Unless waived, the preconstruction meeting shall have the marked layout of the proposed System onto the ground. If not already existing, include any proposed footprints of buildings, pools, or other structures which could affect the System and Replacement Area. Minimum horizontal setbacks shall be in accordance with the approved System Design.

2. Open Trench Inspection:
   Open trench inspections shall be performed by jointly by the System Designer and DEH. At the time of the open trench inspection, all the following shall be completed:
   a. All excavations necessary for the System at designed depth, width, and length.
   b. All smeared or compacted surfaces shall be corrected.
   c. Bottom of the trenches shall be level.

3. Rock and Pipe Inspection:
   a. The connection of the Septic Tank, all distribution piping and the quality of the rock will be inspected.
   b. For Alternative System, this inspection will also include inspection of the dosing tank, pump and filter assembly, and hydraulic squirt test for Pressure Distribution System in conjunction with the System Designer.

4. Final Inspection:
   At the time of final inspection by DEH, all the following shall be completed:
   a. The trenches filled with rock to the specified level with the filter material in place or the gravel-less chambers installed.
   b. Approved Distribution Boxes, with covers, installed level on undisturbed Soil and at the proper elevation.
   c. Approved tank risers and inspection ports.
   d. All pipe, other than in trenches, must be installed on grade (1/8 in./ft. minimum) and grouted to Septic Tank or Distribution Boxes.
   e. All pipe in trenches installed level (maximum drop of 3" in 100 ft.) in the full length of trenches with ends capped. Sealing around pipe is also to be completed at the Distribution Boxes.

f. The Septic Tank set level in place on undisturbed Soil.
g. All trenches must be uncovered to the filter material and visible for inspection - do not backfill. Leave ends of pipes exposed.

5. Other Inspections:
   Other inspections may be required as a Permit condition by DEH depending upon the type of System proposed. Owner-installed Systems may require additional inspections to verify workmanship during the construction. The costs of additional inspections and related services beyond services normally covered by the Permit fee may be charged to the Applicant.

DEH may combine one or more required inspections into a single field visit if possible.

Septic Tanks or other primary components may be required to be filled with water to the flow line prior to requesting inspection. All seams or joints shall be left exposed (except the bottom) and the tank shall remain watertight.

A flow test may be required to be performed through the System to the point of Effluent disposal. All lines and components shall be watertight and distribution shall be according to the approved System Design.

Systems must be backfilled within ten (10) days of written approval for backfill from DEH and Qualified System Designer (if required), or as specified by the approved System Design.

D. ALTERNATIVE SYSTEM INSPECTIONS

Alternative System inspections may include those specified above, and also include those inspections specified in each Alternative System Section (Section 5) of this Manual.

E. SYSTEM MODIFICATIONS/ABANDONMENT INSPECTIONS

Depending on the type of work being conducted, inspections may include any of those specified above and will be disclosed at time of Permit approval.

F. ISSUANCE OF FINAL APPROVAL

1. General:
   Final Approval is a document issued by DEH that indicates the System was installed in compliance with this Manual and relevant County Codes, and all Permit conditions have been fulfilled, including issuance of any required Operating Permit.

2. Requirements for Standard System:
   Prior to issuance of a Final Approval for a Standard System, the following shall be completed:
   a. The System installation has received final approval by DEH.
   b. An approved, scaled As-Built Drawing of the parcel, the System and all relevant Site features has been submitted to DEH and received approval.
   c. The Contractor shall provide with Owner with an Owner's operation and maintenance guide.

3. Requirements for Alternative System:
   In addition to the minimum requirements for a Final Approval required for a Standard System the following shall be provided to DEH:
   a. The Qualified System Designer shall submit written certification that the System has been installed in accordance with the approved System Design and Permit conditions.
   b. Appropriate notice of the Operating Permit, and recordation on the property deed, if applicable.
   c. The Owner shall obtain an Operating Permit, and where required, the contracted services of a Service Provider.
   d. The Qualified System Designer shall provide the Owner with an operations and maintenance manual that outlines the operation of the system, including the Owner's responsibilities for maintaining the system. A copy of the maintenance manual shall be provided to DEH for archiving.

4. Requirements of submitting As-Built Drawings:

   At completion of construction and prior to receiving acceptance Final Approval by DEH, the Contractor and/or Qualified System Designer shall provide to DEH and system Owner, a set of "As-Built" drawings of the completed septic system installation.

   Minimum requirements for the As-Built Drawing is a scaled Plot Plan of the System identifying the location of the installed System and components in relation to structures on the property. The As-Built Drawing is completed after the System is installed or after a Major Repair. The As-Built Drawing shall show the north arrow, show two corners of a permanent structure closest to the Septic Tank, such as the Dwelling. The corners shall be labeled A and B. The corners shall be used to triangulate measurements from points A and B to all of the following: Distribution Boxes, ends of the drainfield laterals, wells, buildings, water lines, Curtain Drains, roof drainage. The As-Built Drawing shall indicate the location of the Replacement Area, and all areas accessible for maintenance and inspection; including risers, observation port, inspection ports, check valves, Supplemental Treatment Unit, house sewer Cleanout, etc. GIS coordinates for the Septic Tank shall be included on the As-Built Drawing.

SECTION 10: OPERATING, MONITORING AND MAINTENANCE

A. GENERAL

The Purpose of the Operating, Monitoring and Maintenance (OM&M) Program is to assure Systems continue to operate as designed, protect the public health and the environment, and provide economical, dependable, long-term service to their owners. The program provides varying levels of requirements appropriate for the complexity of the System and the environmental sensitivity or risk level of the specific site.

B. APPLICABILITY

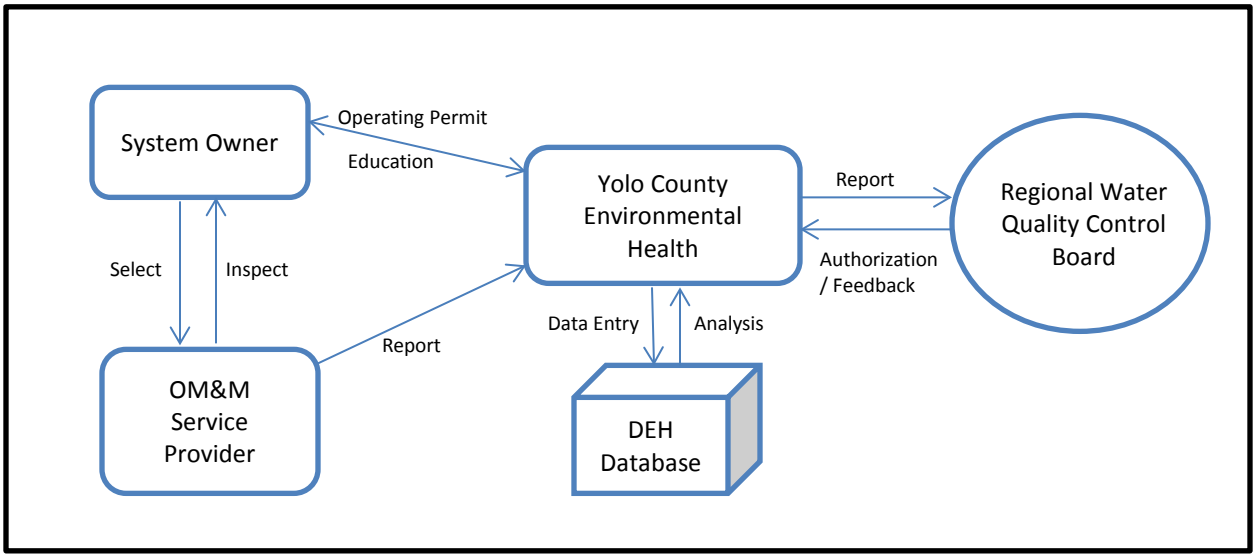
1. The OM&M requirements apply to Systems installed or Repaired after the first adoption of this Manual.

2. Owners of Existing Systems, especially existing Supplemental Treatment Systems are encouraged to voluntarily opt into the OM & M program.

C. ADMINISTRATION

1. The OM&M program will be administered county-wide by DEH.
2. Any required OM&M inspections will be performed by or under the supervision of an approved Service Provider.
3. The following diagram shows the relationship between the parties involved in the program.

Figure 10-1: OM&M Program Administrative Overview



D. OPERATION, MAINTENANCE AND MONITORING PROGRAM

The following table summarizes the OM&M requirements.

Table 10-1: OM&M Requirements

Type of System	Requirement
Septic tank to gravity dispersal system	Owner education DEH database records management Owner's manual and maintenance checklist
Septic tank to pressure distribution dispersal system	Owner education DEH database records management Owner's manual and maintenance checklist
Steep Slope, Mound or raised sand filter bed (not designed for supplemental treatment)	Owner education DEH database records management Owner's manual and maintenance checklist

Supplemental Treatment Unit, Holding Tank, Vault Toilet, Engineered Fill, Cluster Systems, Community Systems	Owner education DEH database records management Owner's manual Operating Permit Notice on property deed Ongoing inspection and maintenance by qualified Service Provider
Waterless Toilet	Owner education DEH database records management Owner's manual Notice on property deed
Non-residential System (including non-residential Graywater)	Any combination of the above depending on the size, complexity and location of the System

1. Homeowner education: DEH will establish methods of increasing public understanding about the proper use and care of Systems. This may be achieved through educational handouts, website information, and press releases. The program goal is to provide Owners with the information they need to properly operate and maintain their Systems.

2. Database: DEH maintains electronic records of issued permits. For Systems utilizing supplemental treatment, DEH will record the required monitoring frequency, results of the maintenance and reporting requirements, identification of the Service Provider, and summary of corrective actions.

3. System Owners will be provided with an Owner's Manual for Systems approved after the adoption of this Manual. The Owner's Manual shall include:
   a. For Standard System, DEH or the System installer will provide an informational packet to new Owners at the time of installation, including an accurate, scaled "as-built" drawing of the System.
   b. For Alternative Systems, the Qualified System Designer will provide the homeowner with an Owner's Manual and provide an electronic version to DEH for archival purposes. The Owner's Manual will be supplemented or updated by the Service Provider when needed due to System misuse, Repairs, or Modifications.
   c. The Owner's Manual will include the following elements as applicable and available:
      (1) Diagrams of the System components
      (2) Accurate, scaled "as-built" drawing of the System
      (3) Explanation of general System function, operational expectations, Owner responsibility, etc.
      (4) Routine maintenance schedule
      (5) Names and phone numbers of the Qualified Profession, installation Contractor, and Service Provider
      (6) List of proprietary system components, including manufacturer name and model number
      (7) Information on troubleshooting common operational problems that might occur with the specific System.

E. OPERATING PERMIT REQUIREMENTS

1. An Operating Permit is required for Supplemental Treatment Units, Intermittent and Recirculating Sand Filter Systems, Holding Tanks, Vault Toilets, Cluster Systems, Community Systems, Systems in Engineered Fill, and Large Systems. Other Systems may be required to obtain an Operating Permit due to the size, complexity, or location of the System as determined by DEH.

2. The Owner of record shall obtain an Operating Permit prior to final System approval and issuance of a Final Approval.

3. Operating Permits are issued to the System Owner and are not transferrable when ownership changes.

4. Upon change of ownership, DEH will provide information to the new System Owner concerning the design, intended use, performance history and OM&M requirements.

5. Under the terms of the Operating Permit, DEH shall conduct an annual review of the performance and condition of the System based on inspection and monitoring results.

6. Operating Permits shall be renewed according to the permit conditions.

7. The maintenance and inspection frequency shall be performed as outlined in Table 10-2 below.

8. DEH may suspend or revoke an Operating Permit for failure to comply with any operational, monitoring, or maintenance requirements. Upon revocation or suspension of an Operating Permit further operation of the Alternative System shall cease until the suspension is lifted or a new permit is issued.

F. NOTICE ON PROPERTY DEED

A certified copy of the following shall be recorded on the property deed in the office of the County Recorder of Yolo County:

1. Notice of the requirement for an Operating Permit

2. Initial Operating Permit issued for the System with listed conditions of operation, maintenance and monitoring.

3. Reissuance of Operating Permit to new Owners

4. Notices of withdrawal of any Operating Permit

G. INSPECTION FREQUENCY AND MAINTENANCE CHECKS

Inspection Frequency: Systems requiring an Operating Permit shall meet the inspection frequencies and maintenance checks as specified in Table 10-2, or as otherwise required by the Operating Permit. Nothing contained in this provision shall prevent DEH from requiring more frequent inspections and maintenance checks as deemed necessary to ensure optimal System

performance. Systems serving commercial (non-residential) uses, especially those that have increased fats, oils and grease in the Wastewater discharge; Large Systems, and multi-family residential uses may require more frequent monitoring and inspections than those outlined in Table 10-2 depending on the size, complexity and location of the System.

Table 10-2: Required Inspection Frequency and Maintenance Checks

Inspection Interval	Residential Standard Gravity System	Pressure Distribution	Raised Sand Filter Bed (not for supplemental treatment), Steep Slope, or Mound	ISF, RSF, or Proprietary Supplemental Treatment Unit and Subsurface Drip if utilized	Disinfection Units
First 6 weeks					PL or SP (required)
First 3 Months		PL or PU or SP or Installer (recommended)	SP (required)	PL or SP (required)	
Monthly					PL or SP (required)
Annually		SP (recommended)			
As required by the manufacturer or NSF, but not less than once per year				PL or SP (required)	
Once every 3 years or after major storm event or earthquake			SP or HO (recommended)		
Every 3-7 years	PU or SP (recommended)				

(1) Supplemental Treatment systems used for Treatment prior to disinfection must be monitored monthly for the first year of operation and longer if necessary to assure Treatment requirements are reliably met

PL= Proprietary Device Licensee (also must be an approved Service Provider)

PU= Septage Pumper

SP= Service Provider

HO – Home Owner

1. Complexity and frequency of inspection will be related to the complexity and maintenance requirements of the System components, recommendations of the manufacturer and industry standards.

2. Minimum Inspection Requirements

a. Septic Tank:
   (1) Inspection frequency should be once every 3-7 years.
   (2) Scum and sludge measurements (pumped as needed)
   (3) Water intrusion (dissolved oxygen measured by the Service Provider only)
   (4) Integrity of tank, including observation for: cracks or indications of structural deterioration; condition of inlet and outlet T's; condition of lids and risers; indication of leaks in risers
   (5) Presence and condition of Effluent filter.
b. Pump and Dosing Chamber
   (1) Scum and sludge measurements, pumping as needed
   (2) Indication of water intrusion (dissolved oxygen measured by the Service Provider only)
   (3) Integrity of tank, including observation for: cracks or indications of structural deterioration; condition of inlet and outlet T's; condition of lids and risers; indication of leaks in risers
   (4) Condition of and correct operation of all floats
   (5) Orderly wrap of float cords
   (6) Condition of pump intake screen
   (7) Verification of pump cycle
   (8) Siphon sitter functioning, if applicable
c. Control panel in good working order based on checking the following components:
   (1) Timer and digital counter readings recorded by the Service Provider during the inspection. For control panels that record pump activity electronically, manual recordings are not necessary.
   (2) Pump cycle counter operation verified by the Service Provider in the field by manual operation of the pump. For control panels that record pump activity electronically, counter operation can be verified remotely.
   (3) Audible and visual alarms functioning
   (4) Run time appropriate, if demand dose
   (5) Electrical box free from moisture and secure connections
d. Gravity Drainfield (Conventional or Gravelless), if applicable
   (1) Depth of Effluent ponding within trench
   (2) Indication of Effluent breakout or discharge to surface of the ground
   (3) Upkeep and accessibility of observation port and inspection ports
   (4) Area verified as free from road, structures, vehicular traffic, surface water drainage with downspouts and landscape drainage properly diverted
   (5) Results of hydraulic loading test, if test is needed.

For additional inspection requirements for Alternative Systems refer to the Management Requirements in each respective System Chapter.

DEH may notify System owners of regular maintenance requirements or recommendations.

H. SUPPLEMENTAL TREATMENT EFFLUENT MONITORING

Any System that is designed to perform Supplemental Treatment shall obtain an Operating Permit and be monitored annually for performance in the following manner:

1. Treated Effluent and, where applicable, untreated Effluent will be sampled and tested at least annually for total and fecal coliform, BOD, and TSS. Influent and Effluent of Systems with Operating Permits requiring nitrogen reduction shall also be tested for total nitrogen. Wastewater treated by Disinfection Units shall be tested for total fecal coliform.

2. When Effluent quality monitoring results indicate that the Supplemental Treatment and/or disinfection did not meet the minimum Treatment levels specified in this Manual, a second sample will be taken within three months. If the follow up sampling results indicate that the Supplemental Treatment and/or disinfection unit is not performing to the Treatment levels specified in this Manual, DEH shall be informed and the Owner or Owner's agent shall take corrective action necessary to achieve the Treatment levels specified in this Manual. Correction of Treatment problems will be verified by two consecutive compliant results within a three month period.

I. REPORTING REQUIREMENTS

For any System that is designed to perform Supplemental Treatment, the property Owner or his/her agent must submit an annual report to DEH, or as otherwise required by the Operating Permit, for review with the following information as a condition of any Operating Permit:

1. Twelve months actual flows into the System. If this cannot be obtained then the best reasonable estimate shall be provided.

2. Inspection findings of the dosing tank and pump system, including
   a. Elapsed time meter readings
   b. Dosing counter meter reading
   c. Pump run cycle time
   d. Proper operation of the alarm system; and
   e. Proper water tightness of all tanks

3. Inspection findings of the System, including:
   a. Evidence of breakout or surfacing of sewage Effluent onto the ground.
   b. Evidence of erosion or degraded erosion control on Slopes and mounds
   c. Testing and condition of adjusting and purge valves
   d. Testing and condition of inspection ports
   e. Results of Effluent sampling.

J. CORRECTIVE ACTION

1. Corrective Action for non-compliance with System maintenance shall result in administrative fines and penalties. If access is not voluntarily granted, DEH may obtain a warrant to conduct necessary inspections and maintenance of the System at the Owner's expense.

2. Corrective Action for non-compliance with Treatment standards may include the following:
   a. Notification of non-compliance sent to the System Owner, Qualified System Designer, Qualified Professional, Service Provider, and System proprietor.
   b. An administrative hearing with the Director of Environmental Health shall be conducted to set forth required corrective action

c. Additional testing and inspections for increased monitoring until the System returns to compliance
d. Restricted or prohibition of the use of the System.

SECTION 11: SEPTAGE PUMPER TRUCK REQUIREMENTS

A. GENERAL

Business that perform the service of pumping or cleaning Septic Tanks, Chemical Toilets, Cesspools, Seepage Pits, or other sewage containments are regulated under the California Health and Safety Code, Section 117400 – 117450 and Yolo County Code and require a Permit to operate. Each Septage Pumper Truck that is used for this purpose requires a Pumper Truck permit from this Division.

B. PERMIT REQUIRED

A Pumper Truck permit is required for each of the following:

1. A vehicle that pumps Wastewater from Septic Tanks, Cesspools, grease traps, grease interceptors, Seepage Pits, Wastewater Holding Tanks, Wastewater ponds, or other Wastewater source; or

2. A business that cleans Portable Toilets; or

3. A vehicle that disposes of Wastewater from these activities in Yolo County.

A Pumper Truck permit is required for each Septage Pumper Truck that performs liquid waste pumping and cleaning services as provided above.

No Permit is required if the entity providing the service is a city, town, county, sanitary district, sanitation district, sewer maintenance district, or any agency or institution of the state or federal government.

C. APPLICATION REQUIREMENTS

The application for a Pumper Truck permit shall include the name and address of the business, the names and addresses of all Owners, (if a partnership, then all names and addresses of all partners shall be disclosed), vehicle license number, vehicle identification number, and the exact location(s) where wastes will be disposed. The application shall be submitted with the required fee.

1. Septage Pumper Truck Operator knowledge
   The Septage Pumper Truck Owner, operator and all employees shall demonstrate knowledge of sanitary principles, and of the requirements and restrictions of Septage Pumper Truck business operation and waste disposal. DEH may require demonstration of knowledge, such as employee training, pumping procedure, spill procedures, etc.

2. Septage Pumper Truck business compliance

The Septage Pumper Truck Business shall demonstrate reliability in observing sanitary laws, ordinances and directions. Failure of the permitted business to operate in compliance may result in Permit revocation.

D. SEPTAGE PUMPER TRUCK INSPECTION PROCEDURES

The Septage Pumper Truck shall be leak proof and have the name and contact information of the business prominently displayed on both sides of the vehicle.

1. Vehicle identification: The business name and phone number shall be permanently affixed on both sides of the vehicle in plain, legible letters and numbers at least four inches high, and shall be visible at all times. The certified capacity of the tank in gallons shall be permanently affixed on both sides of the tank in plain, legible numbers a minimum of four inches high and shall be visible at all times. The capacity as shown shall be that approved and certified by the sealer of weights and measures of the county, or other approved sealer of weights and measures.

2. Vehicle in good repair: Vehicle and all hoses are leak proof and do not show signs of deterioration that could lead to leaking.

3 Vehicle Equipment: A minimum of fifty feet of pumping hose, a bucket and detergent shall be carried on each pumping vehicle. All pumping hoses must be cleaned out into the truck tank or into the Septic Tank, Chemical Toilet or other receptacle being pumped, and not on the surface of the ground. The customer's hose shall not be used.

4. Vehicle Spill Kit: There shall be a spill kit carried on each vehicle at all times which shall include, but not be limited to a sufficient quantity of chloride of lime or other chlorine product for disinfection of hose, absorbent material such as kitty litter, garbage bags, gloves of an impervious material, shovel, and absorbent spill containment barrier.

E. REPORTING REQUIREMENTS

The operator of the permitted Septage Pumper Truck should notify the owner of the System of any problems found during the pumping service.

Where repeated service is provided by the Septage Pumper Truck and incidents of surfacing sewage or other sign of failure chronically continues, the Septage Pumper Truck operator shall report the observation and System location to DEH.

This information may be used to conduct outreach or analysis regarding potential System failures or other problems.

SECTION 12: COMPLAINT INVESTIGATION

A. GENERAL

DEH at times will receive and investigate complaints about illegal installations, illegal Wastewater discharge or similar. All violations of the Ordinance and Manual are determined to be unlawful, and

declared to be detrimental to the public health, safety and welfare, and are Public Nuisances. As such, complaints will be responded to with a high priority.

B. INVESTIGATION

When the complaint investigation determines the public or environmental health may be affected, the property Owner shall be responsible for all subsequent costs associated with the complaint, including but not limited to: water samples, system assessment, time spent by the inspector, Repair Permits, abatement and construction under Permit to eliminate a Public Health Hazard.

1. Right of Entry: DEH representative is authorized to enter property/ premises at any reasonable hour as may be necessary for investigation of complaints and enforcement of the Ordinance and Manual. DEH representative should make attempts to contact the property Owner and Occupant prior to making the investigation. If entry is refused, DEH representative may obtain a warrant to enter and inspect.

2. Right to Investigate: No Person shall obstruct, impede or interfere with the investigation performed by DEH representative in the performance of code enforcement and nuisance abatement duties.

3. Collection of Evidence: DEH representative may take photographs and videos during the investigation as evidence of conditions found on the Site.

To investigate and/or monitor the movement of Wastewater and to further protect public health and safety, water well or surface water samples may be required. To determine the extent of any release of Wastewater, Soil samples may be required.

C. NOTICE OF VIOLATION

When a DEH representative finds a violation of the Ordinance or Manual, the DEH representative shall issue a Notice of Violation to the property Owner, and any or all Persons which may be a part of the violations (such as the Contractor or Occupant). Responsibility of the violations shall be joint and several. The Notice of Violation shall indicate the specific violation found to exist or that was observed.

D. STOP WORK ORDER

DEH representative may issue a “Stop Work Order” if the investigation determines work is being conducted without necessary Permits, or outside of issued Permit conditions. Once the order is issued, no further work will be conducted until the Stop Work Order is released by DEH.

E. WORK CONDUCTED WITHOUT A PERMIT

If a licensed Contractor is found performing work without necessary Permits, he or she will be reported to the State Contractors License Board in addition to being charged double the permit fee as a penalty for the violation.

F. FALSIFICATION

If it is found that false information was provided for the Site Evaluation, Permit Application or other supporting documentation that is relevant to the System performance, the Installation Permit may be suspended or revoked.

G. ABATEMENT

When necessary to protect the public health and safety, DEH may abate conditions that pose such threat.

H. CONDEMNATION

DEH may condemn any building that is found to be causing or may result in the accumulation or disposal of Wastewater in a manner that would be detrimental to the public health, safety, and welfare. DEH may, in conjunction with Sheriff or Police, impound any vehicle found to be illegally discharging Wastewater.

I. FINES AND PENALTIES

Any Person found violating any provisions of the Ordinance and Manual shall be subject to all fines or penalties that may apply, including but not limited to:

1. Fines of up to $1,000 per day or imprisonment as found in Yolo County Code.

2. Any Person conducting work without necessary Permits shall pay double the Permit fee as a penalty. The penalty is separate from required fees for Permits and services to bring the System or condition into compliance.

3. Any Person found violating any of the provisions of the Ordinance and Manual shall be guilty of a misdemeanor shall be subject to fines or imprisonment as described in the Ordinance.

4. Any Person found guilty of a violation of the provisions of the Ordinance and Manual shall be liable for all costs of the County in abatement and prosecution of the violation.

SECTION 13: SYSTEMS NEAR IMPAIRED WATER BODIES

The State and Regional Water Boards assess water quality data for California's waters every two years to determine if they contain pollutants at levels that exceed protective water quality criteria and standards. This biennial assessment is required under Section 303(d) of the Federal Clean Water Act. If surface water bodies or segments thereof are determined to contain such levels of pollutants, they are identified as Impaired Water Bodies and listed by the State Water Board.

Existing, new and replacement systems that are near impaired water bodies may be addressed by a Total Maximum Daily Load (TMDL) and its implementation program, or special provisions contained in this policy. If there is no TMDL or special provisions, existing, new or replacement systems within 600 feet of impaired water bodies listed in Attachment 2 of the State’s RWQCB OWTS Policy must meet the applicable specific requirements found in Tier 3 of the RWQCB OWTS Policy.

Currently, there are no impaired water bodies in Yolo County listed in Attachment 2 of the State's RWQCB OWTS Policy. At such time as an impaired water body is identified and listed, this Division will follow the applicable specific requirements found in Tier 3 of the State's RWQCB OWTS Policy or develop and obtain approval from the RWQCB of an Advanced Protection Management Program.

SECTION 14: VARIANCES AND APPEAL

Variances and Appeals are administrative remedies or alternatives to the strict interpretation of this Manual. The following are procedures for such situations.

A. VARIANCE REQUEST PROCEDURE

1. General

   A variance is a written authorization issued by the Director of Environmental Health that allows relief from the provisions within this Manual and/or certain provisions of Chapter 19 of the Yolo County Code of Ordinances, where the interpretation of the requirements will cause undue hardship or practical difficulties to the property Owner, while still assuring the protection of public health and the environment.

2. Policy

   a. Variances granted

      On a case by case basis, the Director of Environmental Health may grant a variance to certain provision of this Manual and Chapter 19 of the Yolo County Code. Such request shall be made in writing by the Applicant and include an appropriate fee. No variance will be granted that constitutes a grant of a special privilege inconsistent with limitations placed upon other properties in the same or similar circumstances. As such, the variance shall only be granted if all of the following findings are made:

      (1) A finding that the variance, if granted, would not present a Public Health Hazard, have an adverse environmental effect, or result in Pollution or degradation of ground water or surface water; and
      (2) A finding that special circumstance(s) exist(s) for the subject property and for which strict the application of the requirements of this Manual create(s) an undue hardship[1]; and
      (3) A finding that the "hardship" is due to unique conditions affecting the property[2]; and
      (4) The hardship was not intentionally caused by the action of the Applicant; and

[1] *"Hardship" means the subject property cannot be put to a reasonable use under strict application of the requirements of this Manual. Economic hardship is not a valid consideration for granting a variance to strict compliance with the provisions of this Manual.*

[2] *Unique conditions affecting the property include but are not limited to lot size, shape, topography, soil conditions or other circumstances which the landowner has no control over. Except for minor setback reductions, lack of adequate land space for unnecessary features such as a pool, deck, second dwelling, or addition shall not be considered valid hardships.*

(5) A finding that granting the variance will not have an adverse effect on the surrounding properties; and
(6) A finding that granting the variance will not confer on the Applicant any special privilege that is denied by this Manual to other property Owners with similar circumstance; and
(7) A finding that the strict interpretation of the provisions of this Manual would deprive the Applicant of rights commonly enjoyed by other properties in the same or similar circumstances; and
(8) A finding that the variance, if granted, is the minimum variance which would alleviate the hardship.

b. No variances will be granted for the following items:
(1) Allowance of Cesspools
(2) Systems receiving a projected flow of over 10,000 gallons per day
(3) Systems with proposed above ground surface discharge
(4) Slopes greater than 30% without a Geotechnical Report
(5) Under sizing leach fields in emergency situations greater than 70% of the size determined for the estimated flow and design as per standards provided in this Manual.
(6) Operating Permit requirements for Alternative Systems as specified in this Manual.
(7) Use of Proprietary Treatment units that do not have the required NSF listing or equivalent.
(8) Any prohibition as listed in Section 6-19.610 of the Yolo County Code of Ordinances.
(9) Systems receiving significant amounts of Wastewater from RV Holding Tanks.
(10) Minimum Vertical Separation distances.
(11) Installation of new or replacement Systems where a Public Sewer System is available.
(12) Reduction in setback to a Public Water System or surface water intake.
(13) Reduction in setback to a domestic or agricultural well greater than 20% of the setback established the Yolo County Code of Ordinances. For consideration of Variances granted that are less than a 20% reduction in setback, the separation must be maintained to the greatest extent practicable. Setback reduction requires a deeper seal to the extent determined by DEH. Slope, soil type, well construction and well integrity will be factors in consideration of this type of variance. Supplemental Treatment may be required in certain Soil types and a hydrogeological study which estimates the Contamination potential to the well may be required.
(13) Allowance of Systems in unconsolidated fill.
(14) Requirements for Cumulative Impact Assessment
(15) Definitions of Qualified Professional, Qualified System Designer, and Contractor.

3. Procedure

A variance may be requested for any requirement provided in this Manual. However, a variance can only be granted to reduce or modify a requirement, not eliminate it entirely. In reviewing a variance, sufficient information must be provided by the Applicant so that the Director of Environmental Health can make a finding listed above.

The procedure for applying for a variance is as follows:

a. Talk to the Environmental Health Division representative who is helping you with your application. They will be able to tell you the specific requirement that pertains to the requested variance and advise you on solutions that may not require a variance. Keep in mind that the fees for the variance request are not refundable, even if the variance is denied.
b. Talk to your Qualified Professional, Qualified System Designer, or Contractor about the limitations and needs for the variance, and possible alternatives. The variance request form will ask for alternatives to the requested variance.
c. Obtain required forms from DEH.
d. Submit the completed variance application and any needed supplemental information to DEH. You must pay a review fee at that time of variance submittal.
e. The Director of Environmental Health or designated staff will review and investigate the variance application and either approve, conditionally approve, or deny it in writing within fifteen (15) working days from the date a completed application was received. If additional information is requested to consider the request, the variance request may be suspended pending receipt of the additional information.
f. After conclusion of the investigation, the Director of Environmental Health will prepare a written order of specific findings of fact and reasons for granting or denying your variance. The decision of the Director of Environmental Health is final.
g. An Applicant or any Person interested in the variance may Appeal any decision of the Director of Environmental Health regarding the variance to the Appeal Board as provided for in Section B. below.

Applying for the variance does not guarantee the variance will be granted. Denial of the variance request does not grant the right of the Applicant to a refund of fees paid.

4. Reporting Requirements:

All variances from the adopted Ordinance and/or Manual must be reported on an annual basis to the RWQCB. The following information shall be collected and reported:

a. The number of granted variances
b. The address (es) of each location where the variance(s) were granted
c. A description of the Permits issued and type of variance allowed.

B. APPEAL PROCEDURE

1. General:

An Appeal is the administrative process that allows the Appeals Board to consider relief from any provision or requirement of this Manual, or a decision of a requested variance. An appeal may be filed by any person affected by the decision of the Director of Environmental Health or his/her designee. This includes affected parties other than the applicant. Every effort should be made to resolve the concern prior to the Appeal being filed. Therefore the Director of Environmental Health should be consulted when a customer notifies the department of the desire to file an Appeal.

2. Policy:

Any Person may request that the Director of Environmental Health review any decision made as to any standard contained in this Manual. The request should be made in writing within fourteen (14) days after the decision has been made.

Any Person dissatisfied with the decision of the Director of Environmental Health may Appeal the decision to the Board of Supervisors Appeal Board. The Appeal Board is the Board of Supervisors and the procedure for an Appeal is set forth in Section 2-2.1606 of the Yolo County Code of Ordinances related to Appeals.

SECTION 15: DEFINITIONS

Definitions are provided for terms used in this Manual. Some terms are defined in Yolo County Code (YCC). Where defined in YCC, a reference code number is provided with the definition. Terms defined below may be expanded beyond the definition found in YCC for clarification purposes.

Abandoned System: A septic System that will no longer be used to receive Effluent because the Dwelling has been connected to an approved sewer system or DEH has issued a notice or order to destroy the System under Permit.

Abandoned Well: A well whose original purpose and use has been permanently discontinued or which is in such a state of disrepair that it cannot be used for its original purpose. If an Abandoned Well has been properly destroyed so that it will not produce water nor act as a conduit for the movement of water, it will not be subject to well setback requirements.

Alternative System: A type of Wastewater disposal or System component(s) that utilizes either a method of Wastewater Treatment other than a standard Septic Tank and/or a method of Wastewater dispersal other than a standard Dispersal Field in native Soil. (Reference YCC Section 6-19.401)

Appeal: The administrative process that allows the Appeal Board to consider relief from any provision or requirement of the Yolo County Onsite Wastewater Treatment System Ordinance and Manual (Manual). (Reference YCC Section 6-19.402)

Appeal Board: The Appeal Board shall be the Yolo County Board of Supervisors. (Reference YCC Section 6-19.403)

Applicant: A property Owner or the property Owner's Authorized Representative. (Reference YCC Section 6-19.404)

Artificial Drain: Any Artificial Drainage feature or structure that intercepts and concentrates Groundwater or surface water. For example: driveways, roads, road ditches, agricultural drain tile, Cut banks, and Curtain Drains.

As-Built Drawing: A scaled drawing of features on the lot where the System is installed; identifying the location of the installed System and components in relation to structures on the property. The As-Built Drawing is completed after the System is installed or repaired. (Reference YCC Section 6-19.405)

Authorized Representative: Person or Persons authorized by the property Owner to act on the property Owner's behalf on matters pertaining to application for Permits and services, or holder of an easement sufficient to authorize the work on the land on which the System is to be installed, in order to represent the Owner's or easement holder's interests. (Reference YCC Section 6-19.406)

Bedrock: Unweathered solid rock that is impermeable or has less than 15% porosity. If present, fractures are tight, dry, and cemented.

Bedroom or Potential Sleeping Room: For purposes of System sizing, a Bedroom or Potential Sleeping Room shall mean a habitable room with a floor area equal or greater than 70 square feet with direct or indirect access to a bathroom and designed to provide privacy to the occupant(s), regardless of whether or not it contains a closet. Such rooms include, but are not limited to, rooms labeled on plans as bedrooms, lofts, sewing rooms, dens, offices and game rooms. Kitchens, bathrooms, laundry rooms, or rooms with large entryways lacking doors and designed such that the installation of a door would require a building permit may not be considered Bedrooms or Potential Sleeping Rooms. Additionally, rooms that are not considered Bedrooms or Potential Sleeping Rooms are rooms that open to a living room, dining room, family room, kitchen, foyer/entry way, or another room such as a master suite, and these rooms have an un-obstructive opening (no doors) with a minimum 50% opening of the total wall space (minimum 6' wide) with archways or other uncased doorways or acceptable features that do not provide privacy to the occupants. The final determination as to whether a room is a Bedroom or Potential Sleeping Room shall be at the discretion of the Director of Environmental Health. (Reference YCC Section 6-19.407)

Beneficial use: Those qualities of waters of the state that may be protected against quality degradation that include, but are not necessarily limited to, domestic, municipal, agricultural and industrial supply; power generation, recreation; esthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife and other aquatic resources or preserves. (Reference YCC Section 6-19.408)

Biological Oxygen Demand (BOD): The amount of dissolved oxygen needed by aerobic biological organisms in a body of water to break down organic material present in a given water sample at certain temperature over a specific time period.

Blackwater: See Wastewater

Building Permit: An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity. (Reference YCC Section 6-19.409)

Building Division: A local building agency of a city or county which has the jurisdiction to issue Building Permit to construct, alter, Repair or destroy structure.

Building Sewer: The part of the System or drainage piping which conveys sewage from a building to the Septic Tank or public sewer.

Cesspool: An excavation in the ground receiving Wastewater, designed to retain the organic matter and solids, while allowing the liquids to seep into the Soil. Cesspools differ from Seepage Pits because a Cesspool does not have a Septic Tank. (Reference YCC Section 6-19.410

Chemical Toilet Facility: See Portable Toilet

Clay: See Soil Texture

Cleanout: A fitting inserted into a piping system, with a removable plug whereby access to the pipe is obtained for the purpose of cleaning or unstopping.

Cluster System: An Onsite Wastewater Treatment System serving at least two (2) but not more than four (4) Dwellings or other buildings that are sources of Wastewater discharge on the same Lot and under the same ownership. (Reference YCC Section 6-19.411)

Color: See Soil Color.

Commercial Facility: Any structure or building, (excluding single-family residential units), or any portion thereof, intended for commercial or industrial use.

Community System: A System that accepts Wastewater discharges from two or more Lots or a System shared by Dwellings under separate ownership whether or not they are on the same Lot. A Community System is not a Public Sewer System. (Reference YCC Section 6-19.412)

Composting Toilet: A type of dry toilet that uses a predominantly aerobic processing system to treat human excreta, by composting or managed aerobic decomposition.

Conditions Associated with Saturation: The following are Conditions Associated with saturation:

a. Reddish brown or brown oxidized Soil Horizons with dull gray zones of redox depletions (chromas of 2 or less), and red or yellowish red zones of redox concentrations; or
b. Reduced, or iron-depleted Horizons of gray, blue, or olive colors (chromas of 2 or less) with dull red, yellowish red, or brown zones of redox concentrations; or
c. Organic Soils and dark-colored Soils very high in organic matter.[3]

Consistence: See Soil Consistence.

Contamination: Impairment to the quality of the waters of the State from Wastewater to a degree which creates a hazard to public health through toxicity or through the spread of disease. Contamination shall include any equivalent effect resulting from the disposal of Wastewater, whether or not waters of the state are affected. (Reference YCC Section 6-19.413)

Contractor: A Person who possesses an active license as a General Engineering Contractor (Class A), a General Building Contractor (Class B), a Sanitation System Contractor (Class C-42) or a Class C-36 Plumbing Contractor (Class C-36) license in accordance with the provisions of the California Business and Professions Code. Contractors shall be approved by DEH and shall possess knowledge, and skills of Systems siting, design using given design parameters, and installation. (Reference YCC Section 6-19.414)

[3] Kollmorgan Instruments Corporation, Munsell Soil Chart, 1990 and amendments

Cumulative Impacts: The persistent and/or increasing effect resulting from the density of System(s) discharges in relation to the assimilative capacity of the local environment. Examples include, but not limited to:

a. Nitrate, salt additions, or other indicator of human excreta to ground water or surface water; or
b. Rise in Groundwater levels that interfere with the performance of the System, causing drainage problems or results in other adverse hydrological or Soil conditions affecting public health, water quality or public safety; or
c. Coliform Contamination from animal and human waste in surface water, Groundwater, and drinking water wells. (Reference YCC Section 6-19.415)

Cut or Embankment: Any altered area of land surface having distinctly greater Slope than the adjacent natural ground surface, over 24 inches in vertical height, and any part of which is lower in elevation than the ground surface at the nearest point of the System. Cuts supported by retaining walls or similar structures shall be included in this definition as shall steep natural ground surfaces where a sharp break in the ground Slope is discernible.

Curtain Drain: An Artificial Drain installed up Slope from a disposal field to intercept and divert ground water.

Deep Trench Dispersal Field: A Dispersal Field with disposal trenches greater than thirty (36) inches deep.

DEH: See Division of Environmental Health. (Reference YCC Section 6-19.416)

Design Daily Sewage Flow: The quantity of daily sewage flow assigned to a building or structure. It may be referred as Design Flow.

Design Flow: See Design Daily Sewage Flow.

Director of Environmental Health: The Director of the Yolo County Division of Environmental Health and his/her designated employee(s). (Reference YCC Section 6-19.417)

Dispersal Field: The area occupied by the Dispersal System. It may also be referred to as leach field. (Reference YCC Section 6-19.418)

Dispersal System: A subsurface Wastewater distribution System and its components which conveys Wastewater from the Septic Tank, Pump Tank and or Supplemental Treatment Unit to the Soil for subsurface discharge and final Wastewater treatment. (Reference YCC Section 6-19.419)

Dispersal Trench: A ditch or trench with vertical sides and substantially flat bottom designed to receive Wastewater Effluent.

Distribution Box: A structure which receives Effluent and distributes it to the Dispersal Field.

Distribution Pipe or Lateral Pipe: A perforated pipe used in the dispersion of Effluent into disposal trenches.

Distribution Unit: A Distribution Box, crossover unit, Dosing Tank, Diversion Valve or box, Header Pipe, Effluent lift pump or other means of transmitting Effluent from the Effluent Sewer to the Distribution Pipes.

Diversion Valve: A device that receives Wastewater through one inlet and distribute it to two (2) or more outlets, only one of which is used at a given time.

Division of Environmental Health: The Yolo County Division of Environmental Health, the Director of Environmental Health, and designated employees. Also called DEH in this Manual. (Reference YCC Section 6-19.420)

Domestic Wastewater: Wastewater with a measured strength less than high-strength Wastewater and is the type of Wastewater normally discharged from, or similar to, that discharged from plumbing fixtures, appliances and other household devices including, but not limited to toilets, bathtubs, showers, laundry facilities, dishwashing facilities, and garbage disposals. Domestic Wastewater may include Wastewater from commercial buildings such as office buildings, retail stores, and some restaurants or from industrial facilities where the Domestic Wastewater is segregated from the Industrial Wastewater. Domestic Wastewater may include incidental RV Holding Tank dumping but does not include Wastewater consisting of a significant portion of RV Holding Tank Wastewater such as at RV dump stations. Domestic Wastewater does not include Wastewater from industrial processes. (Reference YCC Section 6-19.421)

Dosing Tank: A watertight receptacle constructed of approved materials designed to receive and store clarified Effluent and convey it to a secondary Treatment device or a Dispersal field under positive pressure. The Dosing Tank is equipped with a pump(s), Effluent screen, and level control and alarm floats.

Drain Rock: Clean, sound gravel or crushed rock ranging in size from 3/4 to I 1/2inch diameter, with <5% outside this range.

Drainage Swale: Any course of concentrated drainage water that has formed over time by either natural or man-made forces and where flow of water is either at or near ground surface. Drainage Swale may also be referred to as Swale.

Drainage Way: An unlined channel, with definite bed or banks, which conveys storm water runoff. This also includes facilities used for dispersal of roof runoff or other Site drainage, such as vegetated swales and infiltration/ percolation trenches or basins that contain water intermittently.

Dwelling: Any structure or building or any portion thereof which is used, intended, or designed to be occupied for human living purposes including, but not limited to, houses, houseboats, boathouses, mobile homes, travel trailers, hotels, motels, and apartments.

Effective Infiltrative Area: The surface area measured in square feet per one lineal foot of trench length that is allowed to be considered for receiving the Wastewater effluent dispersal in the Dispersal Field.

Effective Soil: Permeable, unsaturated Soil providing sufficient aeration and retention for optimal filtration Treatment of Sewage Effluent. Effective Soil excludes Soil layers that meet the criteria for

"Soil with rapid Permeability", "Conditions Associated with Saturation", and "Limiting Layers". (Reference YCC Section 6-19.422)

Effective Soil Depth: The depth of Soil material from ground surface that effectively provides filtration of Effluent.

Effluent: Sewage, water, or other liquid, partially or completely treated or in its natural state, flowing out of a Septic Tank, aerobic Treatment unit, Dispersal System, or other System component. (Reference YCC Section 6-19.423)

Effluent Lift Pump: A pump used to lift Effluent to a higher elevation.

Effluent Sewer: That part of the system of drainage piping that conveys sewage Effluent from a Septic Tank or other Treatment facility into a Distribution Unit or a disposal area.

Ephemeral Stream (Intermittent Stream or Seasonal Stream): A natural stream that does not flow continuously throughout the year, but that has a well-defined channel of stream gravel or Bedrock control.

Evapotranspiration System: A type of System using a method of dispersing Effluent through evaporation (the change of liquid into vapor that passes into the atmosphere) or transpiration (the passage of water through a plant from the Roots through the vascular system to the atmosphere). It is typical constructed as an evapotranspiration pond or bed.

Existing Lot: A Lot or parcel legally created prior to the effective date of this Manual.

Existing System: Any installed System constructed in conformance with the rules, laws and local ordinances in effect at the time of construction.

Expansion: The increase in the size of the Dispersal Field, usually as a result of a planned or potential increase in the estimated Wastewater flow to the Dispersal Field. (Reference YCC Section 6-19.424)

Expansive Clay Soil: Mineral Soil that swells and shears when wet, and shrinks and develops cracks when dry, forming slickened sides and wedge-shaped structures. Expansive Clay Soil is very hard or extremely hard when dry, very firm when moist, and very sticky and very plastic when wet. When wet, Expansive Clay Soil is massive and cracks and structure are not evident.

Failing System: Any System that is at least one of the following:

a. Is currently or intermittently discharging untreated or inadequately treated Wastewater Effluent directly or indirectly onto the ground surface, into a Dwelling or other structure, or into surface or Groundwater; or
b. Has a Substandard Tank or Septic Tank failure, such as a baffle failure or tank structural integrity failure such that either Wastewater is exfiltration or Groundwater is infiltrating; or
c. Has a component failure, such as a broken Distribution Box or broken piping connection; or
d. The Dispersal Field is not receiving Effluent, such that Wastewater is backing up into the plumbing fixtures, or the Septic Tank must be pumped frequently to dispose of the Wastewater flow; or

e. System installed or repaired without required Permits; or
f. Is not operated in compliance with Permit conditions or requirements for operation, monitoring and maintenance as specified in this Manual; or
g. Has been retrofitted with unapproved components or been modified from the original approved design without approval from DEH; or
h. Does not meet Effluent quality standards as specified in the approved System design. (Reference YCC Section 6-19.425)

Final Approval: The document, issued by DEH that certifies the System was installed in compliance with Chapter 19 of the Yolo County Code of Ordinances, this Manual and all Permit conditions have been met, including issuance of an Operating Permit. (Reference YCC Section 6-19.426)

Flow Equalization: The process of mitigating changes in flow rate through a portion of a System by providing storage to hold water when it is arriving too rapidly, and to supply additional water when it is arriving less rapidly than desired.

Fractured Bedrock: Moderately to slightly weathered Bedrock that usually is hard and fractured, but not impermeable to water.

Geotechnical Report: A written document prepared by a California Registered Geotechnical Engineer and used to communicate Soil and geologic site conditions, interpretations, analysis and recommendations pertinent to the design, installation and operation of a System in or near areas of steeply sloping terrain, flood control levees, or Unstable Land Masses. (Reference YCC Section 6-19.427)

Graywater: Pursuant to Health and Safety Code Section 17922.12, Graywater means untreated wastewater that has not been contaminated by any toilet discharge, and has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. Graywater includes but is not limited to wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs. Graywater includes “dark graywater,” which means Wastewater from kitchen sinks or dishwashers. (Reference YCC Section 6-19.428)

Graywater System: A Graywater System that is designed to collect graywater and transport it out of the structure for distribution in an Irrigation Field. A Graywater System may include tanks, valves, filter, pumps, or other appurtenances along with piping and receiving landscape. (Reference YCC Section 6-19.429)

Groundwater: Water below the ground surface that is at or above atmospheric pressure. (Reference YCC Section 6-19.430). For purposes of this Manual, Groundwater may also refer to evidence of the high seasonal groundwater as determined through a Site Evaluation.

Groundwater Mounding: A rise in the Water Table which may occur beneath or down-gradient of System as a result of the concentrated or high volume of hydraulic loading from one or more Systems in a limited area.

Hardpan: An irreversibly hardened layer caused by the cementation of Soil particles. The cementing agent may be silica, calcium carbonate, iron, or organic matter.

Header Pipe: The tight jointed part of the sewage drainage conduit which receives Septic Tank Effluent from the Distribution Box, crossover unit or Effluent Sewer and conveys it to and within the disposal area.

High Strength Wastewater: Wastewater has a 30-day average concentration of Biochemical Oxygen Demand (BOD) greater than 300 milligrams-per-liter (mg/L) or of total solid suspended solids (TSS) greater than 330 mg/L or of fats, oil, and grease (FOG) greater than 100 mg/L prior to the Septic Tank or other System Treatment component.(Reference YCC Section 6-19.431)

High Seasonal Groundwater: The highest level of saturation in the soil in a year with normal rainfall.

Holding Tank: A watertight receptacle designed to receive and store sewage to facilitate disposal at another location. A Holding Tank is a Non-Discharging Wastewater Disposal Unit. (Reference YCC Section 6-19.432)

Horizon: See Soil Horizon

Hydrometer: An instrument for measuring the density of liquid.

Impermeable Soil: Soil that has a Percolation Rate slower than 120 mpi.

Incineration Toilet: A type of dry toilet that burns human feces instead of flushing them away with water.

Individual System: A System that is not a Cluster or Community System and serves only one Dwelling or building on one Lot or parcel.

Industrial Wastewater: Any Wastewater generated from any manufacturing, processing institution, commercial, or agricultural operation, or any operation that discharges other than Domestic Wastewater. (Reference YCC Section 6-19.433)

Installation Permit: A document issued by DEH that conveys approval of and sets forth applicable conditions for construction, the installation, replacement, enlargement, repair, modification or abandonment, or modification of a System, or of System components. The Installation Permit may also be referred to as the construction permit. (Reference YCC Section 6-19.434)

Installer: A Person meeting the definition of Contractor, as defined herein, or where approved by DEH, the System Owner as provided in YCC Section 6-19.603.

Invert: The lowest portion of the internal cross section of a pipe or fitting.

Land Use Project: A development project requiring a land use entitlement, including, but not limited to, tentative maps, use permits, variances, site plan review, and lot line adjustments, which is implemented through the County of Yolo or City within Yolo County. Land Use Projects requiring

conditions from this Chapter and the Manual shall be regulated by the Director of Environmental Health. Other County City requirements have separate processes and requirements. (Reference YCC Section 6-19.435)

Large System: A Large System is a System with a Design Flow greater than 1,500 gallons per day. (Reference YCC Section 6-19.436)

Leach Pit: See Seepage Pit.

Limiting Layer: A layer that inhibits the movement of water, air, or the growth of plant Roots. Includes hardpan, claypan, fragipan, bedrock, and expansive clay soil

Lot: A legally recognized and defined piece of land that can be sold individually, as described on an instrument or map recorded or filed with the County Recorder. A Lot may also be referred to as parcel. Public road easements on Lots should be excluded from the Lot for the purpose of locating a System. (Reference YCC Section 6-19.437)

Major Repair: Major Repair includes replacement of or addition to the Dispersal Field, Treatment unit, or any part thereof.

Manual: See Onsite Wastewater Treatment System Manual. (Reference Section 6-19.438)

Minor Repair: Minor Repair includes replacement of the Septic Tank, replacement of a broken pipe, Distribution Unit, or any part of the System external to the Septic Tank or Treatment facility, except the Wastewater Dispersal System. Unless classified as a Major Repair or major maintenance, any replacement of a part of a System with a part that meets the original design specifications is a Minor Repair.

Modification: As in System Modification, Modification includes the increase to the projected or actual Wastewater flow, including addition(s) of Bedroom(s) or Potential Sleeping Rooms, increases in restaurant seating capacity or changes to a business use or occupancy

Monitoring Port: Any artificial excavation by any method for the purpose of monitoring fluctuations in ground water levels, quality of underground water, or the concentration of contaminants in underground water.

Mound System: An above-ground system that consists of a Pressure Distribution network that evenly distributes sewage Effluent to a "mounded" bed of filter material over sand media.

Nitrogen Loading: The total amount of nitrogen entering the Groundwater during a given time.

Non-Discharging Wastewater Disposal Unit: A self-contained, watertight container designed to hold Wastewater until it is pumped and/or cleaned. A Non-Discharging Wastewater Disposal Unit includes but is not limited to a Holding Tank, Vault Privy, Portable Toilet, and Waterless Toilet. (Reference YCC Section 6-19.440)

Non-Expansive Clay: Clay Soil that does not demonstrate expansion when wetted. Properties of Plasticity, cohesion, shrinkage, and swelling are negligible.

Occupant: Any Person living, or sleeping in a Dwelling or Person using or occupying a structure served by a System.

Onsite Wastewater Treatment System (System): A Wastewater disposal facility that includes tanks, piping, Treatment devices or other facilities that convey, store, treat or dispose of Wastewater located on the property where it originates or an adjacent or nearby property under the control of the user which is not connected to a Public Sewer System. This definition includes the designated Replacement Area necessary for System Repairs. Onsite Wastewater Treatment System does not include Graywater Systems pursuant to Health and Safety Code Section 17922.12, and also does not include Public Sewer System(s) or Non-Discharging Wastewater Disposal Unit(s). An Onsite Wastewater Treatment System may be referred to as System in this Manual. It may also be referred to as a Septic System, Wastewater System or OWTS in references, supporting documents and Manuals. (Reference YCC Section 6-19.441)

Onsite Wastewater Treatment System Manual (Manual): The document developed, maintained, and amended by DEH, containing policy, procedural and technical details for implementation of Chapter 19 of the Yolo County Code of Ordinances, as prescribed by the Director of Environmental Health, as approved by the Central Valley Regional Water Quality Control Board and adopted by resolution of the Board of Supervisors of Yolo County. It is referred to as this Manual. (Reference YCC Section 6-19.442)

Onsite Wastewater Treatment System Policy (OWTS Policy): The Water Quality Control Policy for Siting, Design, Operation and Maintenance of Onsite Wastewater Treatment Systems (OWTS Policy), adopted by the State Water Resources Control Board, took effective on May 13, 2013. The OWTS Policy establishes a statewide, risk-based, tiered approach for regulation and management of System installations and replacements. The purpose of the Policy is to allow the continued use of Systems while protecting water quality and public health. (Reference YCC Section 6-19.443)

Operating Permit: The administrative document issued by DEH that authorizes the initial and/or continued use of an Alternative System in conformance with the provisions of the Ordinance and Manual, intended to aid in verification of the adequacy of the System performance and that may contain both general and specific conditions of use. An Operating Permit may also be required for circumstances other than an Alternative System as provided in this Manual or where, in the opinion of the Director of Environmental Health, the type, size, location, strength of Effluent or other details of a particular System and/or Wastewater activity warrant the additional level of oversight provided by an Operating Permit. (Reference YCC Section 6-19.444)

Operation, Maintenance and Monitoring (OM&M) Program: A program that encourages or requires regular inspections, monitoring, and/or service to Systems, Non-Discharging Wastewater Disposal Units, and Graywater Systems as delineated in the Manual to ensure long-term performance, and Groundwater and public health protection. (Reference YCC Section 6-19.445)

Owner: Any Person who alone, or with others:

a. Has legal title to any single Lot, Dwelling, Dwelling unit, or Commercial Facility, or an easement, sufficiently to allow installation and maintenance of the System; or
b. Has care, charge, or control of any real property as Applicant, executor, executrix, administrator, trustee or guardian of the estate of the holder of legal title. (Reference YCC Section 6-19.446)

Parallel Distribution: The distribution of effluent to the Dispersal Field by gravity flow, loading all sections of the Dispersal Field equally at the same time.

Parcel: See Lot.

Percolation Test: A measurement of the ability of the Soil to absorb liquid. The test is conducted with clean water and test results can be used to establish the Dispersal System design. Percolation Tests shall be conducted as provided in this Manual or as specified by DEH. (Reference YCC Section 6-19.447)

Perennial Stream: A natural stream where water is present nine (9) months or more of the year, including all irrigation ditches and other public water conveyances.

Permit: See Installation Permit or Operating Permit.

Person: Any individual, firm, association, organization, partnership, corporation, business trust, company, state agency or department, or unit of local government who is, or that is, subject to the requirements of Chapter 19 of the Yolo County Code of Ordinances, this Manual and all the Permit conditions. (Reference YCC Section 6-19.448)

Plasticity: See Soil Consistence.

Plot Plan: A scaled map of the Lot and relevant features on surrounding Lots that detail the features of the Site according to the requirements of this Manual to aid the Site Evaluation.

Pollution: The undesirable change in the physical, chemical, or biological characteristics of air, land, and water that may or will harmfully affect human life or that of other desirable species, industrial processes, living conditions, and cultural assets; or that may or will waste or deteriorate raw material resources.

Pores: See Soil Pores.

Portable Toilet: Any self-contained Chemical Toilet Facility that is housed within a Portable Toilet Shelter. The Portable Toilet has no direct water connection and is a Non-Discharging Wastewater Disposal Unit. (Reference YCC Section 6-19.449)

Portable Toilet Shelter: Any easily moved structure built to house a Portable Toilet.

Pressure Distribution: A method of Effluent distribution designed to distribute Wastewater equally and evenly throughout the Dispersal Field by placing the liquid Effluent under pressure in the pipe. It may be referred as Pressure Dosing.

Pressure Distribution Lateral: Piping and fittings in Pressure Distribution systems which distribute Effluent to filter material through small diameter orifices.

Pressure Distribution Manifold: Piping and fittings in a Pressure Distribution System which supply Effluent from Pressure Transport Piping to Pressure Distribution Laterals.

Pressure Distribution System: Any System designed to uniformly distribute Effluent under pressure in a disposal area.

Pressure Dosing: See Pressure Distribution.

Pressure Transport Piping: Piping which conveys Effluent to a Pressure Distribution Manifold.

Public Entity: A local agency, as defined in the State of California Government Code Section 53090 et. seq., which is empowered to plan, design, finance, construct, operate, maintain, and to abandon, if necessary, any sewerage system or the Expansion of any sewerage system and sewage Treatment facilities serving a land development.

Public Health Hazard: A condition created by a discharge of biological, chemical, physical, and/or radiological agents which are likely to cause human illness, disorders or disability.

Public Nuisance: "Public Nuisance" shall include but not be limited to, anything which:

a. Is injurious to public health or is indecent or offensive to the senses or any obstruction to the free use of property so as to interfere with the comfortable enjoyment of life or property; and
b. Affects at the same time an entire community or neighborhood or any considerable number of Persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; and
c. Is an attractive nuisance which may prove detrimental to children or others, whether in a building, on the premises of a building, or upon an unoccupied Lot. This includes any Abandoned Wells or shafts, Failing System, Abandoned System, Cesspool, seepage Pit, System installed without an Installation Permit; and
d. Is dangerous to human life or is detrimental to health, as determined by the Director of Environmental Health; and
e. Inadequate or unsanitary or unapproved sewage or plumbing facilities. (Reference YCC Section 6-19.450)

Public Sewer System: Any sewer system constructed, installed, maintained, operated and owned by or for a municipality or Public Entity established for sewage dispersal purposes. (Reference YCC Section 6-19.451)

Public Water System: A system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals, as defined in Part 12, Chapter 4, Section 116275 of the California Health and Safety Code. (Reference YCC Section 6-19.452)

Pump Tank: A sewage tank or separate compartment within a sewage tank, which receives Septic Tank Effluent that serves as a reservoir for a pump.

Qualified System Designer: A person who possesses knowledge, skills and experience in System design and who is qualified to perform civil engineering in accordance with Section 6731 of the Business and Professions Code; or who is licensed as a California Registered Environmental Health Specialist. Notwithstanding Section 6731 of the Business and Professions Code, a California Registered Geologist that has experience designing Systems in Yolo County prior to the effective date of this Ordinance may continue to design Systems with the approval of the Director of Environmental Health, provided however the California Registered Geologist bases the System design on specifications found in this Manual and engineering design specifications provided by manufacturers of System components. (Reference YCC Section 6-19.453)

Qualified Professional: An individual licensed or certified by the State of California and who has been approved by DEH to perform Site Evaluations and to practice as an expert as allowed under their license or registration and as demonstrated by their possession of knowledge, and skills of soils; and Systems siting, design and installation. Depending on the work to be performed and various licensing and registration requirements within the provisions of the California Business and Professions code, this shall include an individual with one or more of the following credentials:

a. California Certified Engineering Geologist
b. California Registered Professional Engineer
c. California Registered Environmental Health Specialist
d. California Registered Geologist

For the purpose of performing site evaluations, Soil Scientists certified by the Soil Science Society of America are considered as Qualified Professionals. (Reference YCC Section 6-19.454)

Redoximorphic Features: features formed by the processes of reduction, translocation, and oxidation of Iron and Manganese oxides in seasonally saturated Soils. Redoximorphic Features are described in Soil Horizons by various types of redox concentrations, redox depletions, and reduced matrices.

Regional Water Quality Control Board: The California Regional Water Quality Control Boards (RWQCB) designated by Water Code Section 13200, which have authority for adopting, implementing and enforcing water quality control plans (also called basin plans) which set forth the State's water quality standards and the objectives or criteria necessary to protect those Beneficial Uses. The Central Valley RWQCB has jurisdiction over Yolo County. (Reference YCC Section 6-19.455)

Repair (System Repair): Installation, replacement and/or connection of the portion(s) of a System necessary to eliminate a Public Health Hazard or Pollution of public waters created by a Failing System.

Replacement Area: An area of land dedicated for replacement of an entire System upon its failure. (Reference YCC Section 6-19.456)

Restrictive Layer: See Limiting Layer

Rock Fragment: See Soil Rock Fragment.

Roots: See Soil Roots.

Sand Filter System: A System combining a Septic Tank or other Treatment unit, Dosing System with Effluent pump(s) and controls, piping and fittings, sand filter and disposal area. Types of Sand Filter Systems includes, but not limited to the following:

a. Intermittent sand filter bed system
b. Recirculated sand filter bed system
c. Raised sand filter bed system

Scum: A mass of organic or inorganic materials floating on the surface of sewage.

Seepage Pit: A drilled or dug excavation, three to six feet in diameter, and typically fifteen (15) to thirty-five (35) feet in depth either lined or gravel filled, that receives the Effluent discharge from a Septic Tank or other system Treatment unit for disposal of Effluent. (Reference YCC Section 6-19.457)

Serial Distribution: The distribution of effluent to the Dispersal Field by gravity flow that progressively loads one section of the Dispersal Field to a predetermined level before overflowing to the succeeding section(s) and does not place a dynamic head on the lower section of the soil dispersal system.

Septage: Materials accumulated in Septic Tanks, Cesspools, Vault Privies, Portable Toilets, Holding Tanks, or any other sewage holding apparatus that receives wastewater from plumbing fixtures. Septage does not include sewage sludge from Public Sewer Systems. (Reference YCC Section 6-19.458)

Septage Hauler: See Septage Pumper

Septage Pumper: A Person with an active approved Septage Pumper Permit issued by the Director of Environmental Health pursuant to California Health and Safety Code Section 117400 et seq., who is qualified to pump and haul waste from Septic Tanks, Chemical Toilets, Cesspools, Seepage Pits, Chemical Toilets, or other sewage containments. (Reference YCC Section 6-19.459)

Septic Tank: A watertight receptacle which receives sewage from a building or structure, that functions to separate solids from liquids, retains and digests organic matter and discharges the resulting Effluent to a second Treatment unit or to a Soil disposal area. (Reference YCC Section 6-19.460)

Service Provider: An individual approved by DEH to perform or conduct oversight of inspections, maintenance and monitoring of Systems operating under the Operation, Monitoring and Maintenance (OM & M) Program. Service Providers shall be approved by DEH and possess knowledge, and skills of Systems and possess one or more of the credentials required of a Qualified Professional, or Contractor as defined in this Manual. In addition, demonstration of proper training from equipment manufacturers/distributors and/or certification from an appropriate professional organization may be required. (Reference YCC Section 6-19.461)

Site (Building Site): An area of a Lot designated for a specific purpose including an approved Usable Area for sewage disposal, building, etc.

Site Assessment: A preliminary review of the physical surface features of the Site that may limit the available dispersal area for the proposed System; and/or limit the available area for proposed work associated with a Building Permit that may interfere with an existing or proposed System.

Site Evaluation: An assessment of the characteristics of a lot sufficient to determine its suitability for the installation and sustainability of a System meeting the requirements of Chapter 19 of the Yolo County Code of Ordinances and this Manual. The Site Evaluation shall be in accordance with procedure and criteria contained in this Manual. The Site Evaluation shall take into consideration the public and environmental health aspects relating to the installation and operation of a System including but not limited to soil texture, soil percolation rate (if a Percolation Test is performed), depth to groundwater, distance from natural land features and structures, site topography, and Usable Space for the installation and repair of the System. (Reference YCC Section 6-19.462)

Site Evaluation Report: A report prepared by a Qualified Professional that includes all information obtained from a Site Evaluation as required in this Manual. The report will be used by DEH to ensure that a parcel is capable of sustaining a System compliant with Chapter 19 of the Yolo County Code of Ordinances and this Manual. (Reference YCC Section 6-19.463)

Single Family Residences: A Dwelling designed for and commonly occupied exclusively by one family.

Slope: The rise or fall in feet per one hundred (100) feet of horizontal distance. Slope is expressed as a percent of grade. For example: a land surface at a 45 degree angle has a Slope of 100%. (Reference YCC Section 6-19.465)

Soil: The naturally occurring body of porous mineral and organic materials on the land surface, which is composed of unconsolidated materials, including sand-sized, silt-sized, and Clay-sized particles mixed with varying amounts of larger fragments and organic material. The various combinations of particles differentiate specific Soil Textures identified in the Soil Textural triangle developed by the United States Department of Agricultural (USDA). For the purposes of this Manual, Soil shall contain earthen material of particles small than 0.08 inches (2 mm) in size. (Reference YCC Section 6-19.466)

Soil Color: Color of moist Soil in terms of hue, value, and chroma based on Munsell soil color system. It may be referred as Color.

Soil Consistence: The attributes of the Soil materials as expressed in its degree of cohesion and adhesion or in its resistance to deformation or rupture. Terms used in describing Consistence are: wet Soil-non sticky, slightly sticky, sticky, and very sticky; Plasticity-non-plastic, slightly plastic, plastic, and very plastic; moist Soil-loose, very friable, firm, very firm, and extremely firm; dry Soil-loose, soft, slightly hard, hard, very hard, and extremely hard; cementation-weakly cemented, cemented, strongly cemented, and indurate. It may be referred as Consistence.

Soil Description: A notation of Soil properties during the Soil Profile Study including Slope, rock fracturing, Effective Soil Depth, and depth to Groundwater, if observed; and, for each Horizon

observed, a notation of depth, texture, Rock Fragment content, Color, Redoximorphic Features, structure, Pores, Clay films, Consistence, Plasticity, Stickiness, Roots, Horizon boundary, and moisture content.

Soil Horizon: A layer of Soil that is distinguishable from adjacent layers by characteristic physical properties such as structure, Color, or texture, or by chemical composition, including content of organic matter or degree of acidity or alkalinity. It may be referred as Horizon.

Soil Horizon Boundary: The topography and distinctness of the change between two Soil Horizons. In Soil Descriptions, the Soil Horizon Boundary is noted as smooth, wavy, irregular or broken. Distinctness of the changes between Horizons is noted as abrupt, clear, gradual, or diffuse.

Soil Moisture: The moisture content of the Soil at the time the Soil Description was made. Described as dry, damp, moist, saturated, or seepage.

Soil Mottling: Soils irregularly marked with spots that vary in Color, number and size.

Soil Pores: Generally tubular voids o the Soil material formed by Roots, animals, and other agents. In Soil Descriptions Pores are noted as few, common, or many in quantity, and as fine, medium or coarse in size. It may be referred as Pores.

Soil Profile Study: An evaluation of the Soil Horizons in an area proposed for Wastewater disposal and for the Replacement Area to ascertain its ability for that purpose. Characteristics of Soil examined in a Soil Profile may include Soil Structure, Soil Texture, Color, impervious layers, or evidence of Groundwater as determined by direct observation or presence of Soil mottles.

Soil Rock Fragment: Rock and mineral particles in the Soil greater than 2.0 mm in diameter. Includes gravel, cobbles, and stones. In Soil Descriptions noted as percent by volume. It may be referred as Rock Fragment.

Soil Roots: The abundance and size of Roots in a Soil Horizon. In Soil Descriptions abundance is noted as none, few, common, or many. Where present, Root size is noted as very fine, fine, medium, or coarse. It may be referred as Roots.

Soil Separate: The groups of mineral particles separated on the basis of range of size. The principal separates are sand, silt, and Clay.

Soil Stickiness: See Soil Consistence. It may be referred as Stickiness.

Soil Structure: The combination or aggregation of primary Soil particles into aggregates or clusters (peds), which are separated from adjoining peds by surface of weakness. Soil Structure is classified on the basis of size, shape, and distinctness into classes, types, and grades.

Soil Test Pit: An Excavation dug for the purposes of the Soil Profile Study of sufficient size and depth to allow thorough examination of the Soil to evaluate its suitability for sewage disposal.

Soil Texture: The relative proportion of Soil Separates in a Soil as described by the twelve (12) classes of Soil Texture as defined by the United States Department of Agriculture. (Reference YCC Section 6-19.467) The major textural classifications are defined as follows:

a. Sand: Soil material that contains 85% or more of sand; percentage of silt, plus 1.5 times the percentage of Clay shall not exceed 15.
b. Loamy Sand: Soil material that contains at the upper limit 85% to 900~? sand, and the percentage of silt plus 1.5 times the percentage of Clay in not less than 15; at the lower limit it contains not less than 70% to 85 % sand, and the percentage of silt plus twice the percentage of Clay does not exceed 30%.
c. Sandy Loam: Soil material that contains either 20% Clay or less, and the percentage of silt plus twice the percentage of Clay exceeds 30%, and 52% or more sand; or, less that 7% Clay, less than 50% silt and between 43% and 52% sand.
d. Loam: Soil material that contains 7% to 27% Clay, 28% to 50% silt, and less than 52% sand.
e. Silt Loam: Soil material that contains either at least 50% silt and 12% to 27% Clay; or 50% to 80% silt and less than 12% Clay.
f. Silt: Soil material that contains 80% or more silt and less than 12% Clay.
g. Sandy Clay Loam: Soil Material that contains 20% to 35% Clay, less than 28% silt, and 45% or more sand.
h. Clay Loam: Soil material that contains 27% to 40% Clay and 20% to 45% sand.
i. Silty Clay Loam: Soil material that contains 27% to 40% Clay and less than 20% sand.
j. Sandy Clay: Soil material that contains 35% or more Clay and 45% or more sand.
k. Silty Clay: Soil material that contains 40% or more Clay and 40% or more silt.
l. Clay: Soil material that contains 40% or more Clay, less than 45% sand, and less than 40% silt.

Soil With Rapid Permeability: Soil with the following properties.

a. Percolation Rates of five (5) minutes per inch or faster, or
b. Soil Texture classes of sand or loamy sand as defined in the Soil Texture, or
c. Soils containing more than 50% coarse fragments greater than 2 mm. in diameter.

Stickiness: See Soil Stickiness.

Swale: See Drainage Swale.

Standard System: A System comprised of a Septic Tank and a gravity-fed Dispersal System which includes Trenches installed in approved undisturbed native Soil. Effluent will flow to the trenches by gravity, or may be pumped to the first distribution box of the Dispersal Field. (Reference YCC Section 6-19.468)

Subdivision: Subdivision as defined by the Subdivision Map Act of the State (Government Code Section 66410 et seq). (Reference YCC Section 6-19.469)

Substandard Tank: Any tank constructed of wood or brick, or any tank which is deteriorated to an extent that it cannot effectively hold and or treat Wastewater, or because of its condition poses a threat to health or safety. (Reference YCC Section 6-19.470)

Supplemental Treatment: A Supplemental Unit or engineered System used to perform additional Wastewater Treatment functions, beyond that provided by a Standard System, and capable of reliably producing Wastewater Effluent of secondary quality or better, prior to discharge to the Dispersal System. Secondary quality is defined as Effluent meeting 30-day average concentration limits of 30 mg/L for biochemical oxygen demand and 30 mg/L for Total Suspended Solids. If the Supplemental Treatment is for the purpose of nitrogen reduction, the quality is defined as meeting a 50 percent reduction in total nitrogen when comparing the 30-day average influent to the 30-day average Effluent. (Reference YCC Section 6-19.471)

Supplemental Treatment Unit: Alternative System listed by National Sanitation Foundation (NSF) and certified by NSF as meeting NSF Standard 40 or NSF Standard 245 or equivalent, and is designed to provide enhanced Treatment over that which would be provided by a Standard System, and that produces Effluent meeting a predetermined performance requirement as specified in this Manual, prior to dispersal into the Dispersal Field. An independent third party testing and listing agency which provides equivalent services as compared to NSF for testing and continuous quality control and consumer complaint response may be used in lieu of NSF upon the approval of the Director of Environmental Health. (Reference YCC Section 6-19.472)

System: See Onsite Wastewater Treatment Systems. (Reference YCC Section 6-19.473

System Design: A System installation/construction plan prepared by a Qualified System Designer, Qualified Professional or Contractor based on the Site Evaluation Report. (Reference YCC Section 6-19.474)

Test Pit: See Soil Test Pit

Texture: See Soil Texture.

Total Suspended Solids (TSS): Solids in water that can be trapped by a filter. TSS can include a wide variety of material, such as silt, decaying plant and animal matter, industrial wastes, and sewage.

Treatment: Any process or action that accomplishes a measureable reduction in wastewater strength or separation of liquid from solids, such as the reduction of solids or organics, dewatering, coagulation, settling, filtration or aeration.

Unstable Land Mass: Land prone to subsidence, erosion, or mass land movement as indicated by historical landslide events, published maps or reports, or evidence of characteristics such as surface rupture, scarps, creep or other irregularities in ground Slope conditions. (Reference YCC Section 6-19.475)

Usable Space: A dedicated area of land on a Lot capable of sustaining the installation and operation of a System compliant with this Manual.

Use Permit: A discretionary entitlement granted by the local Planning Division or Planning Department allowing use of a property for a specific purpose.

Vault Privy: A Vault Privy is a structure used for disposal of human waste without the aid of water. It consists of a shelter built above a subsurface vault into which human waste falls. The Vault Privy has no water connection. A Vault Privy is a Non-Discharging Wastewater Disposal Unit. (Reference YCC Section 6-19.476)

Vertical Separation: The depth of Effective Soil for Effluent filtration that exists between the bottom of a Dispersal Field and the restrictive or Limiting Layer, Groundwater or other feature including, but not limited to:

(a) Permanent or seasonal Groundwater level; or
(b) Consolidated Soil with insufficient permeability or porosity to provide Wastewater Treatment; or
(c) Fractured rock with excessive permeability that would not provide effective Wastewater Treatment; or
(d) Soils determined to be limiting as defined in this Manual. (Reference YCC Section 6-19.477)

Wastewater: Wastewater includes "Blackwater" or "Graywater"

(a) Blackwater means Wastewater contaminated with human or kitchen wastes, generally originating from toilets and kitchen sinks. It includes, but is not limited to, Wastewater discharges from kitchen sinks, garbage grinders, water closets, toilets, urinals or similar fixtures alone or in combination with other Wastewater.
(b) Pursuant to Health and Safety Code Section 17922.12, Graywater means untreated wastewater that has not been contaminated by any toilet discharge, and has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. Graywater includes but is not limited to wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs. Graywater includes "dark graywater," which means Wastewater from kitchen sinks or dishwashers. (Reference YCC Section 6-19.478)

Watercourse: A definite channel with bed and banks within which water flows perennially, including overflow channels contiguous to the main channel. A Watercourse may be either a natural or man-made channel. For purposes of this Manual, Watercourse also includes water bodies such as ponds, lakes, marshes, seasonal wetlands and tidal waters. For purposes of this definition, perennially means more than nine months of the year. (Reference YCC Section 6-19.479)

Waterless Toilet: A composting toilet, incinerating toilet or similar device for the holding and processing of Wastewater from a toilet. A Waterless Toilet is a Non-Discharging Wastewater Disposal Unit. (Reference YCC Section 6-19.480)

Water Table: That level of Groundwater where the hydraulic pressure is zero.

Wet Weather: Wet Weather conditions are defined as when seventy-five (75) percent of the average annual rainfall has occurred for the elevation where the property is being tested.

SECTION 16: APPENDICES

1. Main Steps of Building a New Septic System for a New House

2. Typical Siting Consideration for Onsite Wastewater Treatment Systems

3. Typical Dispersal Trench

4. Intermittent Sand Filter, Plan View

5. Intermittent Sand Filter, with Internal Pump Basin

6. Recirculating Sand Filter

7. Raised Sand Filter Bed

8. Shallow Pressure Distribution System Schematic

9. Shallow Pressure Distribution System

10. Drip Dispersal Details

11. Drip Dispersal System Schematic

12. Diagram of a Mound System

13. Mound System Schematic, Level Site

14. Mound System Cross-Section, Level Site

15. Mound System, Sloping Site

16. Mound System Cross-Section, Sloping Site

17. Sample of a Typical Site Plan

18. Onsite Wastewater Site Evaluation Request for Development

19. Onsite Wastewater Site Evaluation Report for Development

20. Soil Percolation Test Recorded Measurements

21. System Design Form for Standard Gravity System

22. Pressure Distribution or Supplemental Treatment System, System Design

23. Septic System Installation Permit Application

24. Septic System Operating Permit

25. Contractor's As-Built Report

26. Onsite Wastewater Treatment System, Access, Inspection, and Permitting Notification

27. Application for Variance

28. Septic Pumper Truck Spill Kit Requirements