TOWN OF PARADISE
ONSITE WASTEWATER MANAGEMENT ZONE

MANUAL FOR THE ONSITE TREATMENT OF WASTEWATER

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History

Manual for the Onsite Treatment of Wastewater History

INTRODUCTION

STATEMENT OF PURPOSE

This manual was developed for the following reasons:

- To protect the public health and the ground and surface water quality within the Town of Paradise and neighboring areas of Butte County.

- To facilitate an orderly development of wastewater management within the Town of Paradise Onsite Wastewater Management Zone.

- To provide technical guidance for siting, design, construction and inspection of onsite wastewater treatment and disposal systems. Approved procedures, design, and siting criteria, materials, methods, administrative policies, and enabling legislation are described in detail.

SCOPE

The technical issues of safe onsite wastewater treatment and disposal are addressed in this manual. Land planning and zoning issues such as development density are not considered. The manual is based on the soil and site conditions required to treat wastewater from residential dwellings and commercial facilities. Commercial facilities include restaurants, laundromats, hospitals and shopping centers. The onsite disposal of industrial wastewater is not considered in this manual.

Discharge of raw wastewater or untreated septic tank effluent directly or indirectly onto the ground surface or into public waters is prohibited. An approved wastewater disposal system is required for all dwellings. All wastewater shall be treated and disposed of in a manner approved by the Onsite Sanitary Official. No person will dispose of wastewater or septage (septic tank pumpings) in any location not authorized by the Onsite Sanitary Official, and all plumbing fixtures in dwellings and commercial facilities from which wastewater is, or may be discharged, shall be connected to an approved disposal system. If, in the judgment of the Town, proposed operation of a system would cause pollution of public waters or create a public health hazard, system installation or use shall not be authorized.

The Town of Paradise will be responsible for the management of all onsite systems within the boundaries of the Town of Paradise Onsite Wastewater Management Zone. Waste dis-charge permits will be placed under the Town's jurisdiction.

Each septic system will have an adequate capacity to treat and dispose properly of the maximum projected daily wastewater flow. The quantity of wastewater will be determined by the Onsite Sanitary Official. Increased flows into the system are prohibited, except where specifically allowed within this manual. No dwelling or commercial facility shall be connected to an existing system if the total projected wastewater flow would be greater than that allowed under the original system Operating Permit. Certain discharges are also prohibited into the system, such as non-cooking oils, hazardous materials, roof drainage, restrictive chemical material, etc.

A permit to install a new system can be issued only if each site has received an approved site evaluation and is free of encumbrances such as easements, deed restrictions, etc., which could prevent the installation or operation of the system.

APPLICABILITY

This manual applies to all lots in the Town of Paradise.

ORGANIZATION

The manual is organized into two major parts, Part A -- Permits and Policies -- includes all the procedures that must be followed to obtain the permits needed to site, design, construct and repair onsite systems. In addition, sections on variances, fees, and enabling laws, policies, and ordinances are included.

Part B -- Onsite Systems: Description and Design Criteria includes a guide to the selection of appropriate onsite systems based on soil type and site conditions. This part of the manual includes a description of various onsite systems that can be used in the Town of Paradise Onsite Wastewater Management Zone. Details of the system components, materials, servicing, and equipment specifications are included in Chapter 5 followed by a discussion of large flows in Chapter 6 and discussion on innovative applications in Chapter 7.

The manual concludes with a section on terminology followed by Appendixes on soil profile terminology, groundwater monitoring guidelines, hydraulic testing of soil, and sample forms.

UNITS OF MEASURE

The following abbreviations for units of measure are used in this manual:

Unit of Measure	Abbreviation
millimeters	mm
inches	in
feet	ft
second	s
minute	min
hour	hr
day	d
gallons	gal
square inches	in^2
square feet	ft^2
pound	lb

PART A:

PERMITS AND POLICIES

1
PERMITS

1.1 General Guide for Onsite Sewage Disposal System Application
1.2 Site Evaluations
1.3 Construction Permit
1.4 Operating Permit
1.5 Use or Modification of an Existing System
1.6 Repair of Failing Systems
1.7 Emergency Repairs
1.8 Licensing to Perform Wastewater Disposal Services
1.9 Gross Hydraulic Loading of a Parcel

The Town of Paradise requires that permits be obtained to construct, operate, and repair onsite wastewater disposal systems. The Town also requires that septic tank contractors be certified by the Town prior to conducting business within the Town. The permitting procedures are outlined in this chapter.

1.1 GENERAL GUIDE FOR ONSITE SEWAGE DISPOSAL SYSTEM APPLICATIONS

The table shown below is an outline of the Town permits or approval actions required for various common situations.

Situation	Permits[1]		
	Site Evaluation	Construction	Operating[2]
1. Routine system inspection			A
2. New home construction. new system	A	A	A
3. Failing system repair	B	A	A
4. Bedroom addition	B	B	A
5. Replacement of mobile homes with similar units			B
6. Connection of temporary housing to existing system			A

[1] A: Permit required
B: Town should determine if permit is required
[2] New or renewal

1.2 SITE EVALUATION REPORT

Site evaluations are part of the Land Use Review process and may be conducted by either qualified onsite wastewater disposal system designers or authorized Town personnel. Evaluations conducted by private designers must be approved by the Onsite Sanitary Official prior to a Land Use Review approval being given by the Town and the development of construction plans and specifications.

A. Site Evaluation by Qualified Designers

A qualified designer may conduct a site evaluation and prepare a Land Use Review application for approval by the Town. The site evaluation must be conducted by or under the direct supervision of one of the following:

1. Registered Civil Engineer
2. Certified Professional Soil Scientist
3. Certified Engineering Geologist or Registered Geologist
4. Registered Environmental Health Specialist

The professional conducting or directly supervising the evaluation must be knowledgeable and experienced in the field of onsite wastewater disposal. The Town may institute a procedure of random, unannounced verification inspections to ensure that site evaluations by qualified designers meet the standards of the Town.

A Land Use Review approval must be given by the Onsite Sanitary Official before the property owner authorizes the preparation of plans for the construction of a new septic system or addition to an existing septic system. Approval is obtained by submitting a Site Evaluation Report along with a completed Land Use Review application. The Onsite Sanitary Official has the discretion of exempting the requirement for a Site Evaluation Report depending on the size of the project. . The Onsite Sanitary Official may perform a brief site inspection as part of the approval process. Lots or parcels located in identified areas of high groundwater or marginal soil conditions will be inspected by the Town. Justification must be given for a denial of approval for an onsite wastewater disposal system recommendation by a qualified designer.

An approved Land Use Review issued by the Town is transferable with a property sale provided the intended use of the property, structure, size, and proposed dispersal area(s) do not change. There may be a long period of time between the site evaluation and septic system construction during which time the Town's rules and regulations could change. The Town therefore reserves the right to change the type of septic system specified in the Land Use Review approval until a construction permit is issued.

B. Exemption to Soils and Percolation Requirements

All single family residential lots, created by parcel map or subdivision map, and approved by the Town of Paradise subsequent to November 27, 1979, will be considered to be approved with respect to soils and percolation data, if the following criteria are met:

1. The parcel is located in an area location that is listed as AVD, 0-30" (Aiken Very Deep, 0-30% Slope) as illustrated on the general soil map of Paradise prepared by Wert & Associates, on file at the Town Onsite Division.
2. The parcel is not located in an area known to have problematic soils conditions, such as high water table, perched water, or very slow percolation rates (>60 min/inch)

Soil conditions that differ substantially from that represented on the Wert soils map may require relocation of the proposed system or other measures, such as engineered or special design systems, at the discretion of the Town Onsite Sanitary Official.

C. Denial of Application

Upon receipt of a completed Site Evaluation Report, the Onsite Sanitary Official may deny a Land Use Review application if:

- The proposed system would not comply with the approved rules and regulations of the Town, including the maximum gross hydraulic loading rate requirement.
- The proposed system location is compromised by an encumbrance.
- The report contains false information.

D. Site Evaluation Report Requirements

The following items shall be included in the Site Evaluation Report:

- Assessor's parcel map, which may be acquired at the Butte County Assessor's office.
- Gross hydraulic loading calculations for the parcel. For standard treatment septic systems 900 gpd/acre is the maximum application rate (excluding downtown exemption area, Section 1.9). For advanced treatment 2000 gpd/acre is the maximum application rate.
- Preliminary site development plan, drawn to scale, including:

    a. Parcel size: The map must include dimensions of parcel and any easements on the parcel.

    b. Topography: Topographic map of the parcel at a scale of one inch equals fifty feet (1"=50') and two foot contours or greater.

    c. Surface waters: All ponds, intermittent streams, perennial streams, and springs must be located accurately.

    d. Landslides or unstable soils: Areas that appear to be unstable should be checked by an engineering geologist or civil engineer to determine if the presence of a dispersal field will cause mass movement.

    e. Existing and proposed wells located within 100 feet of the proposed dispersal fields (initial and replacement).

f. Encumbrances such as easements, roads, rock outcrops, etc.

g. Escarpments and large cuts (See Figures 1.1 and 1.2).

h. Soil test hole locations.

i. Proposed and existing developments including tank and dispersal field locations. For new construction 100% dispersal field replacement area must be shown.

j. Utilities such as water mains, gas lines, power lines, etc.

- Description of soil and groundwater conditions on the site.

a. Soil profiles: A minimum of two soil profiles taken from soil test pits shall be described. The pits should represent the soils in the initial and replacement area. The test pits should be a minimum of twenty-four inches wide by four feet long by seven feet deep and easily exited by a person. If pits are dug by hand, they should be deep enough to examine the soil to a depth of seven feet.

Minimum observations of the soils are:

- Thickness of each major horizon
- Texture based on USDA definition of textural classes
- Structure
- Color
- Presence of roots, pores, clay skins
- Mottles (low and high chroma)
- Estimates of permeability

All of these soil features are defined in Appendix A.

b. Soil permeability: Often the observations made in the soil profile descriptions will be adequate to assess permeability for a single family dwelling. Where the soil permeability is in question, soil percolation tests shall be required. For very sensitive sites, soil absorption tests shall be needed (see Appendix C for guidelines).

c. Soil underlain by saprolite: Saprolite is material that can be textured, crushed, or broken with hand pressure. If there are clay films or iron coatings with moist values of five or less and moist chromas of four or more, and/or organic coatings with moist values of three or less and moist chromas of three or more occurring on fracture surfaces, then saprolite will be considered soil. Where the material does not meet the above criteria, it shall be treated as fractured bedrock.

d. Presence of saturated soil: The maximum height of a groundwater table shall be noted. Often the presence of a temporary high groundwater table can be detected by soil mottles. However, mottling in the soils of Paradise can understate the maximum level of the groundwater table. . For those sites suspected of having a

seasonally high groundwater table and having unmottled soil, or on sites located in identified areas of high groundwater, monitoring of the water levels will be required (see Appendix B).

Most of the sites in Paradise with drainage problems have temporary high groundwater tables. Typically, these are perched on a clay pan or bedrock, otherwise known as an aquatard. A temporary high groundwater table must last longer than a continuous two-week period in order for it to be regarded as significant for the design of a dispersal field. If it lasts no more than a two week period it is considered a spike and is not used as the level for the temporary high groundwater table when designing a dispersal field.

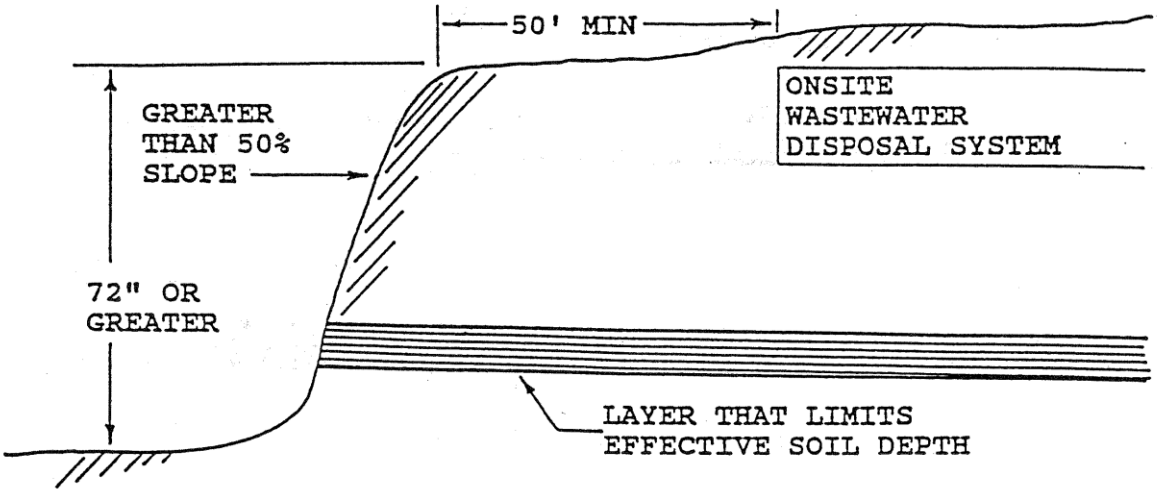


FIGURE 1.1
IDEALIZED CROSS SECTION OF AN ESCARPMENT WITH A LAYER THAT LIMITS EFFECTIVE SOIL DEPTH

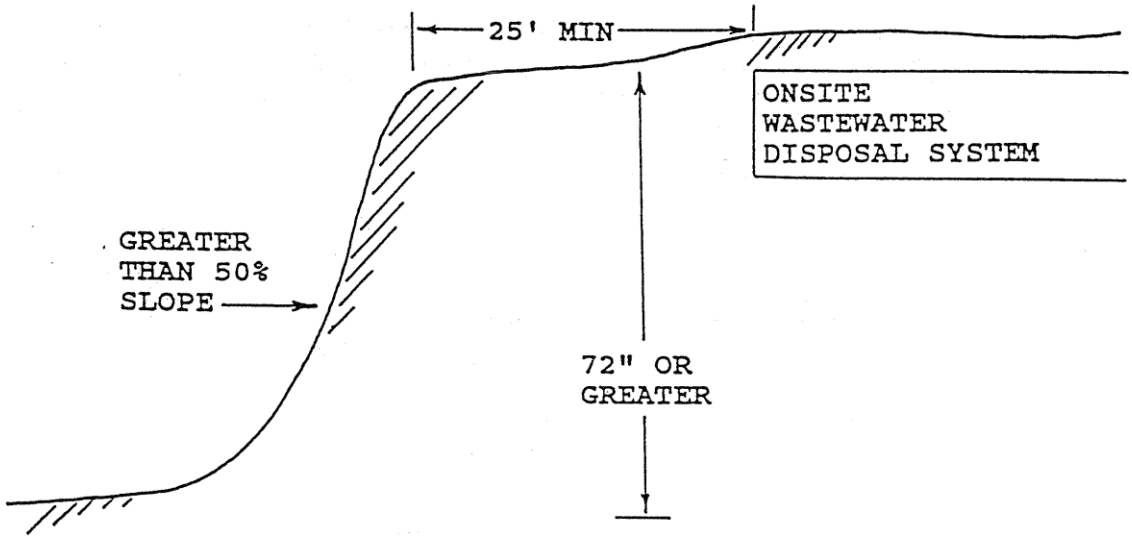


FIGURE 1.2
IDEALIZED CROSS SECTION OF AN ESCARPMENT WITHOUT A LAYER THAT LIMITS EFFECTIVE SOIL DEPTH

1.3 CONSTRUCTION PERMIT

An application must first be submitted to obtain a permit for all construction, alteration or repair of any onsite wastewater disposal system with the exception of the installation of septic tank risers. Applications will be made on forms provided by the Town and will be considered acceptable only when the form is completed in full, signed by the owner or the owner's legally authorized representative, and accompanied by all required exhibits and fees. A permit shall be issued only to a licensed contractor hired by the owner or to the owner or easement holder of the land on which the system is to be installed.

The Town will either issue or deny the permit within thirty days after the receipt of the completed application for a conventional system, with the exception that the weather conditions prevent the Town from acting within thirty days. The applicant shall be notified in writing with the reason for delay. The Town will either issue or deny the permit within sixty days after the mailing date of such notification. Review of alternative or innovative designs may take longer than thirty days.

The approved permit will remain effective for one year from the date of issuance on only new construction permits. Construction Permits for repairs shall remain in effect only for the time period allowed in the Corrective Action Request or Notice. The construction permit is not transferable. Once a system is installed pursuant to the construction permit, an operating permit shall be issued for the installation.

Renewal of a permit may be granted to the original permittee if an application of permit renewal is filed prior to the original permit expiration date. A new construction permit shall only be renewed once.

A. Application Requirements

The application for a construction permit must include the following:

- Site Evaluation Report approved by the Town.
- Detailed and specific site development plans and specifications. Plans and specifications for alternatives systems will need to be prepared by a qualified designer. The plans must include:
    a. Existing and proposed locations of all buildings, roads, driveways and other physical features.
    b. Property lines.
    c. Easements.
    d. Water sources and surface water courses or drainage ways.

E. Exact location of proposed septic tank, distribution box or drop boxes, and all other system components.

F. Exact location of the effluent dispersal field area and replacement area, drawn to scale. Each lot receiving a septic system for the first time must have sufficient usable area available to accommodate an initial and replacement dispersal field.

Sites may be approved where the initial and replacement dispersal fields would be of different types. For example, a standard system could be approved for the initial system and a capping fill for the replacement system.

G. Proposed elevations of the building sewer, the inlet and outlet of the septic tank, distribution boxes or drop boxes, number and length of the dispersal trenches and specification of installation of any other system components.

H. Required setbacks, as discussed in Section 3.1 of this manual, must be identified on the site development plan.

B. Precover inspection

When permitted construction, alteration or repair of a system is complete, or as required by permit, the system installer shall notify the Town for inspection. The installer will provide to the Town a detailed, as-built plan (drawn to scale) of the installation. The Town shall inspect the installation to determine if it complies with construction regulations and conditions prescribed on the permit.

The Town may waive the Precover Inspection for standard systems, at the sole discretion of the Onsite Sanitary Official. Inspections may be waived by the Onsite Sanitary Official for standard system installations made by licensed installers certified by the Town.

1.4 OPERATING PERMIT

A valid operating permit is required for all onsite wastewater disposal systems located in the Onsite Wastewater Management Zone. Operating permits are not transferable and must be renewed periodically. Initial operating permits and renewal of operating permits are discussed separately below. In addition to receiving a Town of Paradise onsite operating permit and compliance with pertinent regulations in the Town of Paradise Local Agency Management Program, all onsite wastewater treatment systems that have projected flows over 10,000 gallons per day are regulated by the Central Valley Regional Water Quality Control Board and are subject to filing a Report of Waste Discharge with them.

A. Initial operating permit

The Town will issue an operating permit if, upon inspection of installation or modification, the system complies with the conditions of the construction permit.

Standard System: The Town will issue an operating permit if, upon inspection of installation or modification, the system complies with the conditions of the construction permit. The Town will not issue an operating permit until as-built plans have been received and approved.

If inspected installation does not comply with the conditions of the construction permit, the permittee will be notified in writing or a Correction Notice will be posted on the site. System deficiencies will be explained and satisfactory completion required before an operating permit will be issued.

Failure to meet requirements for satisfactory completion within thirty (30) days after written notification or posting a Correction Notice on the site constitutes a violation of the construction permit process and these rules, and can result in a Stop Work Notice.

Alternative and Advanced Treatment Systems: The Town will issue an operating permit if, upon inspection of installation or modification, the system complies with the conditions of the construction permit. The Town will not issue an operating permit until as-built plans, and final operation, maintenance and monitoring instructions have been received and approved by the Onsite Sanitary Official. In the instances where alternative systems are advanced treatment systems the following operation, maintenance and monitoring requirements are required:

- Operation and Maintenance Personnel: The system shall be operated and maintained by experienced personnel as approved by the Onsite Sanitary Official. Experienced personnel may include Town of Paradise Licensed Evaluators or other experienced personnel licensed by the State Water Resources Control Board as "Certified Wastewater Treatment Plant Operators". The Owner will provide the Onsite Sanitary Official with written proof that experienced personnel have been retained by the Owner to operate and maintain the system.

- Frequency of Operation and Maintenance Attendance: The frequency of operation and maintenance attendance shall be determined by the Onsite Sanitary Official, but, in no case shall it be more frequent than once a month.

- Operation and Maintenance Attendance Log: An operation and maintenance attendance log of system tasks shall be completed upon each system visit. The log may become part of the reporting requirements submitted to the Town as determined by the Onsite Sanitary Official.

- Minimum Monitoring Requirements: The minimum constituent and physical monitoring requirements are as follows:

    1. Effluent 5-day Bio-chemical Oxygen Demand;
    2. Effluent Total Suspended Solids;
    3. Effluent Total Nitrogen (as determined by the Onsite Sanitary Official);

4. Effluent Flow Metering (as determined by the Onsite Sanitary Official).

Other monitoring requirements, including influent sampling, may be required depending on the site specific characteristics and as determined by the Onsite Sanitary Official.

Frequency of Monitoring Analyses: The frequency of the monitoring analyses shall be determined by the Onsite Sanitary Official depending on the site specific characteristics, system type, and the location and type of discharge.

Monitoring Reporting: The Owner shall submit to the Onsite Wastewater Management Division the results of all monitoring tasks. The submittal shall be on a quarterly basis as outlined below:

1. First quarter analyses data to be submitted on the 15th day of April each year.
2. Second quarter analyses data to be submitted on the 15th day of July each year.
3. Third quarter analyses data to be submitted on the 15th day of September each year.
4. Fourth quarter analyses data to be submitted on the 15th day of January each year.

B. Operating permit renewal – standard systems

1. Operating Permits will be renewed each time a standard onsite wastewater disposal system 1) successfully passes an evaluation performed by a Town of Paradise Licensed Evaluator, or, 2) permitted repairs are finalled by the Onsite Division Staff. .

2. The Town Licensed Evaluators may recommend to the owner and the Town, any correction necessary to bring the onsite wastewater disposal system into compliance with all applicable Town rules and regulations. The Town will issue all correction notices to the owner and issue repair permits as needed to bring the septic system into compliance.

3. The Town will act to resolve any disputes between the property owner and the evaluator personnel.

C. Evaluation schedule – standard systems

Evaluations of septic systems will be required for any of the following circumstances:

1. The Operating Permit for an onsite wastewater disposal system has expired or is soon to be expired.
2. Whenever any parcel of land in the Town upon which an onsite wastewater disposal system is located is having a transfer of title from one owner to another and the system has not been evaluated within the last year.
3. Whenever a complaint is filed with the Town and upon review the Onsite Sanitary Official determines that there is a need to have the onsite wastewater disposal system evaluated so as to substantiate its performance.

The time interval between evaluations for each septic system shall be determined based on the volume of wastewater processed, the most current septic system evaluations report(s), and any other conditions deemed appropriate by the Onsite Sanitary Official. Time

intervals assigned shall be in accordance with provisions of the Paradise Municipal Code, Section 13.04.090.

D. Evaluation schedule – alternative systems

Periodic evaluations of alternative systems may be performed by the Town of Paradise Onsite Division Staff twice each year. The cost for the Onsite Division Staff evaluations shall be borne by the owner based on the Town of Paradise adopted fee schedule for "onsite monitoring".

E. Operating permit renewal – alternative systems

Operating Permits for alternative systems shall be renewed on an annual basis and shall not be issued for periods longer than one (1) year, except for some standard 'pump to pressure' or 'pump to gravity' systems, including capping fills. The requirements for renewal are as follows:

1. The system shall be in total compliance with the previously issued Operating Permit..
2. When required quarterly, semi-annual or annual report submittals shall be up to date with current reporting requirements.
3. Failure of compliance with the above two (2) requirements shall result in the issuance of a Correction Notice with a thirty (30) day, or less requirement to bring the system into compliance.
4. Failure to renew the permit may result in "Abatement" as per the Town of Paradise Municipal Code Section 13.04.430.

1.5 USE OR MODIFICATION OF AN EXISTING SYSTEM

No person shall place into service, change the use of or increase the wastewater strength or daily wastewater flow into an existing onsite wastewater disposal system without obtaining a new operating permit or a construction permit, as appropriate.

To determine whether a previously constructed onsite sewage disposal system is usable when a change of use is proposed, the applicant must apply for a Land Use Review with the Town of Paradise. This review process includes an inspection by the Onsite Division staff, file review of past entitlements and permits, calculations of gross hydraulic loading rates and possibly a soil analysis including a high groundwater determination, soil characterization and permeability testing. If the Town determines that the existing onsite wastewater disposal system appears adequate to serve the purpose for which a particular application is made, then a new operating permit will be issued.

A construction permit will be required when the existing system is failing, setback requirements can no longer be met or the system must be altered in size, location or level of treatment necessary.

A new operating permit is not required when: (1) there is a change in use, but no change in

flows such as replacement of a mobile home with a similar unit, (2) for placing into service a previously unused system, provided a valid operating permit was issued within the last two years for the system.

1.6 REPAIR OF FAILING SYSTEMS

A construction permit is required for the repair of a failing onsite wastewater disposal system, except for emergency repairs as described in Section 1.7. Alternative or experimental designs not found in this manual may be permitted for repairs upon review by the Onsite Sanitary Official. Refer to Chapter 7 for the approval procedures for innovative applications. The Town will require a monitoring program, performed at the owner's expense, for some alternative and all innovative designs.

1.7 EMERGENCY REPAIR

An emergency repair means the repair of a system where wastewater is backing up into a dwelling or commercial facility, or there is a broken pressure sewer pipe or the health and safety of humans are threatened and immediate action is necessary to correct the situation. In order to immediately and temporarily stop a health hazard, the Onsite Sanitary Official may waive the applicable permit requirements. The Town shall determine if a Site Evaluation Report is required for the permanent system repair.

1.8 LICENSING TO PERFORM WASTEWATER DISPOSAL SERVICES

Wastewater disposal services are hereby defined to include:

- The pumping out or cleaning of wastewater systems (including portable toilets), or any part thereof.
- The inspection of standard and alternative onsite wastewater disposal systems for the town.
- The disposal of material derived from the pumping out or cleaning of wastewater systems (including portable toilets).

A. Licensing and Certification

No person will perform wastewater disposal services or advertise or represent himself/herself as being in the business of performing such services without first obtaining certification from the Butte County Environmental Health Department as a septage pumper. Evidence of this certification is required annually by the septage pumper in order to be allowed to operate in the Town of Paradise.

Any wastewater disposal service that does not comply with all requirements with the county to maintain their certification will be prohibited from providing wastewater disposal services in the Town of Paradise.

All individuals that provide wastewater disposal services in the Town of Paradise, including the pumping of septic tanks, grease tanks and any other wastewater tanks, are required to obtain and hold current a septic system evaluators license with the Town of Paradise. The issuance of the evaluator's license must be in compliance with Paradise Municipal Code, Chapter 5.14. Persons who are only servicing portable holding tanks such as those in port-o-potties or recreational vehicles are exempt from the requirement to have an evaluator's license with the Town of Paradise.

1.9 GROSS HYDRAULIC LOADING RATE OF A PARCEL

On all parcels situated in the Town of Paradise, the following wastewater application rates apply. In the case that septic systems serve structures located on multiple parcels, the total cumulative acreage of these parcels is used. Gross area calculations shall include the area to the centerline of any abutting public street or any other public right of way.

- For parcels that receive primary treated wastewater, the maximum application rate of 900 gallons/acre/day shall not be exceeded.
- For parcels that receive secondary treated wastewater, the maximum application rate of 2000 gallons/acre/day shall not be exceeded.
- The gross hydraulic loading rate shall not exceed 1350 gallons/acre/day for primary treated wastewater for all parcels that are located adjacent to Skyway between Black Olive Drive and Elliot Road, for all parcels located between Skyway and Black Olive Drive, for all parcels located adjacent to Black Olive Drive west of Foster Road and for all parcels located between Skyway and Almond Street, with Elliot Road being the northern border. See Figure 4-14.

2
VARIANCES

2.1 Variance Application and Processing
2.2 Notice of Public Hearing
2.3 Right of Appeal
2.4 Appeal of Variance Committee Decisions
2.5 Qualifications of the Variance Committee
2.6 Variance Committee Members Terms
2.7 Officers, Meetings and Rules
2.8 Variance Committee Duties
2.9 Removal of Variance Committee Members
2.10 Variance Committee Member Vacancies
2.11 Limitations on Variances

A variance is a deviation from any onsite wastewater system policy or design standard set forth in this manual or in the rules and regulations of the Town. A variance may be granted to an applicant by the Town after a hearing by a special committee of variance officers. The variance committee will generally issue a directive to the Onsite Sanitary Official to approve, conditionally approve or deny the variance.

Onsite systems enumerated in Chapter 4 (standard and alternative) and Chapter 6 shall be considered approved systems and therefore shall require a valid operating permit to function as an onsite sewage disposal system in the Town.

2.1 VARIANCE APPLICATION AND PROCESSING

Variance applications shall be made to the Onsite Sanitary Official. A separate application shall be filed for each site considered for a variance. Each application should be signed by the property owner and accompanied by:

- A site evaluation report
- Plans and specifications for the proposed onsite wastewater disposal system
- The appropriate fee
- Other information necessary, if requested

The variance committee members shall hold a public hearing on each variance application. The hearing shall take place within thirty days after the date a submitted variance application has been deemed complete by the Onsite Sanitary Official. A copy of the complete variance application and any supporting documentation shall be submitted by the Town Onsite Division to the California Regional Water Quality Control Board, Central Valley Region.

The variance committee shall individually visit the site of the requested variance prior to conducting the hearing, but the burden of presenting the supportive facts shall be the responsibility of the applicant. A decision to grant or deny the variance will be made in writing within thirty days after completion of the hearing. If the variance is granted, the variance committee will state, in writing, the specifications, conditions and location of the onsite wastewater system.

The Town shall issue a construction permit for granted variance systems once the appropriate plans and fees have been submitted, perform necessary inspections, and issue an Operating Permit once the system installation has been approved by the Onsite Sanitary Official or his designee. An operations, maintenance and monitoring program, performed at the owner's expense, shall be required for systems permitted under a variance.

2.2 NOTICE OF PUBLIC HEARING

Notices of public hearing for variance applications shall be given by the body conducting such hearing at least ten days prior thereto, by publication in a newspaper of general circulation in the Town. In addition, the Town shall give additional notice by mail, using addresses from the latest equalized assessment roll, to all owners of property within a three-hundred-foot distance of any boundary of the subject property. The Town shall also mail or deliver such notice at least ten days prior to the hearing to the owner(s) of the subject property, or his agent, and to the project applicant. The Town shall follow the notice procedures of California government Code Section 65091. Failure to any person to post notice shall not invalidate any proceedings conducted by the decision making body.

2.3 RIGHT OF APPEAL

All determinations of the Variance Committee shall be final unless a written appeal and any required appeal fees are filed within seven (7) days from the date the Variance Committee acts on a variance application. The appeal shall be filed with the Town Clerk. Any interested person shall have the right to file an appeal. The Town Council shall conduct a public hearing on the appeal in accordance with applicable procedures as set forth in this chapter.

2.4 APPEAL OF VARIANCE COMMITTEE DECISIONS

Except as otherwise provided in this chapter, appeals of Variance Committee decisions shall be administered in accordance with the following applicable provisions:

A. The appeal shall be in writing with a detailed statement of the grounds for the appeal.

B. The Town Clerk shall set the time, date, and place for a public hearing before the Town Council concerning an appeal of a Variance Committee decision.

C. Public hearings before the Town Council shall be conducted within forty days after the receipt of a written appeal and any required appeal fee.

D. Upon receipt of the notice of appeal of a Variance Committee decision, the Onsite Sanitary Official shall prepare a report of the facts pertaining to the decision of the Variance Committee and shall submit such report to the Town Council.

E. The Town Council may refer any matter subject to appeal back to the Variance Committee for further consideration if, in the opinion of the Town Council, any new and substantial evidence is presented to the Town Council that was not previously presented to the Variance Committee.

F. At the close of the hearing, the Town Council may affirm, reverse, revise or modify the appealed decision of the Variance Committee.

G. If the Town Council does not finalize its action on an appeal within ninety days after the filing thereof, the decision action of the Variance Committee shall be deemed affirmed.

H. The decision of the Town Council may be appealed to the California State Regional Water Quality Control Board, Central Valley Region, within ten days after the date of the decision. The decision by the California State Water Quality Control Board, Central Valley Region, shall be final.

2.5 QUALIFICATIONS OF THE VARIANCE COMMITTEE

The variance committee members shall be selected by the Town Council to give objective third party opinions concerning special or unusual cases. They must have adequate training in soils as they pertain to subsurface wastewater disposal, knowledge of the public health issues associated with onsite wastewater disposal systems, a thorough understanding of pumps and hydraulics, and personal experience with onsite wastewater disposal systems. The variance committee shall consist of three and not more than five citizen-at-large members appointed by the Town Council. The Town Council may also appoint one additional citizen-at-large member to serve on the variance committee only when a member of the variance committee is absent.

2.6 VARIANCE COMMITTEE MEMBER TERMS

The five citizen-at-large positions and the alternate citizen at large position shall serve a term of four years and be appointed by the Town Council in accordance with the standard procedures utilized by the Town Clerk for filling positions on boards and commissions. The terms of the five citizen-at-large positions and the alternate citizen at large position shall be staggered to provide continuity on the Variance Committee.

2.7 OFFICERS, MEETING AND RULES

The Variance Committee shall elect a chairman and vice-chairman from its membership annually. In the absence or disability of either the chairman or vice-chairman, the Variance Committee may designate a temporary chairman.

The Variance Committee shall hold at least one meeting each year and such other meetings as may be necessary. Variance Committee meetings shall be scheduled at the request of the Town Council, Town Manager or the Onsite Sanitary Official.

The Variance Committee shall adopt rules for the transaction of its business and shall keep a public record of its findings and determinations.

2.8 DUTIES OF THE VARIANCE COMMITTEE

The Variance Committee shall comply with the following provisions established within the Onsite Wastewater Management Zone:

- To hear and consider all requests for variances from the Manual for the Onsite Treatment of Wastewater and other regulations of the Town relating to the disposal of wastewater. Such hearing shall be conducted in accordance with the standards and procedures set forth in this chapter.

- To consider items relating to the treatment and dispersal of wastewater within the Town of Paradise referred to them by the Town Council, Town Manager, and Onsite Division staff.

2.9 REMOVAL OF VARIANCE COMMITTEE MEMBERS

A member of the Variance Committee may be removed by a majority vote of all the members of the Town Council. A member who fails, without permission, to attend three successive meetings or fifty percent (50%) of the regular meetings per year of the Variance Committee is subject to possible removal by the Town Council.

2.10 VARIANCE COMMITTEE MEMBER VACANCIES

A vacancy on the Variance Committee occurring by death, resignation, removal or any other cause before the expiration of the affected member's term as a Variance Committee member shall be filled by appointment for the unexpired term by the Town Council.

2.11 LIMITATIONS ON VARIANCES

The following limitations on variances shall apply within the Onsite Wastewater Management Zone:

- A maximum of one variance will be allowed per application.

- No variances will be granted for lot splits or subdivisions.

- No variances will be granted for groundwater or surface water separation requirements.

- No variances will be granted if the proposed system would cause groundwater or surface water degradation.

No variance will be granted if the proposed system would cause public health and safety problems as determined by the Onsite Sanitary Official.

- Any variance issued by the Town shall be considered to be site and situation specific. The granting of a variance for one site shall not set a precedent for other sites.

PART B:

DESCRIPTIONS AND DESIGN CRITERIA

3
SELECTION OF APPROPRIATE ONSITE WASTEWATER SYSTEMS

3.1 General Requirements for Onsite Wastewater Disposal Systems
3.2 Selection of an Appropriate Onsite System
3.3 Lots with Limited Space for Waste Disposal System

This chapter of the manual is intended to serve as a guide for the selection of onsite wastewater disposal systems which are appropriate for the various soil conditions found in the Town of Paradise.

3.1 GENERAL REQUIREMENTS FOR ONSITE WASTEWATER DISPOSAL SYSTEMS

Certain requirements apply to all onsite wastewater disposal systems located within the Town of Paradise. These include setbacks, the acquisition of easements for disposal off the property, and proper abandonment of unused systems, as described within this chapter. Variances will be required for systems which cannot meet the general requirements discussed in this section.

A. Required setbacks

Required setbacks are presented in Table 3.1. Required setbacks for portable toilet systems are shown in Table 3.2. Other guidelines are presented below.

- Water lines and sewer lines: Where water lines and building or effluent sewer lines cross, separation distances shall be as required in the Uniform Plumbing Code, California Plumbing Code Edition and the American Water Works Associations "Guidelines for Distribution of Nonpotable Water."

- Septic tank setbacks: The Town encourages the placement of septic tanks and other treatment units as close as feasible to the minimum separation from the building foundation to minimize potential clogging of the building sewer.

- Stream setbacks: Setback from streams shall be measured from the ten-year high-water mark.

Table 3.1
REQUIRED SETBACKS

Setback requirements are minimum and may be altered for wastewater flows over 2500gpd as determined by the Onsite Sanitary Official

Condition	Setback, ft	
	A[1] Disperal fields, etc.	**B**[2] Septic tanks, etc.
Wells, whether in use or abandoned, excluding shallow aquifer, non-permanent groundwater monitoring wells associated with hazardous substance investigation sites. Properly destroyed wells are exempt from setbacks	100 150 ft for Public water wells	50 150 ft for Public water wells
Surface waters:[3]		
perennial (all year) streams, springs or seeps[4]	100	50
intermittent (part of year) streams, springs or seeps	50	50
ravine, drainageway or ephemeral stream	50	50
lakes and reservoirs[5]	200	50
Groundwater interceptors such as french drain or curtain drain used to collect groundwater:		
upgradient (the interceptor is upgradient)	20	20
downgradient (the interceptor is downgradient)	50[5]	25
Irrigation canals:		
lined (watertight canal)	50	25
unlined		
upgradient	100	50
downgradient	100	50
Cuts exceeding 30%, downslope from a dispersal field, in excess of 30 in. (top of cut):		10
– intersects layers that limit effective soil depth within 48 in. of surface	Four times height of cut[7]	
– does not intersect layers that limit effective soil depth	10	10
Fill downslope from a dispersal field, trenches. Fill must be on top of a native soil surface with over 30% slope [7,8]	Four x's height of fill[7]	10

Condition	Setback, ft	
	A[1]Disperal fields, etc.	**B**[2]Septic tanks, etc.
Escarpment (a steep slope or cliff, over 30% slope, that makes a boundary to a flat or gently sloped upland area) downslope from a dispersal field :	50	10
Roadway setback, from road or street edge	20[9]	20[9]
Property lines	5	5
Swimming pool	5	5
Water lines (service line off water main)	5	5
Water main (public) - New construction / Repairs	25/10	10/10
Water main (private)	10	10
Driveway or parking area	0[10]	0[11]
Foundations, building peers, foundation lines of any building or structure	5[12]	5[12]
Dispersal trench (from the sidewall) Narrow dispersal trenches are exempt as per Section 4.4	8	5
Storm water drainage pipe	25[13]	5[13]
Storm Water Retention/Detention Basins	50	50

1 **A**= From wastewater dispersal fields or infiltrative surfaces, including dispersal field replacement areas

2 **B** = From septic tanks dosing tanks, treatment units and distribution units of over 20 gallon capacity

3 Does not prevent stream crossing in approved piping systems; culverting these drainage ways will not be allowed to reduce these setback requirements

4 When a perennial stream, spring or seep is upgradient and higher in elevation the setback to "A" or "B" may be reduced to 50 feet

5 Any impounded body of water with no less than one-acre foot of water

6 Twenty feet if an impermeable barrier is supplied with the drain

7 Four times the height of the bank, measured from the top edge of bank (with a 50 foot maximum distance)

8 For existing dispersal field repairs where no other option is available earthen fill areas may be exempt from this setback requirement if the fill has been in place for over 5 years, has been adequately evaluated by a qualified designer and has demonstrated compatibility with underlying soils. Native soils underneath fill areas may also be used for dispersal fields if they are properly evaluated by a qualified designer and necessary system controls/mitigations

are designed into the wastewater treatment and dispersal system

[9] If an existing public road right-of-way or public utility easement exceeds the twenty-foot setback a greater setback distance is required. A lesser setback distance to the edge of the road is allowed when information is provided that demonstrates the location of the public road right of way or public utility easement is less than 20 feet. In no instance shall a septic tank, etc., or dispersal field, etc., be allowed to be constructed in a public road right of way or public utility easement.

[10] Only if percolation rate is less than thirty minutes per inch

[11] Only if access risers are provided and a minimum one-foot of total cover is provided over the septic tank. New installations in vehicle areas require traffic-rated septic tanks

[12] Including non-slab porches and steps whether covered or uncovered, breezeways, roofing structures, carports, and similar structures or appurtenances. Small cement porches and steps that do not serve as foundations for overhead structures are exempt from these setback requirements

[13] Greater or lesser distances may be required depending on site characteristics. Lesser distances may be allowed for storm drains that flow only during rain events and are engineered to eliminate effluent infiltration and preferential pathways

Table 3.2
REQUIRED SETBACKS FOR PORTABLE TOILETS

Condition	Setback, ft	
Groundwater supplies, including springs and cisterns	50	25
Surface public waters, excluding intermittent streams	50	50
Intermittent streams	50	25
Property line	25	25

B. Easements

An onsite wastewater disposal system shall be located entirely on the parcel served by the system or a legal permanent easement for a dispersal field needs to be obtained for placement on a neighboring parcel before the issuance of a permit. An easement will provide for future access to allow maintenance of the system. Examples of single party and multiple party easement forms are available from the Town of Paradise.

When the system crosses a property line separating parcels of different ownership, a recorded permanent utility easement and covenant against conflicting uses is required in a format approved by the Town. An easement must accommodate that part of the system, including setbacks for property

lines and building foundations, which lies beyond the applicant's property line. The easement must allow for entry to install, maintain and repair the system.

When the system crosses a property line separating parcels under the same ownership, the applicant/owner must create an easement with covenants in a format approved by the Town to enter and inspect that portion of the system, including setbacks for property lines and building foundations, on the adjacent parcel, by excavation, if necessary, agreeing not to put that portion of the adjacent parcel to a conflicting use, and agreeing upon severance of the adjacent parcel to grant a permanent utility easement in favor of the owner of the parcel served by the system.

Dispersal field easements or covenants are necessary for the repair of existing septic systems crossing property lines.

C. Abandonment of a septic system

The owner shall abandon a septic system for several reasons:

- A public sewer or public onsite septic system becomes available to a building and the building sewer has been connected thereto; or
- The source of wastewater has been eliminated permanently.
- The system has been operated in violation of these rules, unless and until a repair permit and an Operating Permit are subsequently issued therefore; or
- The system has been constructed, installed, altered or repaired without a required permit authorizing such, unless and until a permit is subsequently issued therefore.

Procedures for abandonment should start with the septic tank, cesspool or seepage pit being pumped by a licensed wastewater disposal service to remove all sludge. The septic tank, cesspool or seepage pit should then be filled with sand. If, in the judgment of the Onsite Sanitary Official, it is not reasonable, possible or necessary to pump and fill the system, the Onsite Sanitary Official may waive either or both of these requirements provided such action does not constitute a menace to public health, welfare or safety.

3.2 SELECTION OF AN APPROPRIATE ONSITE SYSTEM

A series of flow charts (Figures 3.1 through 3.7) and a soil map on file with the Town have been developed to aid in the selection of an appropriate onsite wastewater system in the Town of Paradise. Figures 3.1 through 3.7 are based on soil and site conditions commonly found in Paradise, however, they do not cover all conditions. The soil map is also general in nature and may not show all soil conditions present. Therefore, a site evaluation is still required to verify actual soil conditions at all proposed disposal areas. Special designs may be considered under a variance for those sites not described in Figures 3.1 - 3.7. Table 3.3 lists the general procedure for the use of the flow charts and soil map. Table 3.4 is a summary of the soil types, areas, and recommended onsite systems.

TABLE 3.3

PROCEDURE FOR THE SELECTION OF AN APPROPRIATE ONSITE WASTEWATER SYSTEM

For General Planning:

1. Locate the lot on the soil map to identify the soil type commonly found in the area.

2. Use Figures 3.1 through 3.7 to identify the appropriate soil group and probable onsite system requirements.

3. Review the onsite system requirements as described in Chapter 4 of this manual.

For Design:

1. Verify site conditions. Dig test holes, identify soil conditions, and select an appropriate system. The charts and soil map do not replace good judgment or common sense.

3.3 LOTS WITH LIMITED SPACE FOR WASTE DISPOSAL SYSTEM

Those existing lots which have very small suitable dispersal areas can use one or more of the following techniques depending on soil conditions:

- Advanced treatment of septic tank effluent with an intermittent dosing sand filter or recirculating gravel filter.
- Bottomless intermittent dosing sand filter (bed or trench)
- Advanced treatment systems with approved technology components.
- Pressure distribution with narrow dispersal trenches and narrow spacing
- Redundant system

A qualified designer shall prepare plans of the proposed onsite wastewater system. There must be adequate space on the lot for a replacement dispersal field.

TABLE 3.4
SUMMARY OF SOIL TYPES FOUND IN PARADISE AND THE RECOMMENDED TYPE OF ONSITE WASTEWATER DISPOSAL SYSTEM

Soil Map Symbol	Mapping Unit Name	Area (Acres)	Percent of Total	Recommended Onsite System
AVD 0-30%	Aiken Very Deep	7805	66.7	S
AVD 30-45%	Aiken Very Deep	50	0.4	S
AD 0-30%	Aiken Deep	173	1.5	S
BA 0-30%	Aiken Bouldery Phase	380	3.3	S + Extra
BA 30-45%	Aiken Bouldery Phase	19	0.2	S + Extra
PR 0-10%	Basalt flow with soil between columns of rock	140	1.2	S + Extra
MC-C 0-30%	Guenoc-Cohasset complex	243	2.0	S or A
MC-C >30%	Guenoc-Cohasset complex	49	0.4	A
SC-MC 0-30%	Shallow clay loam - Guenoc complex	406	3.5	U
SC-MC 30-45%	Shallow clay loam - Guenoc complex	7	0.1	E
SC-T 0-30%	Shallow clay loam - Toomes complex	133	1.1	U
SC-T 30-45%	Shallow clay loam - Toomes complex	3	>0.1	D or A or E
W	Wetlands/swamp/marshes	10	>0.1	NA

Soil Map Symbol	Mapping Unit Name	Area (Acres)	Percent of Total	Recommended Onsite System
0-10%				
TW-MA 0-10%	Complex of two unnamed series with seasonal water tables	927	7.9	U
SM 0-30%	Shallow, very poorly drained soil	34	0.3	U
PO 0-30%	Mariposa	6	0.1	U
C/F	Cuts and fills	22	0.2	A
F	Fills	8	0.1	A
RL	Rockland	440	3.7	U
Q	Quarries	1	>0.1	U
45%	Slopes over 45% with a variety of soils	844	7.2	U
		11,700	100	

S = Standard System S + Extra = Standard System plus extra drainfield
A = Advanced treatment E = Engineered Fill D = Dewatering U = Unsuitable

FIGURE 3.1
SOIL GROUP CHART

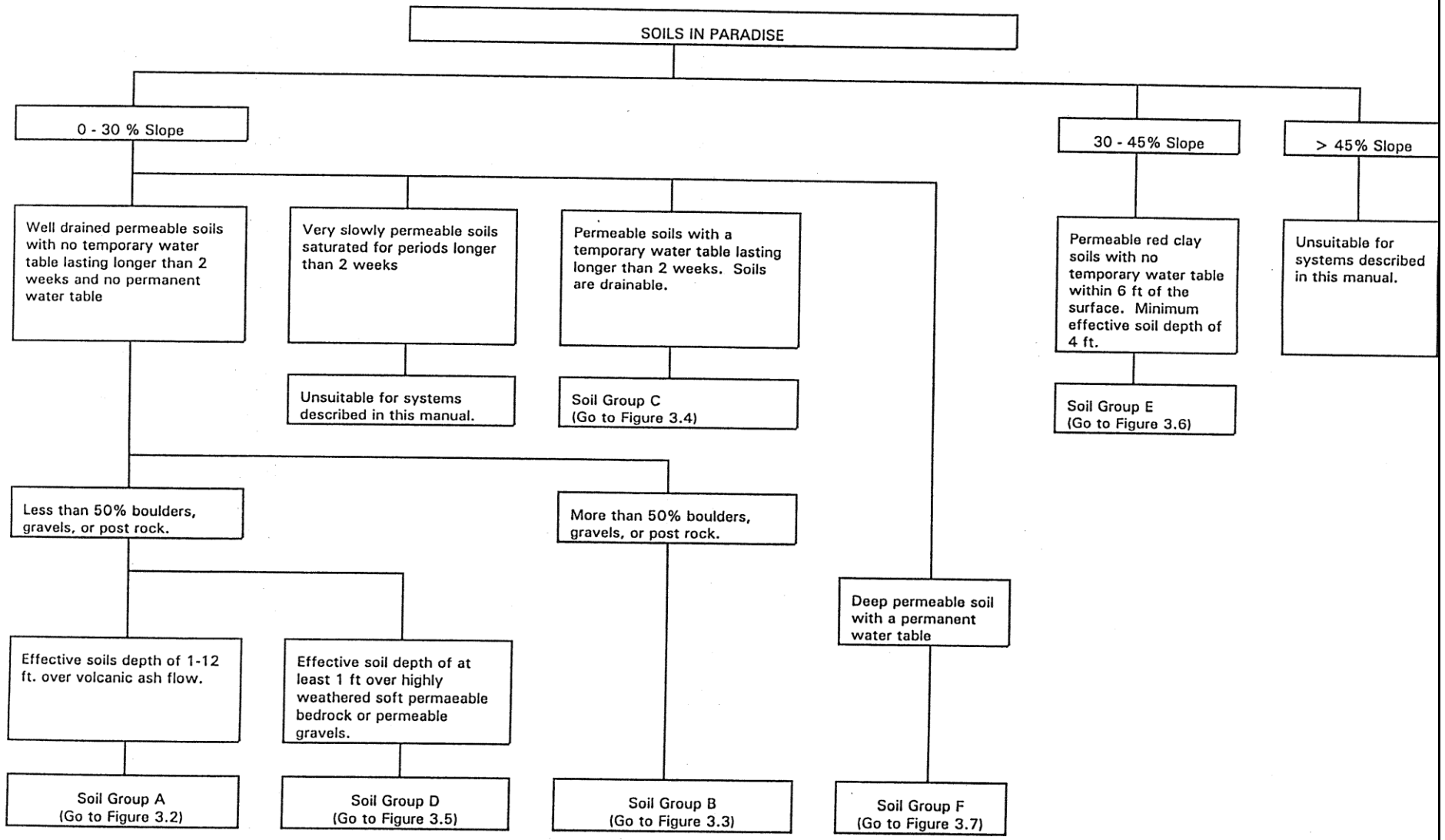


FIGURE 3.2
SYSTEM SELECTION CHART: SOIL GROUP A

Well-drained, permeable soils on slopes less than thirty percent. Soils have no permanent water table and no temporary water table lastir more than two weeks. Texture of subsoil is either clay or clay loam.

Series	Soil Map Symbol	Effective Soil Depth
Aiken very deep	AVD 0-30	5 - 12 ft
Aiken deep	AD 0-30	4 - 5 ft
Cohasset	C 0-30	3 - 4 ft
Guenoc	MC 0-30	2 - 3 ft
Unnamed shallow soil	SC 0-30	1 - 2 ft
Mariposa	PO 0-30	1 - 2 ft

NOTE: ALL SYSTEMS MUST COMPLY WITH THE MINIMUM SEPARATION DISTANCES BETWEEN DISPOSAL TRENCH BOTTOMS AND SENSITIVE LAYERS

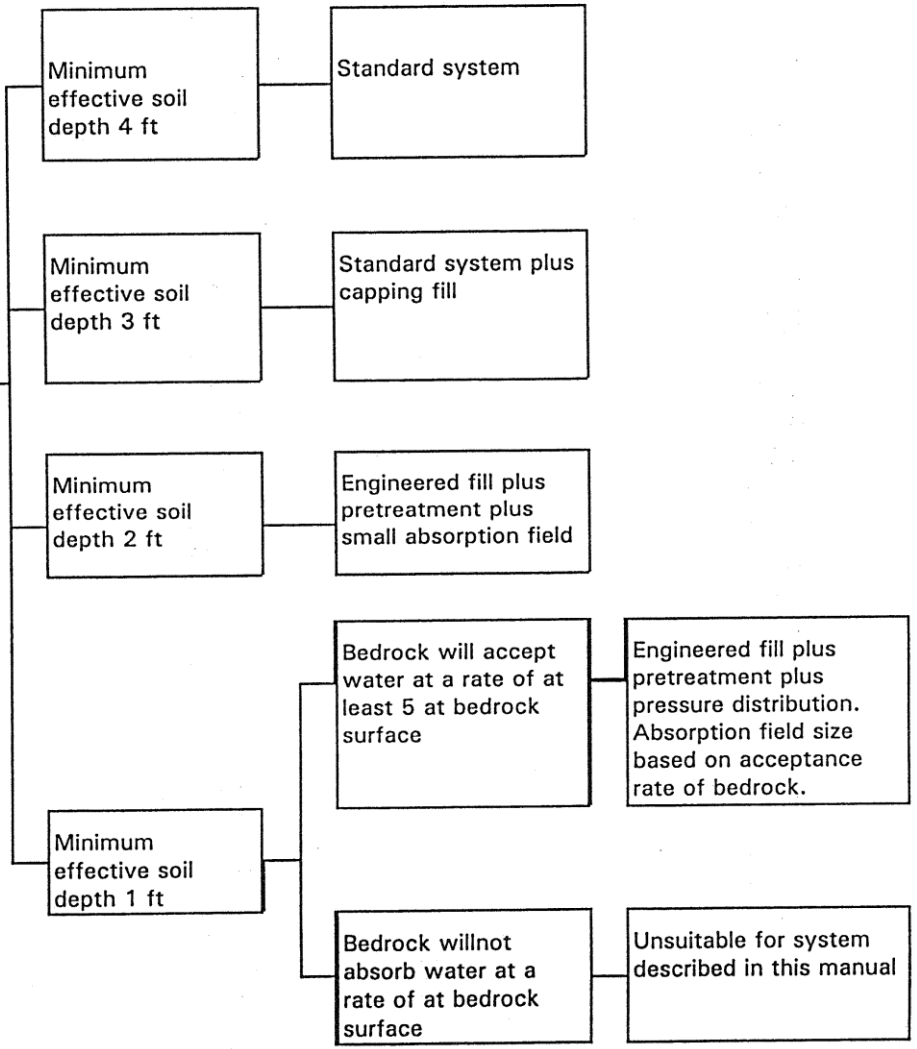
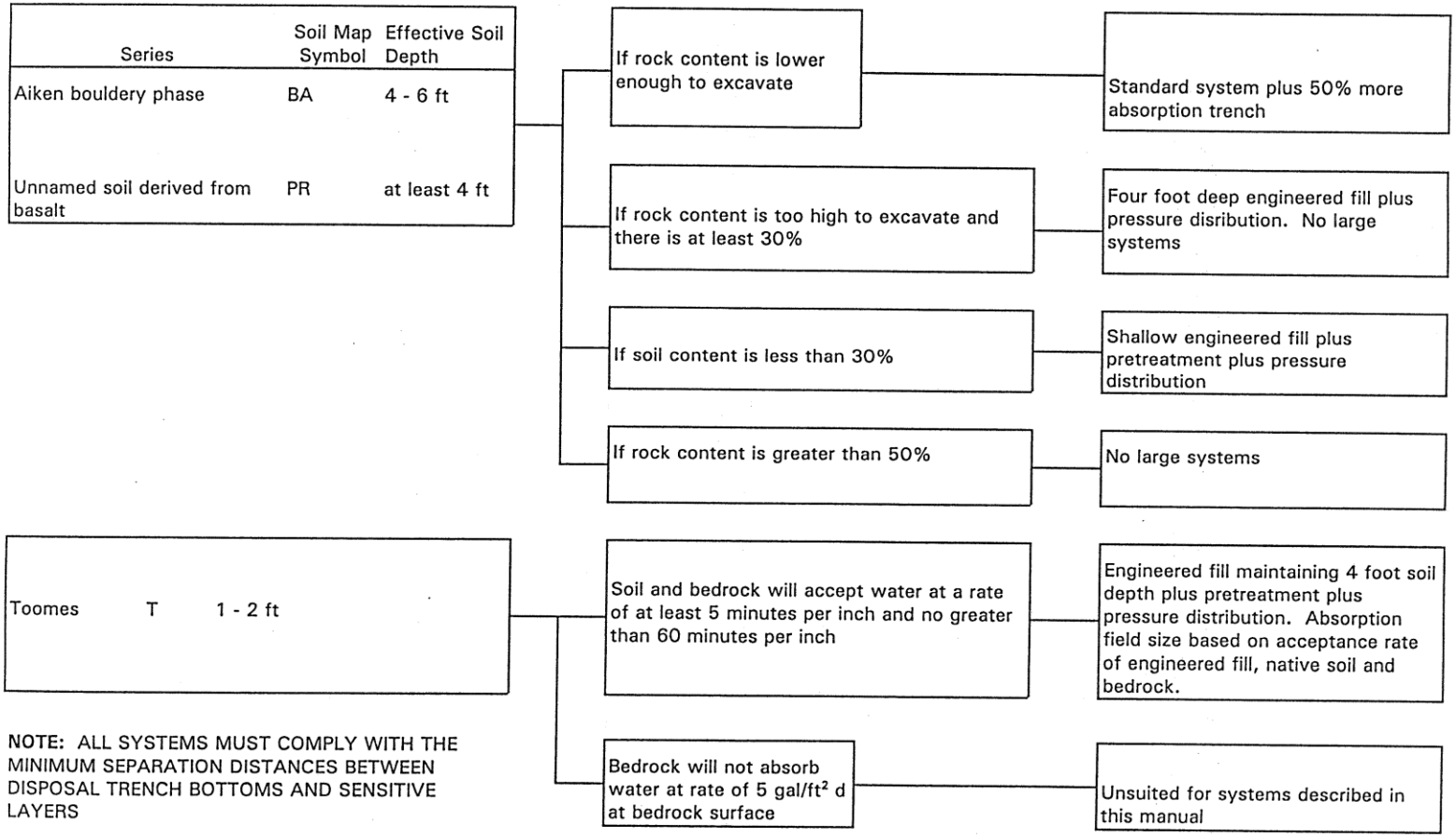


FIGURE 3.3
SYSTEM SELECTION CHART: SOIL GROUP B

Well-drained, permeable soils on slopes less than thirty percent (30%) with more than fifty percent (50%) boulders, gravels, or post rock Texture of the subsoil is very gravelly clay to loam. These soils have no water table.



NOTE: ALL SYSTEMS MUST COMPLY WITH THE MINIMUM SEPARATION DISTANCES BETWEEN DISPOSAL TRENCH BOTTOMS AND SENSITIVE LAYERS

FIGURE 3.4
SYSTEM SELECTION CHART: SOIL GROUP C

Permeable soils on slopes less than thirty percent. Soils have temporary water tables lasting longer than two weeks. Texture of subsoi ranges from clay loam to dense clay.

Series	Soil Map Symbol	Depth to Temporary Water Table		
Unnamed deep clay loam soil	TW	3 - 5 ft	Drainable to 4 ft below ground surface	Perimeter drain plus standard system
Unnamed deep clay soil with clay pan within 3 ft of surface	MA	1 - 3 ft	Drainable to 3 ft below ground surface	Perimeter drain plus narrow absorption trenches plus pressured distribution plus capping fill
			Drainable to 2 ft below ground surface	Perimeter drain plus engineered fill plus pretreatment plus narrow absorption trenches
Unnamed shallow soil	SM	<1 ft	Most areas of this soil are not drainable to 2 ft below ground surface	Unsuitable for systems described in this manual

NOTES: ALL COMPLETED SYSTEMS MUST COMPLY WITH THE MINIMUM SEPARATION DISTANCES BETWEEN DISPOSAL TRENCH BOTTOMS AND SENSITIVE LAYERS.

DEMONSTRATION THAT THE DISPOSAL SITE CAN BE DRAINED OVER AN ENTIRE WET SEASON WILL BE REQUIRED PRIOR TO CONSTRUCTION OF THE WASTEWATER DISPOSAL SYSTEM.

FIGURE 3.5
SYSTEM SELECTION CHART: SOIL GROUP D

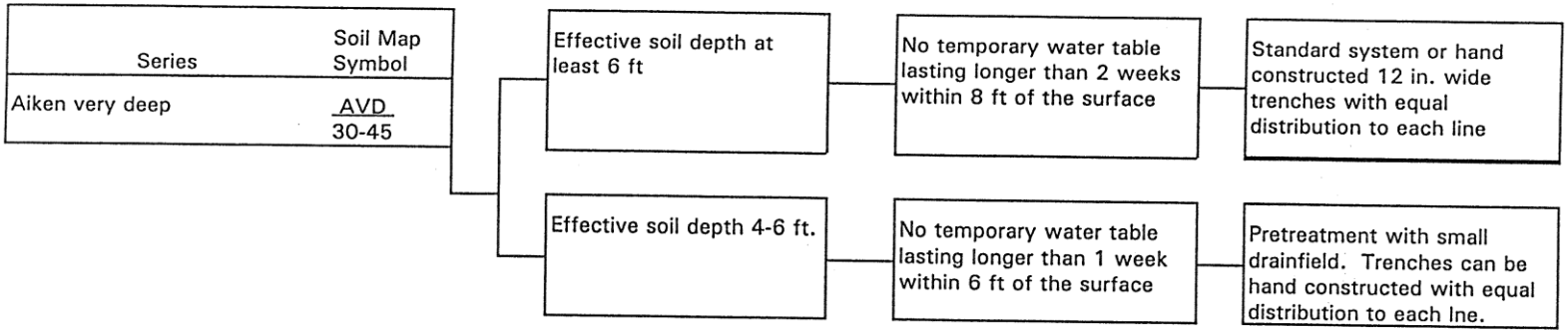
Permeable soils overlying fractured, permeable bedrock on slopes less than thirty percent with no permanent or temporary water table. Bedrock must be diggable with a common backhoe and have clay films along fractures. Infiltration rate thirty-six inches into bedrock must be greater than five gallons per square feet·day.

There are a limited number of areas with these conditions in Paradise. No soil series designations have been developed for these soils. A bottomless and filter may be used if the completed system will have the minimum required effective soil depth.

NOTE: ALL SYSTEMS MUST COMPLY WITH THE MINIMUM SEPARATION DISTANCES BETWEEN DISPOSAL TRENCH BOTTOMS AND SENSITIVE LAYERS

FIGURE 3.6
SYSTEM SELECTION CHART: SOIL GROUP E

Permeable soils on slopes between thirty-forty percent . These soils have no permanent water tables.



NOTE: ALL SYSTEMS MUST COMPLY WITH THE MINIMUM SEPARATION DISTANCES BETWEEN DISPOSAL TRENCH BOTTOMS AND SENSITIVE LAYERS

FIGURE 3.7
SYSTEM SELECTION CHART: SOIL GROUP F

There are a few soils in Paradise which qualify as having a permanent water table. The maximum height of the water lasting more tha two weeks needs to be established on a case-by-case basis. A four foot separation from the trench bottom and the maximum height o the water table shall be maintained.

DESCRIPTION OF ONSITE SYSTEMS

4.1 Standard System
4.2 Advanced treatment Systems
4.3 Pressure Distribution
4.4 Narrow Dispersal Trenches
4.5 Redundant Systems
4.6 Steep Slope Systems
4.7 Capping Fill Systems
4.8 Perimeter Drain or Tile Dewatering System
4.9 Curtain Drain
4.10 Engineered Fill
4.11 Portable Toilets
4.12 Holding Tanks
4.13 Water Conservation Fixtures
4.14 Pre-Constructed Advanced Treatment Systems
4.15 Graywater Systems

This chapter includes descriptions and design guidelines for the various types of onsite wastewater disposal systems allowed in the Onsite Wastewater Management Zone. There are two classifications of onsite systems in the Town: standard systems and alternative systems. Onsite systems not described in this Chapter shall only be permitted under the provisions of Chapter 7. Specifications for various system components such as septic tanks, piping, and pumps, are provided in Chapter 5.

4.1 STANDARD SYSTEMS

A standard onsite wastewater disposal system consists of a septic tank, a flow distribution unit and a gravity-fed dispersal field constructed in accordance with the guidelines outlined in this manual. A standard pressure distribution system consists of a septic tank, a dosing tank and a pressure distribution dispersal field.

The method of septic tank effluent distribution will depend on the system. Variables such as the slope of the site, the depth of soil and the location of the dispersal field will determine the necessary method of distribution. A distribution box is used for systems requiring distribution of effluent in equal portions to dispersal trenches. Drop boxes are distribution boxes used for serial distribution systems on sloping ground.Serial distribution is allowed only when it is impractical to provide equal distribution and is approved by the Onsite Sanitary Official.

DESCRIPTION OF ONSITE SYSTEMS

A. General conditions for approval

To be approved for a standard system each site must meet all the following conditions:

- Soil depth: See Figure 4.1

- Water table levels: Water table levels shall be predicted using conditions associated with saturation (Appendix A) or monitoring wells (Appendix B). If conditions associated with saturation do not occur in soil with rapid or very rapid permeability, predictions of the highest level of the water table shall be based on past recorded observations. If such observations have not been made, or are inconclusive, the application shall be denied until observations can be made. Groundwater level determinations shall be made during the period of the year in which high groundwater normally occurs. A seasonal groundwater table is also known as a temporary high groundwater level and must be maintained for over two weeks in order to be regarded as significant for dispersal field design. Minimum soil separation requirements for the design of waste water dispersal beds are based off of the temporary high groundwater level.

- Slopes shall not exceed thirty percent.

- The site must not have been altered in a way that would affect proper functioning of the system.

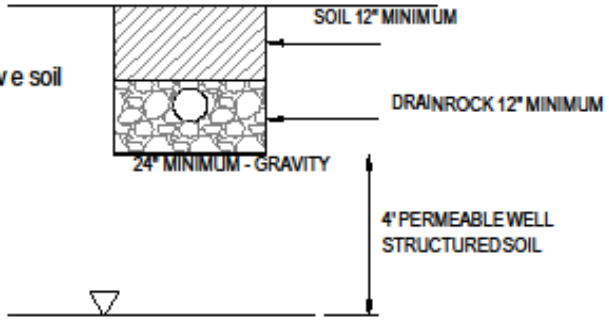
- The site of the initial and replacement dispersal fields will not be subjected to excessive saturation due to, but not limited to, artificial drainage of ground surfaces, driveways, roads, and roof drains.

- The required setbacks must be maintained (See Table 3.1).

- For repair or new construction, the gross wastewater hydraulic loading rate to any parcel with an onsite sewage disposal system that does not have advanced treatment shall not exceed 900 gallons per acre per day. Gross area calculations shall include the area to the centerline of any abutting public street or any other public right of way.

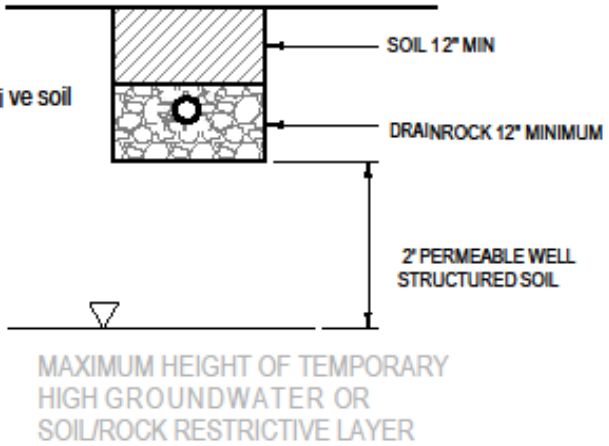
PRIMARY TREATMENT

1. Maximum trench depth is 48" into nativ e soil
2. Maximum drain rock depth is 30"



SECONDARY TREATMENT W/ PRESSURE DISTRIBUTION

1. Maximum trench depth is 48" into nati ve soil
2. Maximum drain rock depth is 30"



TOWN OF PARADISE ONSITE SANITATION DIVISION	Revised: 03-01-16	DISTANCE BETWEEN DISPERSAL TRENCH BOTTOM AND RESTRICTIVE LAYERS PRIMARY & SECONDARY TREATMENT	**FIGURE 4.1**

B. Septic tanks

A diagram of a typical septic tank is shown in Figure 4.2. Volume and installation requirements are listed below. Other specifications are included in Chapter 5.

- Size of septic tank: Septic tanks to serve new single family dwellings shall be sized on the number of bedrooms in the dwelling, as follows:

Bedrooms	Minimum Tank Size (gallon)
1 - 3	1,500
4	1,500
5 - 6	1,500

- Existing septic tanks that are structurally sound and not identified as being in failure shall comply with the minimum septic tank sizes established by Appendix I, Table I-2 of the Uniform Plumbing Code, California Plumbing Code Edition.

- Septic tank installation requirements:

  a. Septic tanks shall be installed on a level, stable base that will not settle. A minimum eight (8) inch base layer of pea gravel shall be required. For fiberglass or PVC tanks, pea gravel or sand shall be used as backfill to the midseam of the tank as a minimum.

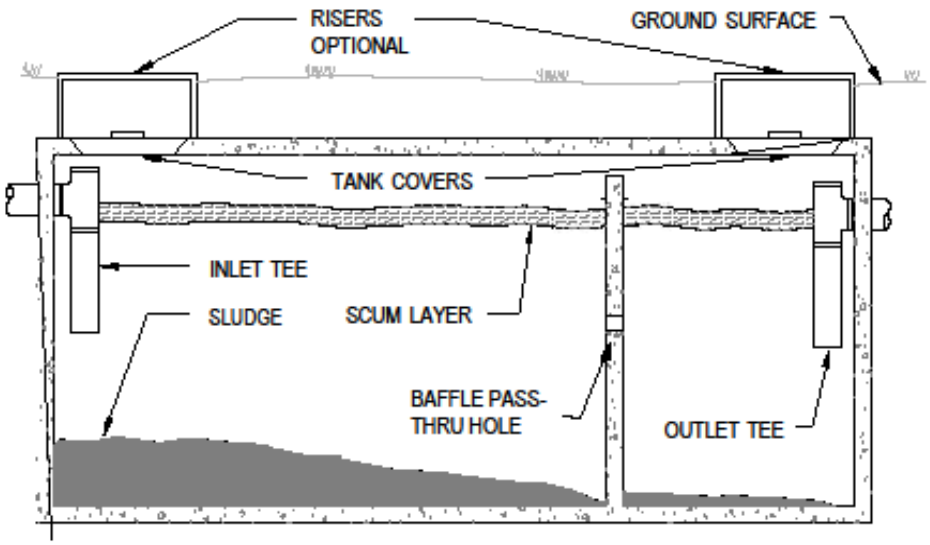
  b. Septic tanks located in high groundwater areas shall be weighted or provided with an antibuoyancy device to prevent flotation.

  c. A watertight access riser extending from the top of the septic tank to the ground surface or above is recommended for standard systems, but are not required. Watertight access risers extending to finished grade which are capable of supporting vehicle loads shall be installed on septic tanks located beneath vehicle traffic areas, sidewalks, and concrete pads. Watertight access risers are required on all alternative systems. The riser shall have a minimum inside dimension equal to or greater than that of the tank access port opening. A cover shall be provided and securely fastened or weighted to prevent easy removal and shall have a gasket to prevent odors from escaping.

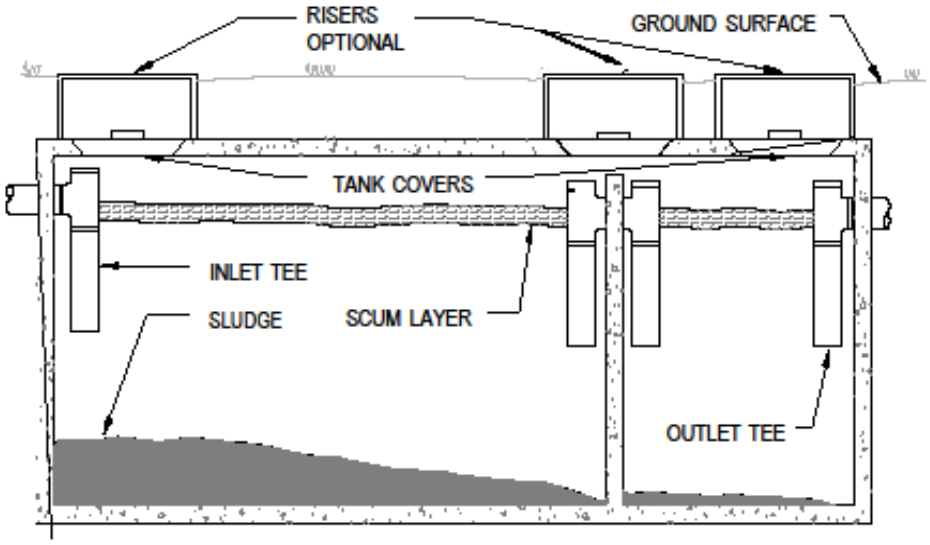
  d. Septic tanks shall be installed in a location that provides access for servicing and pumping.

e. Septic tank construction shall comply with minimum standards set forth in this manual (see Chapter 5), unless otherwise authorized in writing by the Onsite Sanitary Official. A double compartment septic tank shall be used for standard systems.

- Effluent sewer: The effluent sewer shall extend at least three feet beyond the septic tank before connecting to the distribution unit. It shall be installed with a minimum fall of four inches per 100 feet, but in no instance shall there be less than two inches of fall from one end of the pipe to the other. Effluent sewers which are placed on a steep slope and running a long distance require clay dams in the trench containing the effluent sewer. The purpose of the dams is to prevent water from running along the pipe and concentrating at the terminal end, thus over-saturating the dispersal trench or causing a wet surface area.



- STANDARD SEPTIC TANK



- STANDARD SEPTIC TANK WITH 2ND COMPARTMENT DRAW-DOWN

TOWN OF PARADISE ONSITE SANITATION DIVISON	Revised 03-01-16	SEPTIC TANK WITH SANITARY T BAFFLE	**Figure** **4.2**

Distribution boxes

Distribution boxes are mandatory for parallel (equal) distribution to dispersal trenches. The distribution box must be on a stable, level native soil or compacted soil base if it is to function properly. A typical parallel (equal) distribution system is illustrated in Figure 4.3. A typical distribution box installation is shown in Figure 4.4. Distribution box specifications are presented in Chapter 5. Other requirements are listed below:

- The distribution box shall be placed on a stable, level native or compacted soil base.

- Outlets: A separate outlet shall be provided for each distribution pipe. The inverts of all outlets shall be set at the same level that shall be a minimum of two inches above the bottom of the distribution box. When installation is complete the distribution box shall be filled with water at which time the installation shall be checked to make sure that it is level. Adjustments shall be made as necessary so that all outlets are fixed permanently and securely at exactly the same elevation prior to back-filling.

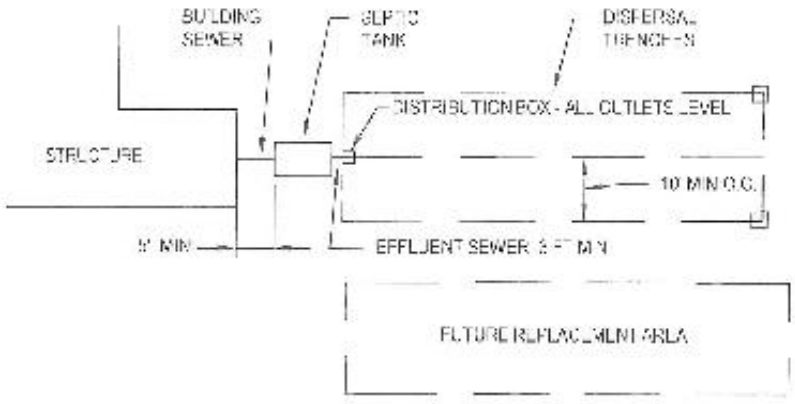
- Inlets: The invert of the inlet shall be at least one inch above the invert of the outlets. Where dosing is used, or where the connecting pipe from the septic tank has a steep slope, measures shall be taken to prevent direct flow of septic tank effluent across the distribution box resulting in unequal distribution of septic tank effluent among the distribution outlets.

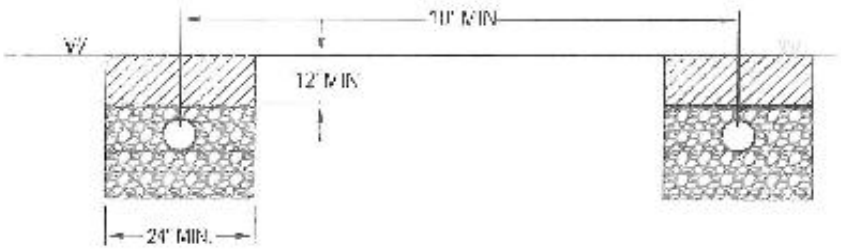
- Access: Distribution boxes shall be provided with a means of access which may be a removable lid for smaller boxes or an access port for larger boxes. Access openings must be large enough for easy removal of accumulated solids and inspection of the inlet and all outlets. Openings must be watertight and also extend to within eighteen inches of the finished grade.

- All distribution box locations shall be permanently marked with a steel post, concrete marker, access riser or other durable material. Traffic shall not be allowed on the distribution box unless the box is constructed to withstand vehicle forces and is provided with a traffic rated access riser.

DISPERSAL FIELD REQUIREMENTS

1. THE DISPERSAL TRENCH ENDS CAN BE CONNECTED IF LEVEL WITH EACH OTHER
2. MAXIMUM TRENCH DEPTH INTO NATIVE SOIL IS 48"
3. MAXIMUM LEACHROCK DEPTH IS 30"
4. DISTRIBUTION BOXES REQUIRED AT END OF EFFLUENT SEWER AND ANY DIRECTION CHANGE OVER 90 DEGREES

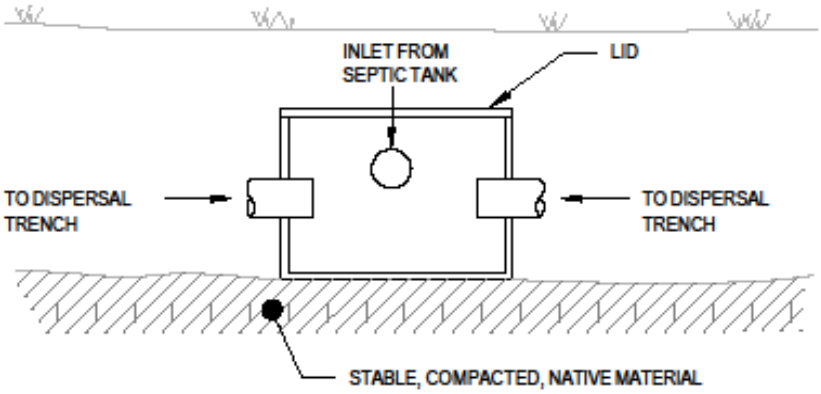




GRAVITY DISPERSAL

NOT TO SCALE

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 05-01-16	TYPICAL EQUAL DIST. SYSTEM	Figure 4.3



DISTRIBUTION BOX- EQUAL

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	TYPICAL DISTRIBUTION BOX	Figure 4.4

D. Drop boxes

Drop boxes are used for serial distribution to dispersal trenches. A typical serial distribution system is shown in Figure 4.5. Construction, installation, inlets, and access requirements are the same as for distribution boxes with the addition of overflow piping. Specific information about drop boxes is included in Chapter 5 Serial distribution is allowed only when it is impractical to provide equal distribution to the dispersal field and upon approval by the Onsite Sanitary Official.

The overflow pipe to the next dispersal trench shall be set so that the upper dispersal trench is full before the flow spills over to the next dispersal trench. The overflow pipe between drop boxes shall be watertight. It shall be placed in a trench dug only deep enough to allow connection to the next lower drop box. The soil back-filled around the overflow pipe shall be carefully compacted below and around it to prevent seepage along the pipe between dispersal trenches. The drop box shall set on a firm base and carefully back-filled so as to prevent settlement or other movements.

E. Gravity-fed dispersal field

A "standard" system will use a gravity-fed dispersal field, as described below.

- The absorptive area of a trench is calculated by counting soil sidewall area only. The soil sidewall that is in contact with the gravel up to two inches above the distribution pipe is considered absorptive area. In the case where leachfield chambers are used instead of leachrock the sidewall area of the chambers that has slots or louvers is regarded as the sidewall absorptive area. The bottom area of a dispersal trench is not counted as absorptive area unless the septic system provides advanced treatment to the wastewater effluent prior to it being discharged.

- Sizing: Dispersal trenches shall be designed and sized based on the guidelines in this manual (Table 4.1). A typical dispersal trench design is shown in Figure 4.6.

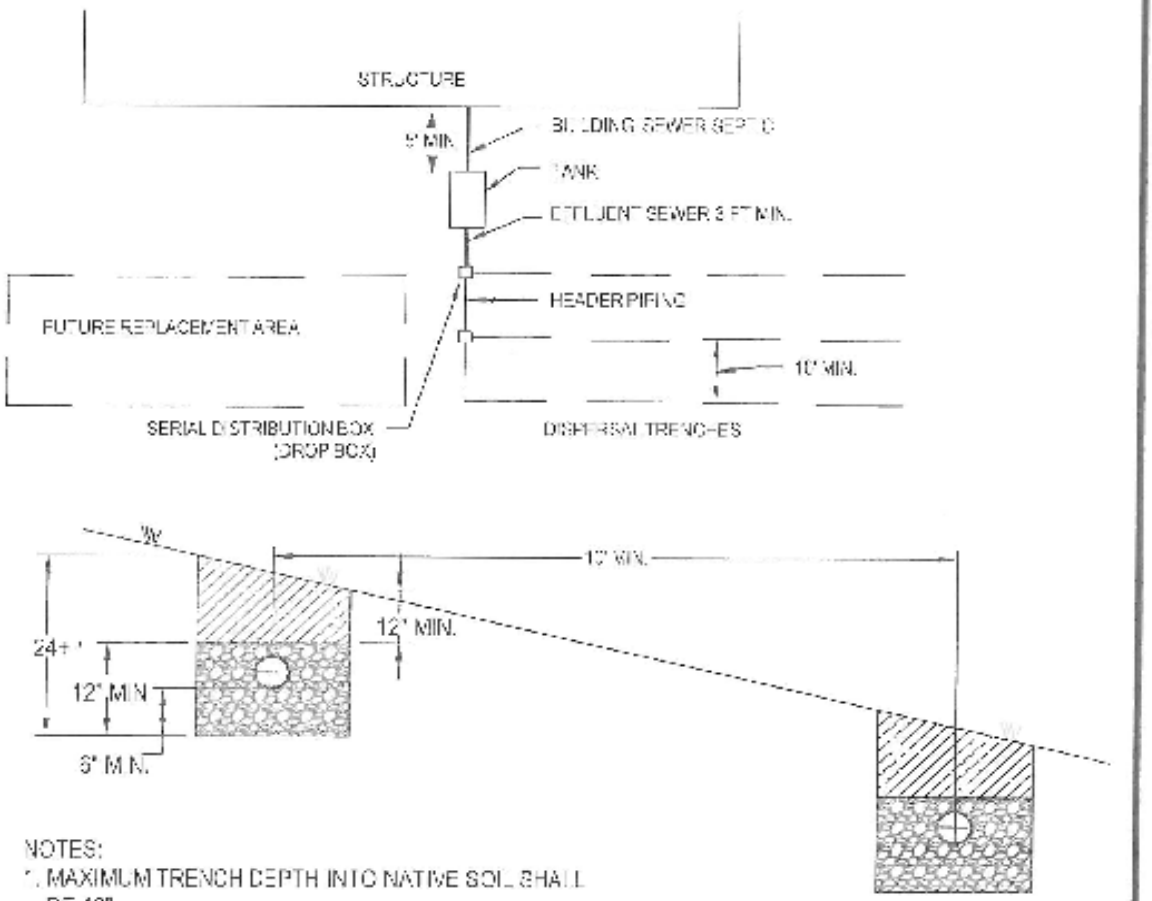
- Dispersal trenches shall be constructed in accordance with the standards contained in Table 4.2, unless otherwise allowed by the Onsite Sanitary Official.

- Construction shall not be allowed by the Town when the soil has a moisture content that will cause permanent damage to the soil. Soil smearing can effectively seal trench walls. When the sidewall within the dispersal trench has been smeared or compacted, sidewalls shall be raked to insure permeability. All smeared material shall be removed from the dispersal trench prior to leachrock placement.

- The bottom of the dispersal trench shall be level within a tolerance of minus two inches per 100 feet.

- Dispersal trenches shall not be constructed in a manner that would allow septic tank effluent to flow backwards from the distribution pipe to undermine the distribution box, the septic tank, or any portion of the distribution unit.

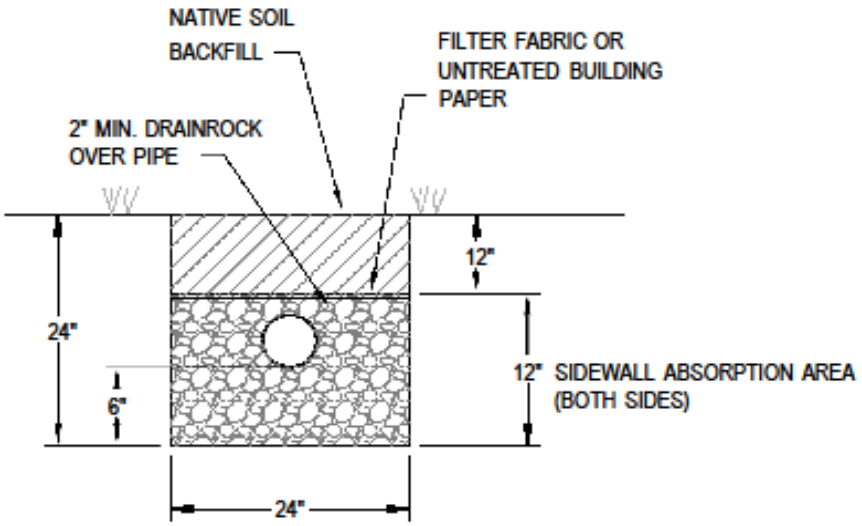
- A minimum of twenty-four inches of drainrock shall extend across the full width of the dispersal trench. There shall be six inches minimum of drainrock under the pipe, four inches of drainrock around the pipe and two inches minimum of drainrock above the pipe.



NOTES:
1. MAXIMUM TRENCH DEPTH INTO NATIVE SOIL SHALL BE 48".
2. MAXIMUM LEACHROCK DEPTH IS 30".

NOT TO SCALE

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	TYPICAL SERIAL DISTRIBUTION WITH DROP BOXES	Figure 4.5



1. Maximum trench depth is 48" into native soil
2. Maximum drain rock depth is 30"

NOT TO SCALE

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	STANDARD GRAVITY DISPERSALTRENCH	**Figure** **4.6**

TABLE 4.1
REQUIRED LINEAL FEET OF DISPERSAL TRENCH
THAT HAS TWELVE INCHES OF DRAINROCK
RECEIVING PRIMARY TREATED EFFLUENT

Number of bedrooms	Design flows (gal/d)[b,e]	All non-sandy soils with <50% fragments smaller than 3 in.[c]	Loam or clay loam or clay >50% coarse fragments larger than 3 in.[d]
1	150	150	250
2	225	225	325
3	300	300	400
4	375	350	450
5	450	400	500
6	525	450	550
7	600	500	600

[a] Dispersal trench sizing for gravity and pressure distribution of effluent that has not undergone secondary treatment.
Loading rates are based on the long term acceptance rates for loam, clay loam, and well structured clays.
[b] Design flows provide a safety factor to cover those individual homes which produce high flow rates.
[c] Soil application rate of .5 gallons/ft^2/day for sidewall area only.
[d] Soil application rate of .375 gallons/ft^2/day for sidewall area only.
[e] Soils containing excessive amounts of clay must have dispersal trench lengths increased based upon soil percolation rate.

TABLE 4.2
STANDARD DISPERSAL TRENCH SPECIFICATIONS

Item	Value
Maximum length of trench	125 feet
Minimum bottom width of trench	24 inches
Minimum depth of trench, using:	
Equal or loop distribution	24 inches
Serial distribution	24 inches
Minimum distance of undisturbed earth between trenches:	
24 to 36 inch wide trenches	8 feet
12 to 18 inch wide trenches	6 feet
Maximum depth of trenches below native soil surface	48 inches[1]
Minimum depth of total drainrock	12 inches
Minimum depth below pipe	6 inches
Minimum depth above pipe	2 inches
Maximum depth of total drainrock - all leach trenches	30 inches
Minimum soil backfill over drainrock	12 inches for gravity or pressure distribution

[1] Trench depths into native soil in excess of forty-eight inches and up to 60 inches may be allowed if; repair construction, there are no other options, minimum separation distances are maintained.

- Prior to backfilling the dispersal trench, the drainrock shall be covered with filter fabric or other material approved by the Onsite Sanitary Official to prevent fines from filling the gravel.

- The installation of a piezometer in each trench is highly recommended, but not required, for standard systems (see Appendix B).

- Dispersal trench backfill:

  a. Backfill shall be placed carefully to prevent damage to the system. Extra backfill is required over the dispersal trenches to allow for settling. The backfill shall not be compacted. The dispersal trenches should not become depressions. Wheeled tractors must be operated with care over constructed dispersal trenches to avoid damaging them. .

b. Backfill shall be free of large stones, clumps of soil, masonry, stumps, or waste construction materials or other materials that could damage the system.

- All surface water shall be directed away from the dispersal field.

- Header pipe shall be watertight, have a minimum diameter of four inches, and be bedded on undisturbed native soil or compacted soil. Where distribution boxes or drop boxes are used, header pipe shall be at least two feet in length. See Chapter 5.

- Distribution pipe:

  a. Distribution pipes shall have a minimum diameter of four inches.

  b. Each dispersal trench shall have distribution piping that is centered in the trench and laid level within a tolerance of minus one inch/100 feet of leachline.

  c. Distribution piping shall comply with the standards listed in Chapter 5.

  d. All perforated pipe shall be installed with centerline markings up.

All other systems described hereafter shall comply with the conditions set forth for standard systems except as indicated by additions and substitutions required for alternative systems.

4.2 ADVANCED TREATMENT SYSTEMS

It may be necessary to provide advanced treatment to septic tank effluent where restrictive layers are present, in areas of high groundwater, on sites with excessively permeable soil, or where dispersal area is limited. Advanced treatment systems are considered to be "alternative systems" by the Town of Paradise. Parcels that have septic systems that are discharging effluent that has undergone advanced treatment are allowed to have a gross hydraulic loading rate of 2000 gpd/acre, whereas parcels that do not have advanced treatment are allowed 900 gpd/acre, (excluding the downtown adjustment area). Advanced treatment is also known as secondary treatment and must meet certain design requirements as described in Chapter 6 of this manual.

A. General conditions for approval

Bottomless sand or fine gravel filters may be permitted when all of the following minimum site conditions are met:

- General conditions for bottomless sand filter placement:

  a. Slope is forty-five percent or less. Refer to Section 4.7 for steep slope (thirty to forty-five percent) conditions.

b. Setbacks shown in Table 3.1 can be met

c. Soil beneath a bottomless sand filter shall be at least three feet in depth above a temporary water table or restrictive soil or rock layer.

B. Sand filters - General

A sand filter system consists of a septic tank, a dosing system with effluent pump and controls or a dosing siphon, bed of sand, and a separate dispersal field (for contained sand filters). A two foot bed of medium sand serves as an aerobic site for microorganisms, which live on the surface of the sand grains. All or portions of the sand bed will require replacement at some point in time depending on operation practices and inert, non-biodegradable material contained in the waste.

C. Sand filter - contained

A contained sand filter consists of an impermeable container filled with a minimum of two feet of medium sand designed to filter and biologically treat septic tank or other treatment unit effluent from a pressure distribution system at an application rate not to exceed 1.23 gallons/ft^2/day of sand surface area, applied at a dose not to exceed twenty percent of the projected daily sewage flow. A typical contained sand filter is shown in Figure 4.7.

Construction:

- Use guidelines for the distribution as outlined in pressure distribution systems.
- Filters can be placed above or below grade.
- A separate dispersal bed is provided.
- Media specifications: effective size 0.30 - 0.50 millimeters, uniformity coefficient of four or less. The media shall conform to the gradation shown below. The sand must be washed as to be free of fines and approved by the system designer prior to delivery to the site.

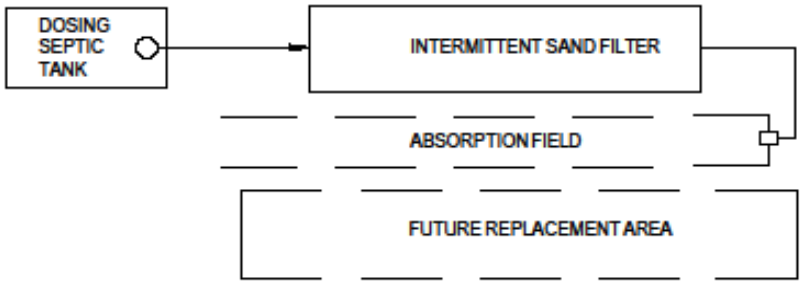
Sieve Size	Percent Passing
3/8 inch	100
No. 4	40 100
No. 10	62 100
No. 16	45 82
No. 30	25 / 55
No. 50	5 20

No. 60	0 10
No. 100	0 4

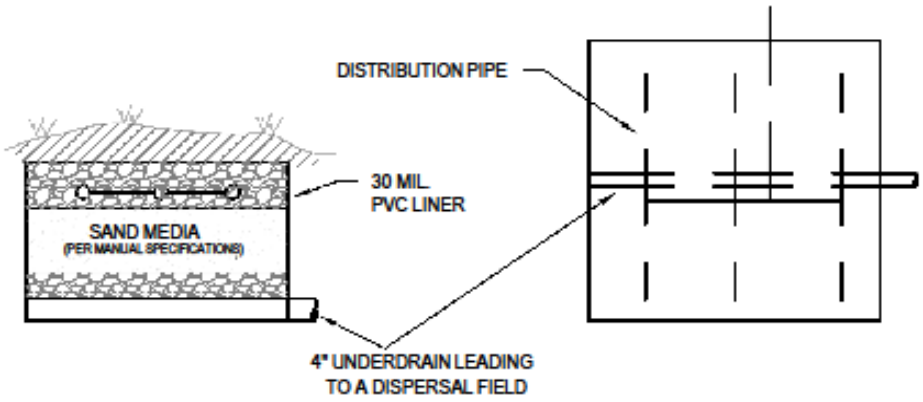
D. Sand filter - bottomless

A bottomless sand filter consists of two feet of medium, washed sand which is pressure dosed and effluent is allowed to drain through the sand directly into the soil beneath. A typical bottomless sand filter is illustrated in Figure 4.8. A bottomless sand filter can typically be used in soils with rapid permeability provided that the required groundwater separation distances are provided.

Maximum loading rates for bottomless sand filters are the same as for contained sand filters. The underlying soil must accept the treated effluent at a rate greater than 5 gallons/ft^2/day. Soil hydraulic testing procedures are outlined in Appendix C.



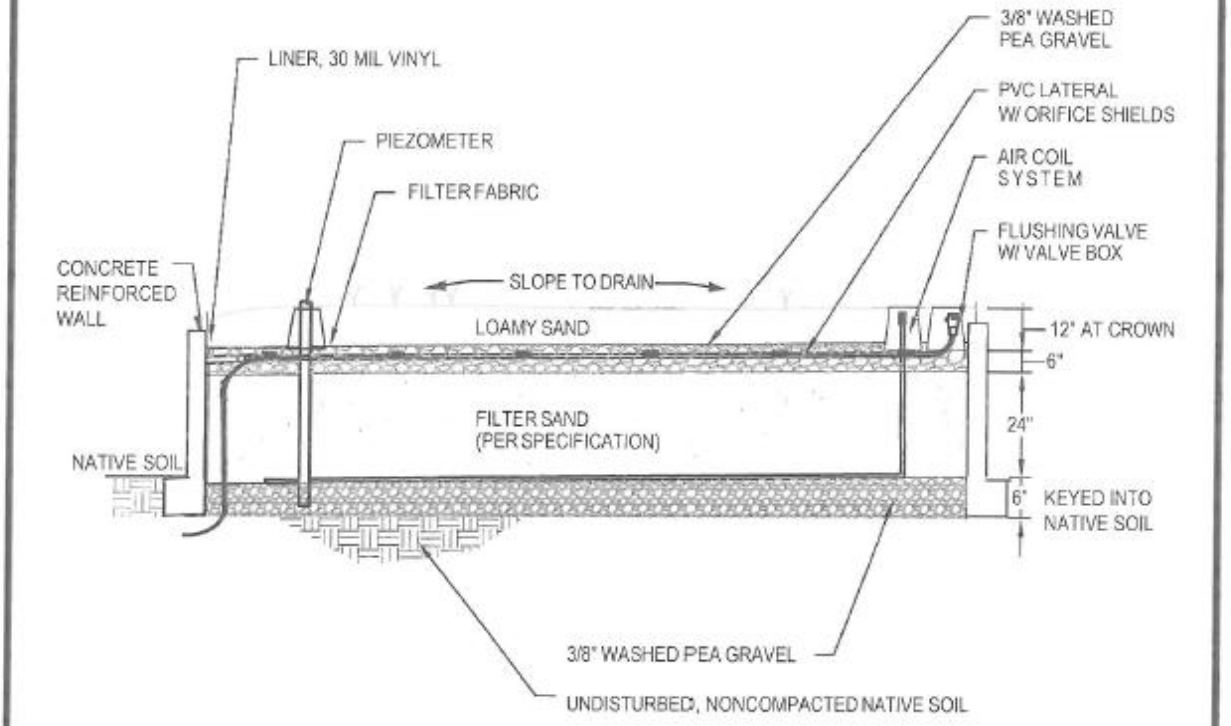
SYSTEM SCHEMATIC



TYPICAL CROSS SECTION

PLAN VIEW

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	TYPICAL INTERMITTENT DOSING SANDFILTER	Figure 4.7



NOT TO SCALE

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	BOTTOMLESS SAND FILTER BED	Figure 4.8

Construction:

- Use guidelines for the distribution as outlined in pressure distribution systems.
- Filters can be placed above or below grade.
- Media specifications: effective size 0.30 - 0.50 millimeters, uniformity coefficient of four or less. The media shall conform to the gradation shown below. The sand must be washed so as to be free of fines and approved by the system designer prior to delivery to the site.

Sieve Size	Percent Passing
3/8 inch	100
No. 4	40 - 100
No. 10	62 - 100
No. 16	45 - 82
No. 30	25 - 55
No. 50	5 - 20
No. 60	0 - 10
No. 100	0 - 4

E. Recirculating gravel, textile or other media filter

Effluent from the septic tank flow to a recirculation tank (see Figures 4.9 and 4.10). Here it mixes with treated effluent returning from a gravel, textile or other media filter unit. A gravel filter typically has two feet of washed rounded gravel. A timer controls a pump used to pressure dose the filter, usually two-three times per hour. A valve or other splitter mechanism allows effluent returning from the filter to either enter the tank or to be discharged to the dispersal field, depending on the liquid level..

- The filter loading rates are based on five gallons/ft^2/day based on the wastewater flow rate.
- Wastewater recirculation ratios will vary from 3:1 to 6:1 (recirculation flow to wastewater flow).

- Soil beneath dispersal fields receiving treated effluent from recirculating gravel, textile or other media filter shall be at least two feet in depth above a temporary water table or restrictive soil or rock layer.

Construction:

- Media specifications for gravel: the effective size is three millimeters with a uniformity coefficient of two or less. The gravel shall have less than two percent passing through the No. 10 sieve and shall have one hundred percent passing the No. 4 sieve. The media must be washed as to be free of fines and must be approved by the designer prior to delivery to the site.

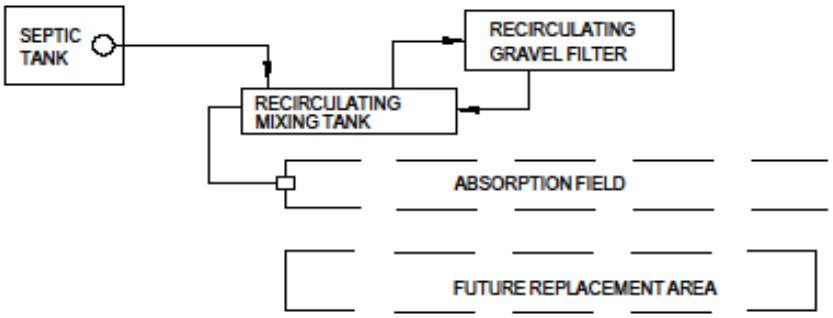
    - Containers are rigid with solid construction and must be watertight.. Use the same guidelines for containers as for contained sand filters.

F. Other types of advanced treatment systems

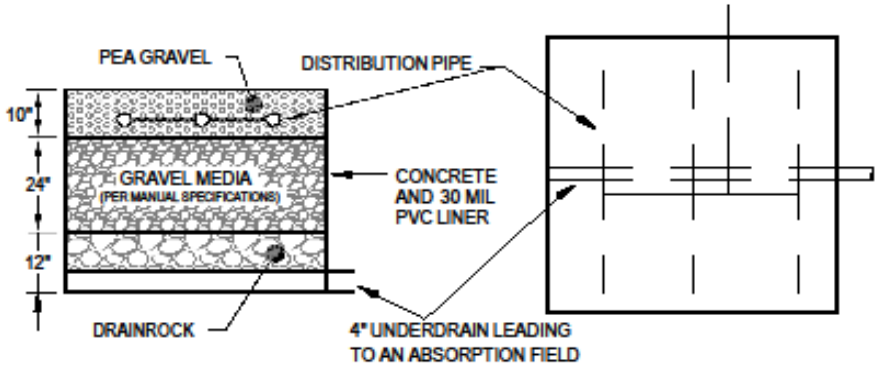
Other advanced treatment systems which vary in design from the filters mentioned in this manual may be authorized by the Town if it is demonstrated that the systems produce effluent quality that meets required standards. Except for bottomless sand filters all advanced treatment systems must have the ability to be sampled for effluent quality. Advanced treatment systems that have an NSF/ANSI certification will be regarded favorably as to their design and construction. Refer to Chapter 7 for approval procedures.

G. Advanced treatment system disposal fields

The minimum total lengths of dispersal trenches for advanced treatment systems serving single family homes are indicated in Table 4.3. For all types and designs of advanced treatment systems the application rate in a dispersal field shall not exceed 1.0 gallons/ft^2/day. Dispersal trenches are allowed to combine sidewall and bottom areas, based on the design flow rate, as discussed in Chapter 6. Dispersal beds cannot use sidewall area in their calculations for total absorptive surfaces. Applications submitted for new construction are required to indicate the original and replacement dispersal field locations.



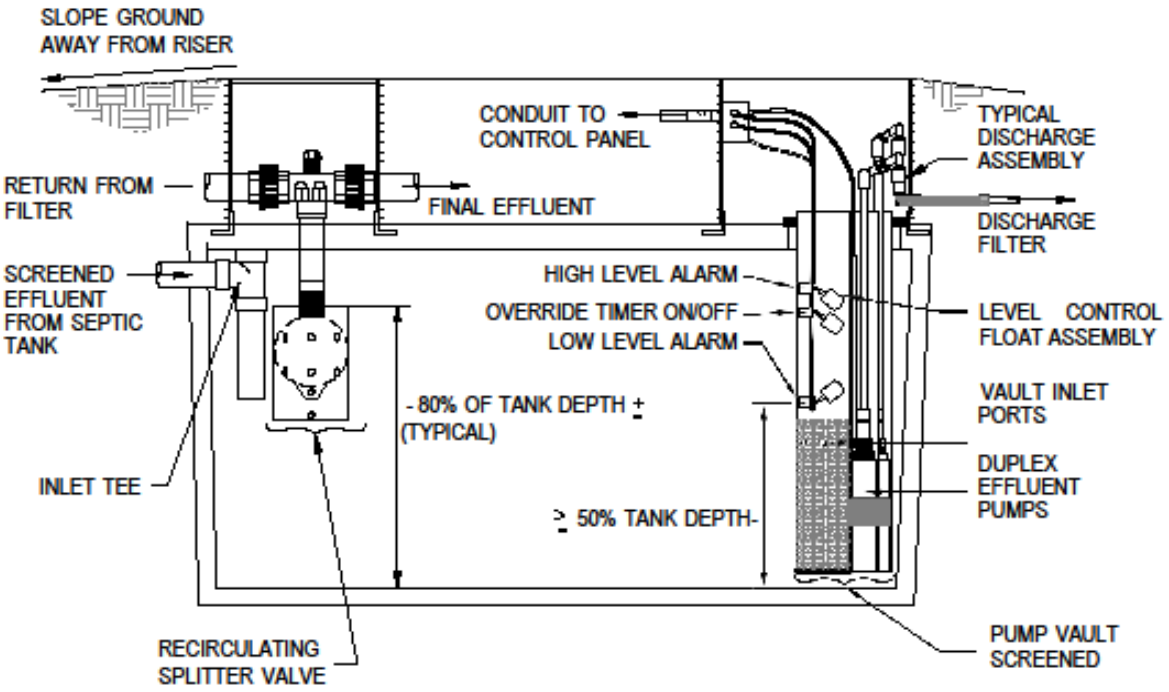
SYSTEM SCHEMATIC



TYPICAL CROSS SECTION

PLAN VIEW

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	RECIRCULATING GRAVEL FILTER TYPICAL	**Figure** **4.9**



TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	RECIRCULATING RECIRCULATING TANK TYPICAL	**Figure** 4.10

TABLE 4.3
SIZING FOR DISPERSALTRENCHES WITH 12 IN. OF DRAINROCK RECEIVING SECONDARY TREATED EFFLUENT *

Number of bedrooms	Design flows (gal/d)	Lineal feet
1-3	300	100
4	375	125
5	450	150
6	525	175
7	600	200

* For slowly permeable soils and fractured bedrock, infiltration tests shall be performed in accordance with Appendix C.

The allowable soil hydraulic loading rates are higher with advanced treatment systems because:

- Advanced treatment reduces soil clogging which allows higher loading rates.
- The bottom area of dispersal trenches are effective absorption surfaces for secondary treated effluent, because secondary treated effluent is much 'cleaner' than primary treated effluent and does not develop a clogging mat. Therefore secondary treated dispersal trenches have more usable surface area than primary treated dispersal trenches

H. General requirements for advanced treatment systems

- All materials used in filter system construction shall be structurally sound, durable and capable of withstanding normal installation and operation stresses. Component parts subject to malfunction or excessive wear shall be readily accessible for repair and replacement.
- All filter containers shall be placed over a stable level base.
- Piping and fittings for the filter distribution system shall be as required under pressure distribution systems.
- A method for sampling treated effluent shall be provided except for bottomless sand filters.
- The specific requirements for septic tanks, dosing tanks, etc. in Chapter 5 shall be met.
- A piezometer shall be installed adjacent in each dispersal trench (see Appendix B).

- The applicable components of the advanced treatment system shall meet minimum specifications indicated in Chapter 5 unless otherwise authorized in writing by the Onsite Sanitary Official.

- Container design and construction: Container may be constructed of concrete or other materials where equivalent function, workmanship, water-tightness and at least a thirty-year service life can be documented. A flexible membrane liner (FML) is permitted provided that it is made of material with the following properties:

    a. Materials are at least equivalent to thirty milliliter unreinforced polyvinyl chloride (PVC) described in Chapter 5.

    b. Have field repair instructions and materials which are provided to the purchaser with the liner; and

    c. Have factory fabricated "boots" suitable for field bonding onto the liner to facilitate the passage of piping through the liner in a waterproof manner. Where accepted for use, flexible sheet membrane liners shall be placed against relatively smooth, regular surfaces comprised of rigid, solid approved materials. Surfaces shall be free of sharp edges, corners, roots, nails, wire, splinters and other projections which might puncture, tear, or cut the liner. A four-inch bed of clean sand or a nondegradable filter fabric acceptable to the Town shall be used to provide liner protection.

- The designer of an advanced treatment system shall supply both the owner and the Onsite Sanitary Official with system operations and maintenance instructions.

I. Operation and maintenance

Operation, Maintenance, Monitoring and reporting shall be as outlined in Chapter 1.4.A. Alternative and Innovative Advanced Treatment Systems, of this Manual.

The owner/purchaser of an advanced treatment system must recognize that he/she assumes the continuous responsibility to preserve the installation as near as practical to its "as built" state. This responsibility includes erosion control, fencing out of livestock and the control of burrowing animals.

J. Operations and maintenance instructions

As a minimum, the operations and maintenance instructions shall include the following information.

- A statement notifying the homeowner of his/her responsibility for maintaining the system in proper working condition.

- A complete description of the system and components. Include process description for the homeowner and design criteria.

- Instructions on how to properly set pump control equipment.

- How treated effluent can be sampled.
- How and when to inspect and flush distribution laterals.
- What to do if the alarm on the control panel activates.
- A system troubleshooting table listing potential problems and their solutions for the septic tank, treatment, and absorption field.
- When to get the septic tank or recirculation tank pumped.
- Safety precautions to be observed.

4.3 PRESSURE DISTRIBUTION

A pressure distribution system is any system designed to intermittently distribute septic tank or other treatment unit effluent uniformly under pressure in a dispersal field or sand filter. Pressure distribution is used to prolong the life of an absorption surface, prevent surfacing of effluent, and allow the use of narrow dispersal trenches which can be built closer together on sites with limited area. Any system using pressure distribution will be considered "alternative" by the Town of Paradise.

A. General conditions for approval

A pressure dosed dispersal field will not be permitted on a site if a standard system would be acceptable. Pressurized distribution systems may otherwise be permitted where this method of effluent distribution is desired.

B. Requirements

A typical dosing tank is shown in Figure 4.11. A single compartment septic tank may be used if the pump or siphon is located in a screened vault.

All materials used in pressurized systems shall be structurally sound, durable, and capable of withstanding normal stresses incidental to installation and operation. Nothing in these rules shall be construed to set aside applicable building, electrical, or other codes.

Pressurized distribution piping: Piping, valves and fittings for pressurized systems shall meet the following minimum requirements, as well as the applicable requirements presented in Chapter 5.

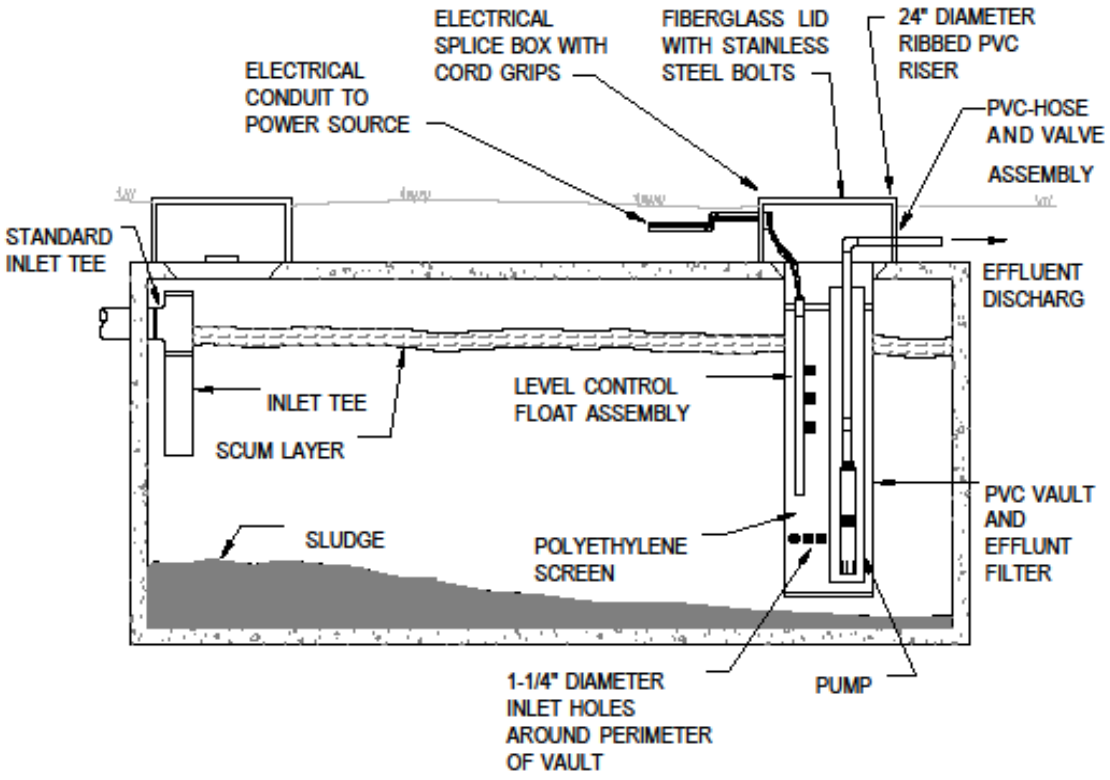
- All pressure transport, manifold, lateral piping, and fittings shall meet or exceed the requirements for Class 200 PVC 1120 pressure pipe as identified in ASTM Specification D2241.

- Pressure transport piping shall be uniformly supported along the trench bottom, and at the discretion of the Town, It shall be bedded in sand or other material approved by the Onsite Sanitary Official. A fourteen gauge tracer wire shall be placed above piping if it crosses property lines or enters public property or right of way.

- Orifices shall be located on top of the pipe.

- The ends of lateral piping shall be provided with threaded plugs or caps and extend to the surface for cleaning purposes.

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



TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	DOSING SEPTIC TANK TYPICAL	Figure **4.11**

- A ball valve shall be placed on the pressure transport pipe, in or near the dosing tank, when appropriate.

- A check valve shall be placed between the pump and the ball valve.

- Antisiphon valves shall be placed between the pump and ball valve when pumping down slope.

Dispersal trench sizing and construction: A pressurized system using dispersal trenches shall be designed and sized in accordance with the requirements for a standard system (see Figure 4.1). Dispersal trenches can be narrow or standard width. A typical pressure dosed dispersal trench is shown in Figure 4.12. Dispersal trenches shall be constructed based on the following guidelines.

- Pressure lateral piping shall not have less than six inches of drain rock below, nor less than four inches of drain rock above the piping.

- The top of the filter material shall be covered with filter fabric, or other non-biodegradable material permeable to fluids that will not allow passage of soil particles coarser than very fine sand.

- A piezometer shall be installed adjacent to each absorption trench (see Appendix B).

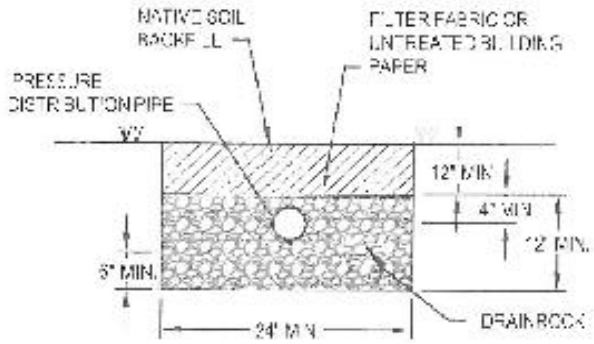
- Hydraulic design criteria: Pressurized distribution systems shall be designed for appropriate head and capacity. Head calculations shall include maximum static lift, pipe friction, and orifice head requirements.

    a. Where pumps are used, static lift shall be measured from the minimum dosing tank level to the highest pipe elevation.

    b. Pipe friction shall be based upon a Hazen Williams coefficient of smoothness of 150. The head loss across a lateral with multiple evenly spaced orifices may be considered equal to one-third of the head loss that would result if the entrance flow were to pass through an equivalent of similar un-perforated pipe length.

    c. There shall be a minimum head of five feet (up to ten feet is desirable) at the most remote orifice and no more than a ten percent head variation between nearest and most remote orifice in an individual lateral.

NOTES;
1. MAXIMUM TRENCH DEPTH IS 48"
2. MAXIMUM ROCK DEPTH IS 30"



NOT TO SCALE

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised 03/01/16	PRESSURIZED DISPERSAL TRENCH	Figure 4.12

- The capacity of a pressurized distribution system refers to the rate of flow given in gallons per minute.

    a. Lateral piping shall have one-eighth inch maximum discharge orifices spaced evenly.

    b. The system shall be dosed at a rate not to exceed twenty percent of the design daily wastewater flow.

    c. The effect of back drainage of the total volume of effluent within the pressure distribution system shall be evaluated for its impact upon the dosing tank and pump operation.

- Orifice spacing: The objective of pressure dosing is to produce unsaturated flow in a trench with no clogging mat. In typical soils found in the Town a spacing of two feet between orifices is adequate. Wider spacing may be approved based on a qualified engineers design.

C. Operation and maintenance

System operation and maintenance tasks and requirements shall be as specified on the operating permit and the designer's operations and maintenance instructions. The system owner shall be responsible for the continuous operation and maintenance of the system. Each system will be inspected by the Town on a regular basis.

The owner/purchaser of a pressure distribution system must recognize that he/she assumes the continuous responsibility to preserve the installation as near as practical in its "as built" state. This responsibility includes erosion control, fencing out of livestock and the control of burrowing animals.

D. Operations and maintenance instructions

As a minimum, the operations and maintenance instructions shall include the following information.

- A statement notifying the homeowner of his responsibility for maintaining the system in proper working condition.

- A complete description of the system and components, including a process description for the homeowner and design criteria.

- Instructions on how to properly set pump control equipment.
- How and when to inspect and test dosing tank components.
- How and when to inspect and flush distribution laterals.
- What to do if the alarm on the pump panel activates.
- A system troubleshooting table listing potential problems and their solutions.
- When to get tank(s) pumped.
- Safety precautions to be observed.

4.4 NARROW DISPERSAL TRENCHES

Narrow dispersal trenches are used to allow closer spacing of trenches in difficult-to-construct locations. A diagram of a narrow dispersal trench system is shown in Figure 4.13. Narrow dispersal trench systems shall be considered "alternative" by the Town of Paradise.

A. General conditions for approval

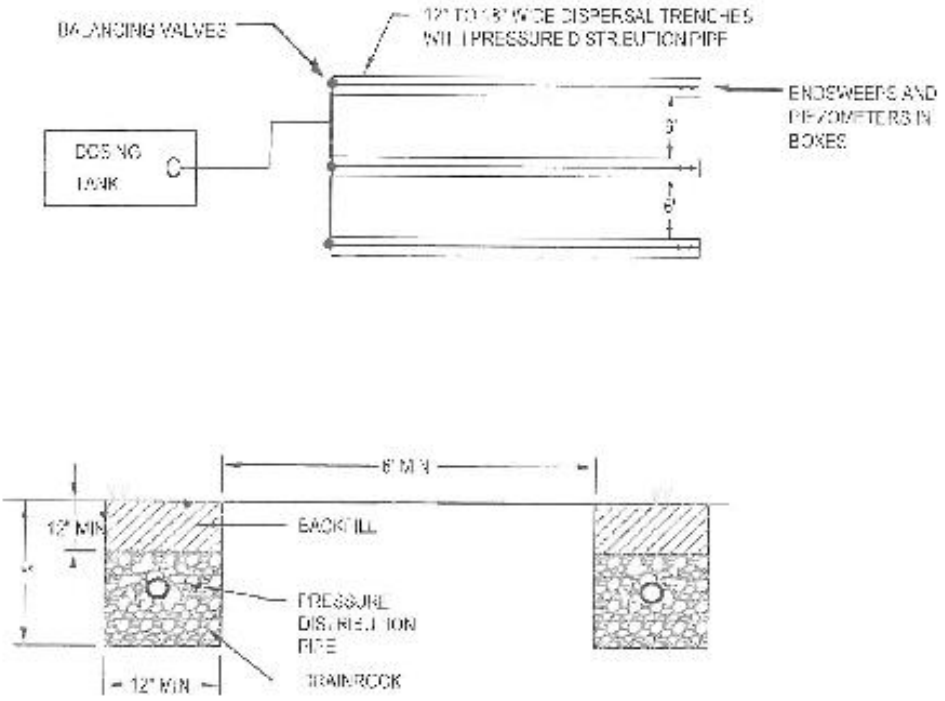
Narrow dispersal trenches will not be permitted on a site if a standard system would be acceptable. Construction permits may be issued by the Town for narrow dispersal trenches for sites that meet the following criteria.

- Any site that meets soil requirements for a standard or pretreated system or
- Those sites where area is limited for dispersal field.

B. Requirements

- All applicable requirements of Section 4.1 apply.
- Minimum dispersal trench width shall be twelve inches, the maximum shall be eighteen inches.
- Minimum distances between dispersal trenches shall be six feet.
- Maximum depth shall be dependent on the depth to restrictive soil horizons and groundwater levels.
- Pressure distribution shall be used as outlined in Section 4.3.
- A piezometer shall be constructed adjacent to each dispersal trench (see Appendix B).

- Narrow dispersal trench fields can be installed in engineered fills. They can have a capping fill (twelve inches) if the soil depth is within twelve inches of the minimum effective soil depth requirements.



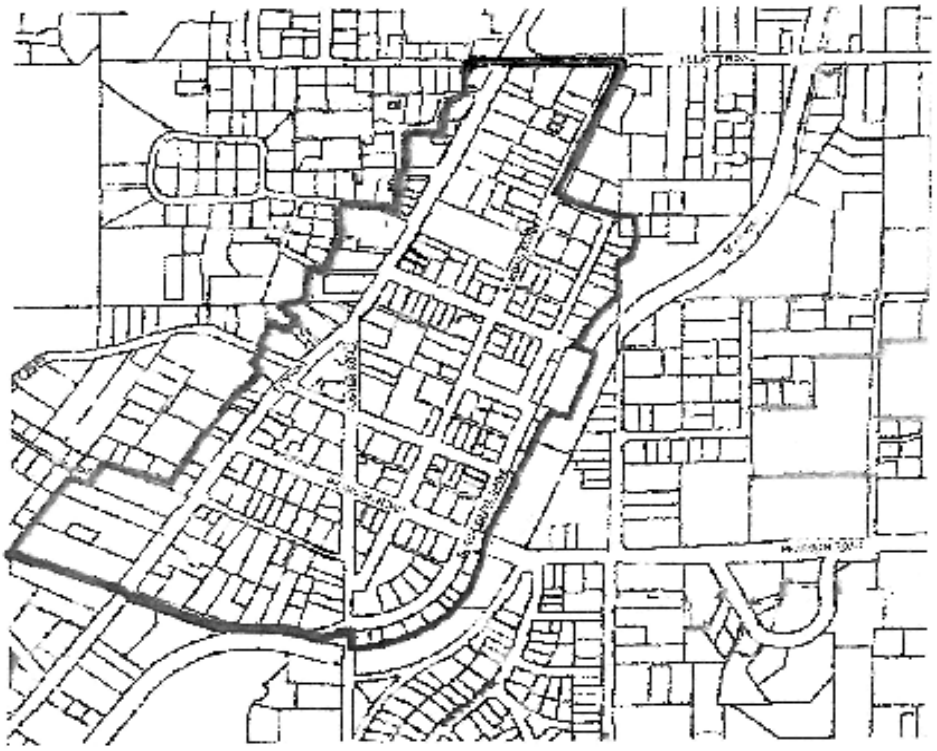
NOTES:
1. MAXIMUM TRENCH DEPTH SHALL BE 48".
2. MAXIMUM TOTAL ROCK DEPTH IS 30".
3. SYSTEM SHALL BE PRESSURE DOSED.
4. WIDTH SHALL BE 12" MINIMUM TO 18" MAXIMUM.

NOT TO SCALE

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised 05-01-16	NARROW DISPERSAL TRENCH - TYPICAL	Figure 4.13

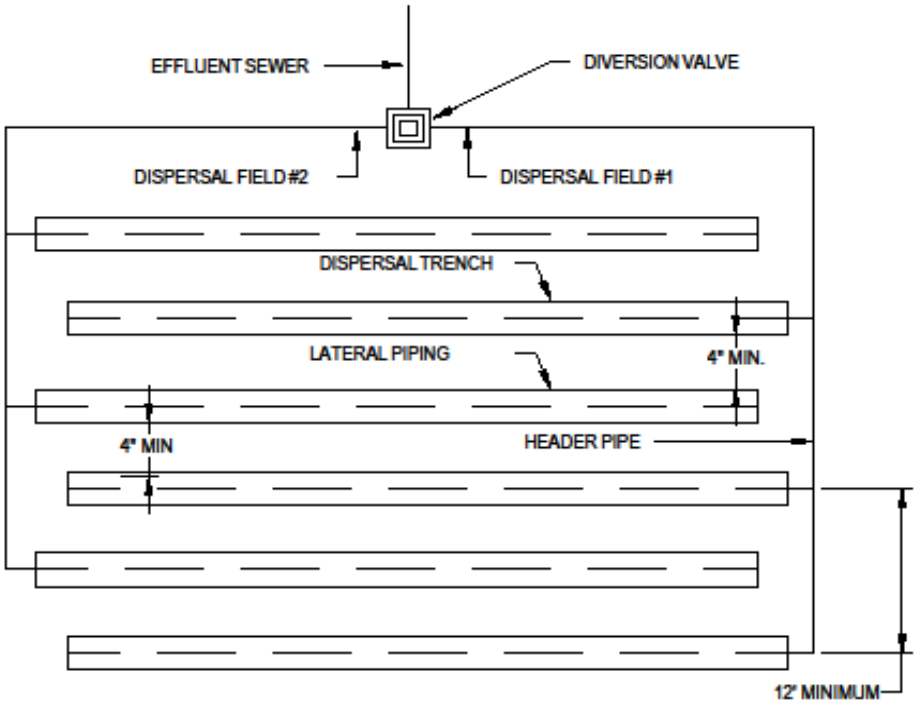
4.5 REDUNDANT SYSTEMS

A redundant dispersal field system is one in which two complete dispersal field systems are installed. The dispersal trenches of each system alternate with each other and only one system operates at any given time. A typical redundant dispersal field system is shown in Figure 4.15. This type of system may be required on small lots where it will be difficult to install a repair dispersal field after the house is built.



DOWNTOWN PARADISE
GROSS HYDRAULIC LOADING RATE SHALL
NOT EXCEED 1350 GALLONS/ACRE/DAY
FOR PRIMARY TREATED WASTEWATER

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Created: 03-21-16	DOWNTOWN PARADISE HYDRAULIC LOADING RATE ADJUSTMENT AREA	**Figure** **4.14**



TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	REDUNDANT SYSTEM	**Figure** 4.15

A. General conditions for approval

A redundant system will not be permitted on a site if a standard dispersal trench system would be acceptable. Construction permits may be issued by the Town for redundant dispersal field systems to serve single family dwellings on sites that meet all the conditions for a standard system. Redundant dispersal systems shall not be used for large systems. Redundant systems shall be considered "alternative" by the Town of Paradise.

B. Requirements

- Each redundant dispersal field system shall contain two complete dispersal fields.
- Each of the two separate dispersal fields shall be adequate in size to accommodate the projected daily wastewater flow from the structure.
- A minimum trench sidewall separation of ten feet (twelve feet on centers) shall be maintained between dispersal trenches designed to operate simultaneously. A minimum trench sidewall separation of four feet (six feet on centers) shall be maintained between adjacent dispersal trenches that are designed to operate alternatively. Dispersal trenches shall be two feet wide for redundant systems.
- A piezometer shall be installed adjacent to each dispersal trench (see Appendix B).
- The diversion valve location shall be marked permanently with a steel post, concrete marker, or other durable material.

C. Operation and maintenance

System operation and maintenance tasks and requirements shall be as specified on the Operating Permit and the designer's operations and maintenance instructions. The system owner shall be responsible for the continuous operation and maintenance of the system. Each system will be inspected by a certified service provider hired by the owner on a regular basis.

The owner/purchaser of the redundant system must recognize that he/she assumes the continuous responsibility to preserve the installation as near as practical in its "as built" state. This responsibility includes erosion control, fencing out of livestock and the control of burrowing animals.

D. Operation and maintenance instructions

As a minimum, the operations and maintenance instructions shall include the following information.

- A statement notifying the homeowner of his/her responsibility for maintaining the system in proper working condition.
- A complete description of the system and components, including a process description and design criteria.

- When and how to alternate the dispersal fields.
- When to have the septic tank pumped.

4.6 STEEP SLOPE SYSTEMS

Slope stability and surfacing of effluent are major concerns when onsite systems are constructed on slopes exceeding thirty percent. Where steep slopes are encountered, dispersal trenches using greater vertical depths of drainrock than standard dispersal trenches can be utilized. All steep slope systems shall be considered "alternative" by the Town of Paradise.

A. General conditions for approval

An onsite system construction permit may be issued by the Town for a steep slope system to serve a single-family dwelling on slopes in excess of thirty percent provided the site meets the following requirements.

- Slope does not exceed forty-five percent.
- The soil is well drained with no evidence of saturation to a depth of eight feet.
- The soil has a minimum effective depth of six and a half feet.
- The construction of a wastewater dispersal field on slopes greater than 30% require a slope stability report approved by a registered professional.

B. Requirements

- Steep Slope dispersal trenches shall be installed at a minimum depth of thirty inches and at a maximum depth that maintains the required separation from the trench base to a restrictive soil horizon or groundwater level. Minimum and maximum dispersal trench depth measurements shall be made from the natural soil surface on the downhill side of the trench, and contain a minimum of eighteen inches of drainrock and twelve inches of native soil backfill. Dispersal trench width can be a minimum of twelve inches (narrow trench design) up to a maximum of thirty-six inches.
- The system shall be sized using the table for Standard Absorption Trench Systems.
- Steep slope dispersal trenches can be excavated manually. All smeared and compacted surfaces in the dispersal trench shall be removed before any filter material (drainrock) is placed.
- A piezometer shall be installed in each dispersal trench (see Appendix B).
- No large or community systems will be allowed on steep slopes. See Chapter 6.

4.7 CAPPING FILL SYSTEMS

A capping fill is a system where the effective sidewall of the dispersal trench is installed a minimum of twelve inches into natural soil and covered with a soil cap of specified depth and texture. A capping fill dispersal system is used where the site is lacking in effective soil depth or depth to groundwater. A typical capping fill is shown in Figure 4.16. All capping fill systems shall be considered "alternative" by the Town of Paradise.

A. General conditions for approval

To be approved for a capping fill system, each site must meet all of the following conditions.

- Slope does not exceed twelve percent. (Special designs may allow installation on steeper slopes.)

- Any site which can meet all the rules for a standard system or a pretreatment system except where effective soil depth (soil depth, depth to seasonal or permanent water table, depth to rapidly draining material) is lacking by twelve inches or less.

- Soil permeability from the ground surface to the layer that limits effective soil depth is adequate to accept wastewater flow plus rainfall.

B. Requirements

The cap shall be constructed pursuant to permit requirements. Unless otherwise required by the Onsite Sanitary Official, construction sequence shall be as follows:

- The soil shall be examined and approved by the designer prior to placement. The texture of the soil used for the cap shall be of the same textural class, or one textural class coarser than the natural topsoil.

- Construction of capping fills shall occur between June 1 and October 1 unless otherwise allowed by the Onsite Sanitary Official. The upper eighteen inches of natural soil must not be saturated or at a moisture content which causes loss of soil structure and porosity when worked.

- The dispersal trench area and the soil cap borrow site shall be scarified prior to construction to destroy the vegetative mat. Rototilling is the preferred method.

- The system shall be installed as specified in the construction permit. There shall be a minimum of ten feet of separation between the edge of the fill and the outside sidewalls of the dispersal trenches.

- The first six inches of the fill shall be mixed thoroughly with the native soil. Fill material shall be evenly graded to a final depth of sixteen inches over the drainrock. Drainrock shall

be covered by filter fabric prior to the placement of the soil cap. Both initial cap and repair cap may be constructed at the same time if the owner wishes.

- A piezometer shall be installed adjacent to each dispersal trench (see Appendix B).

C. Required inspections

The following minimum inspections shall be performed for each capping fill installed:

- The dispersal trench area and soil cap borrow material must be inspected for scarification, soil texture, and moisture content, prior to cap construction.
- Precover inspection of the installed dispersal field.
- Inspection of adequate contact between fill material and native soil (no obvious contact zone visible), adequate depth of material, and uniform distribution of fill material.
- Final inspection after landscaping. The operating permit will be issued after the final inspection.

D. Operation and maintenance

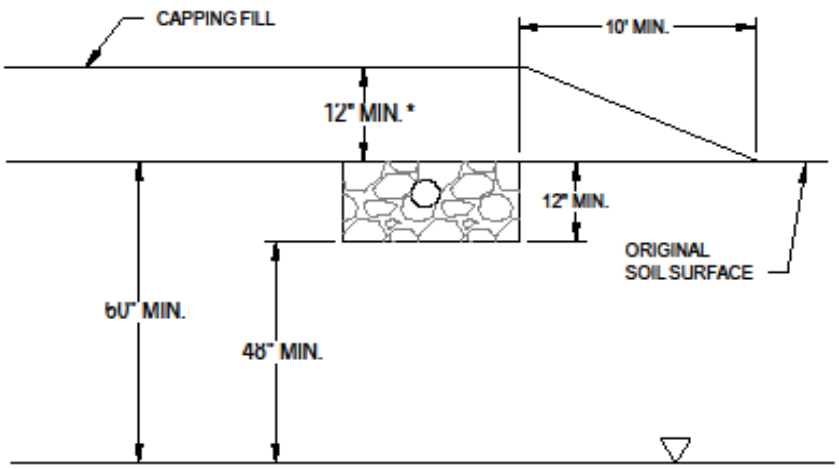
System operation and maintenance tasks and requirements shall be as specified on the operating permit and the designer's operations and maintenance instructions. The system owner shall be responsible for the continuous operation and maintenance of the system. Each system will be inspected by the Town on a regular basis.

The owner/purchaser of a capping fill system must recognize that he/she assumes the continuous responsibility to preserve the installation as near as practical in its "as built" state. This responsibility includes erosion control, fencing out of livestock and the control of burrowing animals.

E. Operation and maintenance instructions

As a minimum, the operation and maintenance instructions shall include the following information.

- A statement notifying the homeowner of his/her responsibility for maintaining the system in proper working condition.
- A complete description of the system and components.
- How to properly maintain the integrity of the fill.



TEMPORARY HIGH OR PERMANENT WATER TABLE
OR SOIL RESTRICTIVE LAYER

* 16" DEPTH BEFORE SETTLING

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised 03-01-16	CAPPING FILL TYPICAL	**Figure** **4.16**

4.8 PERIMETER DRAIN or TILE DEWATERING SYSTEM

A perimeter drain or tile dewatering system is used to lower the groundwater level on sites with slopes less than three percent. A trench is constructed around the entire dispersal field area to collect and divert groundwater away from the dispersal facility. A typical perimeter drain system is shown in Figure 4.17. All drain systems shall be considered "alternative" by the Town of Paradise.

A. General conditions for approval

Construction permits may be issued by the Town for a perimeter drain system provided the site can meet the following requirements.

- The site has a natural outlet that will allow a drainage pipe installed on a proper grade around the proposed dispersal facility to daylight above annual high water.
- Soils must be drainable, with a minimum effective soil depth of at least forty-eight inches in soils with temporary groundwater, and at least seventy-two inches in soils with permanent groundwater.
- Slope does not exceed three percent.
- All other requirements for the system, except depth to groundwater, can be met. However, after the field collection drainage tile is installed, the groundwater levels shall remain below the specified depth.

B. Requirements

- Field collection drainage pipe shall be installed on a uniform grade of 0.2-0.4 feet of fall per 100 feet at:
    a. A minimum of forty-eight inches deep in soils with temporary groundwater, or
    b. A minimum of seventy-two inches deep in soils with permanent groundwater.
- Maximum drainage pipe spacing parallel to the dispersal field shall be seventy feet on center.
- Minimum horizontal separation distance between the drainage pipe and dispersal facility shall be twenty feet.
- Field collection drainage pipe shall be rigid, smooth wall perforated pipe with a minimum diameter of four inches.

- Field collection drainage pipe shall be enveloped in clean filter material (drainrock) to within thirty inches of the soil surface in soils with permanent groundwater or to within twelve inches of the soil surface in soils with temporary groundwater. Filter material (drainrock) shall be covered with filter fabric or other nondegradable material approved by the Onsite Sanitary Official.

- Outlet pipe shall be rigid, smooth wall solid PVC or ABS pipe with a minimum diameter of four inches. The outlet end shall be protected by a four-foot long section of Schedule 40 PVC or ABS or galvanized metal pipe, and a flap gate or grill to exclude rodents. The outlets shall be permanently marked with a steel post or other durable material so that they can be easily located if vegetation is dense.

- The discharge pipe and pipe drainage system are integral parts of the system, but do not need to meet setback requirements to property lines, streams, lakes, ponds or other surface water bodies. The discharge of drainage water shall not create nuisance conditions.

- The Onsite Sanitary Official will require demonstration that a proposed tile dewatering site can be drained over an entire wet season prior to issuing the construction permit for the dispersal field. The installation of piezometers within the proposed site will be required (see Appendix B).

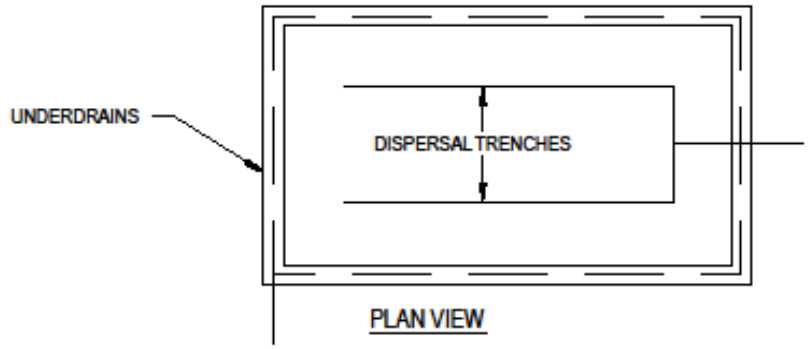
- The dispersal facility shall use equal or pressurized distribution and can use narrow dispersal trenches.

C. Operation and maintenance

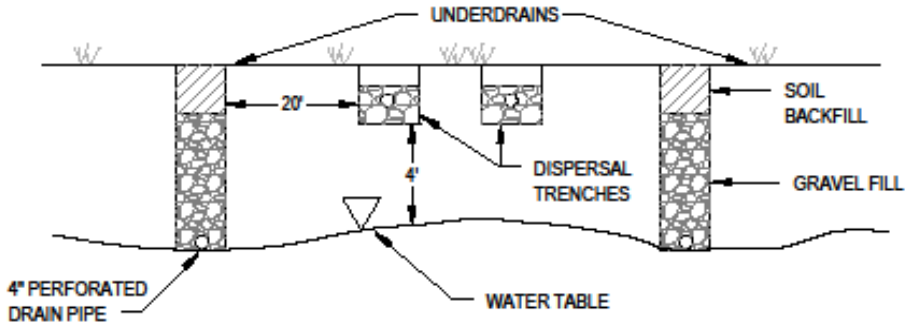
System operation and maintenance tasks and requirements shall be a specified on the Operating Permit and the designer's operations and maintenance instructions. The system owner shall be responsible for the continuous operation and maintenance of the system. Each system will be inspected by the Town on a regular basis.

The owner/purchaser of a perimeter drain or tile dewatering system must recognize that he/she assumes the continuous responsibility to preserve the installation as near as practical in its "as built" state. This responsibility includes maintenance of drain outlets, erosion control, fencing out of livestock and the control of burrowing animals.

NOTES:
1. MAXIMUM DISPERSAL TRENCH DEPTH IS 48".
2. MAXIMUM DISPERSAL TRENCH ROCK DEPTH IS 30".



PLAN VIEW



CROSS SECTION

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	PERIMETER DRAIN	Figure 4.17

D. Operation and maintenance instructions

As a minimum, the operations and maintenance instructions shall include the following information.

- A statement notifying the homeowner of his/her responsibility for maintaining the system in proper working condition.
- A complete description of the system and components.
- How and when to inspect the drain outlets for proper operation.
- When to get the septic tank pumped.

4.9 CURTAIN DRAIN

A curtain drain is used to lower an existing water table on sites with slopes greater than four percent. A trench is installed on the up-hill side of the dispersal field which collects and diverts water away from the dispersal field area. The curtain drain technique applies only to sites with a temporary water table. The effectiveness of most curtain drains extends thirty to fifty feet downslope of the trench. A typical curtain drain system is shown in Figure 4.18. All curtain drain systems shall be considered "alternative" by the Town of Paradise.

A. General conditions for approval

Construction permits may be issued by the Onsite Sanitary Official for a curtain drain system provided the site can meet the following requirements.

- Soils must be drainable, with a minimum effective soil depth of at least forty-eight inches in soils with temporary groundwater.
- Slope does not exceed forty-five percent.
- All other requirements for the system, except depth to groundwater, can be met.

B. Requirements

- Field collection drainage tile shall be installed on a uniform grade of 0.2-0.4 feet of fall per 100 foot, and a minimum of forty-eight inches deep in soils with temporary groundwater.
- Minimum horizontal separation distance between the drainage pipe and absorption facility shall be ten feet.

- Field collection drainage pipe shall be rigid smooth wall perforated pipe with a minimum diameter of four inches.

- Field collection drainage pipe shall be enveloped in clean filter material (drainrock) to within twelve inches of the soil surface. Filter material (drainrock) shall be covered with filter fabric, untreated building paper or other nondegradable material approved by the Town.

- Outlet pipe shall be rigid and smooth wall solid PVC pipe with a minimum diameter of four inches. The outlet end shall be protected by a four-foot long section of Schedule 40 PVC or ABS or galvanized metal pipe, and a flap gate or grill to exclude rodents. The outlets shall be permanently marked with a steel post or other durable material so that they can be easily located if vegetation is dense.

- The discharge pipe and pipe drainage system are integral parts of the system, but do not need to meet setback requirements to property lines, streams, lakes, ponds or other surface water bodies.

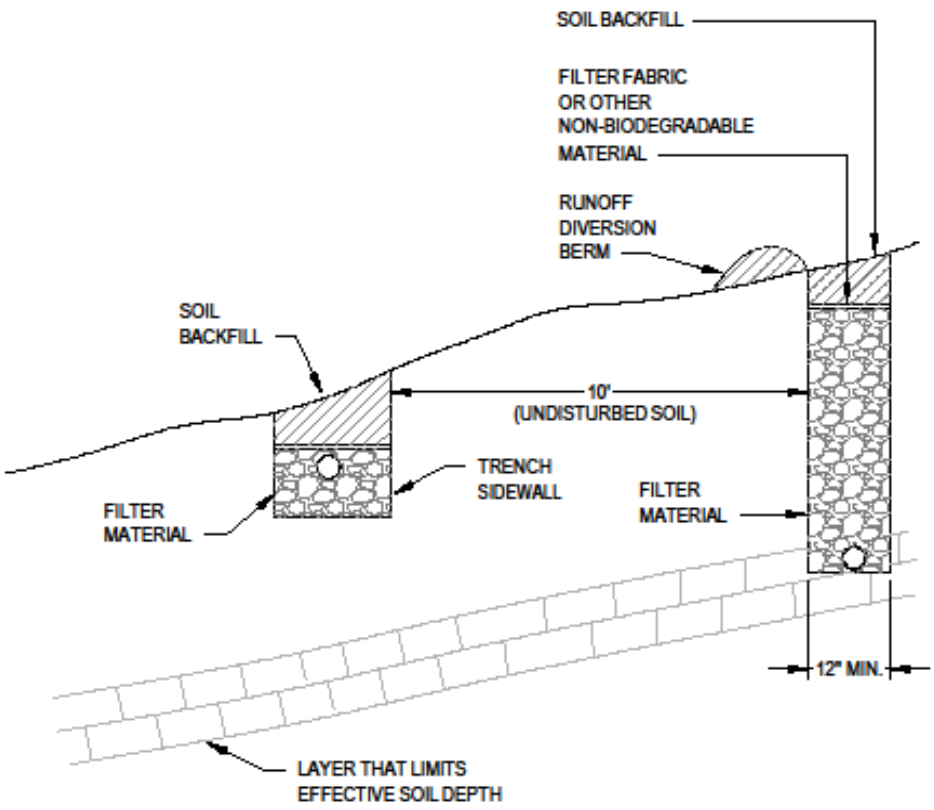
- The Onsite Sanitary Official will require demonstration that a proposed curtain drain site can be drained over an entire wet season prior to issuing a construction permit for the absorption field. The installation of piezometers within the proposed site will be required (see Appendix B).

- The wastewater dispersal field shall have equal or pressurized distribution and narrow dispersal trenches can be used.

- The curtain drain can only be used on sites with a well defined restrictive layer. The bottom of the drain shall be a minimum of 6 in. into the restrictive layer (see diagram).

- The dispersal trenches must be within fifty feet of the curtain drain. If tighter spacing is required to stay within the effective area of the curtain drain, a narrow dispersal trench system can be used.

NOTES:
1. MAXIMUM DISPERSAL TRENCH DEPTH IS 48".
2. MAXIMUM DISPERSAL TRENCH ROCK DEPTH IS 30".



TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised; 03-01-16	CURTAIN DRAIN TYPICAL	Figure 4.18

C. Operation and maintenance

System operation and maintenance tasks and requirements shall be a specified on the Operating Permit and the designer's operations and maintenance instructions. The system owner shall be responsible for the continuous operation and maintenance of the system. Each system will be inspected by the Town on a regular basis.

The owner/purchaser of a curtain drain system must recognize that he/she assumes the continuous responsibility to preserve the installation as near as practical in its "as built" state. This responsibility includes maintenance of drain outlets, erosion control, fencing out of livestock and the control of burrowing animals.

D. Operation and maintenance instructions

As a minimum, the operations and maintenance instructions shall include the following information.

- A statement notifying the homeowner of his/her responsibility for maintaining the system in proper working condition.
- A complete description of the system and components.
- How and when to inspect the drain outlets for proper operation.
- When to get the septic tank pumped.

4.10 ENGINEERED FILL

Any fill thicker than twelve inches and used for an absorption facility shall be considered engineered fill. Engineered fill is typically used to provide the minimum required effective soil depth in areas of high groundwater or over sensitive layers, as illustrated in Figure 4.1. Any engineered fill shall be considered "alternative" by the Town of Paradise.

A. General conditions for approval

To be approved for an engineered fill, each site must meet all the following conditions:

- Have suitable soils which will remain stable and permeable after the fill is in place.
- The finished system must provide the minimum required separation from sensitive layers as shown in Figure 4.1.

B. Requirements

The fill shall be constructed pursuant to permit requirements and be supervised by the designer.

Unless otherwise required by the Onsite Sanitary Official, construction sequence shall be as follows:

- The fill soil shall be examined and approved by the Onsite Sanitary Official prior to placement. The texture of the soil used for the fill shall be of the same textural class, or of one textural class coarser than the natural topsoil.

- Construction of fills shall occur between June 1 and October 1 unless otherwise allowed by the Onsite Sanitary Official. The natural soil on the site and the fill material shall be at a moisture content that will prevent loss of porosity when worked.

- The absorption field area and the fill soil borrow site shall be scarified to destroy the vegetative mat. Rototilling is the preferred method.

- No wheeled vehicles shall be permitted on the fill site or the fill once scarifying has been completed.

- The fill shall be installed when the soil is dry. The fill shall also be dry to prevent compaction. The fill should be as dry as possible when worked and allowed to settle naturally under water, either rainfall or irrigation.

- The system shall be installed as specified in the construction permit. There shall be a minimum of ten feet of separation between the edge of the fill and the outside sidewalls of the absorption trenches.

- The first six inches of the fill shall be mixed thoroughly with the native soil. It shall be placed with a crawler tractor to minimize compaction. Both initial and repair absorption field areas may be constructed at the same time if the owner wishes.

C. Required inspections

The following minimum inspections shall be performed for each fill installed:

- The dispersal field area and fill soil borrow material must be inspected for scarification, soil texture, and moisture content, prior to fill construction.

- After the first six inches are in place, determine adequate contact between fill material and native soil (no obvious contact zone visible), adequate depth of material, and uniform distribution of fill material.

- After entire fill is in place, dimensions and depth shall be checked. Hydraulic testing of the fill must be conducted in accordance with the appropriate procedures in Appendix C. The hydraulic testing will be witnessed by the Onsite Sanitary Official.

- Precover inspection of the installed dispersal facility.

- Final inspection is after landscaping. The operating permit may be issued at this point.

D. Operation and maintenance

System operation and maintenance tasks and requirements shall be as specified on the Operating Permit and the designer's operations and maintenance instructions. The system owner shall be responsible for the continuous operation and maintenance of the system. Each system will be inspected by the Town on a regular basis.

The owner/purchaser of the engineered fill system must recognize that he/she assumes the continuous responsibility to preserve the installation as near as practical in its "as built" state. This responsibility includes erosion control, fencing out of livestock and the control of burrowing animals.

E. Operation and maintenance instructions

As a minimum, the operations and maintenance instructions shall include the following information.

- A statement notifying the homeowner of his/her responsibility for maintaining the system in proper working condition.
- A complete description of the system and components.
- How and when to inspect the drain outlets for proper operation.
- When to get the septic tank pumped.

4.11 PORTABLE TOILETS

A portable toilet is any self-contained chemical toilet facility that is housed within a portable toilet shelter and includes but is not limited to construction-type chemical toilets.

Portable toilets may be approved for temporary or limited use areas, such as construction sites, provided all liquid wastes can be handled in a manner to prevent a public health hazard and to protect public waters, and separation distances also can be met.

Portable toilet waste shall not be discharged into storm sewers, on the surface of the ground or into public waters.

Portable toilets shall be installed by a licensed wastewater disposal business.

No person shall cause or allow the installation or use of a portable toilet unless the pumping or cleaning of the portable toilet is covered by a valid and effective contract with a licensed business. Each portable toilet shall display the business name of the sewage disposal service that is responsible for servicing it.

Portable toilets shall be constructed in accordance with requirements contained in this manual and be maintained to prevent health hazards and pollution of public waters. Required setbacks are listed in Table 3.2.

4.12 HOLDING TANKS

A holding tank is a watertight receptacle designed to receive and store wastewater to facilitate disposal at another location.

A. General conditions for approval

Installation permits may be issued by the Onsite Sanitary Official for holding tanks on sites that meet all the following conditions:

- For permanent use:

    a. The site cannot be approved for the installation of any other type of onsite wastewater disposal system; and

    b. No public sewer system is available or expected to be available within five years; and

    c. The tank is intended to serve a facility with intermittent occupancy; and

    d. Unless otherwise allowed by the Onsite Sanitary Official, the projected daily wastewater flow is not more than 200 gallons; and

    e. Setbacks as required for septic tanks can be met.

- For temporary use:

    a. The Town has committed in writing to provide sewer service to the property within five years.

    b. Installation of an approved onsite system has been delayed by weather conditions; or

    c. The tank is to serve a temporary construction site.

B. Requirements

- No building may be served by more than one holding tank.

- A single lot may be served by no more than one holding tank.

- Plans and specifications for each holding tank proposed to be installed shall be submitted to the Onsite Sanitary Official for review and approval.

- Each tank must:

    a. Have a minimum liquid capacity of 1,500 gallon.

    b. Comply with standards for septic tanks contained in Chapter 5.

    c. Be located and designed to facilitate removal of contents by pumping. The holding tank shall be equipped with watertight risers extending to finished grade to facilitate the removal of contents by pumping.

    d. Be equipped with both an audible and visual alarm, placed in a location acceptable to the Onsite Sanitary Official, to indicate when the tank is seventy-five percent full. The audible alarm only may be user cancelable.

    e. Have no overflow vent at an elevation lower than the overflow level of the lowest fixture served.

    f. Be designed for antibuoyancy if test hole examination or other observations indicate seasonally high groundwater may float the tank when empty.

- The application for a construction permit shall contain:

    a. A copy of a contract with a licensed wastewater disposal service company which shows the tank will be pumped periodically, at regular intervals or as needed, and the contents disposed of in a manner and at a facility approved by the Onsite Sanitary Official.

    b. Evidence that the owner or operator of the proposed disposal facility will accept the pumping for treatment and disposal.

- A record of pumping dates and amounts pumped shall be maintained by both the treatment facility owner and the wastewater disposal service and upon request, made available to the Onsite Sanitary Official.

- Inspection requirements: Each holding tank shall be inspected regularly by the Onsite Sanitary Official.

4.13 WATER CONSERVATION FIXTURES

The use of low flush toilets or other water conservation fixtures is encouraged to aid in water conservation. **NO REDUCTION IN THE SIZE OF THE DISPERSAL FIELDS OR FILTERS WILL BE ALLOWED.** Reduction of water flow does not decrease the amount of biological matter

which must be treated in the onsite system. The use of water conservation fixtures will prolong the life of a dispersal field.

4.14 PRE-CONSTRUCTED ADVANCED TREATMENT SYSTEMS

A pre-constructed advanced treatment system is defined as a proprietary self-contained wastewater treatment system. Proof of compliance with the California Environmental Quality Act, California Water Quality Control Board, EPA and NSF International ANSI/NSF 40 - 1990 Class I standards is required. The performance of the system shall be guaranteed for one (1) year upon start up by the Equipment Manufacturer and Design Engineer.

A pre-constructed advanced treatment system or equivalent shall provide acceptable wastewater treatment as per standards outlined in Chapter 6 of this Manual. Control panel remote telemetry access is required. The Onsite Sanitary Official shall determine the type and and extent of remote monitoring required based on the complexity of the system. .

The minimum basic requirements to permit the use of pre-constructed advanced treatment systems shall in all cases:

- Be certified with NSF International NSF/ANSI 40 classification or similar equivalent.
- Have proof of long-term performance and reliability
- Operation, Maintenance, Monitoring and Reporting shall be as outlined in Chapter 1.4.A., Alternative and Innovative Pre-Treatment Systems, of this manual.

4.15 GRAYWATER SYSTEMS

A graywater system is a wastewater treatment system capable of discharging and treating liquid waste from bathtubs, showers, bathroom wash basins, and water from clothes washing machines and laundry tubs. Graywater systems shall not treat liquid waste discharged from toilets, kitchen sinks, dishwashers or laundry water from soiled diapers. Graywater systems shall be considered "alternative" systems by the Town of Paradise.

A. General conditions for approval

Installation permits may be issued by the Onsite Sanitary Official for graywater systems on sites that meet all the following conditions:

- Sites must be approved for standard system installation.
- Minimum separation distances listed in Figure 4.1 can be met.

- Slope does not exceed forty-five percent.

B. REQUIREMENTS

- System design and installation standards shall comply with minimum standards for graywater waste systems mandated in Appendix J of the Uniform Plumbing Code, California Plumbing Code Edition (Title 24, Part 5, California Administrative Code).

  A one-third reduction in size of the black waste system shall be allowed when a graywater waste disposal system is installed.

C. Operation and maintenance

System operation and maintenance tasks and requirements shall be as specified on the Operating Permit and the designer's operations and maintenance instructions. The system owner shall be responsible for the continuous operation and maintenance of the system. Each system will be inspected by the Town on a regular basis.

The owner/purchaser of a gray water system must recognize that he/she assumes the continuous responsibility to preserve the installation as near as practical in its "as built" state. This responsibility includes erosion control, fencing out of livestock and the control of burrowing animals.

D. Operations and maintenance instructions

As a minimum, the operations and maintenance instructions shall include the following information:

- A statement notifying the homeowner of his/her responsibility for maintaining the system in proper working condition.
- A complete description of the system and components. Include process description for the homeowner and design criteria.
- Instructions on how to properly set pump control equipment.
- How the Town can sample graywater system effluent.
- How and when to inspect and flush distribution laterals.
- What to do if the alarm on the pump panel activates.
- A system troubleshooting table listing potential problems and their solutions for the graywater system.
- When to get the graywater system tank pumped.
- Safety precautions to be observed.

5
COMPONENT AND EQUIPMENT SPECIFICATIONS

5.1 Septic Tanks
5.2 Dosing Septic Tanks
5.3 Distribution Boxes
5.4 Drop Boxes
5.5 Filter Fabric
5.6 Diversion Valves
5.7 Effluent Pumps, Controls and Alarms
5.8 Dosing Siphons
5.9 Pipe Materials and Construction
5.10 Flexible Membrane Liners
5.11 Portable Toilets

Specifications for the major components of onsite wastewater disposal systems are included in this chapter. The goal of this chapter is to provide material and construction requirements which will enable the construction of effective and reliable onsite wastewater disposal systems in the Town of Paradise Onsite Wastewater Management Zone.

5.1 SEPTIC TANKS

A. General

The following requirements shall apply to all septic tanks manufactured for use in the Town of Paradise Wastewater Management Zone unless specifically exempted by other portions of these rules:

- Tanks shall be manufactured to comply with specifications within this manual, and requirements mandated by the Uniform Plumbing Code, California Plumbing Code Edition. Tanks shall be installed in strict conformance with the manufacturer's recommendations.

- Compartments: Septic tanks shall have multiple compartments for standard systems. Dosing tanks equipped with a screened vault may be single compartment. Multiple compartment tanks shall comply with the following:

    a. The first compartment shall have a minimum liquid capacity of at least two-thirds of the total required liquid capacity, as measured from the invert of the outlet fitting.
    b. The second and succeeding compartments shall each have a minimum liquid capacity equal to or greater than one-half of the first compartment.

c. Each compartment shall have access provided by a manhole having not less than eighteen inches across its shortest dimension unless otherwise approved by the Town.

d. No compartment shall have an inside horizontal dimension of less than twenty-four inches.

- Liquid depth: The liquid depth of any compartment shall be at least thirty inches.

- Septic tanks shall be watertight. Tanks shall be capable of successfully withstanding an above-ground static hydraulic test.

- Septic tanks shall be capable of supporting a vertical load of at least 300 pounds per square foot when the maximum coverage does not exceed three feet. Tanks installed with more than three feet of cover shall be reinforced to support the additional load. Tanks shall be designed for lateral loads of at least 62.4 pounds per cubic foot.

- The inlet and outlet fittings shall be of Schedule 40 PVC plastic, Schedule 40 ABS plastic, or other materials approved by the Town, with a minimum diameter of four inches:

  a. The distance between the inlet and outlet fittings shall be equal to, or greater than the liquid depth of the tank.

  b. The inlet and outlet fitting shall be located at opposite ends of the tank. They shall be attached in a watertight manner approved by the Town.

  c. The inlet fitting shall be a "sanitary tee" extending at least six inches above and below the liquid level.

  d. The outlet fitting shall be a "tee" extending below liquid level a distance equal to at least thirty-five percent but not greater than fifty percent of the liquid depth, and at least six inches above the liquid depth in order to provide scum storage. When the tank is used as a holding tank, the outlet fitting shall be provided with a watertight plug.

  e. Ventilation shall be provided through the fittings by means of a two-inch minimum space between the underside of the top of the tank and the tip of the "tee" fitting.

  f. The invert of the inlet fitting shall be not less than one inch but preferably three inches above the invert of the outlet fitting.

  g. The septic tank manufacturer shall provide, with each fitting, a rubber or neoprene rubber gasket meeting ASTM Specification C564, or an appropriate coupler which the Town determines will provide a watertight connection between the fittings and the building and effluent sewer pipes.

h. An access cover of not less than 6 in. across shall be provided above each fitting.

- At least ten percent of the inside volume of the tank shall be above liquid level to provide scum storage.

- In tanks with more than one compartment, a four-inch diameter (minimum) "tee" fitting shall be placed in each common compartment wall, using the same specifications as required for the outlet fitting. The invert of this "tee" fitting shall be at the same elevation as the outlet "tee".

- All prefabricated septic tanks shall be marked on the uppermost tank surface with the liquid capacity of the tank and the manufacturer's identification.

B. Precast concrete tanks

The following requirements apply to precast concrete septic tanks.

- Tanks shall be designed by a registered civil engineer.

- Walls, bottom and top reinforced-concrete tanks shall be designed across the shortest dimension using one-way slab analysis. Stresses in each face of monolithically-constructed tanks may be determined by analyzing the tank cross-section as a continuous fixed frame.

- The walls and bottom slab shall be poured monolithically.

- Reinforcing steel, when used, shall be ASTM A-615 Grade 60, f_y=60,000 psi. Details and placement shall be in accordance with ACI 315 and ACI 318.

- Concrete shall be ready-mix with cement conforming to ASTM C150, Type II. It shall have a cement content of not less than six (6) sacks per cubic yard and maximum aggregate size of three-fourths inch. Water/cement ratio shall be kept low (0.35±), and concrete shall achieve a minimum compressive strength of 5,000 psi in twenty-eight days.

- Tanks shall be protected by applying a heavy cement-base waterproof coating (Thoroseal or equal), on both inside and outside surfaces, in compliance with Council of American Building Officials (CABO) report No. NRB-168; 6181.

- Form release used on tank molds shall be Nox-Crete or equal. Diesel or other petroleum products are not acceptable.

- Tanks shall not be moved from the manufacturing site to the job site until the tank has cured for seven (7) days or has reached two-thirds of the design strength.

- In order to demonstrate water tightness, tanks shall be tested twice prior to acceptance. Each tank shall be tested at the factory, prior to shipping, by filling with water to the soffit and letting stand. After 24 hours, the tank shall be refilled to the soffit and the exfiltration rate

shall be determined by measuring the water loss during the next two hours. The two-hour loss shall not exceed one gallon. After installation is completed, each tank shall be filled with water and retested as previously described. If the tank is filled with water to the top of the riser, backfill of a depth equal to the height of the riser must be in place over the tank to prevent damage due to hydrostatic uplift.

C. Cast-in-place concrete tanks

Cast-in-place concrete tanks shall be designed by a registered civil engineer.

D. Fiberglass tanks

The following requirements apply to fiberglass tanks.

- The tank shall be constructed with a glass fiber and resin content specified by the manufacturer and with no exposed glass fibers. The manufacturer shall supply satisfactory evidence of testing by an approved laboratory showing compliance with IAPMO IGC 3-74, excepting as herein modified. Any metal part shall be 300 series stainless steel.

- The tank wall thickness shall average at least one-fourth inch.

- Holes specified for the tank shall be provided by the manufacturer. Resin shall be properly applied to all cut or ground edges so that no glass fibers are exposed and all voids are filled.

- Water testing shall be performed on each tank. Every tank shall be assembled by the manufacturer and filled with water to the brim of the access opening. The tank shall show no leakage from section seams, pinholes or other imperfections. Any leakage is cause for rejection. The manufacturer shall be responsible for making all corrective measures in production or assembly necessary to ensure a completely watertight tank.

- After installation is completed, each tank shall be filled with water to the top of the riser and the water loss measured after a two-hour period shall not exceed 1 gallon. Backfill of a depth equal to the height of the riser must be in place over the tank to prevent damage due to hydrostatic uplift.

5.2 DOSING SEPTIC TANK

A dosing septic tank combines the functions of a septic tank and dosing tank into one unitized assembly by withdrawing septic tank effluent with a pump or dosing siphon from the clear zone (the area between scum and sludge) at the outlet end of the tank. A second compartment draw-down tank is required for a septic tank that will also be used as a dosing tank (See Figure 4.2 - Second Compartment Draw-Down). A dosing septic tank is not allowed for systems where commercial food preparation is done or where the daily design flow is over 300 gallons per day. These systems require a separate dosing tank.

A. Design

- Design and equipment shall emphasize ease of maintenance and longevity and reliability of components and shall be proven suitable by operational experience, test, or analysis suitable to the Onsite Sanitary Official.

- An easy means of electrical and plumbing disconnection shall be provided, preventing the need for a repairman.

- Component materials shall be durable and corrosion resistance such as Type 316 stainless steel, suitable plastics, or 85-5-5-5 bronze.

- Each dosing tank shall be constructed and reinforced to withstand the loads imposed upon the top, walls and bottom.

- The minimum total volume of the tank shall be 1,500 gallons.

- The minimum submerged volume at the lowest operating liquid level shall be 900 gallons.

- Unless otherwise authorized by the Town, liquid levels shall be controlled so that a maximum of twenty percent of the projected daily wastewater flow is discharged each cycle.

- The invert of the inlet tee shall be not less than one inch above the high operating liquid level.

- Ports, or holes provided in a vault or outlet device shall be located to withdraw effluent horizontally at an elevation that represents the zone of best effluent quality.

- A convenient means of monitoring sludge and scum accumulation shall be provided with access extending to ground level. Dosing septic tanks shall be fitted with watertight access risers that extend to finished grade.

B. Construction requirements

Dosing septic tanks shall comply with applicable Town standards for septic tanks. Each tank shall be water tested by filling to the top of the tank for a period of one hour. During the test there shall be no measurable drop in water level, and no visible leakage. Each tank shall be certified watertight.

Tanks may be constructed of concrete, fiberglass, or other noncorrosive materials approved by the Town.

Dosing tanks with siphons shall be designed and sized for each specific project and shall allow sufficient clearance above the siphon dome to allow removal of the dome.

5.3 DISTRIBUTION BOXES

- Distribution boxes shall be constructed of concrete, fiberglass, or other materials acceptable to the Town.

- Distribution boxes shall be watertight, and designed to accommodate the necessary distribution laterals. The top, walls, and bottom of concrete distribution boxes shall be at least one and one-half inches thick.

- The invert elevation of all outlets shall be the same, and shall be at least two inches below the inlet invert.

- Each distribution box shall be provided with a sump extending at least two inches below the invert of the outlets.

- The minimum inside horizontal dimension measured at the bottom shall be eight inches, with a minimum bottom inside surface area of 160 square inches. The bottom outside surface area shall be equal to or greater than the top outside surface area.

- Distribution box covers shall be marked with the manufacturer's identification.

5.4 DROP BOXES

- Drop boxes shall be constructed of concrete, fiberglass, or other materials acceptable to the Onsite Sanitary Official.

- Drop boxes shall be watertight, and designed to accommodate the necessary piping. The top, walls, and bottom of concrete drop boxes shall be at least one and one-half inches thick.

- The inverts of the inlet and overflow port shall be at the same elevation. The invert of the header pipe port(s) leading to the absorption trench(es) shall be six inches below the inlet invert.

- Drop box covers shall be marked with the manufacturer's identification.

5.5 FILTER FABRIC

Except as otherwise allowed by the Onsite Sanitary Official on a case-by-case basis, filter fabric used within onsite systems in the zone shall meet the following specifications:

- Material: synthetic fabric, either spun bonded or woven

- Burst strength: not less than twenty-five pounds per square inch.

- Air permeability: not less than 500 cubic feet per square foot per minute.
- Water flow rate: not less than 500 gallon per square foot per minute at three inches of head.
- Surface reaction to water: hydrophilic
- Equivalent opening size: No. 70 to No. 100 sieve
- Chemical properties:

  a. Non-biodegradable
  b. Resistant to acids and alkali within a pH range of four to ten
  c. Resistant to common solvents

5.6 DIVERSION VALVES

- Diversion valves shall be constructed of durable material and be of a design approved by the Onsite Sanitary Official. They shall be corrosion-resistant, watertight, and designed to accommodate the inlet and outlet pipes.
- The manufacturer's name shall be marked on the cover.

5.7 EFFLUENT PUMPS, CONTROLS AND ALARMS

Electrical components used in onsite sewage disposal systems shall comply with National Electrical Code, and the following provisions:

- Motors shall be continuous-duty, with overload protection.
- Pumps shall have durable impellers of bronze, cast iron, or other materials approved by the Onsite Sanitary Official.
- Submersible pumps shall 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.
- Pump can be placed within a corrosion-resistant
- Pumps shall be controlled automatically by UL, CSA, or ETL approved sealed mercury float switches with mercury tube ratings of 4-20 amps at 115 volts A.C. (depending on function) or by an approved equivalently reliable switching mechanism. The switches shall be installed so that the design dose is discharged each cycle.
- An audible and visual high water level alarm with manual silence switch shall be located in or near the building served by the pump. The audible alarm can be the type that can be

turned off by the owner. The switching mechanism controlling the high water level alarm shall be located so that at time of activation the dosing tank has a reserve capacity remaining for effluent storage.

- When a system has more than one pump, the Onsite Sanitary Official may require they be wired into the electrical control panel to function alternately after each pumping cycle. If either pump should fail the other pump will continue to function, while an audible and visual alarm indicating pump malfunction will activate. A cycle counter and hour run meter shall be installed in the electrical control panel for each pump.

5.8 DOSING SIPHONS

Dosing siphons used in onsite wastewater disposal systems shall comply with all of the minimum requirements:

- Shall be constructed of corrosion-resistant materials.

- Shall be installed in accordance with the manufacturer's recommendations.

5.9 PIPE MATERIALS AND CONSTRUCTION

- Effluent sewer: The building effluent sewer shall be constructed with materials in conformance to building sewer standards, as identified in the Uniform Plumbing Code, California Plumbing Code Edition. The effluent sewer pipe shall have a minimum diameter of four inches.

- Distribution and Header Pipe and Fittings - Plastic pipe and fittings:

    a. Styrene-rubber plastic distribution and header pipe and fitting shall meet the most current ASTM Specification D2852 and Sections 5.5 and 7.8 of Commercial Standard 228, published by the U.S. Department of Commerce. Pipe and fittings shall also pass a deflection test withstanding 350 pounds per foot without cracking by using the method found in ASTM 2412.

    b. Polyethylene distribution pipe in 10 ft lengths and header pipe in lengths of ten feet or greater of which pipe and fitting shall meet the current ASTM Specification F405. Pipe and fittings shall also pass a deflection test withstanding 350 pounds per foot without cracking or collapsing by using the method found in ASTM 2412.

    c. Polyvinyl chloride (PVC) distribution and header pipe and fittings shall meet the most current ASTM Specification D2729. Pipe and fittings shall pass a deflection test withstanding 350 pounds per foot without cracking or collapsing by using the method found in ASTM 2412. Markings shall meet requirements established in ASTM Specification D2729, subsections 9.1.1, 9.1.2 and 9.1.4.

d. Polyethylene smooth wall distribution and header pipe ten foot lengths and fittings shall meet the most current ASTM specification F810. Pipe and fittings shall also pass a deflection test of 350 lb/ft without cracking or collapsing by using the method found in ASTM 2412. Markings shall meet the requirements established in ASTM specification F810, Section 9.

E. The four types of plastic pipe described above shall have two rows of holes spaced 120 degrees apart and 60 degrees on either side of a center line. For distribution pipe, a line of contrasting color shall be provided on the outside of the pipe along the line furthest away and parallel to the two rows of perforations. Markings, consisting of durable ink, shall cover at least fifty percent of the pipe. Markings may consist of a solid line, letters, or a combination of the two. Intervals between markings shall not exceed twelve inches. The holes of each row shall be not more than five inches on center and shall have a minimum diameter of one-half inch.

- Polyvinyl chloride (PVC) pressure transport pipe, pressure manifolds, and pressure lateral pipe and fittings shall meet the current requirements for Class 200 PVC 1120 pressure pipe as identified in ASTM Specification D2241. The pipe and fittings shall marked be as required by ASTM Specifications D2241.

5.10 FLEXIBLE MEMBRANE LINERS

Unsupported polyvinyl chloride (PVC) shall have the properties listed in Table 5.1.

TABLE 5.1
PROPERTIES OF UNSUPPORTED PVC USED AS A MEMBRANE LINER IN FILTERS

Property			Test Method
A.	Thickness		ASTM D1593, 30 mil, min Para 8.1.3
B.	Specific Gravity (minimum)		ASTM D792
C.	Minimum tensile properties (each direction)		ASTM D882
	1.	Breaking factor (1 in. wide)	Method A or B 69
	2.	Elongation at break (percent)	Method A or B 300
	3.	Modules (force at 100 percent elongation (lb/in. width)	Method A or B 27
D.	Tear resistance (lb, minimum)		ASTM D1004 8 Die C
E.	Low temperature		ASTM S1790 -20F
F.	Dimensional stability (each direction, percent change maximum)		ASTM D1204 + or -5 212 F, 15 min.
G.	Water extraction		ASTM D1239, 0.35 percent maximum
H.	Volatile loss		ASTM D1203, 0.7 percent maximum
I.	Resistance to soil burial (percent change maximum in original value)		ASTM D3083
	1.	Breaking factor -5	
	2.	Elongation at break -20	
	3.	Modulus at 100 percent elongation +10	
J.	Bonded Seam Strength (factory seam, breaking factor, ppi width)		ASTM D3083 55.2
K	Hydrostatic resistance		ASTM D751 82 Method A

Installation standards:

- Patches, repairs, and seams shall have the same physical properties as the parent material.
- Site considerations and preparation:

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

  b. Soil stabilizers such as cementations or chemical binding agents must not adversely affect the membrane.

- Only fully buried membrane liner installation shall be considered to avoid weathering.
- Unreinforced liners have high elongation and can conform to irregular surfaces and follow settlements within limits. Unreasonable strain reduces effective thickness and may reduce life expectancy by lessening the chemical resistance of the thinner (stretched) material. Every effort shall be made to minimize the strain (for elongation) anywhere in the flexible membrane liner.
- Installation of liner:

  a. Preparation of earth subgrade: The prepared subgrade shall be of soil types no larger than Unified Soil Classification System (USCS) sand (SP) to a minimum of four inches below the surface and free from loose earth, rock, fractured stone, debris, cobbles, rubbish and roots. The surface of the complete subgrade shall be properly compacted, smooth, uniform and free from sudden changes in grade. Importing suitable soil may be required.

  b. Maintenance of subgrade: The earth subgrade shall be maintained in a smooth, uniform and compacted condition during installation of the lining.

  c. Temperature: The desirable temperature range for membrane installation is 42□F to 78□F. Lower or higher temperatures may have an adverse effect on transportation, storage, field handling and placement, seaming and backfilling and attaching boots and patches may be difficult. Placing liner outside the desirable temperature range should be avoided.

  d. Wind: Wind may have an adverse effect on liner installation such as interfering with liner placement. Mechanical damage may result. Cleanliness of areas for boot connection and patching may not be possible. Alignment of seams and cleanliness may not be possible. Placing the liner in high wind should be avoided.

  e. Precipitation: When field seaming is adversely affected by moisture, portable protective structures and/or other methods shall be used to maintain a dry sealing

surface. Proper surface preparation for bonding boots and patches may not be possible. Seaming, patching and attaching "boots" shall be done under dry conditions.

f. Penetration of liner: Penetration of a flexible liner by any designed means shall be avoided. Where penetrations are necessary, such as horizontal and vertical pipes, it is essential to obtain a secure, liquid-tight seal between the pipes and the flexible liner. Liners shall be attached to pipes with a mechanical type seal supplied by the liner manufacturer, supplemented by a chemically compatible caulking or adhesives to effect a liquid-tight seal. The highest order of compaction shall be provided in the area adjacent to pipes to compensate for any settlement.

g. Size. The final cut size of the liner shall be carefully determined and ordered to generously fit the container geometry without field seaming or excess straining of the liner material.

h. Transportation, handling and storage: Transportation, handling and storage procedures shall be planned to prevent material damage. Material shall be stored in a secured area and protected from adverse weather.

i. Site inspection: A site inspection shall be carried out by the Onsite Sanitary Official and the installer prior to liner installation to verify surface conditions, etc.

j. Deployment: Panels shall be positioned to minimize handling. Seaming should not be necessary. Bridging or stressed conditions shall be avoided with proper slack allowances for shrinkage. The liner shall be secured to prevent movement and promptly backfilled.

k. Anchoring trenches: The liner edges should be secured frequently in a backfilled trench.

l. Field seaming: Field seaming, if absolutely necessary, shall only be attempted when weather conditions are favorable. The contact surfaces of the materials should be clean of dirt, dust, moisture, or other foreign materials. The contact surfaces shall be aligned with sufficient overlap and bonded in accordance with the suppliers recommended procedures. Wrinkles shall be smoothed out and seams should be inspected by nondestructive testing techniques to verify their integrity. As seaming occurs during installation, the field seams shall be inspected continuously and any faulty area repaired immediately.

m. Field repairs: It is important that traffic on the lined area be minimized. Any necessary repairs to the liner shall be patched using the same lining material and following the recommended procedure of the supplier.

n. Final inspection and acceptance: Completed liner installations shall be checked visually for punctures, rips, tears and seam discontinuities before placement of any

backfill. At this time the installer shall also manually check all factory and field seams with an appropriate tool. In lieu of, or in addition to, manual checking of seams by the installer shall also manually check all factory and field seams with an appropriate tool. In lieu of or in addition to manual checking of seams by the installer, either of the following tests may be performed:

1. Wet test: The lined basin shall be flooded to the four foot level with water after inlets and outlets have been plugged. Workmanship shall be accepted if leakage rate in a twenty-four hour period is no greater than 0.25 inch.

2. Air lance test: Inspect all seams (factory and field) for unbonded areas using an air nozzle to detect loose edges Riffles indicate unbonded areas within the seam, or other undesirable seam construction. Check all bonded seams using a minimum 50 pounds per square inch (gage) air supply directed through a three-quarters inch (typical) nozzle, held not more than two inches from the seam edge and directed at the seam edge.

5.11 PORTABLE TOILETS

All portable toilet facilities shall comply with the following requirements:

- They shall have water-tight chambers constructed of reinforced concrete, plastic, fiberglass, metal, or of other material of acceptable durability and corrosion resistance, approved by the Onsite Sanitary Official, and designed to facilitate the removal of the wastes.

- Blackwater shall be stored in an appropriate chamber until removal for final disposal elsewhere. Wastes shall be removed from the chamber whenever necessary to prevent overflow.

- Chemicals containing heavy metals, including but not limited to copper, cadmium and zinc, shall not be used.

- All surfaces subject to soiling shall be impervious, easily cleanable, and readily accessible.

- Toilet bowls shall be constructed of stainless steel, plastic, fiberglass, ceramic or of other material approved by the Onsite Sanitary Official.

- Waste passages shall have smooth surfaces and be free of obstructions, recesses or cross braces which would restrict or interfere with flow of black wastes.

- Biocides and oxidants shall be added to waste detention chambers at rates and intervals recommended by the chemical manufacturer and approved by the Onsite Sanitary Official.

- Chambers and receptacles shall provide a minimum storage capacity of fifty gallons per seat.

- Portable shelters housing chemical toilets shall display the business name of the licensed sewage disposal service that is responsible for servicing them.

6
LARGE AND ADVANCED TREATMENT SYSTEMS

6.1 Definition of Large and Advanced Treatment Systems
6.2 General Requirements for Large and Advanced Treatment Systems

The focus of Chapters 3 and 4 relates to onsite wastewater disposal systems designed to serve single family homes. This chapter addresses the requirements for the design of Large Systems, those systems that have a design flow of over 1000 gallons per day and Advanced Treatment Systems, those systems that provide secondary treatment to wastewater effluent.

6.1 DEFINITION OF LARGE AND ADVANCED TREATMENT SYSTEMS

An Advanced Treatment System is one that provides secondary treatment to wastewater effluent. A Large System is a septic system designed to receive over 1000 gallons per day but does not necessarily provide advanced treatment to wastewater effluent. Both Large Systems and Advanced Treatment Systems are considered Alternative Systems.

A. Community Systems

A community system which serves more than one lot, more than one condominium unit, or more than one unit of a planned unit development is typically a Large or Advanced Treatment System.

B. Apartments, Duplexes and Mobile Home Parks

Multifamily housing developments typically require a Large or Advanced Treatment Systems for wastewater disposal. Separate onsite wastewater disposal systems may be provided for each individual multifamily housing development. Separate onsite wastewater disposal systems for individual multifamily housing developments shall sometimes be considered Large Systems depending on wastewater design flows.

C. Commercial Establishments

Commercial establishments include restaurants, laundromats, hospitals, shopping centers, etc. Many onsite wastewater systems for commercial establishments are Large or Advanced Treatment Systems because of their high design flow or strength of wastewater.

D. Industrial Wastewater Discharges

Industrial wastewater is water that has been used as part of a manufacturing or processing enterprise. Industrial wastewater often has a very high strength and/or does not have a nutrient balance similar to domestic wastewater. Industrial wastewater systems will be considered Large or Advanced Treatment Systems. The design of onsite wastewater disposal systems for industrial discharges is beyond the scope of this manual.

6.2 GENERAL REQUIREMENTS FOR LARGE AND ADVANCED TREATMENT SYSTEMS

Unless otherwise authorized by the Town Council, Large or Advanced Treatment Systems shall comply substantially with the following requirements:

1. The system shall be designed by a registered Civil Engineer or Registered Environmental Health Specialist experienced in the design of Wastewater Treatment Systems. Upon request, the designer shall provide the Onsite Sanitary Official with a Qualification and Experience record.

2. The characteristics of the wastewater to be treated shall be documented to the satisfaction of the Onsite Sanitary Official. At a minimum the following constituent concentrations in the wastewater shall be identified in the Site Evaluation Report.
   a. 5-day B.O.D.
   b. Total Suspended Solids.
   c. Total Nitrogen reported individually as Kjeldahl Nitrogen and Nitrate Nitrogen.
   d. Any other constituent that the Onsite Sanitary Official deems necessary to identify the character of the wastewater.

3. The quantity of the wastewater shall be established and documented in the Site Evaluation Report. Wastewater quantities shall be identified through the combined or individual methods outlined in Chapter 6.2.B., Chapter 6.2.C. and Table 6.1 in this Manual. The Onsite Sanitary Official shall make the final determination of the correct wastewater flow assignment for the proposed facility based on the above Chapters methods.

4. The gross wastewater hydraulic loading rate for an Advanced Treatment System on any parcel shall not exceed 2000 gallons per acre per day. The gross wastewater hydraulic loading rate on any parcel that has a Large System, (not providing advanced treatment), shall not exceed 900 gallons per acre per day, except those areas in the downtown adjustment area. Gross area calculations for any parcel shall include the area to the centerline of any abutting public road or public trail right of way.

5. The hydraulic capacity of a site to accept the daily wastewater flow shall be determined using a method(s) acceptable to the Town for all new systems designed to treat and disperse over 900 gallons per acre per day except those parcels in the downtown adjustment area (see Figure 4.14).

6. A nitrogen loading prediction calculation on groundwater must be calculated for each newly designed Advanced Treatment System treating and dispersing wastewater in quantities over 900 gallons per acre per day and with a design flow in excess of 5000 gallons per day. The method utilized for calculation shall be the "Hantzche-Finnemore Equation" that is approved by the Central Region of the Regional Water Quality Control Board. The approved maximum level of concentration of Nitrate Nitrogen predicted in the ground water through the use of this equation is 7.0 mg/l. Specific values utilized in the equation authorized by the Regional Water Quality Control Board are as follows:

a. % of Nitrate-Nitrogen loss due to Soil Denitrification is "0". (d-Value)
b. Average rainfall recharge rate is 75% of 52 inches of rainfall on level ground. (R-value)
c. Background Nitrate-Nitrogen Concentration in rainfall recharge is 0.5 mg/l. (Nb-value)

7. Any Large System (having a design flow of over 1000 gallons per day), shall install both the original and replacement dispersal fields at the time of construction. A diverter valve shall be installed between the two dispersal fields. . Replacement dispersal areas shall be divided into relatively equal units and have the same dispersal capacity as the original field. The replacement dispersal area shall be located as near to the original dispersal area as is practical.

8. Effluent distribution shall alternate between the dispersal area units.

9. Dispersal fields for systems designed to treat over 900 gallons per acre per day shall not be allowed on slopes greater than thirty (30) percent.

10. Duplex pumping systems or other acceptable means of alternating effluent distribution between dispersal area units shall be provided.

11. The applicant shall provide a written assessment of the impact of the proposed system upon the quality of public waters and public health.

12. Ground water monitoring wells may be required for Large or Advanced Treatment System dispersal fields by the Onsite Sanitary Official. There shall be a minimum of one well installed up gradient and two wells down gradient of the dispersal area. Additional wells may be required by the Onsite Sanitary Official depending on the location of the system.

13. Where there are groundwater monitoring wells, a ground water monitoring program will be required for each dispersal area. Constituent analyses and frequency of analyses shall be as determined by the Onsite Sanitary Official. All costs for the monitoring program shall be borne by the discharger.

14. Operation and Maintenance of Large or Advanced Treatment Systems shall be as outlined in Chapter 1.4.A., Alternative and Innovative Advanced Treatment Systems, of this Manual.

15. Any onsite wastewater disposal system, whether existing, under repair or newly constructed, that receives high strength wastewater from a commercial food service building must have a properly sized and functioning grease interceptor. Sizing and design criteria at a minimum shall be in accordance with the most current version of California Plumbing Code, or based on current industry standards as approved by the Onsite Sanitary Official. If the wastewater coming into the septic system has a BOD higher than 900 mg/l than the owner of the system must notify the State Regional Water Quality Control Board and submit a Report of Waste Discharge. The system will then be regulated by the Regional Water Quality Control Board as well as the applicable provisions in the Town of Paradise Local Agency Management Program.

Construction of a Large or Advanced Treatment System shall be in substantial conformance with the approved plans and specifications and with any terms of the construction installation permit issued by the Onsite Sanitary Official. After completion, the professional who prepared the plans shall certify that the system was installed in substantial conformance with such plans.

A. Septic tank sizing

- For all projected daily wastewater flows, the total septic tank operating level capacity shall be at least two times the design flow capacity of the system. . This shall apply to all advanced treatment systems as well as all alternative and standard systems.

- Additional septic tank volume, even up to three times the design flow capacity, may be required by the Onsite Sanitary Official for industrial or other special wastes such as RV parks, restaurants, laundromats, etc.

- The quantity of daily wastewater flow shall be estimated using the guidelines in this manual.

B. Design flow

Design flow is the maximum flow that may be reasonably expected to be discharged from a residential, commercial or institutional facility on any day of operation, and is expressed in gallons per day. The design flow is not considered an average daily flow, but incorporates a factor of safety over the average flows to accommodate peak wastewater flows of facilities.

The design flows anticipate variations in flows among different establishments of the same class as well as flow variations over time in the same establishment. The design flows also assume wastewater with strengths typical of the class of establishment. The calculation of design flows based on water saving devices will not be allowed.

Each component of the disposal system shall be designed and constructed to adequately treat and dispose of the design flow discharged from the premises to be served.

The flows listed in Table 6.1 are minimum guideline standards for average facilities of the categories listed.

C. Methods for determining design flows

Flows from existing comparable facilities can be used in determining design flows. The design flow may be calculated by actual potable water meter readings, or facility wastewater influent or effluent meter readings if in fact the;

- Water records are from billing records of the service provider, or from water meters certified to be within two percent by the water purveyor, or, in the case of wastewater metering, the meter read values are certified “correct” by a Registered Engineer and approved by the Onsite Sanitary Official

Adjustments for peak days: The average daily flows shall be adjusted for flow days as follows:

- Daily monitoring: If the water meter records are recorded on a daily basis, the highest consecutive ten-day flows taken over the course of one month can be averaged and used for the design flow.

- Weekly monitoring: If the water meter records are recorded on a weekly basis a minimum of four weeks must be recorded. The design flow shall be calculated by dividing the highest weekly flow by 7 days and then multiplying by 1.2.

- Monthly monitoring: If the water meter records are recorded on a monthly basis, at least 4 months shall be recorded. The design flow shall be calculated by dividing the number of days the facility was in use into the highest monthly flow, and multiplying by 1.5.

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

D. Disposal field hydraulic loading rates

Dispersal field trenches for systems discharging secondary treated effluent (less than thirty milligrams per liter BOD_5 and TSS) shall be sized using the absorption trench bottom and sidewall area. The trench hydraulic loading rate shall not exceed 1.0 gallons per square foot/day, based on the design flow rate.

- For systems with a design flow over 5000 gallons per day a mounding analyses similar to the methodology described in the "Assessment of Cumulative Impacts of Individual Waste Treatment & Disposal Systems" prepared by Ramlet Associates for the North Coast Regional Board, February 1982, will be required.

E. Loading rates for sand and gravel filter systems

Sand and gravel filter systems shall be sized on the basis of projected peak daily sewage flow and the strength of the wastewater, using the following criteria:

- The hydraulic loading rate to an intermittent dosing sand filter shall not exceed 1.5 gallons/ft^2/day.

- The hydraulic loading rate to a recirculating gravel filter shall not exceed five gallons/ft^2/day, (forward flow).

- The organic loading rate to either type of filter system shall not exceed 5×10^{-3} pound BOD_5 per ft^2/day. .

TABLE 6.1

DESIGN FLOWS FOR COMMERCIAL ESTABLISHMENTS

Type of Facility	Unit of Measure	Design Value (gal/d)
Airports	passenger + employee	5 15
Barber Shop	chair	100
Bathhouses and swimming pools	person	10
Beauty salon	chair	100
Bed and breakfast	establishment + Rental room	225 75
Boarding houses (meals)	house + boarder	225 50
Bus service areas	passenger + employee	5 5
Cafeteria, open general public	seat + employee	45 15
Cafeteria, private	meal/seat + employee	10 15
Camps: Campground with central comfort stations With flush toilets, no showers Construction camps (no meals served) Resort camps with limited plumbing (night and day)	 person person person person	 35 25 15 50
Luxury camp	person	100
Children's camps, (day use only)	camper + staff person	15 15

Type of Facility	Unit of Measure	Design Value (gal/d)
Children's camps, day and night	camper + staff person	20 15
Churches	seat	5
Country clubs	resident non-resident	100 25
Dance hall	attendee + staff person	5 15
Day care facilities, serving meals	child + adult	20 15
Day care facilities, not serving meals	child + adult	15 15
Delicatessen, food prepared and no seats	establishment + employee	50 15
Eating place, fast food and no full meals and no china service	inside seat + outside seat + employee	20 10 15
Fairgrounds	attendee, based on daily average	2
Factories (with showers, exclusive of industrial wastes)	person per shift	35
Factories (without showers, exclusive of industrial wastes)	person per shift	15
Gyms, not associated with schools	participant + spectator + employee	10 3 15

Type of Facility	Unit of Measure	Design Value (gal/d)
Hospitals	bed	250
Hotels and motels with shared baths	bedroom + employee	80 15
Hotels with private baths	bedroom + employee	100 15
Institutions other than hospitals	bed space	125
Laundry, self service	machine + employee	500 15
Medical offices, clinics and dental offices	medical staff + patient + office employee	80 5 15
Mobile home parks	unit	125
Motels (with bath, toilet and kitchen)	bedroom	150
Motels with private baths (without kitchen)	bedroom	100
Parks and picnic areas, public restrooms, no showers	attendee + employee	5 15
Parks and picnic areas, public restrooms with showers	attendee + employee	10 15
Picnic parks (toilet wastes only)	picnicker	5
Picnic parks (with bathhouses, showers and flush toilets)	picnicker	10
Rooming houses, no meals	house + roomer	180 30
Rental cabins and cottages	bed +	50

Type of Facility	Unit of Measure	Design Value (gal/d)
	employee	15
Restaurants	seat	40
Restaurants (single service)	customer	2
Restaurants (with bars and/or lounges)	seat	50
Schools, elementary	student + teacher + administrative employee	7 15 15
Schools, junior high	student + teacher + administrative employee	9 15 15
Schools, senior high	student + teacher + administrative employee	12 15 15
Schools, boarding	student + teacher + administrative employee	75 15 15
Service Stations	1st set of fuel pumps + each additional set + employee	500 300 15
Swimming pools and bathhouses	person	10
Shopping centers or stores, public restrooms	water closet	400

Type of Facility	Unit of Measure	Design Value (gal/d)
and showers (Design for any eating places or butcher shop shall be determined and added to total design flow.)	+ shower	20
	+ employee	15
	+ parking space	1
Tennis and racquetball courts (Design flows for any eating place to be determined and added to the total design flow.)	court	300
	+ employee	15
Theaters:		
Walk-in	per seat	5
Drive-in	car space	20
Travel trailer parks (without individual water and sewer hookups)	space	50
Travel trailer parks (with individual water and sewer hookups)	space	100
Visitors center	visitor	6
	+ employee	15
Worker:		
Construction (as semi-permanent camps)	person	50
Day, at school and offices	shift	15

Note: When full-time equivalent employees will be present at an establishment, estimate the maximum number of employees who may be present during a single day of operation and add additional fifteen gallons per employee per eight hour shift, except where otherwise indicated. The design flow for employees is based on the maximum number of employees present in a twenty-four hour period.

F. Aesthetics of Alternative and Advanced Treatment Systems

All Alternative and Advanced Treatment System above ground components shall be screened with aesthetically pleasing vegetative or manmade materials so as to reduce visibility from any public street. Components include but are not limited to above ground filter units, sand filter beds, tanks and air intake units. Above ground filter beds whose retaining walls are over two feet above finished grade and are visible from a public street shall be designed with landscaping, rock work or vegetative covering that screens the view of the filter. The aesthetic quality of the screening, landscaping, rock work or vegetative covering used and its effectiveness in fulfilling

this requirement shall be reviewed administratively via the Town's design review process in conjunction with the wastewater permit approval process. Appeals of administrative design review decisions may be made to the Planning Commission.

All visual barriers or aesthetic components used to satisfy this requirement shall be maintained in good condition for as long as the alternative system remains in place. For purposes of this requirement, above ground piezometers, control panels and other small components shall not be required to be screened from public view.

7
INNOVATIVE APPLICATIONS

INNOVATIVE TREATMENT AND DISPERSAL APPLICATIONS

Any onsite wastewater treatment and disposal system not described in this manual shall be considered under an innovative application permit. All innovative systems are considered alternative systems

A. General policies

Alternative technologies to those listed in this manual are encouraged, if it is a system which would benefit significant numbers of people within the Town of Paradise Onsite Wastewater Management Zone. Unproven and undocumented technologies will not be permitted. Only sound, well engineered systems will be accepted. The Onsite Sanitary Official shall require the submission of references.

No person shall construct or operate an innovative onsite wastewater treatment and disposal system without first obtaining a permit from the Onsite Sanitary Official.

For innovative systems that provide advanced treatment, an operations, maintenance and monitoring program must be established subject to approval of the Regional Water Quality Control Board, and at the expense of the owner. As a minimum, the monitoring shall consist of semi-annual effluent BOD_5, TSS analyses, plus measurement of solids accumulation.

B. Application procedures

Application for innovative applications shall be made on forms provided by the town.

The application shall be complete, signed by the owner and be accompanied by the required fee.

- The application shall include detailed system design specifications and plans and any additional information the town considers necessary. All innovative systems shall be subject to Regional Water Quality Control Board approval.

- The owner shall agree, in writing, to hold the State of California, the County of Butte, the Town of Paradise, its officers, employees, and agents harmless of any and all loss and damage caused by defective installation or operation of the proposed system.

C. Criteria for approval

Sites may be considered for innovative application permits where:

- A specific acceptable backup alternative is available in the event of system failure.

- For dispersal systems, soils in both original and system replacement areas are similar.

- The system design shall supply operations and maintenance instructions to both the owner and the town. It shall be the responsibility of the owner to maintain the system in accordance with the instructions and the operating permit. The town shall regularly inspect the system for proper operations and maintenance. Monitoring shall be performed by the town at the owner's expense.

D. Repair or replacement of system

If the town finds the operation of the system unsatisfactory, the owner, upon written notification from the town, shall promptly repair or modify the system, replace it with another acceptable system, or abandon the system.

8
LOCAL AGENCY MANAGEMENT PROGRAM

Since its incorporation in 1979, the Town of Paradise (Town) has developed a set of comprehensive body of regulations that govern onsite wastewater construction. These regulations are contained within the Paradise Municipal Code and the Town of Paradise Manual for the Onsite Treatment of Wastewater (Manual) and are tailored to the unique geographic, hydrologic and soil conditions of the Town as well as to the Town's infrastructure and administrative processes.

On June 19, 2012, and in accordance with California Water Code Section 13290 and AB885, the State Water Resources Control Board (State Water Board) adopted Water Quality Control Policy for the Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (State Policy) along with a statewide conditional waiver that established minimum requirements for the permitting and operation of onsite wastewater treatment systems. The waiver allows owners of all onsite systems with projected flows less than 10,000 gallons per day to discharge wastewater without having to file a report of waste discharge with the appropriate Regional Water Board, so long as the onsite system and its owner comply with the requirements set forth in the State Policy. Such requirements are found in Tier I provisions of the State Policy. Under Tier II provisions of the State Policy, a wastewater management jurisdiction such as the Town of Paradise, is allowed to receive approval from the State Water Board to implement its own local regulations for the management of onsite wastewater treatment systems within its jurisdiction. This is called a Local Agency Management Program (LAMP) and must provide the same protection for water quality and public health that Tier I provisions of the State Policy provide. The benefit of a LAMP is that it can be customized to local conditions and characteristics.

This chapter primarily addresses those portions of the Town of Paradise LAMP dealing with the administrative aspects of the town's onsite wastewater management program. This chapter also addresses provisions required by State Policy that are not addressed in other portions the Manual or the PMC, or that need reiteration. Therefore, this chapter is not intended to address all requirements for the Town of Paradise LAMP, but rather is a supplement for the LAMP.

OWTS POLICY SECTION

3.3. ANNUAL REPORTING;

The Town shall report annually to the Central Valley Regional Water Quality Control Board. The annual report shall include the following information (3.3.1 - 3.3.3) organized in tabular spreadsheet and will summarize any further actions that are warranted to protect water quality or public health:

3.3.1. Number and location of complaints pertaining to onsite wastewater treatment systems operation and maintenance and identification of those systems which were investigated and how the complaint was resolved.

3.3.2. Registrations of septic pumpers working in the Town of Paradise and certified by the Butte County Environmental Health Department.

3.3.3. The number, location and description of onsite wastewater treatment system new construction and repair construction permits and under which State Policy Tier it was issued.

3.4. PERMANENT RECORDS

The Town shall retain permanent records of its onsite wastewater treatment system construction permitting actions and will make those records available within 10 working days upon written request by the appropriate Regional Water Board. Each permit shall be designated by the Tier under which it was authorized.

3.5. NOTIFICATION TO MUNICIPAL WATER SUPPLIERS

The Town shall notify the owners of public water wells and the California Department of Public Health as soon as practical, but not later than 72 hours, upon discovery of a failing onsite wastewater treatment system that is within the setback requirements for public water wells found in this regulation. Failing systems shall include those that allow the surfacing of wastewater or wastewater backing up into plumbing, or that have a septic tank that is cracked, no longer water tight or has structural deficiencies, or any other aspect of an onsite wastewater treatment system failure that could compromise public health.

9.0. LOCAL AGENCY MANAGEMENT PROGRAM FOR MINIMUM OWTS STANDARDS

The Town of Paradise Onsite Wastewater Disposal Zone was formed in 1992. It has been the wastewater management authority for the Town of Paradise since that time. The Town of Paradise Manual for the Onsite Treatment of Wastewater, along with portions of the Paradise Municipal Code, encompasses the body of code and regulations that have governed the construction and management of onsite wastewater treatment systems in the Town of Paradise since 1995. These codes and regulations comprise the Town of Paradise Local Agency Management Program as allowed in Tier II provisions of the State Policy.

9.1.1. The Town of Paradise is comprised of 18.5 square miles and lies on a volcanic plateau known as the Tuscan formation. This plateau is tilted northeasterly to southwesterly and has an elevation gradient of 2350 feet above sea level in the north to 1350 elevation gradient in the south. It has approximately 18 surface water drainage basins on its borders. Over the course of many years the Town has had several studies completed regarding its hydrogeology and soil formations. Those publications include the following:

- 1983 Town of Paradise Wastewater Management Study, Phase I Report. James M. Montgomery Consulting Engineers, Inc.
- 1984 Town of Paradise Wastewater Management Study Supplementary Phase I Report. George Tchobanoglous. P.E.
- 1985 Town of Paradise Wastewater Management Plan, Phase II Report. R.A.Ryder & Associates

- 1989 Environmental Impact Report for the Town of Paradise. Central Area Wastewater Collection and Sewage Treatment Facilities System. Quad Consultants.
- 1992 Soils of Paradise and Their Ability to Treat Domestic Wastewater. Wert and Associates, Inc.
- 1998 Septic Tank and Recirculating Gravel Filter Effluent Treatment and Disposal With Subsurface Absorption Trenches: A Research, Development, Monitoring and Educational Project for the Town of Paradise. National Onsite Demonstration Project for Small Communities. Steward M. Oakley, Wesley P. Greenwood, Matt Lee, Brian Reed. Dept. of Civil Engineering, CSUC.
- 1999 Town of Paradise Onsite Wastewater Management Program Evaluation and Recommendations - Final Report. Questa Engineering Corporation, Norm Hantzsche R.C.E.

Included in these reports are discussions of siting restrictions and design criteria for onsite wastewater systems so as to facilitate the protection of water quality and public health. Hydrogeologically vulnerable areas are identified. Reasonable percolation rates of least permeable soil horizons are discussed. An exhaustive review of the different soil horizons throughout the town including locations of seasonally shallow groundwater based on direct observations, mottling, gleying and redoximorphic features are found in "Wert, Soils of Paradise, 1992" along with mapping of the general soil types throughout the Town. Static water levels, drainage basins as well as subsurface parent geologic material are also identified.

Based on these studies, a comprehensive program for the construction, repair and ongoing maintenance of onsite wastewater treatment systems has been instituted. The 1999 Town of Paradise Onsite Wastewater Management Program Evaluation and Recommendations - Final Report, by Questa Engineering, was a fundamental study for efficacy of this program in protecting water quality and public health. Changes and revisions were recommended and with Town Council approval many were made to the Manual as well as to the Paradise Municipal Code since 1992. Changes and revisions have also been made to keep regulations current with developing science and technology of onsite wastewater treatment.

Part of this onsite wastewater program has included the sampling and monitoring of surface water and ground water quality which has been routinely done since before the creation of the wastewater management zone. This sampling program is designed to monitor groundwater in up to ten drainage basins and surface water in over twenty creeks, with 30 sampling sites. Most of the creeks sampled are perennial. The groundwater monitoring wells are relatively shallow and are designed to encounter 'first water,' which is almost always perched groundwater on the ubiquitous underlying lava cap beneath the entire Town. Sampling occurs twice a year, generally in early spring and fall.

The Town of Paradise will continue this program of sampling and monitoring groundwater and surface water in its efforts to identify any emerging negative effects from onsite wastewater dispersal. Results from these sampling efforts will be presented to the State Regional Water Board every five years.

9.1.2. As the aforementioned studies and reports indicate the effect that the high density of onsite wastewater dispersal has on surface and groundwater has been monitored for many years in the Town of Paradise and will continue to be monitored as described in this Manual. Some of the mitigating

factors for the high density of onsite wastewater treatment systems, as found in the LAMP are as follows:

- The Town of Paradise was recognized as a Wastewater Management Zone in 1992 by the State Regional Water Quality Control Board.
- Development of all parcels in the Town cannot exceed the limit of 900 gallons per day per acre for primary treated effluent (with the exception of the Downtown Adjustment Area - Figure 4.14) and 2000 gallons per day per acre for parcels receiving secondary treated effluent. As of 2015, based on the local water purveyor's records, a gross hydraulic loading rate of 187 gallons per day of wastewater effluent per acre is being achieved in the Town. This rate is much less than the 900 gpd limit recommended in the 1999 report by Questa Engineering.
- All onsite wastewater systems are required to be permitted for operation in the Town. Operating permit effective dates range from one year for advanced treatment systems to twelve years for owner occupied systems in favorable soils. All systems are 'tracked' by the Town and notices that operating permits are expiring are sent to owners on a routine basis. Operating permits have an annual fee that is collected via the County Assessor Tax roll.
- All septic system owners are required to have their systems evaluated to renew their operating permit. Septic system evaluators trained and certified by the Town perform the evaluations and submit their findings on a standardized report. Failure of an owner to have their septic system evaluated upon expiration of an operating permit could result in administrative citations and fines as enforced by the Town of Paradise Code Enforcement program. The operating permit and evaluation program is the fundamental monitoring program for assuring that onsite wastewater treatment systems in Town are operating appropriately.
- Advanced treatment onsite wastewater systems are required to have contractual maintenance and monitoring with routine sampling of effluent. The majority of these systems are commercial and are required to be sampled on a quarterly basis. Minimum standards for effluent levels are found in this Manual, Chapter 6, Large and Advanced Treatment Systems.
- As described in 9.1.1 above there is an ongoing surface water and groundwater monitoring program designed to help identify any contamination issues associated with onsite wastewater dispersal in the Town. Sampling is conducted semiannually and state certified labs must perform the testing.

9.1.3. Shallow soils are addressed in this Manual through different standardized dispersal field design types intended to protect groundwater. They include the following;

- Capping Fill Systems, Section 4.8
- Bottomless Sand Filter Systems, Section 4.2
- Advanced treatment Systems, Section 4.2

All but advanced treatment systems maintain a minimum four foot separation to groundwater or impermeable layers from the rock media layer in the dispersal field. Advanced treatment systems are allowed a minimum separation of two feet from the rock media layer.

9.1.4. Domestic well use is not common in the Town of Paradise. Some private wells exist, but the majority are not used for drinking water purposes. Most are used for landscaping. Many of the wells are relatively shallow, particularly the older ones. As of 2016, there are only two public water wells within the Town limits owned by the local water purveyor. One has no pump and the other is

sporadically used during summer months. The majority of the public water source is from a surface water source outside the Town limits. The groundwater monitoring program will continue to be administered by the Town as an effective program for monitoring wastewater contaminants, including nitrate nitrogen, specific conductance, total and fecal coliform.

9.1.5. Prior reports mentioned in this chapter, such as Soils of Paradise, Wert 1992, address the geotechnical issues of permeability trends of water bearing fractures and potential pathways of effluent toward receptors such as domestic wells and surface water. Groundwater monitoring and sampling, as well as surface water monitoring and sampling will continue to be the most effective procedure by the Town of Paradise for monitoring the potential migration of wastewater effluent through underlying fractured bedrock.

9.1.6. The soils in the Town of Paradise have been characterized for every existing parcel. (See: Soils of Paradise, Wert 1992). Poorly drained soils, such as those with high clay content and a percolation rate above 120 minutes per inch are not commonly found in the Town. Alluvial soils, and those that percolate at a rate under three minutes per inch are also not commonly found. Standardized procedures for percolation and infiltration testing are found in Appendix C, Hydraulic Testing of Soil, of this Manual. These tests are used effectively in determining soil permeability throughout the Town.

9.1.7. Historically, groundwater and surface water sampling have not shown elevated levels of phosphate and other nutrients associated with dishwasher detergents. Sampling for indicators of detergent contaminants has been for specific conductance levels. Specific conductance will continue to be sampled in the groundwater monitoring program. Any persistent elevated levels of specific conductance or other detergent contamination indicators will warrant further review by a qualified professional with mitigation measures recommended.

9.1.8. There are no impaired water bodies in the Town of Paradise.

9.1.9. The Town of Paradise is a high density onsite wastewater treatment system area. Because of this, the LAMP has been designed to address those issues that could compromise water quality and public health. The aforementioned reports and studies conducted on the Towns onsite wastewater characteristics have contributed to the long term creation of this LAMP. The ongoing water sampling program, operating permit and routine evaluation program and alternative treatment system maintenance and monitoring program assures continual monitoring of any deleterious effect that onsite wastewater dispersal may have on the environment.

9.1.10. All parcels within the Town of Paradise (except for the Downtown Adjustment Area as indicated in Figure 4.14) are limited by a gross hydraulic loading rate of wastewater (see Section 4.1.A of this Manual). For primary treated wastewater, that rate is 900 gallons per day per acre. For secondary treated wastewater that amount is 2000 gallons per day per acre. All onsite wastewater systems under new construction are required to designate an area for secondary replacement dispersal fields.

9.1.11. There is no area in the Town of Paradise where onsite wastewater treatment systems were installed pre-dating regulatory oversight. Cesspools are not allowed in the Town.

9.1.12. Onsite wastewater treatment systems in the Town are required to meet the existing setback requirements found in Table 3.1 of this Manual. If existing systems comply with the permitted setback requirements existing at the time of their construction and are found to be in good working order, and not negatively impacting the environment, they are allowed to remain until a repair or upgrade is made, even if the system does not meet current setback standards.

Setback standards found in this Manual are compliant with Tier I standards of the OWTS Policy with the following two exceptions;

- There is no setback requirement listed for public water surface intake points because there are no such intake points within in the Town.
- 2. The setback from ponds is 100 feet because there are very few ponds in Paradise; almost all are less than a half acre in size and all are located on small creeks or springs in drainage basins with earthen dams.

9.2. The Town of Paradise LAMP details the maximum authorized projected flows from onsite wastewater treatment systems in Section 1.9 of this Manual. Approved types of onsite wastewater treatment systems are contained in Chapter 4, Description of Onsite Systems. Siting criteria and siting evaluations are described in Section 1.1 and 1.2 of this Manual.

9.2.1. The Town of Paradise requires that all onsite wastewater treatment systems operate under permit and are routinely evaluated. This requirement is found in Section 1.4 of this Manual. The requirement to have annual maintenance and evaluations for all Alternative Systems is found in this same Section. Section 1.6 contains a requirement that all repairs to onsite wastewater disposal systems must be done under a permit issued by the Town.

9.2.2. There are no special provision areas or impaired water bodies in the Town of Paradise.

9.2.3. Variances to the LAMP are allowed under provisions found in Chapter 2, Variances, of this Manual.

9.2.4. Education and certification requirements for onsite wastewater treatment system evaluators are found in the Paradise Municipal Code, Chapter 5.14, Onsite Sanitation Systems Operation Evaluators. Construction permits are only issued to owners of systems or legally authorized representatives as outlined in Section 1.3 of this Manual. Construction or repairs to onsite wastewater treatment systems must be done by qualified persons in accordance with requirements of the California State Contractors License Board. Only certified evaluators that meet minimum education requirements are allowed to provide operations maintenance and monitoring services to advanced treatment systems as outlined in Section 1.4.A. of this Manual.

9.2.5. Education and Outreach. General operations and maintenance guidelines for standard onsite wastewater treatment systems will be made available on the Town website for all interested parties. All advanced treatment systems are required to have operation, maintenance and monitoring instructions before being issued an operating permit per Section 1.4.A of this Manual. Information pertaining to individual sewage disposal systems design, construction and location are available to the public at the Town of Paradise Onsite Sanitation Division during normal business hours.

9.2.6. The Butte County Public Works Division oversees the operations and management of the septage receiving station that is closest to the Town of Paradise. The Town will continue monitoring the life expectancy of this station and the development of its future replacement.

9.2.7. The Town of Paradise will ensure that responsible entities such as homeowners' associations and special maintenance districts have the financial resources, stability, legal authority, and professional qualifications to operate a community onsite wastewater treatment system in the Town.

9.2.8. The Town of Paradise may consider development and implementation of a Regional Salt and Nutrient Management Plan if necessary.

9.2.9. The Town of Paradise may consider coordination with watershed management groups relating to onsite wastewater treatment systems and the Town of Paradise LAMP.

9.2.10. If a sewer system is constructed in the Town of Paradise procedures for evaluating the proximity of onsite wastewater treatment systems will be considered. As of 2016 there is no municipal sewer system in the Town of Paradise.

9.2.11. There are no intake points for surface water treatment plants in or within 1200 feet of the Town of Paradise.

9.2.12. There is no setback exemption for onsite wastewater treatment systems and public water wells. The setback requirement is 150 feet.

9.2.13. Cesspools are prohibited in the Town of Paradise. There are no known cesspools operating in the Town.

9.3. The minimum responsibilities of the Town of Paradise for the management of its LAMP are contained in the following 9.3 sections:

9.3.1. The Town of Paradise will maintain records of the number, location and description of permits issued for onsite wastewater treatment systems when a variance is granted.

9.3.2. The Town of Paradise will continue conducting its Water Quality Assessment Program by semiannually sampling surface water locations in up to 30 sampling points throughout the Town and sampling the ten designated groundwater monitoring wells in the Town on a semiannual basis. An annual report containing this data will be provided to the Regional Water Board as per State Policy requirements (historically this information has been submitted to the Regional Water Board on an annual basis). In addition to the designated 10 groundwater monitoring wells, sampling data may also be obtained from individual groundwater monitoring wells constructed around several large commercial onsite systems that are required to be sampled on an annual basis. (*If* usable data is obtained, typically these wells are dry). Other sources of groundwater data may be reviewed for efficacy, including the various examples provided in the State Policy.

Sampling shall include monitoring for nitrates and pathogens and may include sampling for other constituents which are needed to adequately characterize water quality.

9.3.3. By February 1st of each year the Town of Paradise shall submit to the applicable Regional Water Board an annual report summarizing the status of items 9.3.1 through 9.3.2, above. Every fifth year, the Town of Paradise shall submit an evaluation of the monitoring program and an assessment of whether water quality is being negatively impacted by onsite wastewater treatment systems. That evaluation will also identify any changes in the LAMP that will be undertaken by the Town of Paradise to address these impacts. The first annual report will be developed one year after the approval of the LAMP. All groundwater monitoring data shall be submitted in EDF format and surface water monitoring shall be submitted to CEDEN in a SWAMP comparable format.

9.4. The Town of Paradise Local Agency Management Program prohibits the following:

- Cesspools of any kind.
- The permitting of any onsite wastewater system that has a projected flow over 10,000 gpd that is not accompanied by a Report of Waste Discharge filed with and approved by the State Regional Water Board.
- Installation of an entire new or replacement onsite wastewater treatment system where public sewer is available. Partial replacement of an onsite wastewater treatment system does not automatically apply to this prohibition and will be evaluated on a case by case basis.
- Onsite wastewater treatment systems dedicated to receiving significant amounts of wastes dumped from RV holding tanks.
- The construction of a wastewater dispersal field on a slope greater than 30% without a slope stability report approved by a registered professional.
- New or replacement onsite wastewater treatment systems less than 150 feet from a public water well.
- Other prohibitions as identified throughout this Manual and the Paradise Municipal Code.

9
DEFINITIONS

Absorption capacity: See mounding analysis.

Advanced treatment: Treatment provided to wastewater after primary treatment has occurred. The treatment enhances the aerobic environment of wastewater by introducing oxygen into it, thus promoting the microbial decomposition of organic pollutants. Advanced treatment reduces the level of constituents in wastewater including BOD and TSS. Advanced treatment is also commonly known as pretreatment, secondary treatment or supplemental treatment.

Aerobic: A condition in which molecular oxygen is present in the environment.

Aerobic media system: An advanced treatment system that uses a type of media to promote microbial attachment and growth so as to enhance the microbial decomposition of organic material in wastewater. Media substances include sand, gravel, textile fabric, plastic, and peat. The primary purpose of the media is to increase surface area for microorganisms to grow and receive increased oxygen exposure. Aerobic Media Systems are also known as Filter Systems.

Alteration: Any change in the physical configuration of an existing onsite wastewater disposal system or any of its component parts, including replacement, modification, additional or removal of disposal system components, installation, size, capacity, type or number of one or more components. The term "alter" shall be construed accordingly.

Alternative System: Any onsite wastewater disposal system other than the standard septic tank/gravity-fed dispersal field described in Chapter 4. Any system installed under a variance or classified as innovative shall be considered an alternative system.

Anaerobic: A condition in which molecular oxygen is absent from the environment.

Applicant: The person who signs and submits an application for permit to construct, install or alter a disposal system.

Bedrock: A solid and continuous body of rock, with or without fractures, or a weathered or broken body of rock fragments overlying a solid body of rock. It has less than 25% fines and can not be broken by hand pressure.

Bedroom: Any room within a dwelling unit, furnished or unfurnished, that may reasonably be expected to serve primarily as sleeping quarters.

Black wastewater: Wastewater derived from plumbing fixtures or drains that only receive excreta wastewater.

Bottomless sand filter: An unlined intermittent dosing sand filter that allows effluent to travel into the soil below the bed of sand.

Building drain: That portion of the lowest piping of a plumbing system that receives the discharge plumbing and other pipes inside the walls of a building and conveys it to the building sewer.

Capping fill: A dispersal field that is used at a site that is lacking effective soil depth above groundwater or restrictive layers for a standard system. The dispersal trench for a capping fill system is installed a minimum of twelve inches into native soil. Approved cover soil is added to "cap" the system.

Chroma: The relative purity or strength of color of soil; a quantity that decreases with increasing grayness. Chroma is one of the three variables of color as defined in the Munsell system of color classification.

Clay: See Soil texture

Clay pan: A dense, compact clay layer in the subsoil. It has a much higher clay content than the overlying soil horizon from which it is separated by an abrupt boundary. Clay pans are hard when dry and very sticky and very plastic when wet. They impede movement of water and air and growth of plant roots.

Community system: An onsite wastewater disposal system designed to serve more than one lot or parcel or more than one condominium unit or more than one unit of a planned unit development.

Conditions associated with saturation: A) Reddish brown or brown soil horizons with gray (chromas of two or less) and red or yellowish red mottles; or, B) Gray soil horizons, or gray soil horizons with red, yellowish red, or brown mottles; or, C) Dark colored highly organic soil horizons; or, D) Soil profiles with concentrations of soluble salt at or near the ground surface.

Contour: An imaginary line of constant elevation on the ground surface; the corresponding line on a map is called a "contour line".

Criteria: Technical requirements upon which a judgment or decision may be based.

Curtain drain: A method of artificially lowering the water table by installation of a trench on the up-hill side of a dispersal field on sites with slopes greater than four percent. The trench has a perforated pipe in the bottom that collects and diverts water away from the dispersal field area.

Design flow: The wastewater flow that may reasonably be expected to be discharged from a residential, commercial, or institutional facility on any day.

Dispersal field: One or more dispersal trenches, or dispersal beds where wastewater effluent is discharged for the sake of dispersing into the underlying soil strata. A dispersal field is also known as a drainfield, absorption field, disposal field or leachfield.

Dispersal trench: A dispersal trench receives wastewater effluent for the purpose of dispersing the effluent through the soil media that surrounds the trench. It consists of a trench with vertical

sides and flat bottom and a minimum of twelve inches of clean, rounded leach rock material. A distribution pipe lays flat toward the top of the leachrock column. The trench has a minimum of twelve inches of soil cover, or, in the case of pavement, a minimum of six inches of soil cover and the remaining six inches consisting of road base, concrete or asphalt.

Distribution box: A watertight structure that receives septic tank effluent and is used to distribute such effluent in equal portions to two or more disposal fields or distribution pipes within a disposal field.

Distribution pipe: A perforated pipe or one of several perforated pipes used to carry and distribute septic tank effluent throughout the disposal field.

Distribution network: Two or more inter-connected distribution pipes.

Diverter valve: A device that permits alternating use of two or more disposal fields or the diversion of septic tank effluent.

Diversion ditch: A ditch to intercept and divert surface water runoff.

Dosing septic tank: A unitized device performing functions of both a septic tank and a dosing tank.

Dosing siphon: A hydraulic device designed to discharge rapidly the contents of a dosing tank between predetermined water or sewage levels.

Dosing tank: A watertight receptacle located between the septic tank and disposal field and equipped with a pump or siphon, to store and deliver doses of septic tank effluent to the disposal field.

Drainrock: Clean, washed gravel ranging from three-quarter to two and one-half inches in size, or clean crushed rock ranging in size from one and one-half to two and one-half inches.

Drainage area: An area from which the surface runoff is carried away by a single watercourse.

Drainage ditch: A ditch used to receive and divert receiving and diverting surface runoff or subsurface water.

Drop box: A component of a serial distribution system. The drop box allows overflow from one dispersal trench to the next.

Dry well: A system that involves effluent being discharged from a septic tank into a cesspool.

Dwelling unit: Any structure or portion of a structure, permanent or temporary in nature, used or proposed to be used as a residence seasonally or throughout the year.

Effective absorption area: The entire sidewall area of a dispersal trench to a level two inches above the distribution pipe. The bottom area of a trench that receives secondary treated wastewater is also considered effective absorption area.

Effective size: The size or diameter of the particle or sand grain, in millimeters, in a sand mixture, below which ten percent by weight of the sand grains are smaller in diameter.

Effective soil depth: Permeable soil that is effective in receiving and dispersing wastewater effluent from an onsite wastewater disposal system. The effective soil depth is typically underlain by a limiting horizon which includes bedrock, dense clays, excessively coarse soils and seasonally high groundwater tables.

Effluent lift pump: A pump used to lift septic tank or other treatment facility effluent to a higher elevation.

Effluent sewer: Part of the system of drainage piping that conveys partially treated sewage from a septic tank or other treatment facility into a dispersal field. .

Emergency repair: Repair of a failing system where immediate action is necessary to relieve a situation in which sewage is backing up into a dwelling or building, or repair of a broken pressure sewer pipe.

Engineered fill: Importation of select soil placed deeper than twelve inches on a site for the express purpose of constructing a drainfield.

Escarpment: Any naturally occurring slope greater than fifty percent which extends vertically six inches or more as measured from toe to top, and which is characterized by a long cliff or steep slope which separates two or more comparatively level or gently sloping surfaces, and may intercept one or more layers that limit effective soil depth.

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

Experimental systems: See Innovative Applications, Chapter 7.

Failing system: Any onsite wastewater dispersal system which discharges untreated or incompletely treated wastewater directly or indirectly onto the ground surface or into surface waters, including creeks, ponds or groundwater. Any onsite wastewater dispersal system which has a cracked, deteriorated or leaking tank. Any onsite wastewater disposal system that is not performing as it was designed for the treatment and dispersal of wastewater, including dispersal fields not accepting wastewater at the rate for which it is designed or for that which is flowing into it.

Fill material: Any soil, rock or other material placed within an excavation or over the surface of the ground. The term "fill or back-fill" is equivalent in meaning.

Finish grade: The surface elevation of the ground after completion of final grading.

Filter fabric: A woven or spun-bonded sheet material used to impede or prevent the movement of sand, silt and clay into filter material.

Five-day biochemical oxygen demand (BOD_5): The quantity of oxygen used in the biochemical oxidation of organic matter in five days at 20 degrees Centigrade under specified conditions and reported as milligrams per liter (mg/L).

Gleization: A process of intense reduction caused by long periods of soil saturation in the presence of organic matter while the soil temperatures are above biologic zero, forty-one degrees Fahrenheit.

Gleyed: A soil condition resulting from intense reduction, characterized by the presence of ferrous iron and neutral gray, green or blue colors that commonly change to brown upon exposure to air.

Gravel: See Soil texture

Gray wastewater: That portion of the wastewater generated within a residential, commercial or institutional facility that does not include discharges from water closets and urinals.

Grease trap: A device located inside a building in which the grease in wastewater is intercepted, congealed by cooling, accumulated and stored for pump-out and disposal.

Grease interceptor tank: A septic tank with the outlet tee extended to within twelve inches of the floor of the tank used to intercept and retain any grease that may be present in the wastewater.

Groundwater:

a. **Permanent Groundwater table**: The upper surface of a saturated zone that exists year-round. The thickness of the saturated zone, and, as a result, the elevation of the permanent groundwater table may fluctuate as much as twenty feet or more annually; but the saturated zone and associated permanent groundwater table will be present at some depth beneath land surface throughout the year.

b. **Groundwater aquifer:** A porous formation of ice contact and glacial outwash sand and gravel, or bedrock that contains significant recoverable quantities of water that is likely to provide drinking water supplies.

c. **Groundwater gradient:** For purpose of this manual, the groundwater gradient is assumed to follow the topographic gradient except for stratified drift and ablation till landscapes where the disposal system is assumed to be down gradient regardless of the topographical gradient.

d. Groundwater table: The upper surface of a zone of saturation.

Hazardous waste: Any chemical substance or material, gas, solid or liquid designated as hazardous by the U.S. Environmental Protection Agency pursuant to the United States Resource Recovery and Conservation Act, Public Law 94-580.

Holding tank: A closed watertight structure designed and operated in such a manner as to receive and store wastewater or septic tank effluent, but not to discharge wastewater or septic tank effluent to the surface or groundwater or onto the surface of the ground.

Horizon, soil: A layer within a soil profile differing from the soil above or below it in one or more soil morphological characteristics including color, texture, rock fragment content, structure and consistence of each soil horizon or parent material.

Horizontal reference point: A stationary, easily identifiable point to which horizontal dimensions can be related.

Hue: The dominant spectral color, one of the three variables of soil color defined within the Munsell system of color classification.

Infiltration rate: The rate water is absorbed by a soil surface whether that surface be the ground surface or interior of a trench lined with drainrock.

Innovative application: See Chapter 7.

Install: To assemble, put in place or connect components of a disposal system in a manner that permit their use by the occupants of the structure served.

Intermittent dosing sand filter: A filter with two feet or more of medium sand designed to filter and biologically treat septic tank or other treatment unit effluent from a pressure distribution system at an application rate not to exceed 1.5 gallons per square foot per day applied at a dose not to exceed twenty percent of the projected daily wastewater flow per cycle.

Invert: The floor, bottom or lowest portion of the internal cross-section of a closed conduit, used with reference to pipes or fittings conveying wastewater or septic tank effluent.

Large system: See Chapter 6.

Malfunctioning system: An improperly functioning or non-operational onsite wastewater disposal system , as indicated by, but not limited to, any of the following events: (1) Contamination of nearby water wells or surface water bodies by wastewater of septic tank effluent as indicated by the presence of fecal bacteria where the ratio of fecal coliform to fecal streptococci is four or greater; (2) Ponding or outbreak of wastewater or septic tank effluent into portions of buildings below ground; (3) Seepage of wastewater or septic tank effluent into portions of buildings below ground; (4) Emanations of foul odors from any component of the

system; or (5) Back-up of wastewater into the building served which is not caused by a physical blockage of the internal plumbing.

Media Filter: A component of an advanced treatment system where wastewater effluent is passed through filter material multiples time to achieve a level of wastewater constituent reduction. Media filters rely on an aerobic environment that promotes microbial growth. Microbial decomposition of wastewater nutrients occurs on the filter media surface. Filter media may be sand, aggregate, textile, or other substances that provide a large amount of surface area.

Medium sand: A mixture of sand with 100 percent passing the No. 3/8 inch sieve, ninety to 100 percent passing the No. 4 sieve, sixty-two to 100 percent passing the No. 10 sieve, forty-five to eight-two percent passing the No. 16 sieve, twenty-five to fifty-five percent passing the No. 30 sieve, five to twenty percent passing the No. 50 sieve, ten percent or less passing the No. 60 sieve, and four percent or less passing the No. 100 sieve.

Mineral soil: Any soil consisting primarily of sand, silt and clay rather than organic matter.

Mottles, drainage: Soil color patterns caused by alternating saturated (anaerobic) and unsaturated (aerobic) soil conditions. When saturation occurs while soil temperatures are above biological zero forty-one degrees Fahrenheit, iron and manganese will become reduced and exhibit subdued shades such as grays, greens or blues. When unsaturated conditions occur, oxygen combines with iron and manganese to develop brighter soil colors such as yellow and reddish brown. Soils which experience seasonally fluctuating water tables usually exhibit alternating streaks, spots, or blotches of bright colors (oxidized area) with dull or subdued colors (reduced areas). The longer a soil is saturated and in an anaerobic condition, the greater is the percentage of color which will be subdues. Soils which are never or are rarely exposed to free oxygen are considered totally reduced or gleyed. (See Appendix A).

Mounding analysis: A hydrogeologic study of a proposed dispersal field area to determine the capacity of the underlying soils to transmit water off the site without surfacing. Words used to describe water flow through soil and away from a drainfield include site capacity, assimilation of flows, and absorption capacity.

Mottling: A color pattern observed in soil consisting of blotches or spots of contrasting color. The term "mottle" refers to an individual blotch or spot. Drainage mottling is an indication of seasonal or periodic and recurrent soil saturation.

Munsell system: A system of classifying soil color consisting of an alpha-numeric designation for hue, value and chroma, such as "7.5YR6/2," together with a descriptive color name, such as "strong brown."

Normal high water line, river line, stream, lake and pond: That line on the shore or bank of stream that is apparent from visible markings, changes in the character of soil, rock or vegetation resulting from submersion or the prolonged erosion action of the water.

Operate: To use or convey a structure or facility served by disposal system or to own a structure or facility where such use or occupation exits.

Owner: Any person who alone, or jointly, or severally with others: (1) Has legal title to any single lot, dwelling, dwelling unit, or commercial facility; or (2) Has care, charge or control of any real property as agent, executor, executrix, administrator, administratrix, trustee, commercial leasee, or guardian of the estate of the holder of legal title; or (3) Is the contract purchaser of real property NOTE: Each such person as described in subsections (2) and (3) thus representing the legal title holder, is bound to comply with the provisions of these rules as if he were the legal title holder.

Parent material: The unconsolidated and more or less un-weathered mineral or organic matter from which the soil profile is developed.

Perimeter drain or tile dewatering: A method of artificially lowering the water table on sites with slopes less than twelve percent by installation of a trench that completely surrounds the entire absorption field. The trench shall be twelve inches wide and approximately five feet deep with perforated pipe in the bottom that collects and diverts water away from the absorption field area.

Person: An individual or his/her heirs, executor, administrator, assign or agents, a firm, corporation, association, organization, municipal or quasi-municipal corporation, or governmental agency. Singular includes plural and male includes female.
Pit privy: An alternative toilet placed over an excavation where human waste is deposited.

Portable toilet: Any self-contained chemical toilet facility that is housed within a portable toilet shelter and includes, but is not limited to construction-type chemical toilets.

Potable water: Water that does not contain objectionable pollution, contamination, minerals, or infective agents, is satisfactory for human consumption and is used for human consumption.

Pre-existing native ground surface: The original level of the ground surface before any man-made development occurred, typically in the form of soil being removed or soil being deposited at the site.

Pressure distribution lateral: Piping and fittings in pressure distribution systems which distribute septic tank or other treatment unit 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 septic tank or other treatment unit effluent under pressure in a dispersal field or sand filter.

Pressure transport piping: Piping which conveys septic tank or other treatment unit effluent to a dispersal field by means of pressure, typically created by a pump.

Primary treatment; Primary treatment is the removal of solids from wastewater. It entails the settling of heavy solids and the floating of lighter solids within wastewater while it is placed in a static environment, such as in a septic tank. Wastewater effluent that is plumbed to flow out of a septic tank, where the heavier and lighter solids have been removed, has undergone primary treatment.

Public sewer: Municipal sewerage system.

Public waters: Lakes, bays, ponds, impounding reservoirs, springs, wells, rivers, streams, creeks, estuaries, marches, inlets, canals, the Pacific Ocean within the territorial limits of the State of California, and all other bodies of surface or underground waters, natural or artificial, inland or coastal, fresh or slat, public or private (except those private waters which do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the State or within its jurisdiction.

Qualified designer: A registered civil engineer, certified professional soil scientist, registered environmental health specialist, registered engineering geologist, or registered geologist with experience in designing onsite wastewater disposal systems. A qualified designer may perform soil tests, prepare site evaluation reports, and design onsite wastewater disposal systems. Firms performing satisfactory site evaluations at the time this manual is adopted are also considered to be qualified.

Realty improvement: Any new residential, commercial or industrial structure or other premises, including but not limited to condominiums, garden apartments, town houses, mobile homes, stores, office buildings, restaurants, and hotels, not served by an approved public sewer, the useful occupancy of which will require the installer erection of disposal systems. Each dwelling unit in a proposed multiple-family dwelling unit or each commercial unit in a commercial structure shall be construed to be a separate realty improvement.

Recirculating gravel filter: A gravel filter which processes liquid waste by mixing filtrate with incoming septic tank effluent and recirculating it several times through the filter material before discharge to a final treatment or absorption area.

Redundant dispersal field system: A system in which two complete dispersal fields are installed, the dispersal trenches of each system alternate with each other and only one system operates at a given time.

Restrictive chemical material: Any chemical material that contains concentrations in excess of one part per hundred, by weight of any halogenated hydrocarbon chemical, aliphatic or aromatic, including, but not limited to trichloroethane, trichloroethylene, methylene chloride, tetrachoreoethlylene, halogenated benzenes and carbon tetrachloride, any aromatic hydrocarbon chemical, including but not limited to benzene, toluene and naphthalene; any phenol derivative in which a hydropsy group and two or more halogen atoms are bonded directly to a six-carbon

aromatic ring, including but not limited to trichlorophenol or pentachloro-phenol; or acrolein, acrylonitrile or benzidene. Restrictive chemical material does not, however, include any chemical material that is biodegradable and is not a significant source of contamination of the groundwater of the State.

Restrictive soil layer: A soil horizon or zone within a soil profile that slows or prevents the downward or lateral movement of water.

Rock fragment: A rock fragment contained within the soil that is greater than two millimeter equivalent spherical diameter or that is retained on a two millimeter sieve.

Sand: See Soil texture.

Sand filter surface area: The area of the level plane section in the medium sand horizon of a conventional sand filter located two feet below the bottom of the filter material containing the pressurized distribution piping.

Sand filter system: The combination of septic tank or other treatment unit, dosing system with effluent pump and controls, or dosing siphon, piping and fittings, sand filter, and absorption facility used to treat and dispose of sewage.

Saprolite: Weathered material underlying the soil that grades from thoroughly decomposed rock to rock that has been weathered sufficiently so that it can be broken in the hands or cut with a knife. It does not include hard bedrock or hard fractured bedrock. It has rock structure, but behaves like soil. It is considered soil in determining soil depth.

Seasonal or temporary high groundwater table: The upper limit of the shallowest seasonal groundwater table that occurs in the soil. This zone may be determined by identification of soil drainage mottling or by wet-season monitoring. A high groundwater level that is not maintained for over two weeks, but is a temporary spike due to extreme rainfall, is not regarded as a seasonal high groundwater table.

Secondary Treatment: A process of wastewater treatment that is provided after primary treatment where small suspended solids and other organic materials undergo a biological process that removes them from the wastewater. Typically secondary treatment entails naturally occurring microorganisms given an accelerated amount of oxygen, thus promoting their metabolic digestion of organic pollutants in wastewater.

Seepage bed: An absorption system having disposal trenches wider than three feet.

Seepage pit: A "cesspool" which has a treatment facility such as a septic tank ahead of it

Seepage trench system: A system with disposal trenches with more than six inches of filter material below the distribution pipe.

Septage: All sludge, scum, liquid and any other material removed from a septic tank or disposal field.

Septic tank: A watertight receptacle that receives the discharge of untreated wastewater, and is designed and constructed so as to permit settling of settleable solids from the liquid collection of the scum, partial digestion of the organic matter and discharge of the liquid portion into a disposal field.

Septic tank effluent: Primary treated wastewater discharged through the outlet of a septic tank.

Serial distribution: A method of distributing septic tank effluent between a series of dispersal trenches so that each successive trench receives septic tank effluent only after the preceding trench has become full to overflowing.

Setback distance: The nearest horizontal distance between a component of a disposal system and selected site features or structures.

Single-family dwelling unit: A structure or realty improvement intended for single-family use.

Site evaluation: The practice of investigating, evaluating and reporting basic soil and site conditions that apply to wastewater treatment and dispersal in compliance with code.

Site evaluator: A certified professional soil scientist (CPSS), registered civil engineer, certified engineering geologist, registered geologist, registered environmental health specialist or other individual as approved by the Onsite Sanitation Division, that has adequate knowledge and training in soil science pertaining to onsite wastewater disposal system design See also qualified designer.

Slope: The rate of fall or drop in feet per 100 feet of the ground surface, expressed as a percent.

Sludge: A relative dense suspension of wastewater solids that settle to the bottom of a septic tank, are relatively resistant to biological decomposition, and that collect in the septic tank over a period of time.

Small flow wastewater construction service: (1) The installation of onsite sewage disposal systems (including the placement of portable toilets, or any part thereof; or (2) The pumping out or cleaning of onsite sewage disposal systems (including portable toilets), or any part thereof; or (3) The disposal of material derived from the pumping out or cleaning of onsite sewage disposal systems (including portable toilets); or (4) Grading, excavating, and earth-moving work connected with the operations described in subsection (1) of this section, except streets, highways, dams, airports or other heavy construction projects and except earth-moving work performed under the supervision of a builder or contractor in connection with and at the time of the construction of a building or structure; or (5) The construction of a drain and sewage lines from five feet outside a building or structure to the service lateral at the curb or in the street or alley or other disposal terminal holding human or domestic sewage.

Soil: The collection of natural bodies on the earth's surface, in places modified or even created of earthy materials, containing living matter and capable of supporting plants out-of-doors.

Soil material: Soil as well as any naturally occurring unconsolidated mineral deposit that is not bedrock.

Soil permeability rating: That quality of the soil that enables it to transmit water or air, as outlined in the United States Department of Agriculture Handbook, Number 18, entitled Soil Survey Manual.

Soil profile: A vertical cross-section of the undisturbed soil showing the characteristic soil horizontal layers or soil horizons of the soil that have formed as a result of the combined effects of parent material, topography, climate, biological activity, and time.

Soil saturation: The state when all the pores in the soil are filled with water. Water will flow from saturated soils into an observation hole.

Soil structure: The naturally occurring arrangement, within a soil horizon, of sand, silt and clay particles, rock fragments and organic matter, that are held together in clusters or soil aggregates.

Soil texture: The amount of each soil separate in a soil mixture. Field methods for judging the texture of a soil consist of forming a cast of soil, both dry and moist, in the hand and pressing a ball of moist soil between thumb and finger. The major textural classifications are defined as follows:

1. Sand: Individual grains can be seen and felt readily. Squeezed in the hand when dry, this soil will fall apart when the pressure is released. Squeezed when moist, it will form a cast that will hold its shape when the pressure is released, but will crumble when touched.

2. Sandy loam: Consists largely of sand, but has enough silt and clay present to give it a small amount of stability. Individual sand grains can be readily seen and felt. Squeezed in the hand when dry, this soil will readily fall apart when the pressure is released. Squeezed when moist, it forms a cast that will not only hold its shape when the pressure is released, but will withstand careful handling. The cast formed of moist soil and be handled freely without breaking.

3. Silt loam: Consists of a moderate amount of fine grades of sand, a small amount of clay, and a large quantity of silt particles. Lumps in a dry, undisturbed state appear quite cloddy, but they can be pulverized readily, the soil then feels soft and floury. When wet, silt loam runs together in puddles. Either dry or moist, casts can be handled freely without breaking. When a ball of moist soil is pressed between thumb and finger, it will not press out into a smooth, unbroken ribbon, but will have a broken appearance.

4. Clay loam: Consists of an even mixture of sand, silt and clay, which breaks into clods or lumps when dry. When a ball of moist soil is pressed between the thumb and finger, it will

form a thin ribbon that will readily break, barely sustaining its own weight. The moist soil is plastic and will form a cast that will withstand considerable handling.

5. Silty clay loam: Consists of a moderate amount of clay, a large amount of silt, and a small amount of sand. It breaks into moderately hard clods or lumps when dry. When moist, a thin ribbon or one-eight inch sustain its weight and will withstand gentle movement.

6. Silty clay: Consists of even amounts of silt and clay and very small amounts of sand. It breaks into hard clods or lumps when dry. When moist, a thin ribbon or one-eighth inch or less sized wire formed between thumb and finger will withstand considerable movement and deformation.

7. Clay: Consists of large amounts of clay and moderate to small amounts of sand. It breaks into very hard clods or lumps when dry when moist, a thin, long ribbon or one-sixteenth inch wire can be molded with ease. Fingerprints will show on the soil, and a dull to bright polish is made on the soil by a shovel.

These and other soil textural characteristics are also defined as shown in the United States Department of Agriculture Textural Classification Chart (Figure A.1) which is hereby adopted as part of these rules. This textural classification chart is based on the Standard Pipette Analysis as defined in the United States Department of Agriculture, Soil Conservation Service Soil Survey Investigations Report No. 1.

Soil with rapid or very rapid permeability:

A. Soil which contains thirty-five percent or more of course fragments two millimeters in diameter or larger by volume with intersectional soil of sandy loam texture or coarser as defined herein and as classified in Soil Textural Classification Chart (Figure A.1).

B. Coarse textured soil (loamy sand or sand as defined herein and as classified in Soil Textural Classification Chart).

C. Stones, cobbles, gravel and rock fragments with too little soil material to fill interstices larger than 1 mm in diameter.

Subsurface sewage treatment: The physical, chemical or bacteriological breakdown of wastewater through aerobic treatment in the unsaturated zone of the soil. .

Temporary high groundwater table: The upper surface of a saturated zone that exists only on a seasonal basis, typically during winter and/or early spring. The elevation of a temporary high groundwater table may fluctuate but is only regarded as significant for dispersal field design if it is present more than a two week period.

Total suspended solids (TSS): Solids in wastewater that can be removed readily by standard filtering procedures in a laboratory and reported as milligrams per liter (mg/L).

Variance: Written authorization issued by the Town of Paradise that permits some act or condition otherwise impermissible in the Onsite Wastewater Management Zone.

Value: The relative lightness or intensity of a color, one of the three variables of soil color defined within the Munsell system of classification.

Vault Privy: An alternative toilet that retains human waste in a sealed vault.

Wastewater: Any liquid waste containing animal or vegetable matter in suspension or solution or the water carried wastes from the discharge of water closets, laundry tubs, washing machines, sinks, dishwashers, or other source of water carried wastes of human origin. This term specifically excludes industrial, hazardous or toxic wastes and materials.

Wastewater discharge requirements: Wastewater discharge requirements are issued by the California Regional Water Quality Control Board, Central Valley Region, for discharge of wastewater to the environment.

Wastewater strength: The concentration of pollutants in wastewater as measured by BOD_5 (Biochemical Oxygen Demand), TSS (Total Suspended Solids), Nitrogen compounds and FOG (Fats, Oils and Grease). High strength wastewater has a 30-day average concentration of BOD_5 greater than 300 mg/l and/or TSS greater than 330 mg/l and/or FOG concentration greater than 100 mg/l.

Water well: A bored, drilled or driven shaft or dug hole that extends below the seasonal groundwater table and is used as a drinking water supply.

APPENDIX A
SOIL PROFILE TERMINOLOGY

A. General

The relative amounts of the sizes of mineral particles in a soil are referred to as soil texture. All soils are comprised of sand, silt and clay. The soil texture classification set forth in this section is based upon the U.S. Department of Agriculture twelve soil textural classes. However, for the purpose of this code, a site evaluator can adequately describe soil texture based upon the twelve general soil textural classes described in Figure A-1.

B. Mottling

Mottling terms: The site evaluator shall estimate the abundance, size, and contrast of mottling using the volume estimation charts provided in Munsell charts and using the following terms in (Mottle abundance) and (Mottle contrast):

- Mottle abundance: Mottle abundance means the percentage of the exposed soil surface occupied by mottles and is described as follows:

- Few: Mottle abundance is "few" where the mottles color occupies less than two percent of the exposed soils surface

- Common: Mottle abundance is "common" where the mottles color occupies from two to twenty percent of the exposed soil surface.

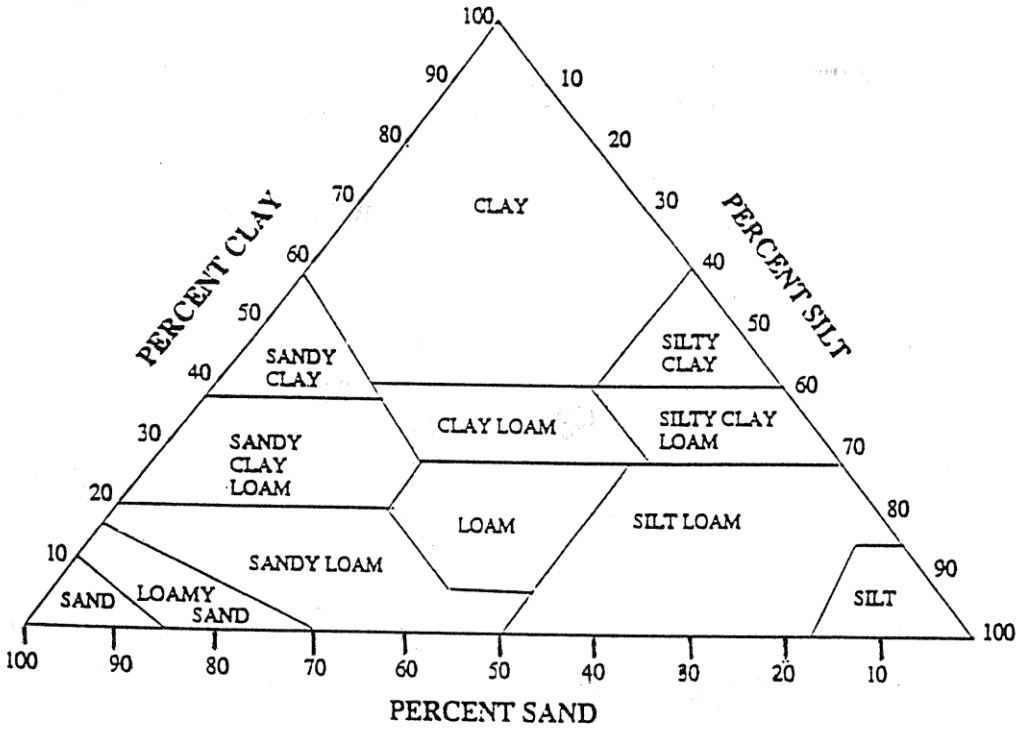
- Many: Mottle abundance is "many" where the mottles color occupies more than twenty percent of the exposed surface.

Mottle contrast: Mottle contrast means the difference in color between the soil mottle and the background color of the soil and is described as follows:

- Faint: Mottle contrast is "faint" where mottles are evident but only recognizable under close examination.

- Distinct: Mottle contrast is "distinct" where mottles are readily seen but not striking.

- Prominent: Mottle contrast is "prominent" where mottles are obvious and mottles are one of the outstanding features of the soil horizon.



SAND - 2.0 TO 0.05 MM. DIAMETER
SILT - 0.05 TO 0.002 MM. DIAMETER
CLAY - SMALLER THAN 0.002 MM. DIAMETER

FIGURE A.1
UNITED STATES DEPARTMENT OF AGRICULTURE TEXTURAL CLASSIFICATION CHART

C. Soil Texture

A standard procedure to report soil texture is presented in this section.

Sandy loam texture: The texture is "sandy loam" where the soil contains much sand, but has enough silt and clay to make it somewhat sticky. Individual sand grains can be readily seen and felt.

- Dry: Dry soil aggregates are easily crushed. Squeezed when dry, it will form a cast that will fall apart. Very faint velvety feeling initially but as rubbing is continued, the gritty feeling of sand dominates.

- Moist: If squeezed when moist, a cast can be formed that will bear careful handling without falling apart. It does not form a ribbon between the thumb and forefinger.

Loam texture: The texture is "loam" where the soil has a relatively even mixture of sand, silt and clay. A loam feels somewhat gritty, yet fairly smooth and highly plastic.

- Dry: Dry soil aggregates are crushed under moderate pressure; clods can be quite firm. When pulverized, loam has a velvety feel that becomes gritty with continued rubbing.

- Moist: Squeezed when moist, it will form a cast that can be handled quite freely without breaking. It has a very slight tendency to ribbon between the thumb and forefinger. The ribbon surface is rough.

Silt loam texture: The texture is "silt loam" where the soil is medium-textured soil.

- Dry: Dry soil aggregates are firm but may be crushed under moderate pressure. Clods are firm to hard. Silt loam may appear cloddy, but the clods are readily broken. It will form casts that can be handled freely without breaking. When pulverized, smooth, flour-like feel dominates.

- Moist: Squeezed when moist, it will form casts that can be handled freely without breaking. It has a slight tendency to ribbon between the thumb and forefinger. The ribbon has a broken effect or rippled appearance.

Silt texture: The texture is "silt" where the soil is medium textured and feels floury when dry and nonsticky when moist.

Silty clay loam: The texture is "silty clay loam" when the soil is a fine-textured soil.

- Dry: Dry soil aggregates are very firm. Silty clay loams usually breaks into clods or lumps that are hard when dry.

- Moist: Squeezed when moist, it will form a thin ribbon that will break readily, barely sustaining its own weight. The moist soil is plastic and will form a cast that will stand

considerable handling. When hand kneaded it does not crumble readily, but tends to become a heavy, compact mass. It is sticky when moist.

Silty clay texture: The texture is "silty clay" where the soil is fine-textured.

- Dry: Usually forms very hard clods or lumps when dry.

- Moist: Squeezed when moist, it will form a long flexible ribbon. A silty clay soil leaves a "slick" surface when rubbed with a long stroke and firm pressure. Silty clay tends to hold the thumb and forefingers together, due to its stickiness. When placed between the teeth silty clay has a smooth slick feeling.

- Wet: Quite plastic when wet. It can be very sticky when wet.

D. Rock Fragments

Intent: This section provides a standard procedure to modify the soil texture description based upon the size of rock fragments and the volume percentage of rock fragments in the soil profile and on the surface of the site.

General: Where the soil profile contains fifteen to thirty-five percent by volume of rock fragments, the soil texture description shall be modified using the appropriate adjectives set forth in Soil Survey manual.

Terms for reporting rock fragment size: The rock fragment size terms for modifying the soil texture description are as follows:

Gravelly: "Gravelly" is used where the rock fragments range from 0.1 to 3.0 inches in diameter (i.e. gravelly sandy loam, gravelly loam, etc.)

Cobbly: The "cobbly" is used where the rock fragments range from 3 to 10 inches in diameter (i.e. cobbly sandy loam, stony loam, etc.).

Bouldery: "Bouldery" is used where rock fragments are larger than 10 inches in diameter.

E. Terms for Reporting the Percentage of Rock Fragments

The rock fragment abundance terms for modifying the soil texture description are as follows:

Very: Where the soil profile contains thirty-six to sixty percent by volume of rock fragments, the word "very" is used along with the appropriate rock fragment size term is to be incorporated with the textural name (i.e. Very gravelly sandy loam, very cobbly sandy loam, very stony sandy loam, etc.)

Extremely: Where the soil profile contains sixty-one to ninety percent by volume of rock fragments, the word "extremely" is used along with the appropriate rock fragment size terms is to be

incorporated with the textural name (i.e. extremely gravelly sandy loam, extremely cobbly sandy loam, extremely stony sandy loam, etc.).

Surface stones: Where the surface of the site contains more than fifty percent by area of large stones if not proposed to be removed, the site shall be considered excessively coarse and require the disposal field to be the stones.

F. Soil Consistence

Intent: This section provides a standard procedure to report soil consistence in the field. For the purposes of this code, however, consistence describes the resistance a soil horizon presents to a pocket penetrometer. This is described as "consistence in place". It is not unusual for a soil to be described as "firm in place" but to be friable when crushed between the thumb and forefinger. The soil that is firm in place will restrict the downward movement of septic tank effluent, even though it may be friable when removed. It is important to note that dry soils may exhibit greater resistance to a pocket penetrometer than when moist. If possible, soil consistence should be measured in a moist state. Soil consistence shall be described based upon the following:

Loose soil: The consistence is "loose" where a soil horizon has a single grain structure and offers resistance to a pocket penetrometer of less than 0.25 ton per square foot. Soil does not adhere when pressed together.

Friable soil: The consistence is "firm" where a soil horizon has a platy, prismatic or massive structure. Resistance to a pocket penetrometer is 0.75 to 1.5 ton per square foot. Soil coheres when pressed together.

Firm soil: The consistence is "firm" where a soil horizon has a platy, prismatic or massive structure. Resistance to a pocket penetrometer is 0.75 to 1.5 ton per square foot.

Very firm soil: The consistence is "very firm" where a soil horizon has a platy, prismatic or massive structure. Resistance to a pocket penetrometer is greater than 1.5 ton per square foot.

Cemented soil: The consistence is "cemented" where a soil horizon has a hard consistence caused by some cementing substance other than clay minerals, such as carbonate, silica, or oxide or salts or iron and aluminum. Cementation is usually altered very little by wetting.

G. Soil Structure

Intent: This section provides a standard procedure to define soil structure. Soil structure refers to the shape of the natural soil aggregates. Soil structures are described as follows:

Spherical structure: The structure is "spherical" where the soil aggregates have more or less equal dimensions and lack sharp corners, sharp edges or well defined faces. This term includes crumb and granular structure as defined by the U.S. Department of Agriculture.

Subangular structure: The structure is "subangular blocky" where soil aggregates have more or less equal dimensions and possess well defined flat or somewhat curved faces, sharp corners and sharp edges.

Prismatic structure: The structure is "prismatic "where soil aggregates have one axis distinctly longer than the other two and are oriented with the long axis in an upright vertical position.

Platy structure: The structure is "platy "where soil aggregates have one axis distinctly shorter than other two and are oriented with the short axis in an upright vertical position.

Massive structure: The structure is "massive" where the soil consists of dense, compact mass and shows no recognizable natural soil aggregates or structural faces.

Single grain structure: The structure is "single grain" where the soil consists of loose individual sand grains that will not bind together into recognizable soil aggregates.

H. Saprolite

Saprolite is derived from a German word meaning rotten rock. It is soft, highly weathered material that many thousands of years ago was bedrock. Today it may have somewhat the appearance of bedrock, however it behaves like soil in treating effluent. It can be crushed with finger pressure, has clay skins, has moderate permeability, and usually contain roots. In this manual, saprolite is considered as soil.

I. Bedrock

Intent: This section provides a standard procedure to recognize the presence of bedrock. Bedrock affects the ability of a system to treat septic tank effluent, thus plays a significant role in the performance of a disposal system.

Recognition criteria: Criteria for the recognition of bedrock shall include, but shall not be limited to any solid and continuous body of rock, with or without fractures.

J. Excessively Course Soil Horizons

Intent: This section provides a standard procedure for the recognition and reporting of excessively coarse soil horizons. Excessively coarse soil horizons provide less opportunity for the treatment of septic tank effluent and thus, these soil horizons play a significant role in the performance of a disposal system.

Recognition criteria: Criteria for the recognition of excessively coarse soil horizons are as follows:

Greater than fifty percent rock fragments: Soil horizons that have rock fragment content greater than fifty percent by volume shall be considered excessively coarse.

Coarse to very coarse sands: Sandy textured soil horizons that are composed primarily of coarse to very coarse sand (from one-half to two millimeters in diameter) and lack detectable amounts of two percent or more) fines as defined by U.S. Department of Agriculture.

If in doubt: When doubt exists as to whether a soil horizon should be considered excessively coarse, the soil horizon shall be considered excessively coarse.

K. Hydraulically Restrictive Soil Horizons

Intent: This section provides a standard procedure to recognize and report hydraulically restrictive soil horizons. Hydraulically restrictive soil horizons slow down the vertical movement of septic tank effluent and thus these soil horizons play a significant role in the performance of a disposal system.

Recognition criteria: Criteria for recognition of hydraulically restrictive soil horizons shall include, but not be limited to any soil horizon which cannot accept two gallons per square foot per day.

Cemented horizons: Any cemented soil horizon that remains hard when soaked in water shall be considered hydraulically restrictive.

L. Seasonal Groundwater Table

Intent: This section provides a standard procedure to recognize seasonal groundwater tables.

General: The two most widely recognized features that reflect prolonged wetness in soils when soil temperatures are above biologic zero are gleying and mottling. Simply described, gleyed soils are predominately neutral gray in color and occasionally greenish or bluish gray.

Continuous saturated soils: In gleyed soils, the distinctive colors result from a process known as gleization. Prolonged saturation of mineral soil converts iron from its oxidized (ferric) form to its reduced (ferrous) state. Soils that are always saturated are uniformly gleyed throughout the saturated zone. These soils often show evidence of oxidizing conditions only along root channels.

Alternately saturated and aerated: Soils that are alternately saturated and aerated during the year are usually mottled in part of the soil that is seasonally wet. Mottles are spots or blotches of different colors or shades of colors interspersed with the dominant (matrix) color. The abundance, size and color of the mottles usually reflect the duration of the saturation period. Mineral soils predominantly grayish with brown or yellow with gray mottles are saturated for shorter periods. Mineral soils that are never saturated are usually bright colored and are not usually mottled.

Recognition criteria: Criteria for the recognition of seasonal groundwater table shall include, but not be limited to any soil horizon within or below a soil profile that exhibits common drainage mottling, shall be considered a seasonal groundwater table. The upper limit of the seasonal groundwater table shall be determined by one of the following means:

Common mottling: The highest level at which common drainage mottling is observed.

M. Disturbed Ground

Intent: This section provides a standard procedure to recognize disturbed ground.

General: When placement of a disposal field is proposed in an area of disturbed ground, the type and depth to the most limiting soil horizons as well as a variety of additional factors must be considered. Types of soil disturbance include, but are not limited to, filled areas, excavated areas, re-graded areas, artificially drained areas and pre-existing disposal fields.

Recognition criteria: A site shall be considered disturbed ground when any of the following conditions are present:

Displaced or man-made objects: Displaced or man-made objects, such as tree stumps, branches, plant stems, leaves, building debris or trash of man-made origin, are observed below the ground surface in the profile pits.

Unexplained soil horizons: Soil horizons are absent or mixed in a manner that cannot be explained as a result of natural processes.

Buried "A" or "O" horizons: Observation holes reveal A-horizons or O-horizons that are buried by layers of soil or other material. (Note: Natural buried soil horizons may occur.)

Mounds or depressions: Mounded areas or depressions in the land surface are observed that do not conform with the surrounding topography and that show signs of recent disturbance such as lack of vegetation, weedy vegetation, severe erosion, wheel ruts, etc.

Subsurface drains: Subsurface drains or their remnants are observed in profile pits or in the outlets of drains are observed at the surface.

Disposal systems: Components of an existing disposal system, or remnants of an abandoned disposal system are present below the site of a proposed first time disposal system.

Determination of the pre-existing natural ground surface: When evidence is found that the surface of the ground may have been modified by a disturbance such as addition of fill material, removal of soil horizons or regrading, the pre-existing natural ground surface shall be identified based on the following criteria:

Buried "A" or "O" horizons: When a buried A-horizon or O-horizon is present, the pre-existing natural ground surface shall be taken as the top of the A-horizon or the bottom of the O-horizon.

Extrapolation: When a buried A-horizon or O-horizon is not present, the level of the pre-existing natural ground surface shall be determined by extrapolation from adjacent areas beyond the limit of soil disturbance. When this method is relied upon, the nature of the pre-existing topography as well as the nature of the ground disturbance shall be described, using topographic contour maps and soil profiles where appropriate.

Suitability of disturbed ground: In cases where disturbed soil or other fill material are present at the site, the suitability of this material shall be evaluated based upon the following criteria and characteristics, fill or disturbed soils must be relatively free of foreign materials and may contain only trace amounts of the following materials or any other materials that are subject to disintegration or change in volume in order to be considered suitable: tree stumps, plant stems, leaves, food or animal remains or wastes, wood chips, sawdust or any organic materials that may be subject to decay; trash, discarded furniture, buildings or demolition debris or any bulky objects containing large voids or subject to collapse or reorientation; or cans, bottles, drums or any containers that are empty or filled with liquids.

Existing subsurface groundwater drains: Ground containing subsurface groundwater drainage systems or the remnants of abandoned subsurface groundwater drainage systems is unsuitable for the installation of a disposal field, unless the groundwater drains are removed, the outlets of the groundwater drainage system are permanently sealed, or adequate separation can be maintained.

N. Soil Color

Intent: To provide a standard procedure for the evaluation of soil colors.

General: Soil colors often reveal much about a soil's wetness. Site evaluators examining the soil shall report the approximate soil color in accordance with the Munsell soil color chart. The standardized Munsell soil colors are identified by three components: hue, value and chroma. The hue is related to one of the main spectral colors: red, yellow, green, blue or purple, or various mixtures of these principal colors. The value refers to the degree of lightness, while the chroma notation indicated the color strength or purity. In the Munsell soil color book, each hue has its own page, each of which is further subdivided into units of value (on the vertical axis) and chroma (on the horizontal axis). Because accurate reproductions of soil colors are expensive, the Munsell soil color book contains a limited number of hues, values and chromas. The soil matrix or mottle colors are determined by comparing the soil with individual color chips in the soil color book.

Recognition criteria: Color is best determined in soils that are or have been moistened. The colors of the topsoil are valuable in determining the drainage condition of a site.

Gleying: Gleying (bluish, greenish, or grayish colors) immediately below the A-horizon is an indication of a saturated soil. Gleying can occur in both mottled and unmottled soils. Gleyed soil conditions can be determined by using the gley page of the "Munsell Soil Color Charts" (Caution: Gleyed conditions normally extend throughout saturated soils. Beware of soils with gray E-horizons due to leaching and not to saturation; these latter soils can often be recognized by bright-colored layers below the E-horizon.

Matrix chromas of two or less: Matrix chromas of two or less are considered low chromas and are often diagnostic of soils saturated for long periods. They are used to establish water tables.

Iron and manganese concretions: During the oxidation-reduction process, iron and manganese in suspension are sometimes segregated as oxides into concretions or soft masses. Manganese

concretions are usually black or dark brown, while iron concretions are usually yellow, orange or reddish brown.

Sandy and gravelly soils: Soil color in saturated sandy soils may not follow the color patterns just described.

Bright colored mottles and a low chroma matrix: Soils that have brightly colored mottles and a low chroma matrix are indicative of alternating saturated and unsaturated soil conditions.

APPENDIX B
GROUNDWATER MONITORING GUIDELINES

The Onsite Sanitary Official may require a groundwater level monitoring program as part of the site evaluation process to ensure adequate separation between the bottom of the dispersal trenches and the water table. Monitoring shall be done at a time of the year when the highest seasonal groundwater table occurs. Some sites are subject to significant year to year fluctuations in the highest seasonal groundwater table.

Sites to be monitored shall be carefully checked for groundwater drainage tile and open ditches that may have altered natural seasonal groundwater table. Where such factors are involved, information on the location, design, ownership and maintenance responsibilities for such groundwater drainage systems shall be provided. Documentation shall be provided to show that the groundwater drainage network has an adequate outlet and will be maintained.

The Onsite Sanitary Official shall witness the excavation and installation of the piezometers. The Onsite Sanitary Official may require a maximum of fifteen days prior to written notice for the purpose of witnessing the location and installation. The Town may waive the witnessing requirements. Failure of the Town personnel to be present when fifteen days prior written notice is given shall be construed to be a waiver of witnessing requirements. The piezometers shall be installed where possible with an auger rather than a backhoe. Larger backhoe pits give a false high reading in fine textured soils. Illustrations of typical piezometer installations are shown in Figures B.1., B.2., and B.3.

Installation shall be made on or before November 1. Groundwater level observations shall be made thereafter every fourteen days or less until April 1, or until the site is determined by the Onsite Sanitary Official to be unacceptable, whichever comes first.

When monitoring discloses that a site is acceptable, data giving test locations, ground elevations at the monitoring wells, soil profile descriptions, dates observed, depths to observed water tables and soil water temperatures for those dates as well as supporting data indicating that monthly precipitation amounts (see Table B-1) are within the normal range shall be submitted to the Onsite Sanitary Official in a written report.

TITLE B-1

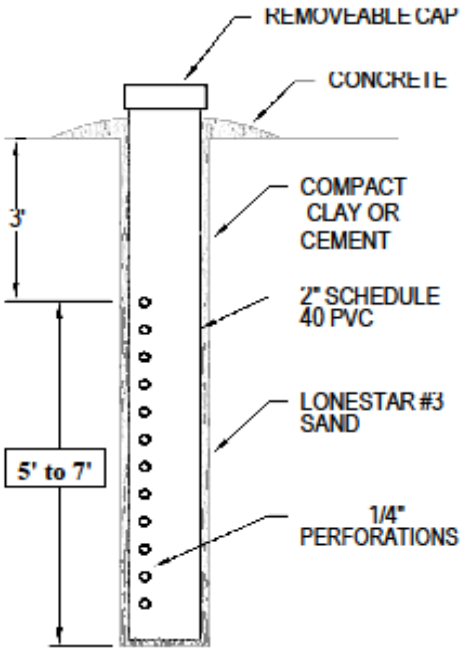
TEN YEAR RAINFALL FOR BUTTE COUNTY
INTENSITY IN INCHES PER HOUR

Mean Annual Rainfall	One Day	Twelve Hours	Six Hours	Three Hours	Two Hours	Sixty Min.	Thirty Min.	Fifteen Min.	Ten Min.	Five Min.
16	0.08	0.13	0.17	0.24	0.30	0.44	0.58	0.83	1.02	1.39
18	0.09	0.14	0.20	0.27	0.34	0.50	0.66	0.93	1.15	1.56
20	0.10	0.16	0.22	0.31	0.37	0.55	0.73	1.03	1.27	1.74
22	0.11	0.17	0.24	0.34	0.41	0.61	0.80	1.14	1.40	1.91
24	0.12	0.19	0.26	0.37	0.45	0.67	0.87	1.24	1.53	2.08
26	0.13	0.20	0.28	0.40	0.49	0.72	0.95	1.34	1.66	2.26
28	0.14	0.22	0.30	0.43	0.52	0.78	1.02	1.45	1.78	2.43
30	0.15	0.24	0.33	0.46	0.56	0.83	1.09	1.55	1.91	2.61
32	0.16	0.25	0.35	0.49	0.60	0.89	1.17	1.65	2.04	2.78
34	0.17	0.27	0.37	0.52	0.64	0.94	1.24	1.76	2.17	2.95
36	0.18	0.28	0.39	0.55	0.67	1.00	1.31	1.86	2.29	3.13
38	0.19	0.30	0.41	0.58	0.71	1.05	1.38	1.96	2.42	3.30
40	0.20	0.31	0.43	0.61	0.75	1.11	1.46	2.06	2.55	3.47
42	0.21	0.33	0.46	0.64	0.79	1.17	1.53	2.17	2.67	3.65
44	0.22	0.34	0.48	0.67	0.82	1.22	1.60	2.27	2.80	3.82
46	0.23	0.36	0.50	0.70	0.86	1.28	1.68	2.37	2.93	3.99
48	0.24	0.38	0.52	0.73	0.90	1.33	1.75	2.48	3.06	4.17
50*	0.25	0.39	0.54	0.76	0.93	1.39	1.82	2.58	3.18	4.34
52	0.26	0.41	0.56	0.79	0.97	1.44	1.89	2.68	3.31	4.52
54	0.27	0.42	0.59	0.82	1.01	1.50	1.97	2.79	3.44	4.69
56	0.28	0.44	0.61	0.86	1.05	1.55	2.04	2.89	3.57	4.86
58	0.29	0.45	0.63	0.89	1.08	1.61	2.11	2.99	3.69	5.04
60	0.30	0.47	0.65	0.92	1.12	1.66	2.19	3.10	3.82	5.21
62	0.31	0.49	0.67	0.95	1.16	1.72	2.26	3.20	3.95	5.38
64	0.32	0.50	0.69	0.98	1.20	1.78	2.33	3.30	4.08	5.56

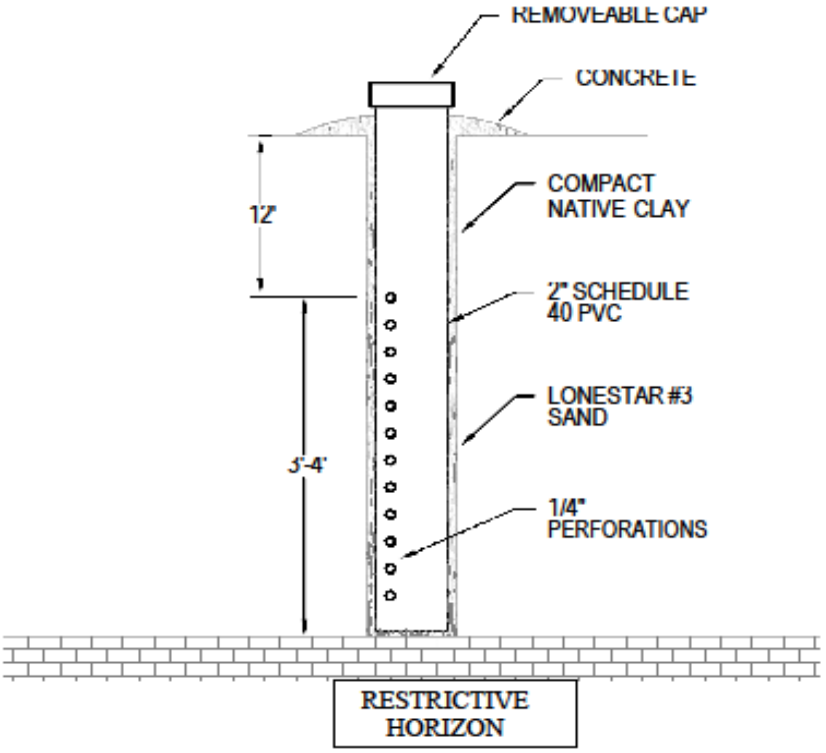
Mean Annual Rainfall	One Day	Twelve Hours	Six Hours	Three Hours	Two Hours	Sixty Min.	Thirty Min.	Fifteen Min.	Ten Min.	Five Min.
66	0.33	0.52	0.72	1.01	1.23	1.83	2.40	3.41	4.20	5.73
68	0.34	0.53	0.74	1.04	1.27	1.89	2.48	3.51	4.33	5.91
70	0.35	0.55	0.76	1.07	1.31	1.94	2.55	3.61	4.46	6.08
72	0.36	0.56	0.78	1.10	1.35	2.00	2.62	3.72	4.59	6.25
74	0.37	0.58	0.80	1.13	1.38	2.05	2.70	3.82	4.71	6.43
76	0.38	0.60	0.82	1.16	1.42	2.11	2.77	3.92	4.84	6.60
78	0.38	0.60	0.83	1.17	1.43	2.13	2.79	3.95	4.88	6.65
80	0.39	0.62	0.85	1.20	1.47	2.18	2.86	4.06	5.00	6.82
82	0.40	0.63	0.87	1.23	1.51	2.23	2.93	4.16	5.13	6.99
84	0.41	0.65	0.90	1.26	1.54	2.29	3.00	4.26	5.25	7.16
86	0.42	0.66	0.92	1.29	1.58	2.34	3.08	4.36	5.38	7.33
88	0.43	0.68	0.94	1.32	1.62	2.40	3.15	4.46	5.50	7.51
90	0.44	0.69	0.96	1.35	1.65	2.45	3.22	4.56	5.63	7.68

***** PARADISE STATISTICS

The normal annual precipitation varies from approximately thirty-two inches at the lower elevations of the town limits to approximately sixty-four inches at the higher elevations. This rainfall is concentrated mainly in the months of December, January and February with storms of generally smaller intensity occurring in October, November, March and April. Precipitation is generally in the form of rainfall with only one or two significant snowfalls per year.



TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	PIEZOMETER TYPICAL	Figure B-1



TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	PIEZOMETER TYPICAL	Figure **B-2**

APPENDIX C
HYDRAULIC TESTING OF SOIL

The Onsite Sanitary Official may require hydraulic testing of disposal area soils as part of the site evaluation process. The hydraulic tests shall either be a percolation test, infiltration test, or absorption test, as described below.

A. Percolation Test

1. Test Procedure

   a. Construct 4 holes, six-inches in diameter, 2 in the area to be considered for the absorption field and 2 in the replacement absorption field area. (A lesser amount may be approved by the Town Onsite Sanitation Division upon approval).

   b. The depth of the hole shall be the maximum depth of the proposed absorptive surface whether it is trenches or infiltrative bed.

   c. Carefully scrape the surface of the hole to remove all smeared surfaces. Remove the scrapings.

   d. Place 2 inches of pea gravel in the bottom of the hole.

   e. Place a four-inch perforated pipe in the center of the hole. The perforated pipe shall be long enough to store at least 10 vertical inches of water above the gravel at the bottom of the hole.

   f. Place pea gravel around the outside of the pipe to a height of at least 10 inches above the gravel at the bottom of the hole.

   g. Begin presoaking the hole a minimum of 18 and maximum of 24 hours before the actual percolation test is performed. Do this by keeping the pipe full of water 10 inches above the gravel at the bottom of the hole for at least 4 hours. After 4 hours the hole should be allowed to drain naturally.

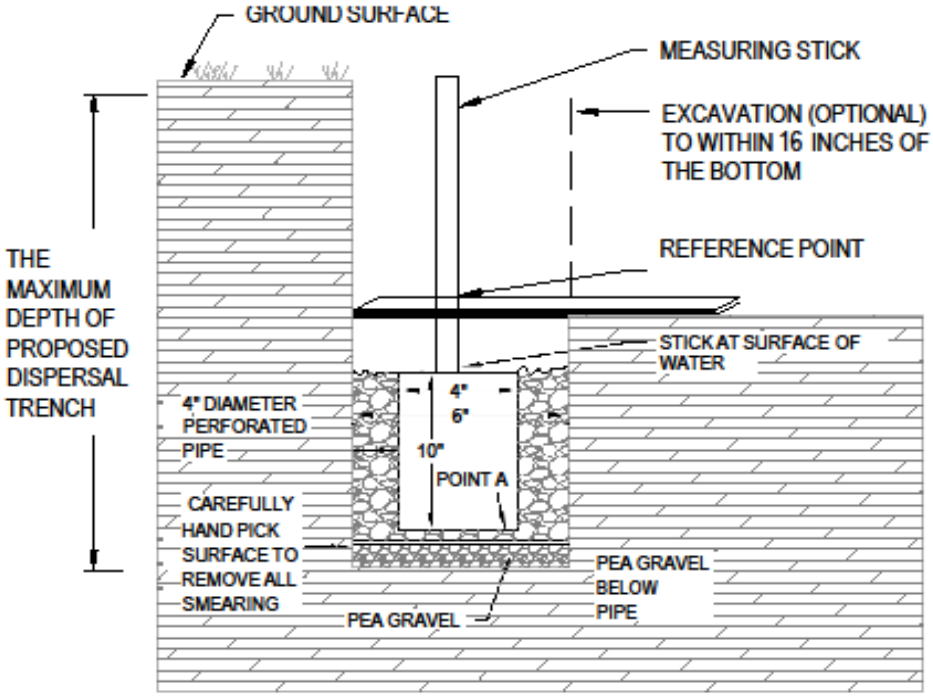
   h. 18 to 24 hours after the presoak began, the percolation testing must be performed. Percolation testing must not be performed if presoaking has not been completed.

   i. Begin the percolation testing by filling the pipe 6 inches above the gravel (Point A shown on Figure C.1).

j. Measure the distance that the water level drops in 30 minutes. After recording this distance refill to the 6 inch mark. Continue measuring the water drop in 30 minute intervals for 3 hours. If all 6 inches drops out before 30 minutes, this is a fast percolation rate. If this occurs refill and measure the drop every 10 minutes over a one-hour testing period. Always refill to the 6 inch mark after each reading.

k. Continue this process for 3 hours (or 1 hour for a fast 'perk' as described above), until the last 2 measurements are within $1/8^{th}$ an inch of each other or until 5 hours have elapsed, (or 2 hours for a fast 'perk').

l. Calculate the percolation rate in min/in. using the average of the last 2measurements taken. Adjust the rate to compensate for the volume of gravel in the hole by using a 1.6 multiplication factor on the calculated percolation rate.



NOTES;
1. A GRAVEL CORRECTIVE FACTOR OF 1.6 MUST BE APPLIED TO CALCULATE PERCOLATION RATE.
2. FOR SHALLLOW SOILS TESTING AN EXCAVATION TO THE SIDE OF THE PERCOLATION HOLE IS NOT REQUIRED.

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised: 03-01-16	PERCOLATION TEST	Figure C-1

2. Example of Gravel Volume Compensation Calculations

a. Calculate the volume of the hole without gravel or pipe.

$$Y = \pi r^2 h$$

where: y = volume of hole without gravel (ft^3)
π = 3.14
r = hole radius (0.25 ft)
h = depth of infiltration zone (1 ft)

$y = 0.196\ ft^3$ for gravel filled percolation test

b. Calculate the volume of the 4 in. pipe

$$Vp = \pi r_p^2\ hp$$

where: V_p = volume of pipe (ft^3)
r_p = radius of pipe (0.17 ft)
h_p = depth of pipe in infiltration zone (0.83 ft)

$V_p = 0.075\ ft^3$ for gravel filled percolation test

c. Calculate the volume of the void space in the gravel

$$Vg = (Y-Vp)\ n$$

where: Vg = volume of gravel (ft^3)
n = gravel porosity (0.40)

$Vg = 0.048\ ft^3$ for gravel filled percolation test

d. Calculate the volume of the void space with the pipe and gravel in place.

$$x = Vp + Vg$$

$x = 0.123\ ft^3$ for gravel filled percolation test

e. Calculate the adjustment factor to compensate for the gravel.

$$A.F. = \frac{Y}{X}$$

where: A.F. = adjustment factor

A.F.= 1.6

f. Multiply the test results (min/in.) by the adjustment factor to compensate for the gravel in the hole.

B. Infiltration Test

1. General Test Procedure

a. Carefully drive a 20 to 24 inch diameter steel ring 2 inches into the soil surface as shown in Figure C.2. Make sure the soil surface has been scraped clean of loose duff and organic material.

b. Place a small board or rock to act as a splash plate.

c. Begin presoaking the surface a minimum of 18 and maximum of 24 hours before the actual infiltration testing is performed. Do this by keeping the ring full of water above the bottom of the hole, for at least 3 hours. After 3 hours the hole should be allowed to drain naturally.

d. On the next day the testing shall begin. Pre-soak one more time by adding water to the ring, keeping the level at least one inch above the surface for 30 minutes. After this second pre-soak, begin measuring the amount of water level drop in 30 minute intervals.. If rates are very rapid measure the amount of drop every 15 minutes.

e. Continue to measure the rate of drop for a minimum 2-hour period and until the last 2 readings indicate a stabilized infiltration rate. Measurements are done in inches and converted to gallons.

f. Report results in gal/ft^2/hr.

2. Test Procedure for Weathered Bedrock

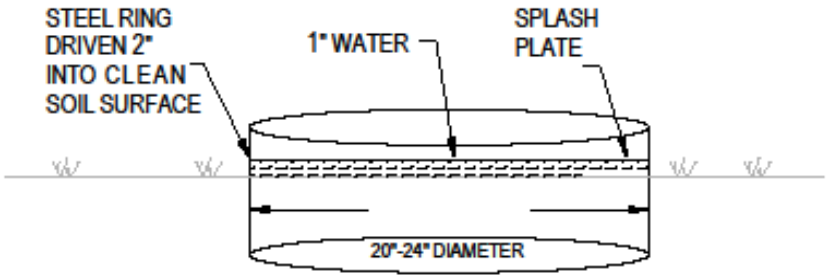
Follow the same steps as listed above, except dig a basin one-half inch into the bedrock instead of using the infiltration rings. Carefully pick the surface and remove all loose soil.

C. Absorption Test

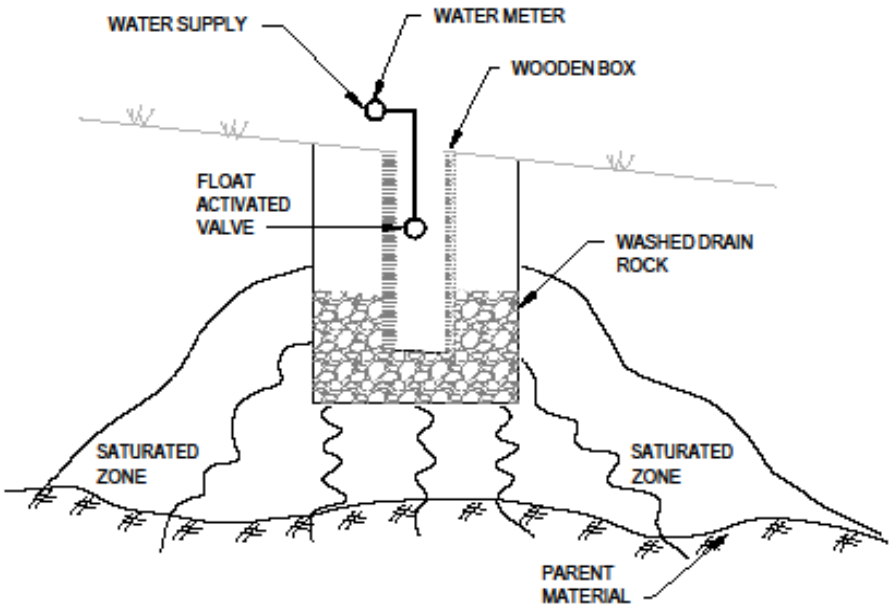
An Absorption test is a method of determining the capacity of a site to accept the daily wastewater flow. It consists of constructing a short segment of a disposal trench, maintaining water in the trench for several days, and then excavating the soil to determine where the water has traveled and how much area was required to absorb the water. A typical absorption test is illustrated in Figure C.2. A shallow trench of adequate length (six to ten feet) is excavated in the location where the actual disposal field trenches are to be placed. The bottom and sidewalls of the trench are picked to remove any smeared soil. A wooden box is placed in the trench and

clean gravel is placed around the box. A float is installed in the box to maintain a constant head of water. Water applied to the trench is metered so that an accurate accounting can be maintained. The trench is then filled with water to a given height and the water level is maintained at that height throughout the test period (typically two to six days). As water is applied to the trench, a portion of the water flows vertically and another portion moves laterally. To determine the acceptance rate of the underlying soil strata, the horizontal extent to which the water spreads under saturated flow conditions is defined. The extent of the spread (or plume) is cross section area through which flow takes place, the total water applied, the water remaining in the trench, in the soil column above the area defined by the plume, and in the capillary fringe, the soil acceptance rate and the saturated coefficient of permeability can be determined.

Absorption tests shall be conducted by a qualified designer. A thorough knowledge of soils and soil hydraulics is required to accurately interpret the results.



INFILTRATION RING TEST



NOT TO SCALE

ABSORPTION TEST

TOWN OF PARADISE **ONSITE WASTEWATER MANAGEMENT ZONE**	Revised: 03-01-16	INFILTRATION TEST ABSORPTION TEST TYPICAL	**Figure** **C-2**

APPENDIX D
SURFACE AND GROUNDWATER MONITORING PROGRAM

The following surface and groundwater monitoring program is recommended for the Town of Paradise Onsite Wastewater Management Zone.

A. Surface Water

- Collect and analyze surface water samples semi-annually from all sampling stations for total coliform, fecal coliform and nitrate.

- Collect additional samples as needed to more accurately determine sources of bacterial pollution if any are indicated from the original sampling set. Analyze for all surface water parameters listed above.

- Compile all analytical results into a database for evaluation of long-term trends in water quality.

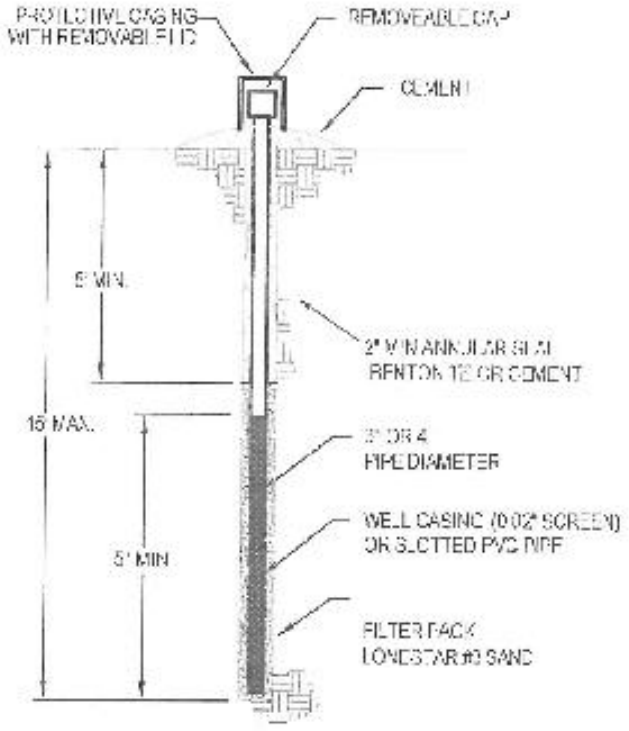
B. Groundwater Monitoring

- Disinfect and purge all monitoring wells prior to any further analyses. See Figure D-1 for Typical Groundwater Monitoring Well.

- Collect samples from the existing private wells and monitoring wells on a semi-annual basis.

- Analyze groundwater samples for total coliform, fecal coliform, nitrate and specific conductance.

- Continue to record depth to groundwater in each well prior to purging and record the pH, temperature and specific conductance of the groundwater with a properly calibrated field instrument.



NOT TO SCALE

TOWN OF PARADISE ONSITE WASTEWATER MANAGEMENT ZONE	Revised 03-31-16	GROUND WATER MONITORING WELL TYPICAL	Figure D.1

APPENDIX D
SURFACE AND GROUNDWATER MONITORING PROGRAM

TOWN OF PARADISE

MANUAL FOR THE ONSITE TREATMENT OF WASTEWATER HISTORY

Ordinance No. Adoption Date

599……March 8, 2016
(Amended PMC Sections 13.04.035, 040, 070, 080, 110 and 112 in preparation for LAMP submittal to the State Water Resources Control Board)

522……October 6, 2011
(Amended Section 13.04.120 relating to Onsite Sewage Disposal and Setback Requirements)

286 ……March 4, 1997
(Amended Section 13.04.310 of Chapter 13.04, "Variance Procedure")

254 ……August 15, 1996
(Amended Sections 13.04.045 "Licensing Requirements, 13.04.090 "Evaluations Required", 13.04.095 "Violations an Infraction")

245 ……March 21, 1995
(Amended Chapter 5.14, "Evaluator of Onsite Wastewater Treatment and Disposal Systems")

228 ……December 7, 1993
(Deleted Section 13.04.020, (J) *Definitions* "Health Officer". Amended Section 13.04.020 to include definitions (J), (K), (L), (M), (N), (O), and (P))

221 ……March 2, 1993
(Added Chapter 5.14, "Evaluator of Onsite Wastewater Treatment and Disposal Systems" to Title 5 of the PMC)

220 ……March 2, 1993
(Amended Section 13.04.090, "Evaluations Required" and added Section 13.04.095, "Violations a Misdemeanor" to the PMC)

219 ……July 7, 1992
(Repealed Chapter 13.04 of the PMC and replaced with a new Chapter 13.04)

211 ……September 3, 1991
(Amended Chapter 13.04, Sections 13.04.020 and 13.04.112 to add the definition of "bedroom")

209 ……June 4, 1991
(Added Chapter 3.30 "Fee and Service Charge Revenue/Cost Comparison System" to the PMC)

115 ……January 17, 1984
(Amended Sections 3, 6, 7, 10, 15, 18 of Ordinance No. 103 regarding definitions, permits, sewage disposal systems, and liability of Town. Added Sections 20, 21, & 22 regarding setbacks, gallons per day and minimum net lot areas)

103 ……June 21, 1983
(Implemented recommendations made by the Montgomery Phase I, 201 Report concerning Surface Wastewater)

Resolution No. **Adoption Date**

16-19 ……May 10, 2016
(Created a new Chapter 8 Local Agency Management Program of the Onsite Manual in preparation for LAMP submittal to the State Water Resources Control Board)

16-15 ……..April 12, 2016
(Amended multiple Onsite Manual chapters including several Figures in preparation for LAMP submittal to the State Water Resources Control Board)

14-20 ……..……....June 10, 2014
(Amendments to Chapter 4, Section 4.16 Graywater Disposal Systems)

11-33.....October 6, 2011
(Amended Chapter 3, Table 3.1 Required Setbacks, and added Chapter 6, Section F, Aesthetics of Advanced Treatment Systems)

05-46 .... November 8, 2005
(Amended Chapter 3, Table 3.1. of the Onsite Manual regarding setbacks from streams for existing legal lots of record)

04-38 .....July 27, 2004
(Amended Chapter 6 of the Onsite Manual regarding replacement area for large systems)

00-09 ..... March 28, 2000
(Amended Chapter 1 of the Onsite Manual regarding exemptions to soil and percolation requirements)

98-19 ..... July 7, 1998
(Amended Table 6.1 of Chapter 6.2 in the Onsite Manual regarding the minimum loading rate for theaters)

97-22 ..... October 7, 1997
(Amended Chapter 2 of the Onsite Manual pertaining to public appeal rights for Onsite Variances)

97-17 .....June 20, 1997
(Declared a moratorium on variances of effluent loading until amendments to Chapter 2 of the Onsite Manual were adopted or rejected by the Town Council)

97-11 .....May 6, 1997
(Amended Chapter 6 “Large Systems” of the Onsite Manual)

97-06 .....March 4, 1997
(Amended the qualifications of the Variance Committee)

96-34 ..... December 3, 1997
(Rescinded Resolution No. 94-37 and established the memberships, terms, and duties of the Variance Committee)

96-6 .....May 7, 1996
(Rescinded Resolution No. 93-44)

95-16 .....August 15, 1995
(Amended Resolution No. 94-40 regarding “Licensing to Perform Wastewater Disposal Services”)

94-40 ..... October 4, 1994
(Rescinded Resolution No. 93-35 & 92-22 and readopted the Onsite Manual)

94-37 ..... June 21, 1994
(Appointed members to serve on the Variance Committee and defined their duties)

94-16 ..... June 21, 1994
(Repealed Resolution No. 94-2 & abolished the OWMZ Commission)

94-2 ..... February 1, 1994
(Established the OWMZ Commission and established terms, and duties)

93-44 ..... December 21, 1993
(Established the policy of the Town concerning the use of the Regional Water Quality Control Board by the Onsite Sanitary Official)

93-35 ..... November 16, 1993
(Amended Resolution 92-22 by adding “Package” or “Plant Systems” as encouraged alternative technologies)

93-31 ..... September 21, 1993
(Est. service fees to fund the Onsite Division, repealed Res. No. 92-18, and amended Section 3.1 of Resolution No. 91-10 “Community Development Wastewater Fees”)

92-46 ..... December 1, 1992
(Agreement between Butte County and Town of Paradise to have Butte County act as the local enforcement agency governing solid waste)

92-30 ..... August 18, 1992
(Appointed members to serve on Variance Committee)

92-22 ..... July 7, 1992
(Adopted the Onsite Manual as a supporting document associated with Title 13 of the PMC)

92-18 ..... July 7, 1992
(Est. service fees and charges to fund the Onsite Division and added Section 3.1, “Community Development Wastewater Fees”, to Resolution 91-10)

92-10 ..... May 18, 1992
(Established the Onsite Wastewater Management Zone)

92-5 ..... March 17, 1992
(Council’s intent to form the Onsite Wastewater Management Zone)

92-03 ..... March 17, 1992
(Designated Butte County Department of Public Health as the Local Enforcement Agent)

91-10 ..... June 4, 1991
(Established a fee schedule for Town services)