

**INYO COUNTY ENVIRONMENTAL HEALTH SERVICES
RESIDENTIAL ONSITE SEWAGE TREATMENT AND DISPOSAL GUIDE**

I. SCOPE

This guide has been prepared to inform the residential property owner of the permitting process and construction requirements for new, onsite wastewater treatment and disposal systems. Where environmental conditions allow, a conventional system, consisting of a septic tank, distribution piping and leach lines/beds, will suffice. Where a conventional system is unacceptable, an engineered, alternative system will be required.

II. PERMIT PROCEDURE

1. Before any construction begins, an "Application to Construct Sewage Disposal System" must be submitted to and approved by the Inyo County Environmental Health Services Department (ICEHSD). All required information on the application must be filled out completely, and the application must be signed and dated by the owner of the property or properly licensed contractor.

Contractors that are licensed to construct septic systems are General Engineering (A), Sanitary Systems (C-42), Plumbing (C-36), or if it is a part of a larger project, General (B).

2. Included with the application is a plot plan, which shall show the location of property lines, easements, surface waters, existing and/or proposed structures, wells and septic systems on the subject parcel and all adjoining parcels, if relevant. The plot plan shall indicate the separation distances between the proposed sewage disposal system and replacement area and all structures, property lines, easements, wells, watercourses, and existing septic systems. See Table 1 for the required separation distances.

3. The completed application, plot plan, and the application fees are to be submitted to the ICEHSD. The applicant will be issued a receipt for fees paid.

4. After receipt of the application, the registered

environmental health specialist (REHS) will review the application for completeness, and a site evaluation will be conducted. When all information has been received and approved, the REHS will sign the permit application as "application approved/site evaluated" and a copy will be given to the applicant. This will then become the applicant's authorization to begin construction.

5. It is the responsibility of the property owner to ascertain that all submitted information is factual and accurate, and that all conditions of the permit are met completely to the satisfaction of the Inyo County Environmental Health Services Department.

III. SITE EVALUATION

1. Upon receipt of the completed application, plot plan, and application fees, a site evaluation will be conducted by the REHS. The site evaluation is conducted to verify that setback distances will be met, and that soil conditions, permeability, and other physical factors are appropriate for the system design being proposed. The assurance that the proposed system installation will not have significant impact on groundwater quality or on adjacent land use, and that the system will operate without failing (surfacing of sewage), are major objectives of the site evaluation.

2. Soil profiles excavated to a depth of ten feet, and percolations tests are required. Generally two profiles and two percolation tests are required in the proposed construction area; and one profile and one percolation test is required in the replacement area. However, the number and location of soil profiles and percolation tests will be determined by ICEHSD staff during the site evaluation. Profile trenches and percolation test requirements may be waived only at the discretion of the REHS.

3. At least one of the profiles in the proposed installation area will undergo a detailed horizontal description by ICEHS staff. This detailed analysis will document the depth to seasonal high groundwater, soil permeability, capability of existing soil conditions to receive subsurface wastewater, and what degree of treatment is expected. Soil profiles must be excavated with one end sloped to facilitate entry to at least five feet into the

profile. It is the responsibility of the property owner or his/her agent to provide soil profile excavations that are accessible and that do not jeopardize safety upon entry.

4. Where the site evaluation indicates that the proposed system area is not complicated with high groundwater, impermeable soils, insufficient leaching area, fast percolation rates, etc., percolation tests may be performed by a licensed contractor who has been approved by the ICEHSD. Where the site evaluation documents that an alternative system is required, percolation tests shall be performed by a licensed engineer, certified geologist, or a registered environmental health specialist.

5. Consistent with the Lahontan Regional Water Quality Control Board Basin Plan requirements, the acceptable standards for percolation rates are generally 5 minutes/inch to 60 minutes/inch.

6. If the site evaluation reveals adverse conditions, or if a required setback cannot be met, an engineered alternative sewage disposal system may be allowed, at the discretion of the Director of Environmental Health. These adverse conditions include, but are not limited to:

- a. High Groundwater - when observable groundwater level or physical/geological evidence of past level(s) is within five feet of the bottom of the proposed leaching trench, methods shall be employed to provide at least five feet of separation.
- b. Impermeable Soil - when caliche or other hard packed soil is present, or percolation tests reveal a percolation rate greater than 60 minutes per inch, an engineered or otherwise amended system shall be constructed.
- c. Insufficient Leaching Area - minimum leaching area must be available, based on soil type and septic tank capacity. ICEHS requires a minimum 1,000-gallon tank and a UPC soil type of 20 to yield no less than 200 square feet in a leach field plus 100% replacement area. Any proposed system with tank volume, soil type or square feet less than the above figures shall require an alternative system design.
- d. Fast Percolation Rates - percolation rates faster than 5 minutes/inch may require special engineering and a minimum separation from the highest anticipated groundwater.
- e. Other - a ground slope of greater than thirty percent may

require special engineering due to potential seepage from side slope.

7. After the site evaluation has been completed and all required information has been submitted to the ICEHS, the permit application will be reviewed by staff and the director. Within ten working days from receipt, ICEHS will respond with either the approval or denial of the permit. The director has the right to waive or extend the ten day period if appropriate.

Table 1
Minimum Distances For Siting Waste Disposal Systems

<u>Distance from:</u>	<u>To leachfield</u>	<u>To septic tank</u>
Lakes, ponds, standing surface water	200 feet	50 feet
Wells	100 feet	100 feet
Year-round stream	100 feet	50 feet
Intermittent streams; drainage course	50 feet	25 feet
Property lines	5 feet	5 feet
Water line (private/public)	5/10 feet	5/10 feet
Trees	As far as possible	10 feet
Structures	8 feet	5 feet
Easements	5 feet	5 feet
Cut Bank	50 feet	25 feet
Fill Bank	4 x fill bank height	10 feet

IV. SYSTEM DESIGN

1. Septic Tank Sizing

The required liquid capacity of the septic tank is based upon a) the number of bedrooms or apartment units, or b) the number of fixture units as defined in Section 107(d), Chapter 1 Part 1, of the Uniform Plumbing Code, 1985 Edition. The method used, either a) or b) above, will be the one that results in the largest septic tank capacity. The following table will be used as a guideline:

Table 2
Septic Tank Sizing Criteria

<u>Single Family Dwelling</u>	<u>Multiple Dwelling Unit/Apartments</u>	<u>Fixture Units</u>	<u>Gallons</u>
<u>Bedrooms</u>	<u>Units</u>		
1-2-3	2	20	1000
4	3	25	1200
5-6	4	33	1500
		45	2000

Tanks larger than 2000 gallons or of special design must be approved by ICEHSD prior to installation. This includes any pumping unit used in conjunction with effluent disposal.

2. Septic Tank Design Specifications

- a. Septic tanks shall be watertight and constructed of sound and durable materials that are not subject to excessive corrosion or decay. Wooden septic tanks are prohibited. All septic tanks must be IAPMO approved and installed per

manufacturer's instructions.

- b. Septic tanks shall have a minimum of two compartments. The inlet compartment of any septic tank shall be two thirds of the total tank capacity. Exception: When specified otherwise by manufacturer for certain alternative systems.
- c. Access to each septic tank shall be provided by at least two manholes 20 inches in diameter, minimum. Septic tanks installed under concrete or blacktop paving shall have the manholes accessible by extending the manhole openings to grade.
- d. The inlet and outlet pipe T-fittings shall extend at least 12 inches below the liquid surface. The invert of the inlet pipe shall be at a level not less than two inches above the invert of the outlet pipe.
- e. Inlet and outlet T-fittings and compartment partitions shall have a free vent area equal to the required cross sectional area of the house sewer or private sewer discharging into the tank to provide free ventilation above the water surface from the disposal field through the septic tank, house sewer and vent stack to the outer air.
- f. The total depth of the tank shall exceed the liquid depth by at least nine inches. The cover of the septic tank shall be at least two inches above the vent openings.
- g. Partitions or baffles between compartments shall be of sound and durable materials and shall extend at least four inches above the liquid level. An inverted fitting equivalent in size to the tank inlet, but in no case less than four inches in diameter, shall be installed in the inlet compartment side of the baffle with the bottom of the fitting placed midway in the depth of the liquid. Wooden baffles are prohibited.

3. Leach Field Absorption Area Sizing

The amount of leaching area needed to dispose of sewage effluent increases in direct proportion to the percolation rate of a soil. That is, the longer time it takes for water (effluent) to be absorbed into the soil the greater the area needed for absorption. The size of a leach field is calculated using two factors:

- a) capacity of septic tank (in gallons)
- b) application rate (in square feet per 100 gallons of septic tank capacity.)

The total leaching area required for a disposal system can be calculated as follows:

$$(\text{Septic tank Size}) \times (\text{Application Rate}) = \text{Leaching Area}$$

Example: A three bedroom structure requires a 1000-gallon septic tank. If the percolation test results averaged 18 minutes/inch then the corresponding application rate (see Table 3) is 50 sq. ft. per 100 gallons septic tank capacity. Absorption area required is therefore:

$$1000 \text{ gal} \times 50 \text{ sq. ft./100gals.} = 500 \text{ sq. ft.}$$

The size of the absorption area will determine the dimensions of the leaching trench (length, depth, and width.) If 500 sq. ft. will be required for absorption and the leach field is proposed to be 100 ft. long, then 5 sq. ft. of absorption area is needed for every foot in length of trench. The first vertical foot of sidewall on each side of the trench is not used in absorption area calculations.

Plot plans accompanying all permit applications must clearly designate a 100% leachfield replacement area, for future considerations.

Table 3
Application Rates From Percolation Rates

<u>Percolation Rate</u> (minutes per inch)	<u>Application Rate</u> (sq ft per 100 gals of septic tank capacity)
5-6	25
7-9	30
10-12	40
13-18	50
19-25	60
26-30	70
31-36	80

37-42	90
43-48	100
49-54	110
55-60	120

>60 = unsuitable for on-site disposal

4. Trench Length and Spacing

The maximum length of any one leach line shall be 100 feet. The separation between one or more leach lines shall be as listed below (from centerline to centerline):

<u>Depth of Rock Under Leach Pipe</u>	<u>Required Separation</u>
1.5 ft.	6 ft.
2.0 ft.	6 ft.
3.0 ft.	8 ft.
4.0 ft.	10 ft.
5.0 ft.	12 ft.

Leach lines shall not be constructed under asphalt, concrete or other impervious materials, or in an area subject to vehicular traffic.

All installations shall conform to ICEHS standards and Lahontan Resolution 73.5 - "Rules for Land Developments," and the Uniform Plumbing Code.

5. Leach Field Installation

- a. Solid, non-perforated pipe shall be utilized to connect the septic tank effluent to the leach field or to the distribution box. The line shall be installed at a slope (fall) of at least one eighth of an inch (1/8") per horizontal foot. There shall be a minimum of five linear feet of solid line between the septic tank and the leach field and between the distribution box and the leach field.
- b. Leachline trenches shall be from 18 inches to 36 inches wide, with leveled bottom. From 6 inches to 36 inches of crushed stone or gravel, free of fines and dirt, sized from three quarters of an inch to two and one half inches, shall be installed below the perforated leach pipe. Four inch drain (sewer) pipe shall be placed level on top of the crushed rock or gravel, with the perforations facing down. A minimum of two inches of rock or gravel shall be placed on top of the perforated pipe. Over the rock or gravel place three inches of straw or hay, or a layer of untreated building paper to keep the backfill from infiltrating the crushed rock or gravel. A minimum of six inches of backfill shall be placed over the straw, hay or building paper.
- c. If two or more leach lines are used, a distribution box shall be placed at the head of the leach lines. Unless specified, the distribution box shall be constructed so that each leach line is fed simultaneously and equally. Connections between the septic tank, distribution pipe, and leach lines shall be watertight. Distribution boxes shall be built on a level concrete slab installed in natural or compacted soil. A Zabel, or equivalent, flow divider may be used in place of a distribution box, if prior approval is given by the REHS.
- d. Installation of vertical observation ports at the end of each leach line is recommended.

6. Chamber Leaching Systems

The Infiltrator plastic chamber leaching systems are approved for use in Inyo County. Installation is per manufacturer's recommendations. All setbacks for standard systems also apply for chamber systems. Filter material (crushed rock, gravel) is not required when using the chamber system. For calculation of

required leaching area, no sidewall credit is given. Only bottom credit is given. However, a multiplication factor of 0.70 should be utilized when calculating square footage required.

7. Alternative Systems

Where the site evaluation documents that adverse or unacceptable conditions exist, or where setbacks cannot be met, an alternative system may be considered. An alternative sewage disposal system employs various methods to decompose and disperse sewage effluent under circumstances which would compromise the functioning ability of a standard septic system (septic tank and leaching field.) Examples of alternative technology include:

- pressurized leachlines/pressure dosing systems
- importation of soil
- mound systems
- sand filters
- aerobic systems
- package plants

All alternative sewage disposal systems shall be designed by a California licensed civil engineer or Registered Environmental Health Specialist. The final approval of the engineered plans will be made by the Director of Environmental Health.

V. LIST AND SCHEDULE OF INSPECTIONS

The inspection schedule includes, but is not limited to the following:

1. Site evaluation
 - a) Verification of plot plan dimensions
 - b) Soil profile analysis
 - c) Percolation holes
2. Inspection of finished system components
 - a) Septic tank distribution boxes, lift stations, etc., with fixtures in place.

- b) Solid leach lines joining septic tank and leach system
- c) Exposed leach pipe properly leveled and sealed on leach rock; untreated building paper or other approved cover material available on site.

NOTE: LEAVE ALL WORK OPEN FOR INSPECTION

3. Final inspection

- a) The final assessment of the installed septic system is to ascertain and document that all provisions in the previous sections pertaining to the permit , site evaluation, design and construction are in compliance with the wastewater policy.
- b) The final assessment of the septic system will be to approve or disapprove the installation as determined by the ICEHSD.
- C) Following final inspection and approval of the completed septic system, it is recommended that septic tanks be pumped at least once every three years. Leachfield life may be reduced considerably if the tank is allowed to accumulate excessive sludge and grease.

List of references:

UPC 1985 Edition (to be superseded by current adopted publication)
EPA Design Manual for Onsite Wastewater Treatment and Disposal Systems
Lahontan Basin Plan (CA Regional Water Quality Control Board)