

# **Mono County Health Department**

## **Construction Guide for Residential and Commercial On-Site Sewage Treatment & Disposal System**

### **I. Scope:**

This construction guide and permit application procedure has been prepared to assist the property owner in meeting State and local regulations for construction, alteration, and/or repair of a conventional (standard) sewage treatment & dispersal system for residential use and commercial uses with domestic waste flows. A conventional system consists of a septic tank, distribution piping and leach lines. Leach beds may be considered in special circumstances but these are generally impractical for soil conditions in Mono County. Seepage pits and cesspools are prohibited in Mono County.

### **II. Procedure**

#### **A. Submit an Application:**

The property owner or authorized agent shall submit an application, plot plan, site location map and permit fee to the Mono County Health Department (MCHD).

1. The **application** shall be on a **form** designated by the health department.
2. A **plot plan** (Figure-1, "Typical Plot Plan") shall be submitted with the application and shall contain all of the following information:
  - a. On the property, the proposed or existing
    - (1) Water supply source(s) including wells, springs, streams, lakes, ponds and canals. If on a public water system, indicate the name of the public water system and the location of the connection.
    - (2) Streams, lakes, ponds, streams and drainage courses
    - (3) Buildings
    - (4) Septic tank
    - (5) Leach lines and/or bed
    - (6) Driveways and parking pads
    - (7) Elevations and slope or grade of the land.
  - b. On adjoining property, within 100 feet of the proposed system
    - (1) Water wells (irrigation and domestic wells)
    - (2) Other water supply sources such as springs, streams and canals
    - (3) Streams, springs and water courses
    - (4) Access roads
  - c. The plan may be sketched and should be drawn to scale. (Please indicate the scale used.)
3. A **site location map** should be submitted with the application that shows the location of the property.
4. All **commercial systems** shall be designed by an appropriately licensed consultant. Soil tests shall be conducted by an appropriately licensed geologist or soil scientist and shall be verified by MCHD. Verification of all tests and procedures by the MCHD is required by inspection while the tests are being conducted.
5. The appropriate **permit fee** shall be submitted with the application.

**B. Identify the Site:**

In order for the health department to properly evaluate the site, the property corners should be located and flagged prior to the site evaluation and permit issuance.

**C. Test Trenches**

The property owner shall arrange to excavate a minimum of two test trenches in the proposed disposal area for inspection by the health department. Each trench shall be a minimum of 10 feet deep. The need for test trenches varies in certain areas of Mono County. In some areas the requirement for the test trenches may be waived, whereas in other areas additional test trenches may be required. Please contact the health department for requirements in your area.

**D. Percolation Tests**

The property owner shall arrange for completion of a minimum of two percolation tests in the proposed disposal area. As with the test trenches the need for percolation tests vary in certain areas of Mono County. In some areas the requirement for the test may be waived while in other areas additional percolation tests may be required. Please contact the health department for requirements in your area. Where percolation tests are required a Registered Engineer, Registered Geologist or Registered Environmental Health Specialist shall conduct the test.

**E. Issuance of a permit:**

After evaluation of the property and inspection of the test trenches and percolation tests, if the proposed sewage disposal system is satisfactory for the site, a permit will be issued by this department for installation of the system.

**F. Alternative Systems**

If the health department determines that the site is not suitable for a conventional system, an alternative system may be considered. Whenever possible, after evaluating the property and test results, the health department may provide recommendations concerning alternative systems that may be acceptable. A Registered Civil Engineer, Registered Engineering Geologist or Registered Environmental Health Specialist shall design the alternative system. All alternative systems shall comply with the Mono County Health Department requirements for alternative systems.

**G. Aerobic systems:**

The health department may approve an aerobic system if the system will produce results at least equivalent to a septic tank, whether their aeration systems are operating or not.

**H. Inspections required:**

1. Site inspection (prior to issuance of permit);
2. Soil profile trenches (prior to issuance of permit);
3. Open trench inspection (prior to placement of leach rock);
4. Septic tank, leach-lines, distribution system (final inspection).

### III. Site Criteria and Construction Requirements:

#### A. Site Criteria:

1. The *soil* in the absorption field shall be a loam, sandy loam, silty loam or clayey loam as determined by USDA soil classification system. The coarse fragment (e.g. gravel, rock, and boulders) shall be less than 50% (by volume).
2. The *soil percolation rate* in the absorption field shall be not less than 5 minutes per inch or greater than 60 minutes per inch, as determined by the U.S. EPA Manual percolation test procedures.
3. In all portions of the absorption field the *depth or soil* beneath the bottom of the trench shall be a minimum of 5 feet to bedrock, an impermeable stratum (e.g. heavy clay) and/or ground water and seasonal ground water.
4. Sufficient area, equal to 100% of the initial area, shall be set-aside exclusively for repair and, if necessary, replacement of the system.
5. The natural *slope* in the area of the absorption field shall be less than 30 percent (30%).
6. All portions of the absorption system shall be *located* and constructed in compliance with Table – 1, “Location of Sewage Disposal System.”

#### B. Septic Tank:

1. **Septic tanks** shall be constructed of concrete, plastic, fiber reinforced plastic or steel and shall be *approved* by the Mono County Health Department for installation in Mono County. Wooden septic tanks are prohibited.
2. Septic tanks shall meet the *capacity* as described in Table – 2, “Capacity of Septic Tank.”
3. The septic tanks shall be *installed* in an excavation in native soil. The bottom of the excavation and tank (inside) shall be level. The tank inlet pipe and tank outlet pipe shall be level (with a maximum grade drop of 2 inches from the invert of the inlet pipe to the invert of the outlet pipe).
4. An excavation around a concrete or steel tank may be back-filled with native soil provided the boulders and large rocks have been removed.
5. An excavation around a fiberglass or plastic tanks shall be back-filled with a minimum of 12 inches of fill sand or concrete sand on the bottom and sides of the tank. During placement of the back-fill, the tank shall be filled with water to support the walls of the tank.
6. Upon completion of the installation a minimum of 12 inches of earth shall be placed over the septic tank.
7. **Access risers** extending from the septic tank lids to the ground surface are recommended for all septic tanks. Access risers extending from the septic tank lids to the ground surface are required for septic tanks installed under concrete and/or pavement; the risers shall be accessed through a manhole covers.
8. The minimum thickness of any steel septic tank shall be No. 12 U.S. gauge (0.109”) and each such tank shall be protected from corrosion, both externally and internally, by an approved bituminous coating.

### C. Distribution and Drainage Piping

1. The **building sewer** piping from the house to the septic tank shall be constructed of ABS or Schedule 40 PVC pipe. A clean out shall be installed at every 90-degree bend and every 100 feet of sewer line. The sewer (inlet) piping shall extend 2-3 inches into the first compartment of the septic tank. For tanks that do not have an inlet baffle, an **inlet tee** shall be installed on the end of the sewer pipe on the inside of the septic tank. The invert portion of the tee shall extend 12-15 inches below the water surface.
2. All **distribution piping** from the septic tank to the drainage piping shall be constructed of solid 4-inch ABS or PVC pipe. A minimum of 5 feet of distribution piping shall be installed between the septic tank and drainage piping. The distribution (outlet) piping shall extend 2-3 inches into the second compartment of the septic tank. For tanks that do not have an outlet baffle, an **outlet tee** shall be installed on the end of the distribution piping on the inside of the tank. The invert of the tee shall extend 12-15 inches below the water surface. All joints and connections in the distribution system shall be watertight.
3. If more than one leach line is installed a **distribution box** shall be installed in native (undisturbed soil) at the head of the disposal field. A minimum of 5 feet of solid distribution piping shall be installed between the septic tank and distribution box and the distribution box and drainage piping. On level ground the distribution box shall be installed for *equal distribution* to each lateral. On sloping ground the distribution box shall be installed for *serial distribution*. When the total amount of leach line exceeds 500 feet the leach field shall be *pressure dosed* to the distribution box.
4. Leach line **drainage piping** shall be constructed of 4 inch perforated ABS or PVC pipe.

### D. Conventional Leach Line

1. **Leach lines** shall be constructed in trenches excavated in native and undisturbed soil. Each line shall consist of drain rock, perforated plastic drainage piping and cover material.
2. The **required amount of leach line** is based on the daily flow and the absorption capacity (percolation rate) of the soil.
  - a. *Daily flow* for a single-family dwelling is 150 gallons per day per bedroom. Daily flow for a multiple family dwelling is 150 gpd per bedroom for up to 6 units, then 100 gpd per bedroom for each additional unit.
  - b. The *soil's absorption capacity* is based on a number of factors including soil texture and soil structure. The most accurate method of determining the absorption capacity is by conducting two or more percolation tests.
  - c. The amount of *leach line needed* is calculated from the absorption capacity described in Table – 3, “Capacity of the Absorption Field.” An estimate of needed leach line is described in Table – 4, “Estimate of Required Amount of Absorption Field.”

- d. If rocks, boulders, heavy clay or other impermeable material are encountered during the trench installation, additional leach line shall be installed to compensate for the loss of absorption area.
3. The leach line **trenches** shall be installed parallel to the contour of the slope.<sup>1</sup> The trench width shall be a minimum of 18 inches and a maximum of 36 inches. The trench length shall not exceed 100 feet. The bottom of the trench shall be level with a maximum fall of 3 inches per 100 feet of trench. All smeared and compacted surfaces shall be removed from the trenches by raking to a depth of 1 inch and the loose material removed. If more than one trench is installed, the separation between trenches shall be a minimum of two times the depth of the trench.
  4. The leach line **drain rock** shall be sorted stone varying in size from three-fourths (3/4) inch to two and one-half (2-1/2) inches. The stone shall be free of fines such as clay, silt, sand and gravel. The depth of the drain rock below the drainpipe shall be a minimum of 12 inches and a maximum of 36 inches.
  5. The leach line **drainage piping** shall be installed level (with a maximum fall of 3 inches per 100 feet) over the required depth of drain rock. The ends of the drainage piping shall be capped. After installation of the drainage piping, additional drain rock shall be placed around and over the drainage piping to a depth of 2 inches over the drainage piping.
  6. The drain rock shall be *covered* with **untreated building paper**, straw or filter fabric to prevent the intrusion of soil into the drain rock. Roofing paper is prohibited. A minimum of 12 inches of **earth back fill** shall be placed over the untreated building paper, straw or filter fabric.
  7. Following is a summary of leach line construction requirements:

	<u>Minimum</u>	<u>Maximum</u>
Length of each line	-----	100
Bottom width of trench	18 inches	36 inches
Spacing of trenches, edge-to-edge	2 x depth	-----
Depth of earth cover	12 inches	-----
Drain rock under drain line	12 inches	36 inches
Drain rock over drain line	2 inches	4 inches
Grade of perforated piping	level	3-inches/100 ft.
Grade of trenches	level	3-inches/100 ft.

### **E. Chamber Leach Line**

An equivalent amount of chamber leach line may be used in lieu of conventional (rock and pipe) leach line. For information concerning chamber leach lines please see the Mono County Health Department supplement for chamber leaching systems.

### **F. Observation Pipe**

An observation pipe shall be installed at the end of each leach line. Each observation pipe shall consist of a solid 4 inch vertical pipe extending from the bottom of the leach line to the ground surface. The portion of the pipe in the drain rock or chamber shall be drilled or slotted to permit wastewater flow into the pipe. The bottom of the pipe

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<sup>1</sup> That is, the trench depth shall not vary more than one foot from the shallowest to deepest end.

may be pressed into the soil or fill sand for stability. The top of the pipe shall be covered with a removable cap.

### **G. Final Inspection**

1. Upon completion of the installation the owner shall prepare the system for health department inspection by
  - a. Removing the tank lids and distribution box lid(s).
  - b. Completing a flow test by filling the septic tank, distribution box and piping with water.
2. The tank top, distribution box and drainage piping end caps shall be exposed for the inspection. The distribution piping and drainage piping shall be left exposed whenever practical.
3. The owner or installer shall contact the Mono County Health Department 24 hours in advance to setup an appointment for inspection of the installation.

### **H. System Operation and Maintenance**

1. Shallow rooted grasses may be planted over a septic tank and leach field. However, avoid planting brush or trees (especially hydrophilic plants such as cotton woods, aspens or willows) on or near the system.
2. For proper system operation :
  - a. Do not flush diapers, sanitary products, cigarette butts, hair, and/or plastics into the system.
  - b. Do not dispose of harsh chemicals such as paints, solvents and cleaners into the household drainage piping. Use bleaches and laundry detergent in moderate amounts. Labels on these products will help in determining their effect on the system.
  - c. Do not disposal of cooking grease and other oils into the drainage piping.
  - d. Avoid the use a garbage disposal.
  - e. Do not drain a hot tub or indoor spa into system.
  - f. Do not drain water purifier backwash water into system.
3. The septic tank should be pumped every 5 to 7 years. More frequent pumping may be required for systems with heavy use.

## IV. Tables

**Table – 1**  
**Location of Sewage Disposal System**

<u>Minimum Horizontal Distance Required From</u>	<u>Building Sewer</u>	<u>Septic Tank</u>	<u>Leach Lines</u>
Water supply wells	50 feet	100 feet	100 feet
Private domestic water line	1 foot	5 feet	5 feet
Public water main	10 feet	10 feet	10 feet
Property line,	clear	5 feet	5 feet
Property line, special conditions*	25 feet	25 feet	50 feet
Perennial Streams & Springs	50 feet	100 feet	100 feet
Ephemeral Streams	25 feet	2 5 feet	50 feet
Lake or Reservoir	50 feet	50 feet	200 feet
Cut or fill bank	10 feet	10 feet	4 x Height
Cut or fill bank, special conditions	25 feet	25 feet	50 feet
Distribution box	(None)	5 feet	5 feet
Disposal field	(None)	5 feet	10 feet
Building or Structure	2 feet	5 feet	8 feet
Large trees	(None)	10 feet	10 feet

(\*“Special conditions” apply in areas where private wells and springs are used for domestic water supply.)

**Table – 2**  
**Capacity of Septic Tank**

<u>Single Family Dwelling, # of Bedrooms</u>	<u>Multiple Dwelling Units or Apartment (1-bedroom each)</u>	<u>Other Uses Maximum Fixture Units Served</u>	<u>Minimum Septic Tank Capacity in Gallons</u>
1		15	750
2 or 3		20	1000
4	2 units	25	1200
5 or 6	3	30	1500
	4	45	2000
	5	55	2250
	6	60	2500
	7	70	2750
	8	80	3000
	9	90	3200
	10	100	3500

For Commercial installations the system size shall be based on Table K-3 of the California Plumbing Code or an equivalent standard.

**Table – 3  
Capacity of the Absorption Field<sup>2</sup>**

<u>Soil Texture</u>	<u>Percolation Rate (mpi)</u>	<u>Absorption Capacity (gpd/sq. ft.)<sup>3</sup></u>
Gravel, coarse sand	< 1	not suitable <sup>4</sup>
Coarse to medium sand	1-5	1.2
Fine sand, loamy sand	6-15	0.8
Sandy loam, loam	16-30	0.6
Loam, porous silt loam	31-60	0.45
Silty Clay loam, clay loam <sup>5</sup>	61-120	0.2

**Table – 4  
Estimate of Required Amount of Absorption Field**

The following chart may be used for estimating the amount of leach line or leach bed needed for your system:

Septic Effluent Application Rate gpd/sq. ft.	Leach Line Required LF/bedroom <sup>6</sup>	Leach Bed Required SF/bedroom <sup>7</sup>
1.2	25	125
0.8	38	188
0.6	50	250
0.45	67	333
0.2	150	750

**V. Figures: (See Attached)**

- A. Typical Plot Plan
- B. Leach Line Observation Pipe (Typical)

<sup>2</sup> Rates are based on septic effluent from a domestic source and may not be applicable for other use.

<sup>3</sup> Rates are suitable for sidewall and bottom area on leach lines and bottom area only on leach beds.

<sup>4</sup> Site may be suitable for standard system with 2 feet of concrete sand below the drain rock. Use application rate of 1.0 gpd/sf.

<sup>5</sup> This soil type is unsuitable if clays are expansive.

<sup>6</sup> Lineal feet per bedroom of standard leach line 3' wide by 3' deep with 18" of drain rock below the drainpipe.

<sup>7</sup> Square feet per bedroom of leach bed bottom area with 12" of drain rock below the drainpipes.