



PLUMAS COUNTY

Sewage Disposal System Installation and Procedure Manual

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PLUMAS COUNTY ENVIRONMENTAL HEALTH



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EFFECTIVE
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Sewage Disposal System Installation and Procedure Manual

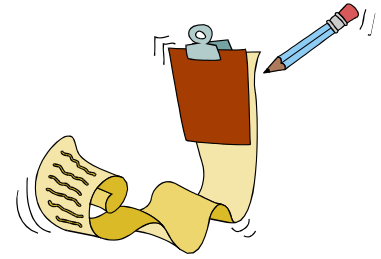
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I. SEWAGE DISPOSAL PERMIT PROCEDURE

Please use the following procedure to ensure timely processing of your sewage disposal permit application.

A. Sewage Disposal System Application:

Submit the completed Sewage Disposal System Application, along with a preliminary plot plan drawn to scale on an 8 ½" X 11" sheet, the percolation test data and any soil profile/mantle excavation test data to the Building Department along with the appropriate fee. Following processing the application package will be forwarded to Environmental Health.

Engineered designs are required for septic systems with percolation rates less than 5 minutes per inch (mpi) or greater than 60 mpi, elevated mound systems, and Advanced Treatment Units.

Engineered design, and concurrence from the Regional Water Quality Control Board, are required for septic systems serving five (5) or more structures.

Septic systems with pump stations require an approved electrical permit from the Building Department.

B. Percolation Testing:

If percolation testing has not been completed or is not on file, it must be conducted before the application can be approved. Additional testing such as soil profile or piezometer monitoring may also be needed before the application can be approved.

C. Site Visit:

An Environmental Health Specialist will conduct a site visit of the property to review the location and size the proposed system.

To facilitate the site visit, please do the following:

1. Ensure the parcel is clearly identified from the roadway showing the name of the owner and the street address.
2. If the parcel is secured please provide access either by unlocking the gate or providing an escort.

D. Permit Issuance:

After the location has been approved and all required testing has been submitted and approved, Environmental Health will issue a permit. This permit is valid for a period of one (1) year from the date of issue. The permit and a copy of the approved plot plan will be mailed to the applicant and/or contractor as requested.

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E. Begin Construction:

The permit and approved plot plan should list all of the information necessary to construct the system, including the size, configuration, maximum depth of excavation, and special conditions of installation. Construction may commence only after permit issuance.

If you have any specific questions, or wish to change the designated size, configuration or location, please contact Environmental Health BEFORE PROCEEDING at (530) 283-6355.

Re-inspections resulting from an improper installation maybe billed at the department's hourly rate.

F. Final Inspection:

After installation, but before covering with earth, contact Environmental Health for a Final Inspection, 24 hours notice is recommended.

1. The final inspection can not be conducted without the following:

a) As-Built Information:

As-built information identifying the location and dimensions of the leach bed in relation to the septic tank is required (not required for tank only installations).

b) Septic Systems with a Pump:

The pump and alarm systems must be tested as part of the final septic system inspection.

(1) The control/alarm panel must be fixed to a permanent location and wired according to the requirements of the electrical permit.

- (a) Existing Construction: The electrical system must be inspected by the Building Department prior to contacting Environmental Health.
- (b) New Construction: The electrical system will be inspected as part of the overall electrical system by the Building Department.

(2) Electrical Power:

- (a) Electrical connections: Must have molded plugs or must be contained within approved electrical boxes (no open field connections where wire splices are outside of approved junction boxes).
- (b) Temporary electrical power: Power connections must meet the following safety requirements:
 - (i) A plug-cord connection must have a three-wire (grounded) extension cord, and must be connected to a Ground Fault Interrupter (GFI) protected outlet or breaker.

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- (ii) An electrical generator connection must be properly grounded and have over-current protection.

2. Engineer Designed Septic Systems:

The designing engineer is required to:

- a) Inspect the installation;
- b) Perform a “squirt test” (if a pumped system); and
- c) Provide a signed letter of conformance stating that the system was installed and functions according to their design.

II. PERMIT EXPIRATION AND EXTENSIONS

A. Application to Construct:

Applications for permits are valid for one (1) year from date of receipt. The applicant has one (1) year to submit all supporting documentation, such as percolation test results, piezometer results, etc. to demonstrate compliance with Plumas County Code, Title 6, Chapter 6 for permit issuance.

An application becomes invalid at the end of one (1) year and is not typically eligible for extension of time.

B. Permit to Construct:

The permit is valid for one (1) year from date of issue. Approximately thirty (30) days prior to the permit expiration date, the applicant should receive written notification from Environmental Health regarding the expiration date of the permit.

If the system is not installed prior to permit expiration, the applicant may request a one time permit renewal for up to one (1) year. The renewal request must be received along with the appropriate fees prior to permit expiration. Should a permit expire before renewal, the permit is declared invalid and a new application and fee are required to complete the project.

III. BACKGROUND SEWAGE DISPOSAL INFORMATION

Excerpts paraphrased from Agriculture Information Bulletin #349.

A. Soil Absorption Capacity:

In planning an on-site sewage disposal system, first find out if the soil can absorb the liquid sewage, the effluent, that flows from the septic tank. Some soils absorb effluent rapidly, others slowly.

How long and how well your sewage disposal system functions depends largely on the absorption capacity of the soil. The effluent must be absorbed and filtered by the soil; otherwise unfiltered sewage may reach the surface or may contaminate ground water. Sewage that reaches the surface has a very bad odor, attracts flies and other insects, and is a public health hazard with a high potential for disease exposure for both humans and animals.

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Knowing the absorption capacity of the soil is an important part in determining the size of leachfield your parcel will require. The slower the rate of absorption, the larger the leachfield required. It is possible that if your lot is small and the soil on your lot has a slow rate of absorption, you may need an absorption field larger than your lot can accommodate. Some soils, regardless of the size of the lot, are not suitable for on-site sewage disposal.

B. Why Absorption Fields Fail:

Inspections by engineers have shown that sewage absorption fields fail to work properly mostly because the soils either are poorly drained or are so compact that the absorption rate is very slow.

Poorly drained soils are saturated with water during wet weather; creating a condition where there is no space left for effluent absorption. Leachfields in such soils may function well in dry weather and fail in wet weather. If a soil has a very slow absorption rate, the effluent may rise to the surface even in dry weather.

C. Additional Information:

For more information or to contact the Environmental Health Specialist assigned to your area or to obtain a guide for septic system maintenance, please contact Environmental Health.

IV. SITE SUITABILITY REQUIREMENTS

The applicant must demonstrate suitability of a property for on-site sewage disposal using the services of a CA Registered Engineer, CA Registered Geologist, or CA Registered Environmental Health Specialist. A list of testing consultants working in Plumas County is available in Appendix I.

The demonstration of site suitability will include some or all of the following tests:

A. Percolation Testing:

A percolation test is required on every lot where a septic tank and leach drainage system will be used. Percolation testing must be performed at the depth and location of the proposed drainage system. Percolation test results, in conjunction with projected sewage flows or the number of bedrooms served, determine the absorption area sizing requirements of the drainage system.

B. Soil Profile Testing (Mantle Test):

Soil profile testing, also known as soil mantle testing, may be required on some parcels. This testing can be performed by a qualified third party consultant to verify soil depth to impermeable layers or bedrock, and possible indicators of a high groundwater table. Typically, a backhoe excavation is conducted in the presence of a representative of Environmental Health. Visual observations are often adequate to determine site suitability, but deep percolation or other tests may be required in conjunction with the profile.

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C. Groundwater Monitoring (Piezometer Testing):

On parcels where seasonal high groundwater is suspected or known, the property owner or their designated representative must demonstrate adequate separation between the highest seasonal groundwater and the deepest portion of the leachfield. This demonstration usually requires the installation and wet season monitoring of at least one (1) piezometer within the proposed leachfield area. The piezometer must be installed under permit in a location and manner approved by Environmental Health. The wet season monitoring must be conducted by a site suitability consultant. The piezometer must be installed and monitored from November 1 through May 31.

The highest water level will be used to assess the suitability of the parcel for a sewage disposal system. A signed permit application is required for piezometer installation and authorization for monitoring. Please contact Environmental Health for permit applications and more information.

V. DRAINFIELD SIZING - BEDROOM CRITERIA

Sizing of a sewage disposal system depends upon the parcel percolation rate and number of bedrooms in the structure. Leachfields for commercial structures are sized by other criteria. Environmental Health uses the following criteria for determining what is and is not a bedroom for purpose of designing sewage disposal systems:

A. Habitable rooms:

Habitable rooms (at least 70 square feet with minimum natural light and ventilation) with closable doors such as: sewing rooms, dens, offices, studios, game rooms, etc. are considered bedrooms. The presence or absence of a closet does not determine whether a room is potentially a bedroom.

B. Lofts:

Rooms such as lofts are considered bedrooms provided there is some expectation of privacy.

C. Large Rooms:

A single large room that is adaptable to partitioning will be counted as one bedroom for each 100 square feet of floor area.

D. Non-Bedroom Features:

Several of the following features would remove a room from bedroom consideration:

1. A large passage way without a door that opens onto a living space, entry, or main activity area.
2. Use of a half wall or railing along at least one side of the room.
3. A conversation pit, which encumbers the floor area.

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4. Presence of a fuel-burning fireplace in a room designated as a family, game room or recreation room.
5. A main activity area of the dwelling.
6. A wet bar in family, game or recreation room.

In general, any room, for which there is some expectation of privacy and that could be used as a bedroom by current or future residents, will be considered a bedroom for the purposes of sewage disposal design.

Note: Septic system upgrades for remodels with bedroom additions must be completed and receive final approval by Environmental Health before the building permit final inspection.

VI. STANDARD SEPTIC SYSTEM COMPONENTS

A standard individual sewage disposal system consists of three (3) main components: a septic tank (gravity flow or pumped effluent), a drainage system (leachfield or drain field), and the drainage system replacement area:

A. Septic Tank:

Septic tanks must be constructed as a one-piece¹ unit and consist of two (2) compartments. Each tank compartment is fitted with an access riser that extends to the ground surface with a minimum diameter of 20 in.

Access risers and their gas-tight and securable lids shall be constructed of polyethylene, concrete or other equally durable water and corrosion resistant material. The inlet and outlet fittings must be provided with sanitary tees, baffles, or an approved equivalent. Septic tanks must be constructed of reinforced concrete, fiberglass, polyethylene or other equally durable, waterproof and corrosion resistant material. The tank model and manufacturer must be approved by the Director of Environmental Health. A list of approved septic tanks can be found in Appendix J.

¹ Certain plastic two-piece tank units are allowed provided they are on the approved list and they are assembled by qualified personnel at the supplier's facility (no field assembly allowed).

Minimum septic tank capacities for residential applications include the following:

1 - 3	Bedrooms	1,000 Gallons
4	Bedrooms	1,200 Gallons
5 - 6	Bedrooms	1,500 Gallons

Notes: Tank volumes less than 1,000 gallons are no longer approved.

Tanks with internal pumps must be increased in volume to the next available size to accommodate the displacement of the pump system, must have raised baffle penetration, and a drop tube (see Septic Tank Effluent Pump diagram in Appendix G).

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Minimum septic tank capacities for commercial or industrial applications shall be equal to the maximum estimated daily wastewater flows.

B. Drainage System (leachfield):

The drainage system can vary widely in shape, appearance and design, based on site-specific considerations. The purpose of any drainage system, regardless of design, is to adequately hold, treat, and safely dispose of the septic tank effluent.

In Plumas County, the preferred standard drainage system design (where site considerations allow) is a shallow leach bed.

A gravel leach bed consists of a level, and usually rectangular excavation filled with drainage gravel. A distribution piping system disperses the effluent throughout the bed. For specific installation requirements, please see the attached diagrams.

A “gravel-less” chamber leach bed uses plastic leaching chamber units. Installation details vary by manufacture. Please specify on the application the manufacturer and model of the chamber you would like to use. Please contact Environmental Health for more information.

Other drainage system options include deep trench, shallow trench, and shallow mound with each option matched to particular site conditions.

In any case, each drainage system must be installed across slope to minimize excavation depth as much as possible and must be located to meet all setbacks to water lines, buildings, easements, property lines, water wells, etc.

C. Leachfield Replacement Area:

Designating a 100% leachfield replacement area is required. This area can be an undeveloped area in the natural state that keeps in place existing trees and vegetation and meets the same size and setback requirements as the leachfield.

It is advisable to locate the replacement area near to, and down slope of, the primary leachfield to minimize plumbing changes should the future installation of a replacement leachfield become necessary.

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VII. SYSTEM LOCATION REQUIREMENTS

In order to safely and effectively treat and dispose of wastewater, septic tanks and drainage systems must be located and installed to meet the separation distances as outlined below.

Minimum Separation Distances in Feet

Facility	Septic Tank or Sewer Lines (ft)	Drainage System (ft)
Water supply well serving other than a public water system	50	100
Public water well	100	150
Perennial streams or springs	50	100 from the 10-year high water mark
Drainage courses, ephemeral streams	25	50
Meadows, wet marshy areas	25	50
Lakes, reservoirs, ponds or other surface water impoundments	50	200 from high water line "
Lakes, reservoirs, ponds or other water with a surface water intake point for a public water system	50	400 from high water mark if the drainage system is within 1,200 feet of the intake and within the catchment of the drainage
Cut or fill banks	10	4 x vertical bank height or a maximum of 100
Natural escarpments in excess of 50% slope	25	4 x vertical bank height or a maximum of 100
Private property lines	5	5 '''
Buildings or structures	5	8
Public water supply main	25	25
Individual water line	10	10
Sewage drain systems	3	6 '''
Roads, driveways, areas of vehicular traffic, or utility easements	Clear	Clear
Geothermal Heat Exchange Wells	25	50

" Lake Almanor drainage system separation shall be one hundred (100') feet from high water line.

''' Distance shall be increased to fifty (50') feet where wells have not been installed or well sites have not been designated on the subject and adjacent properties.

''' Fifteen-foot minimum separation required for deep trench disposal systems.

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Vertical separation distances also apply. They include 5 feet between the bottom of the drainage system and highest seasonal groundwater and 4 feet from the bottom of the drainage system to impermeable soil or bedrock.

Drainage systems cannot be installed on slopes in excess of 30 percent. Notwithstanding, benching of steep slope soil is permissible provided the drain fields are installed in the undisturbed soil and the bottom of the finished excavation meets the required vertical separations as noted above.

VIII. PUMPED EFFLUENT SYSTEM (STEP) REQUIREMENTS:

STEP systems are an alternative to gravity delivery systems where leachfields must be located up-slope or a long distance from the septic tank. With proper installation and maintenance, these systems can provide great flexibility in property development or in replacement of failing system. Both separate vault and integral pump systems are approved for use in Plumas County.

Regardless of style, all septic tank effluent pumping systems must include the following (refer to Appendix G):

- A. Water Tight Construction: Water-tight construction includes gaskets and penetration grommets as needed.
- B. Surface Access: Access through risers with 20-inch minimum dimensions and gasketed and securable lids is required.
- C. Plumbing Installation: Shall include:
 - 1. A pipe union to allow for the removal of the pump;
 - 2. A check valve to stop back flow into the sump; and
 - 3. A control valve for service and maintenance located within the vault or in an adjacent surface-accessible location.
- D. Pump, Alarm and Control Panel:
 - 1. The pump must be of a submersible design and sized to meet the minimum flow and head pressure for the application.
 - 2. An audible & visual alarm is required to alert should high tank water level conditions occur. The alarm must be located in an area where the occupants will hear and see the alarm signal (crawl-space installation is not acceptable).
 - 3. An electrical permit, issued by the Building Department, is required for the pump and alarm installation. The septic system final approval will be withheld until the electrical permit has received final approval.
- E. Septic Tank with Internal Pump: A Plumas County approved septic tank with modified baffle design is required.
 - 1. The baffle penetration must be no more than 4 inches below the elevation of the tank inlet and shall have a sanitary tee attached onto the baffle penetration tube; AND
 - 2. At a minimum, the septic tank must be oversized by one (1) bedroom size to offset the displacement of the pumping equipment.

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Environmental Health recommends a minimum 1500-gallon capacity tank.

- F. Separate Vault with Internal Pump: A water-tight vault equipped with a water-tight access riser and gas-tight lid is required.
1. There is no minimum vault volume required by code; however, the larger the vault the less frequent the pump will cycle, potentially extending the pump service life. Also, a larger vault will provide additional space for effluent holding should a power-outage occur.
 2. The vault should be designed for effluent pump use with sufficient wall strength to withstand soil pressure when the tank is empty of effluent.
 3. If installed in areas where elevated groundwater could occur, the vault must be weighted to prevent buoyancy.
 4. The vault should not require a separate atmospheric vent as venting is provided through the gravity line between the septic tank and vault.

IX. NON-STANDARD SEPTIC SYSTEMS:

A. Engineered Design Systems:

Some sites may not be acceptable for a standard on-site sewage disposal system due to site conditions such as; inadequate percolation rates, vertical separation to an impermeable layer; or an elevated seasonal groundwater table. On parcels where these types of conditions exist it may be possible to apply engineering techniques to allow the placement of an engineered on-site sewage disposal system.

The type of engineered system will be determined by the on-site characteristics of the parcel. All plans for engineered design on-site sewage disposal systems must be submitted to Environmental Health for review and approval. The following are qualified to design engineered septic systems: CA Registered Engineer; a CA Registered Geologist, or CA Registered Environmental Health Specialist. Refer to Appendix I for a list of consultants.

Note: Only CA Registered Engineers are qualified to design advanced treatment or pressure dosed septic systems.

B. Advanced Treatment Systems:

Advanced Treatment systems and alternative technologies will be considered on a case-by-case basis, provided such proposals are submitted under wet-stamp by a California Registered Engineer.

All advanced treatment units must have a monitoring and maintenance plan specific to the type of technologies utilized. This monitoring and maintenance plan is due at the time of application submittal.

All monitoring and maintenance shall be performed under contract by a qualified third-party service provider.

All advanced treatment systems shall be operated under a renewable annual permit issued by Plumas County Environmental Health.

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X. DECOMMISSIONING SEPTIC SYSTEMS

Currently there is no requirement for a permit to decommission an on-site septic system.

- A. Abandoning Leachfields: The leachfield can be abandoned in place by disconnection from the septic tank effluent line.
- B. Abandoning Septic a Tank: All lines must be disconnected and pumped clean of sludge and liquids by a licensed septic pumping company. The tank must be disposed by:
 - 1. Removal as solid waste; OR
 - 2. Abandonment in place by:
 - a) Filling the tank with inert material (sand, gravel, concrete, etc.); OR
 - b) Crushing the tank and ensure all voids in the tank space are filled and filling the pit with inert materials.

XI. COMMUNITY SEWER SYSTEMS

- A. Converting from On-Site to Community Sewer:

Converting a parcel from on-site sewage disposal to a community sewer collection system is encouraged whenever possible. In order to ensure public health, Environmental Health requires the following documentation: sewer agency line connection application; sewer agency inspection record; documentation of tank pump out and destruction; and a sewer agency Will-Serve letter.
- B. On-Site Sewage Systems Within Community Sewer Districts:

Installing an on-site sewage disposal system within the jurisdictional boundaries of a community sewer agency requires written approval from the sewer agency prior to Environmental Health permit approval.

XII. REUSE OF EXISTING SEPTIC SYSTEMS

In order for Environmental Health to approve the use of an existing septic system for reuse after a home is destroyed or removed and there is no septic system installation documentation, the following information is required:

- A. Document the following on a plot map that shows:
 - 1. The location, size, and materials used to construct the septic tank and the leachfield;

Note: Locating the leachfield and septic tank to determine the materials used for construction (tank shell, supply and distribution piping, and leach bed) can be accomplished by digging small diameter “pot holes” until the corners of the tank and field are located (where the leach rock ends) and uncovering the distribution box(s), and portions of the piping used within the field for distribution.
 - 2. A designated 100% leachfield replacement area; and
 - 3. The location of proposed or existing home, garage, sheds, driveways, water well(s), surface water drainages, animal enclosures, etc.

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B. Percolation test data:

Current soil percolation test results are required in order to ensure the field and replacement area are sufficiently sized for the anticipated flows of the new home. A current percolation test is a one that meets the percolation test requirements as described in the site suitability requirement section above.

XIII. GRINDER PUMPS AND GRINDER PUMP VAULTS

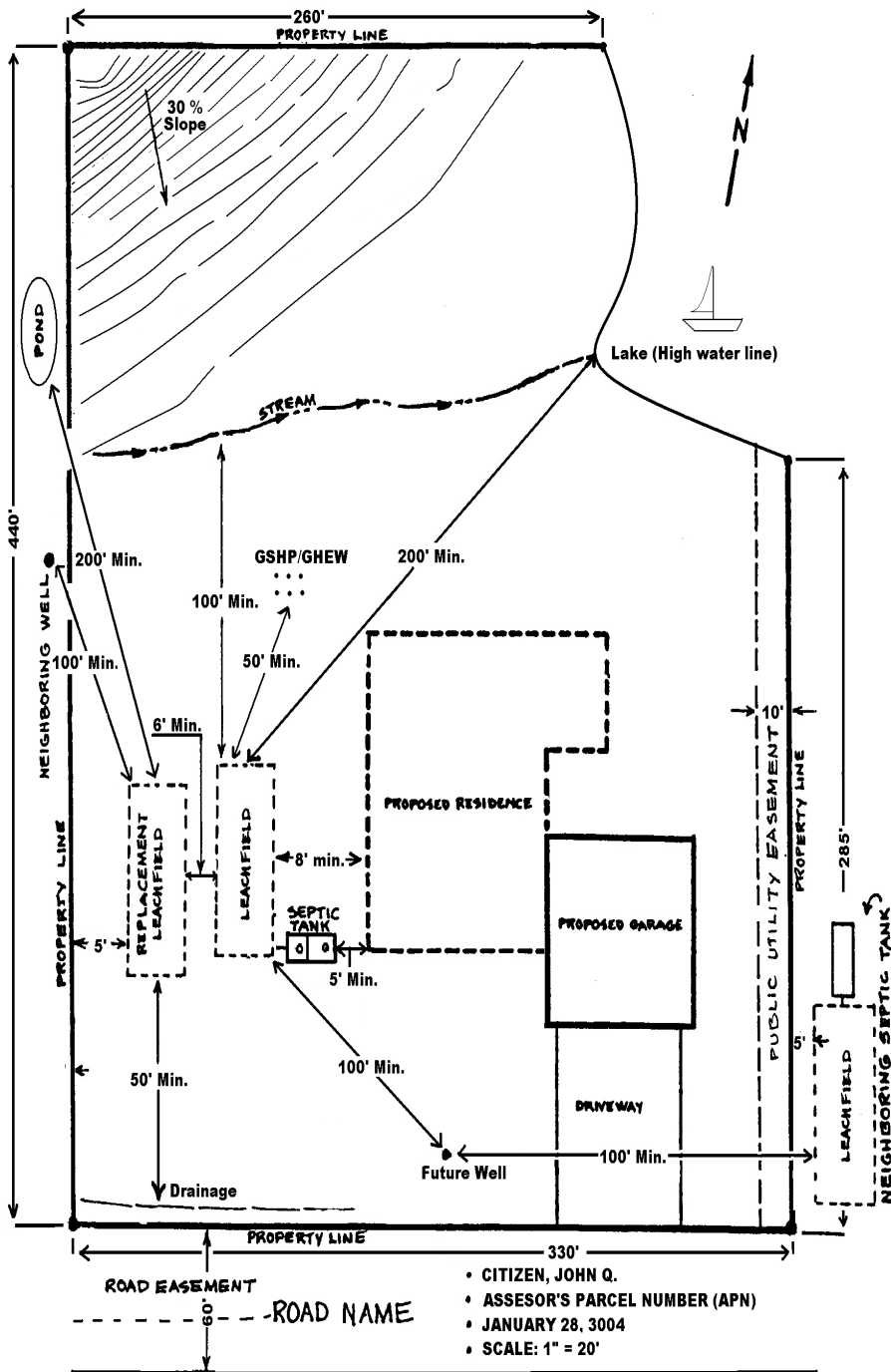
Grinder pumps and grinder pump vaults are not currently subject to permit or inspection by Environmental Health. The Building Department and/or the local community sewer agency have jurisdiction over the installation and operation of these pumps and vaults.

XIV. GREASE INTERCEPTORS

The installations of underground grease interceptor tanks are not currently subject to tank permitting requirements by Environmental Health; however, grease interceptor tanks and/or under sink grease traps are necessary for facilities such as restaurants that have the potential for imparting grease to the waste water.

In the case of food facilities with on-site septic systems, please consult with Environmental Health for guidance on sizing the grease traps. In the case a facility connected to a community sewer system, please contact the sewer agency for their requirements.

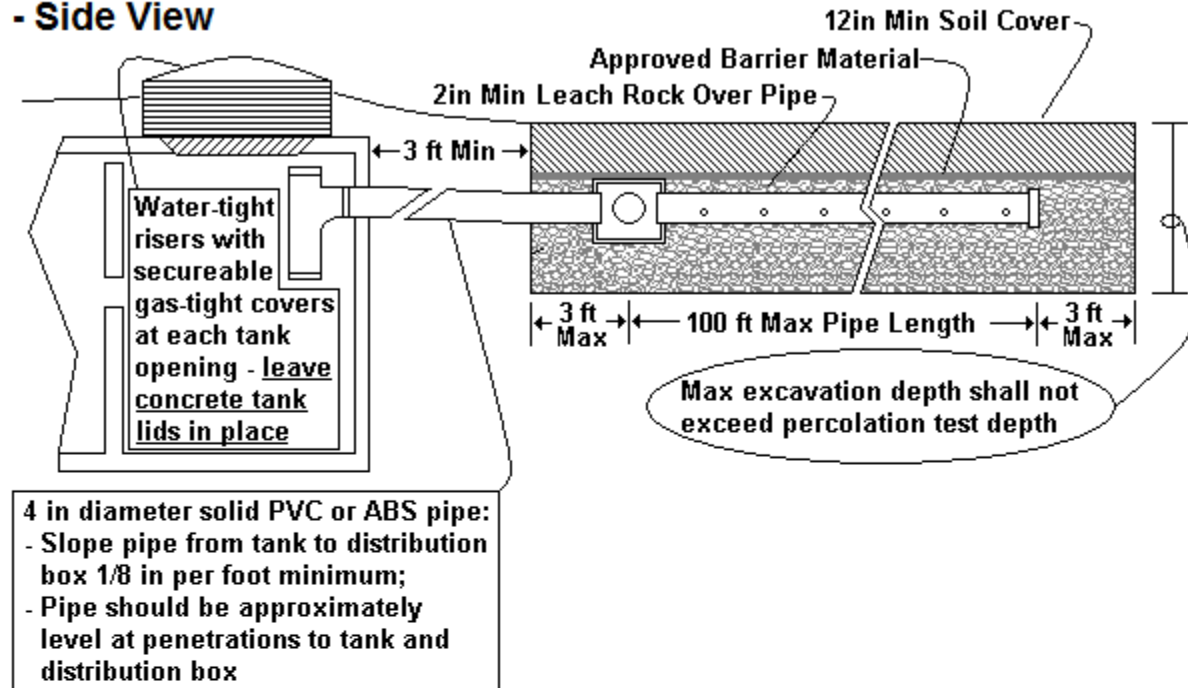
APPENDIX A: PLOT PLAN DIAGRAM EXAMPLE



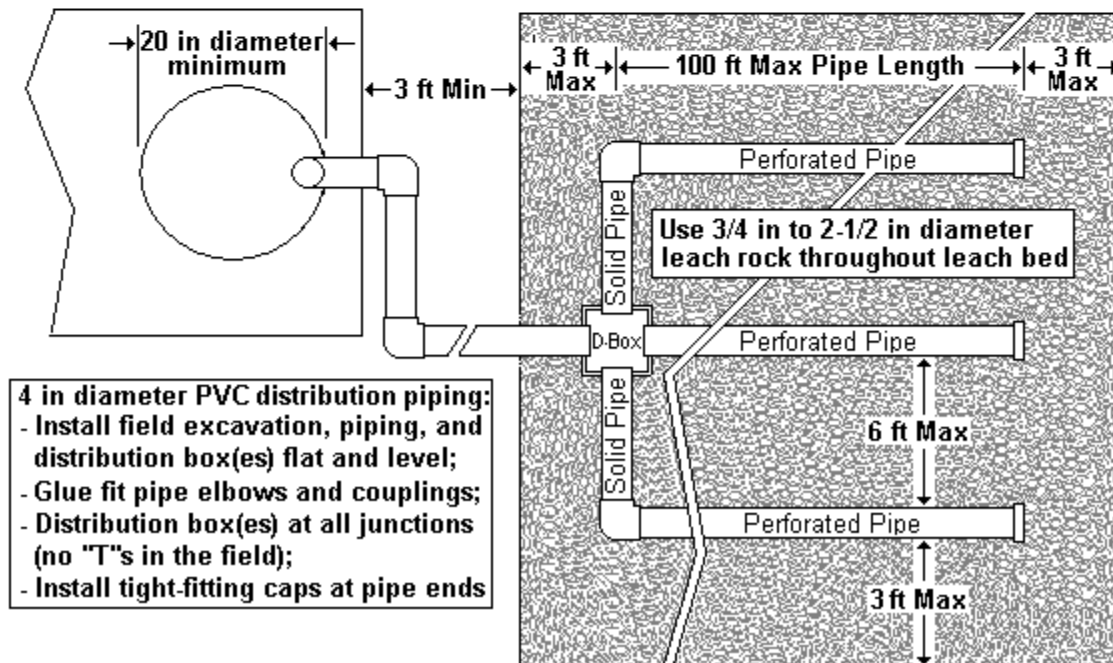
1. Plot plan to be drawn on 8 ½" x 11" paper, in ink or otherwise indelible.
2. In the lower right corner: List the parcel owner's name and current mailing address. List the date of the plot map. , Assessor's Parcel Number (APN), address and lot number if applicable
3. Indicate Scale (example 1" = 20')
4. True North Arrow
5. Indicate location of any survey monuments and how property corners/lines can be located by the Environmental Health inspector.
6. Show location(s) of existing and/or proposed well's (within 200 feet of proposed leach area) and any public water supply main (within 25 feet).
7. Show all existing and/or future leach area(s).
8. Show all of the following that are within 200 feet of proposed leach area(s): year-round and seasonal watercourses (streams, springs etc.), drainage, bodies of water, meadows and wet marshy areas.
9. Show all cut or fill banks and natural escarpments in excess of 50% slope within 100 ft of leach area.
10. Show area of current and/or future buildings and structures.
11. Show all roadways, easements, areas of vehicular traffic, driveways and off-street parking.
12. Show location of proposed/current Geothermal Heat Exchange Wells (GHEW).
13. Show locations of all soil profiles, percolation test and piezometers.

APPENDIX B: STANDARD GRAVEL LEACHBED DETAIL

Standard Gravel Leachbed - Side View

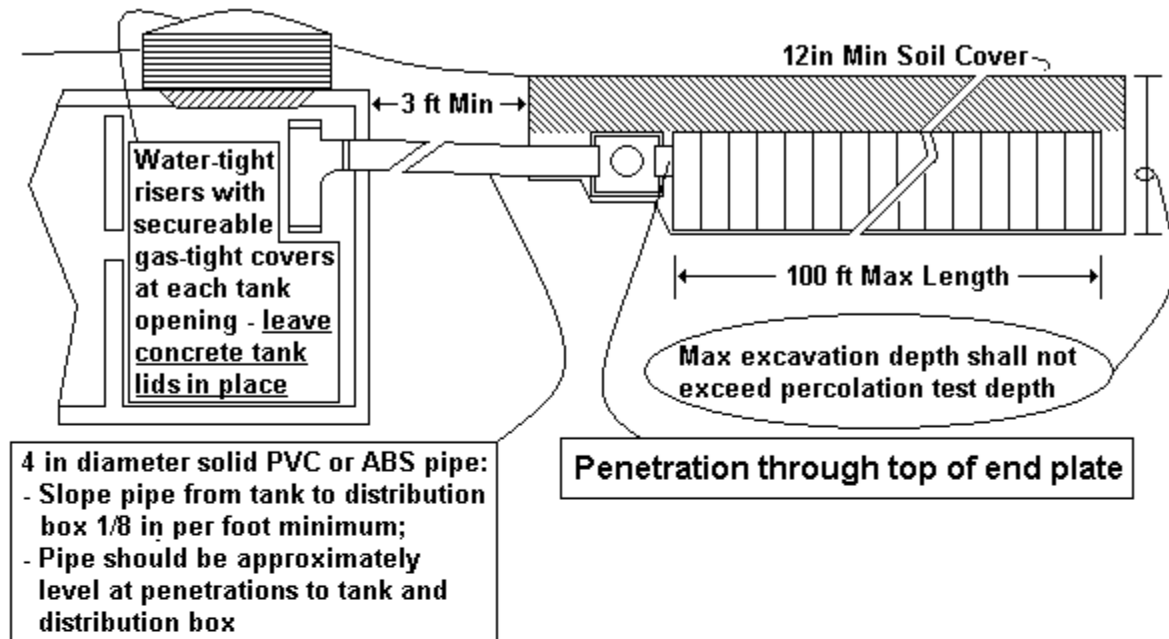


Standard Gravel Leachbed - Top View

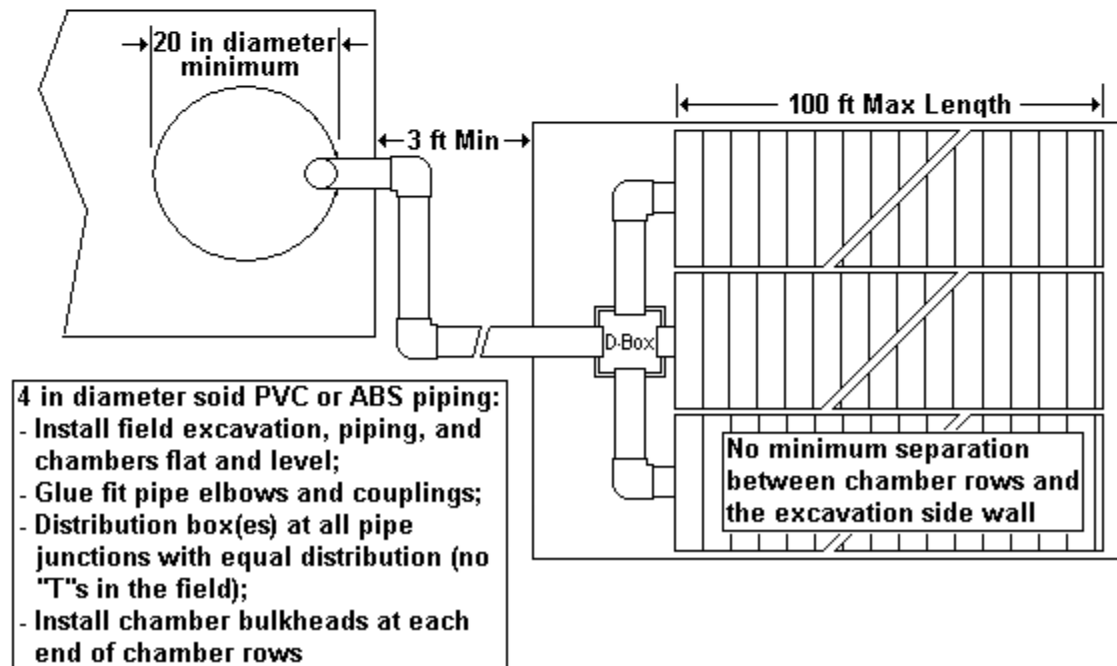


APPENDIX C: STANDARD CHAMBER LEACHBED DETAIL

Standard Gravelless Leachbed - Side View

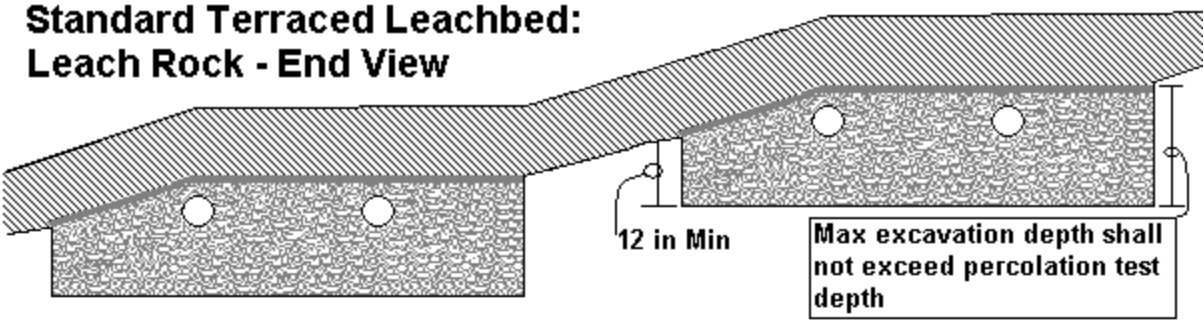


Standard Gravelless Leachbed - Top View

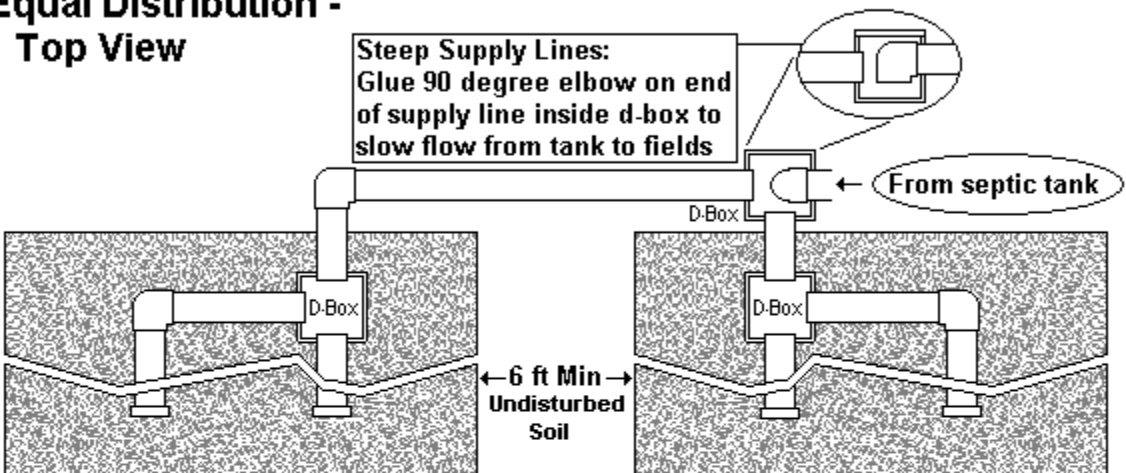


APPENDIX D: STANDARD TERRACED LEACHBED DETAIL

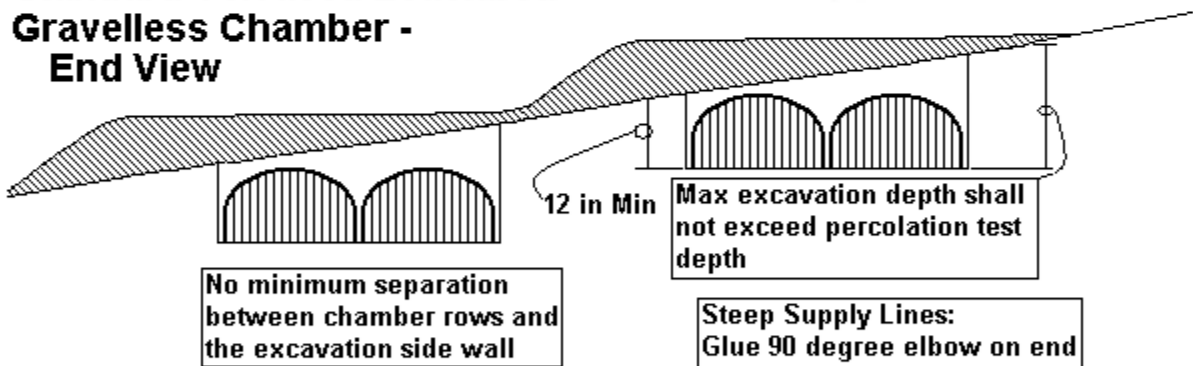
**Standard Terraced Leachbed:
Leach Rock - End View**



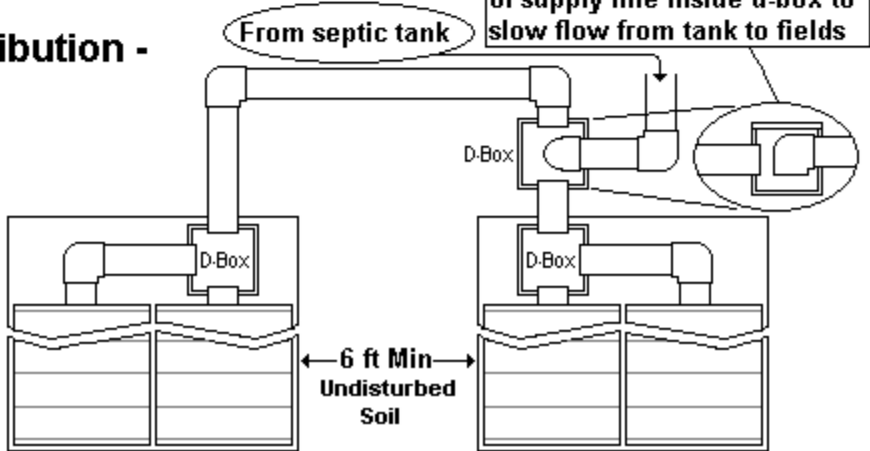
**Equal Distribution -
Top View**



**Standard Terraced Leachbed:
Gravelless Chamber -
End View**

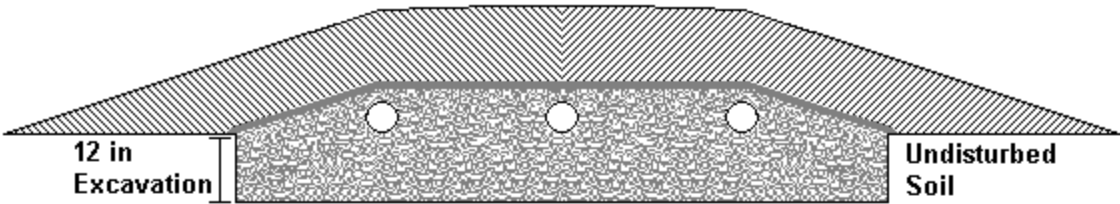


**Equal Distribution -
Top View**

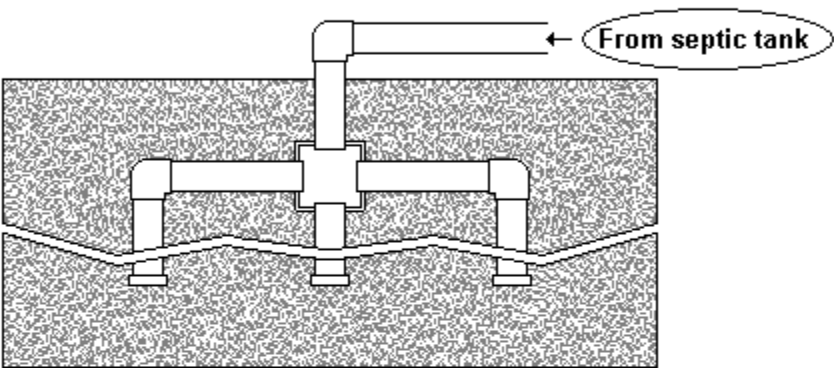


APPENDIX E: STANDARD AT-GRADE LEACHBED DETAIL

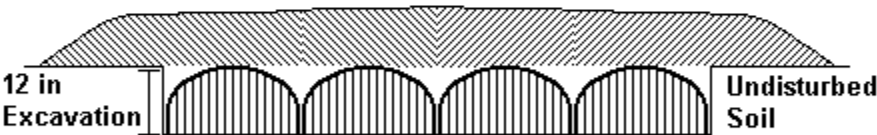
**Standard At-Grade Leachbed:
Leach Rock - End View**



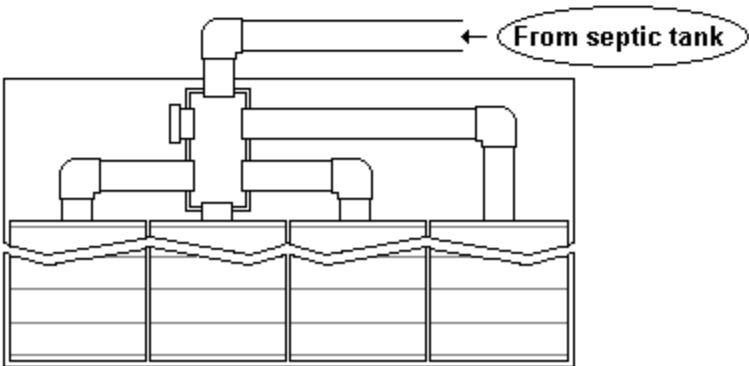
**Equal Distribution -
Top View**



**Standard At-Grade Leachbed:
Gravelless Chamber - End View**

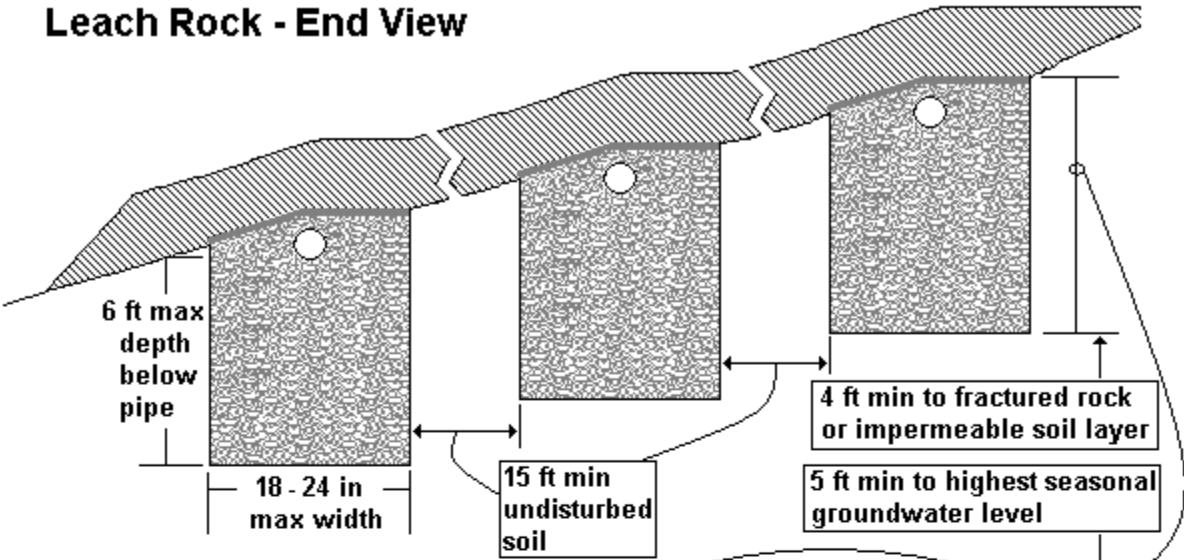


**Equal Distribution -
Top View**

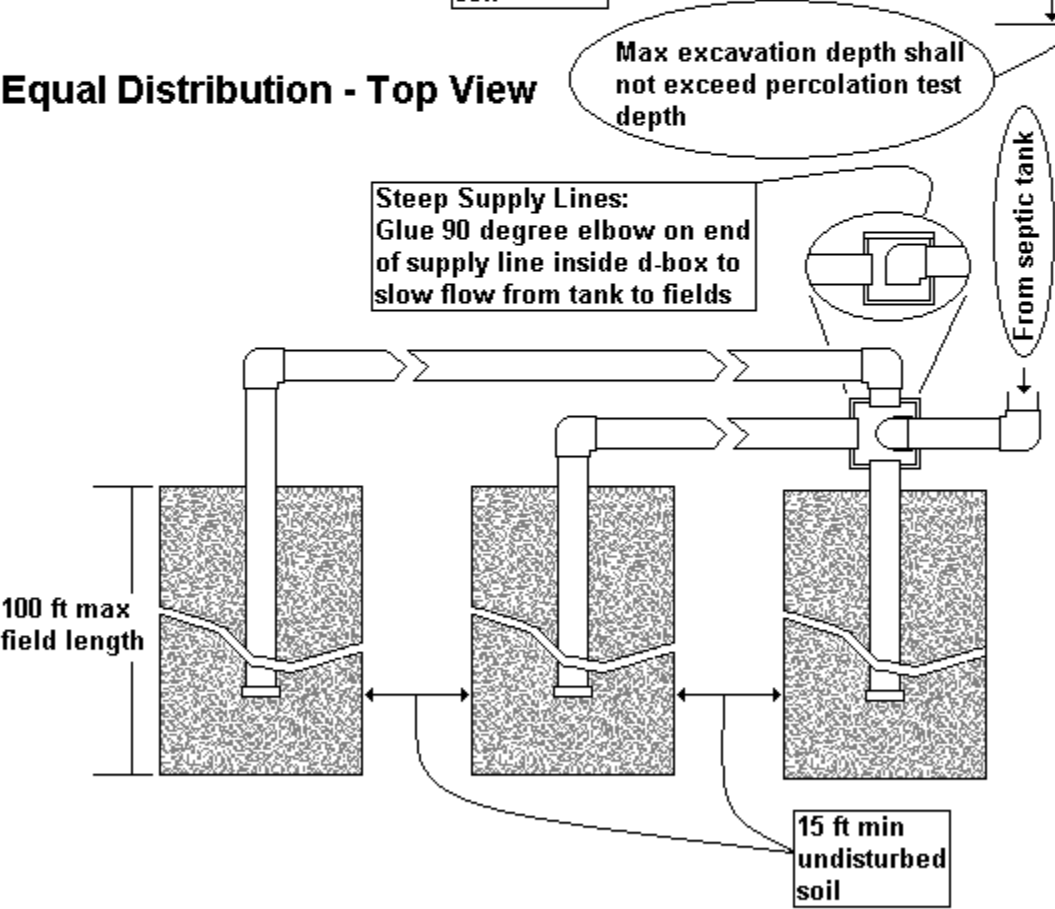


APPENDIX F: DEEP TRENCH TERRACED LEACHBED DETAIL

**Deep Terraced Leachbed:
Leach Rock - End View**

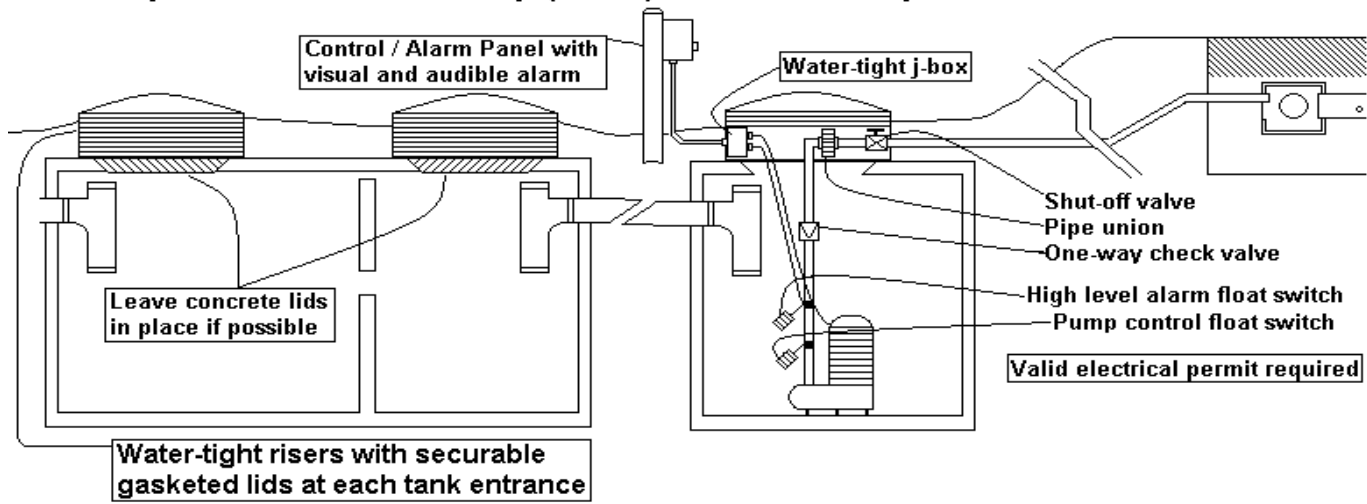


Equal Distribution - Top View

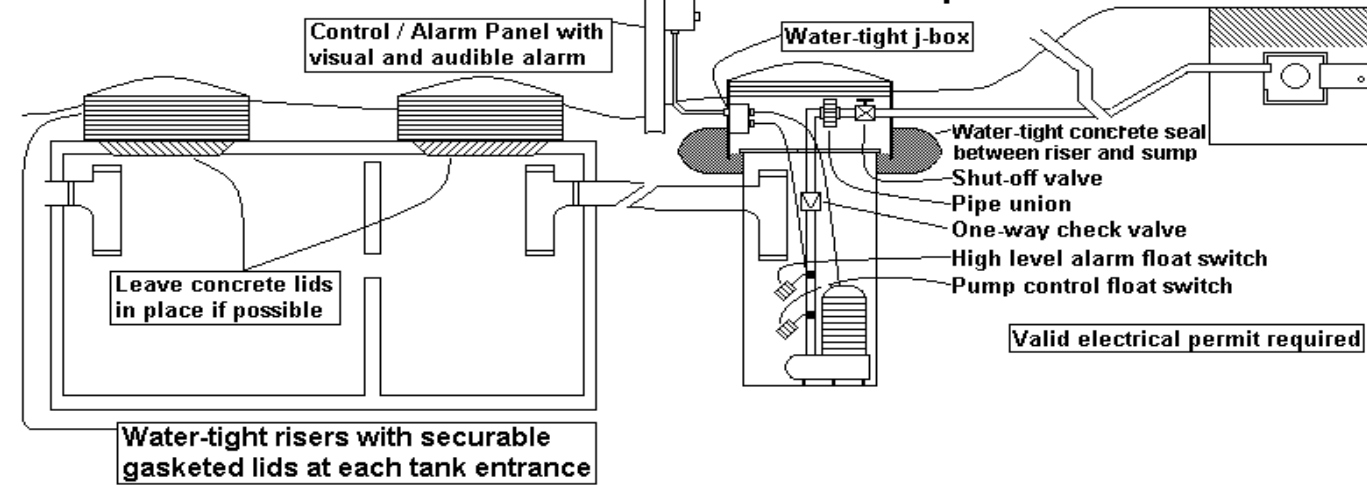


APPENDIX G: PUMPED EFFLUENT SYSTEM DETAILS

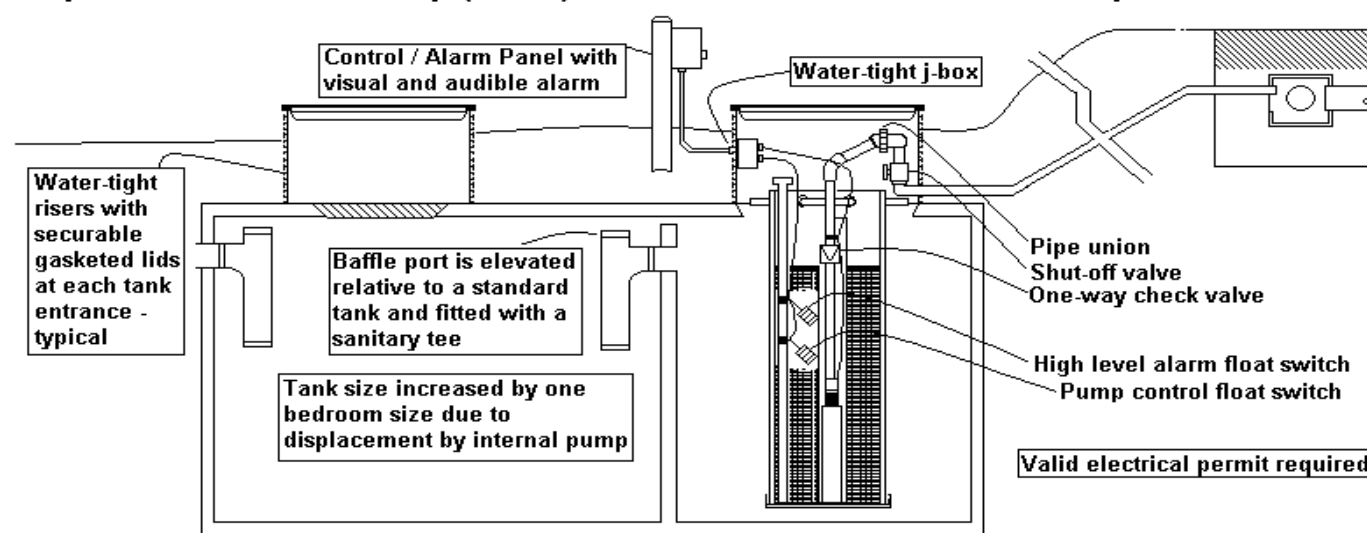
Septic Tank Effluent Pump (STEP) - External Pump Tank - Side View



Septic Tank Effluent Pump (STEP) - Alternative "Trash-Can" Style External Pump Tank - Side View



Septic Tank Effluent Pump (STEP) - Modified Tank with Internal Pump - Side View



APPENDIX H: PERCOLATION RATE TABLE & LEACHBED EXAMPLE

Percolation values outside the scope of this table require engineered septic designs

Min/Inch	Sq Ft Req	Min/Inch	Sq Ft Req	Min/Inch	Sq Ft Req	Min/Inch	Sq Ft Req	Min/Inch	Sq Ft Req
5	125	16	195	27	240	38	280	49	310
6	130	17	200	28	245	39	280	50	315
7	140	18	205	29	245	40	285	51	315
8	150	19	210	30	250	41	285	52	320
9	160	20	215	31	255	42	290	53	320
10	165	21	220	32	255	43	290	54	320
11	170	22	220	33	260	44	300	55	325
12	175	23	225	34	265	45	300	56	325
13	180	24	230	35	270	46	300	57	325
14	185	25	230	36	275	47	305	58	330
15	190	26	235	37	275	48	305	59	330
								60	330

Example leachfield and septic tank requirements:

A property owner wants to install a three (3) bedroom gravity flow septic system for a single-family residence on a gently sloping parcel. The percolation test result is 30 minutes per inch (mpi) at a depth of 32 inches. The parcel has no shallow groundwater or shallow soil issues.

The chart above shows a 30 mpi percolation rate requires 250 square feet (sq ft) per bedroom of leachfield area. The resulting leachfield size for this home would be 250 sq ft x 3 bedrooms = 750 sq ft. Most leachfields are constructed in increments of 6 feet with 12 feet as the most common width: 750 sq ft / 12 ft = 62.5 (rounding up to the next whole foot) = 63 ft. For this example, a 12 ft x 63 ft leachfield is required for the proposed single-family residence.

The leachfield must be installed across the slope with a minimum excavation depth (shallowest cut) of 12 inches and a maximum excavation depth (deepest cut) of 32 inches. Should the installer find that the layout of the field can not stay within the 12 to 32 inch depth specifications, he/she could split the field into two (2) fields of 6 ft x 63 ft with a minimum of 6 ft separation between leachfield for a total of 750 sq ft of leach area.

Remember there must still be sufficient area available for leachfield replacement!

Bedrooms	Perc Rate	Sq Ft / Bedroom	Total Area Required (Sq Ft)	Example Field Dimensions	Minimum Tank Size
1	30	250	250	12 ft x 21 ft	1000 gallon
2	30	250	500	12 ft x 42 ft	1000 gallon
3	30	250	750	12 ft x 63 ft	1000 gallon
4	30	250	1000	12 ft x 84 ft	1200 gallon
5	30	250	1250	12 ft x 104 ft	1500 gallon

APPENDIX I: SITE SUITABILITY CONSULTANTS

Piezometers, Percolation Testing, & Engineered Septic Systems

REGISTERED ENVIRONMENTAL HEALTH SPECIALISTS

Elizabeth Morgan

P.O. Box 80
Loyalton, CA 96118
(530) 251-6920
Text to: 530-251-6920

REGISTERED CIVIL ENGINEERS

Hinds Engineering

P.O. Box 1421
Graeagle, CA 96103
(530) 401-0000
Web: hindsengineering.com

Cranmer Engineering, Inc.

1188 E. Main Street
Grass Valley, CA 95945
(530) 273-7284
Web: cranmerengineeringinc.com

NST Eng. Assoc., Inc.

1495 Riverside Drive
Susanville, CA 96130
(530) 257-5173
Web: nstengineering.com

Bastian Engineering

P.O. Box 20308
Graeagle, CA 96103
(530) 836-2644
E-Mail: dbcells@psln.com

Cornerstone DEC

645 Main Street
Chester, CA 96137
(530) 596-4233
Web: cornerstonedec.com

Shaw Engineering

20 Vine St.
Reno NV 89503
(775) 329-5559
Web: shawengineering.com

Black Eagle Consulting

1345 Capital Blvd., Ste A
Reno, NV 89502-7140
(775) 359-6600
Web: blackeagleconsulting.com

Condor Earth Tech Inc.

2941 Sunrise Blvd. Ste. 150
Rancho Cordova, CA 95742
(916) 783-2060
Web: condorearth.com

Rolls, Anderson & Rolls

115 Yellowstone Drive
Chico, CA 95973
(530) 895-1422
Web: rarcivil.com

CA Engineering Company

1110 Civic Center Blvd., Ste 404
Yuba City, CA 95993
(530) 751-0952
Web: cecusa.net

Fred D. Hock

328 Main St.
Chester, CA 96020
(530) 258-3200

Haling & Associates

2540 Zanella Way #40
Chico, CA 95928
(530) 342-6958
Web: haling-associates.com

Robson Engineering Company

846 Victorian Ave.
Sparks, NV 89431
(775) 852-2251
Web: robisoneng.com

Tom Connolly

530-816-0586
snowmtn@psln.com

REGISTERED GEOLOGISTS

Plumas Geo-Hydrology

P.O. Box 1922
Portola, CA 96122
(530) 836-2208
Web: graeagle.com/hydro

Condor Earth Tech Inc.

2941 Sunrise Blvd. Ste. 150
Rancho Cordova, CA 95742
(916) 783-2060
Web: condorearth.com

Advanced Geologic Exp., Inc.

P.O. Box 1956
Chester, CA 96020
(530) 258-4228
Web: advancedgeologic.com

APPENDIX J: PLUMAS COUNTY APPROVED SEPTIC TANKS

APPROVED CONCRETE

Jenson Precast
625 Bergin Way
Sparks, NV 89431
775-359-6200
Web: jensenprecast.com

North Valley Precast
11 Three Sevens Lane
Chico, CA 95926
530-343-5401
Web: north-valley-precast.hub.biz

Merrill and Sons
Precast Concrete
12619 Loma Rica Drive
Grass Valley, CA 95945
800-200-4605
Web: merrillandsons.net

Oroville Concrete Products
6900 Lincoln Blvd
Oroville, CA 95965
530-534-7670
Web: www.oroilleproducts.com

APPROVED ALTERNATE CONSTRUCTION

Infiltrator Systems, Inc
IM Series Septic Tanks
4 Business Park Road,
Old Saybrook, CT 06475
800-221-4436
Web: infiltratorwater.com

Orenco Systems
M-Series Tanks
814 Airway Ave
Sutherlin, OR
800-348-9843
Wed: orenco.com

Norwesco, Inc.
4365 Steiner Street
St. Bonifacius, MN 55375
612-446-1945
Web: norwesco.com

RMI-D
Division of Rotonics
6770-T Brighton Blvd.
Commerce City, CO 80022
303-227-9300
Web: industrialinterface.com

Snyder Industries, Inc.
602 Industrial Ave
Marked Tree, AR 72365
870-358-5112
Web: snydernet.com

Notes: When ordering a septic tank, please inform the sales representative that this tank is for installation in Plumas County. A septic tank with two (2) compartment construction, equipped with water-tight access risers and gas-tight lids. The minimum capacity of 1,000 gallons is required.

Only septic tanks included on this list are approved for installation in Plumas County. For inclusion on this list, the tank manufacturer must submit tank details including structural calculations to Environmental Health for consideration prior to purchase and/or installation.

APPENDIX K: SEWAGE DISPOSAL SYSTEM CONTRACTORS

North County Including Chester & Lake Almanor			
Greg Lopez Construction Lake Almanor CA 96137 (530) 596-4111 Web: greglopezconstruction.com	Bill Davies Lake Almanor CA 96137 (530) 284-6689	Turner Excavating Lake Almanor CA 96137 (530) 596-3953 Web: turnerexcavatinginc.com	Womack Construction Lake Almanor CA 96137 (530) 596-3364
Kevin Lawrence Construction Chester CA 96020 (530) 258-7700	Mike's Grading & Backhoe Chester CA 96020 (530) 596-3557		
Central County Including Quincy, Indian Valley, Bucks Lake, La Porte			
Wilburn Construction 747 Lee Rd Quincy CA 95971 (530) 283-2871 Web: wilburnconstructioninc.com	Lambert Construction Quincy CA 95971 (530) 283-4456	Charles Fenwick Construction Meadow Valley CA 95956 (530) 283-5506	John Kuipers Plumbing Meadow Valley CA 95956 (530) 283-3119
Kingdon Backhoe Service Greenville CA (530) 284-7320	Germann Engineering P.O. Box 1958 Quincy CA 95971 (530) 640-3165	Randy Hovland Greenville, CA 95947 (530) 961-2811	Ackley Engineering AKA "Dirt Digger" P.O. Box 1230 Quincy CA 95971 (530) 249-4052 DirtDiggerConstruction@gmail.com
East County Including Graeagle, Portola, Lake Davis, Sierra Valley			
Clark Construction Portola CA 96122 (530) 832-0653	Hartwig Construction Clio CA 96106 (530) 836-0393 Web: Hartwig-construction.hub.biz	McGarr Construction Portola CA 96122 (530) 832-5959 Web: mcgarrexavation.com	Sierra Earthworks Clio CA 96106 (530) 836-4213 Web: sierraeearthworks.com
Midnight Sun Construction Clio CA 96106 (530) 836-0560 midnight-sun-construction-ca.hub.biz	Folchi Logging & Construction Portola CA 96122 (530) 832-5214 Web: folchiconstruction.com	Engel Construction Graeagle 96103 (530) 836-0257	Rick Giese Construction Doyle CA 96109 (530) 827-3260
Genesis Group Graeagle CA 96103 (530) 836-6855			

APPENDIX L: SEPTIC PUMPERS

SEPTIC PUMPERS		
Plumas Sanitation (530) 832-0370 Portola, CA 96122	Waters Septic Tank Service (775) 825-1595 Reno, NV 89510	Ben’s Toilet Rentals 530-846-4110 Gridley CA 95948
Westwood Sanitation (530) 596-3064 Westwood, CA 96137	Johnny on the Spot (530) 893-5687 Chico, CA 95926	United Site Services (775) 826-5646 Reno, NV 89434