REGULATIONS OF THE EL PASO COUNTY BOARD OF HEALTH

EL PASO COUNTY, COLORADO

Chapter 8

ONSITE WASTEWATER SYSTEMS REGULATIONS

El Paso County Public Health

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CHAPTER 8

ONSITE WASTEWATER SYSTEMS REGULATIONS

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SECTION 8.1: TITLE, PURPOSE, POLICY, AND APPLICATION

A. Title: These regulations shall be known as the El Paso County Onsite Wastewater Systems Regulations.

B. Purpose: The El Paso County Board of Health declares the purpose of the regulations is to protect the physical and mental health of the people, to control communicable diseases, to regulate wastes from dwellings, business, industrial and public buildings. These regulations shall be applicable throughout El Paso County, and shall be enforced by the El Paso County Board of Health. These regulations are designed to control the construction, location, and operation of sewage disposal systems, the transportation and final disposal of sewage materials and to license systems installers and cleaners.

C. Policy: The El Paso County Board of Health declares that its general policy is to recommend the use of public sewer systems where and whenever feasible, and to limit the installation of onsite wastewater systems only to areas in which public sewers are not feasible.

D. Application: These regulations shall apply to onsite wastewater systems of less than 2,000 gallons per day design capacity and to onsite wastewater systems that will have no discharge into waters of the state.

SECTION 8.2: DEFINITIONS

A. ABSORPTION FIELD: That part of an onsite wastewater system, from which treated sewage flows into the ground, and may include evaporation, or is evaporated into the atmosphere. These systems include, but are not limited to, absorption trenches, seepage beds, seepage pits, sand filters, and combination absorption and evapotranspiration systems.

B. ABSORPTION TRENCH: One or more trenches not over 3 feet in width of varying length and depth in which sewage effluent is percolated into the soil.

C. ACCEPTABLE DESIGN: A standard design of a tank, plant or system, the installation of which is permitted by Public Health, provided that site requirements are met.

D. AEROBIC SEWAGE TREATMENT SYSTEM: An onsite wastewater system employing biological action that is maintained by the addition of air or oxygen.

E. ALTERATION: The addition, deletion or modification of any component of an existing onsite wastewater system.

F. ALTERNATIVE TREATMENT SYSTEMS: An onsite wastewater system that includes components different from those used in a conventional septic tank and absorption area system. An alternative system is used to achieve acceptable treatment and discharge of wastewater where a conventional system may not be able to meet established performance requirements to protect public health and water resources.

G. APPLICANT: The property owner or any person acting as the authorized agent of the property owner who submits an application for a permit for an onsite wastewater system.

H. APPROVED: The official consent given by the Board of Health, or its authorized representative.

I. BEDROCK: A consolidated rock formation that may exhibit jointed cohesive, fractured, or deteriorated characteristics. The more or less solid undisturbed rock in place either at the surface or beneath superficial deposits of gravel, sand or soil or a consolidated rock formation of impervious material that may exhibit jointed, fractured or deteriorated characteristics.

J. BEDROOM: Any room that could be used as a bedroom now or at some future date; or any room so designated by the owner or agent, or any room that has a closet and a window, or a room designated by the local building code as a bedroom.

K. BOARD OF HEALTH: The El Paso County Board of Health, and/or its authorized representative.

L. BOD_5: A measure of the amount of molecular oxygen required by bacteria to stabilize the decomposable matter present in wastewater by aerobic biochemical action. The method for determining BOD_5 is prescribed in the most recent addition of *Standard Methods for the Examination of Water and Wastewater.*

M. BUILDING SEWER: That part of the piping of a drainage system which extends from the end of the building drain and which receives the discharge of the building drain and conveys it to a public sewer, private sewer, or other point of disposal. In an onsite wastewater system the building sewer includes any pipe conveying sewage to the septic tank, and the pipe conveying treated effluent between the septic tank and the absorption area.

N. CESSPOOL: A covered underground receptacle that receives untreated sewage from a building and permits the untreated sewage to seep into surrounding soil.

O. COMPETENT TECHNICIAN: A person designated by Public Health who is able to conduct and interpret the results of percolation tests.

P. COMPONENT PARTS: All physical, mechanical and electrical components of an onsite wastewater system.

Q. COMPOSTING TOILET: A unit which consists of a toilet seat and cover over a riser which connects to a

compartment or a vault that contains or will receive composting materials sufficient to reduce waste by aerobic decomposition.

R. CONSTRUCTED WETLAND: A system that utilizes various wetland plants to provide secondary treatment of wastewater through biological, physical and chemical processes.

S. PUBLIC HEALTH: El Paso County Public Health.

T. DESIGN FLOW: The design flow is 150% of average daily flow as calculated by methods recognized in these regulations.

U. DISPERSAL SYSTEM: A system for the disposal of effluent after final treatment in an onsite wastewater system by a method that does not depend upon or utilize the treatment capability of the soil.

V. DISTRIBUTION BOX: A watertight chamber that receives wastewater from a septic tank or other primary treatment unit and from which effluent is distributed evenly throughout the absorption field.

W. DOSING: A high rate periodic discharge into an absorption field.

X. DOSING TANK: A tank that provides for storage of wastewater from a septic tank or treatment unit for a high rate, periodic discharge to an absorption or dispersal system.

Y. DRIP IRRIGATION or LOW PRESSURE PIPE SYSTEM: A system of small diameter perforated pipe placed in narrow, shallow, closed spaced trenches, which relies upon evapotranspiration and absorption for treatment and disposal of effluent. The effluent is dosed into the laterals in the absorption area using a pump or siphon.

Z. DRYWELL: A type of soil absorption field dependent upon suitable soil, filled with gravel and containing a system of approved distribution that is designed on the basis of side wall and bottom absorption area.

AA. EFFECTIVE SIZE OF GRANULAR MEDIA: That size such that 10% by weight of the media is finer than this size.

BB. EFFLUENT: The liquid waste discharge to an onsite wastewater system, or approved treatment works.

CC. ENVIRONMENTAL HEALTH SPECIALIST, or SANITARIAN: A person who is trained in physical, biological, and sanitary science to carry out inspection and education duties in the field of environmental health sanitation.

DD. EVAPOTRANSPIRATION SYSTEM: A type of dispersal system that wholly or primarily utilizes liquid evaporation or transpiration by vegetation as a means of effluent disposal.

EE. EXPERIMENTAL SYSTEM: A particular design or type of system based upon improvements or developments in the technology of sewage disposal and not otherwise provided for in Section 25-10-105(l) (e) through (J), C.R.S.

FF. FLOODPLAIN: An area that is subject to flooding as a result of the occurrence of a one hundred (100) year flood, and is so adverse to past, current and foreseeable construction or land use as to constitute a significant hazard to public or environmental health or safety or to property or is designated by the Federal Emergency Management Agency (FEMA) or National Flood Insurance Program (NFIP). In the absence of FEMA/NFIP maps, a Colorado licensed professional engineer shall certify the flood plain elevations. The relatively flat area or lowlands adjoining the channel or a stream or water course and subject to flood water overflow resulting from a 100 year flood which is defined as that flood equivalent of a 1% or greater chance of flooding in any given year.

GG. FLOODWAY: That area of a flood plain in which the channel of the water course and those portions of the adjoining flood plain that must be preserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one (1) foot at any point or as designated by the Federal Emergency Management Agency or National Flood Insurance Program. In the absence of FEMA/NFIP maps, a Colorado licensed professional engineer shall certify the flood way elevation and location.

HH. GREY WATER SYSTEM: An onsite wastewater system designed to collect, treat and dispose of liquid wastes from sinks, lavatories, tubs, showers, and other devices or fixtures that discharge no urinary or fecal wastes.

II. GROUNDWATER TABLE: The upper surface of groundwater in the zone of saturation of a geologicformation.

JJ. GUIDELINES: Minimum requirements as described in "Guidelines on Individual Sewage Disposal Systems, Revised 2000 (or later) Colorado State Board of Health, Authority: Chapter 25, Article 10, Colorado Revised Statutes, as amended".

KK. HEALTH OFFICER or PUBLIC HEALTH EXECUTIVE DIRECTOR: The chief administrative officer of Public Health, or other designated representative.

LL. INDIVIDUAL SEWAGE DISPOSAL SYSTEM (ISDS) and the term "SYSTEM": An absorption field of any size or flow or a system or facility for collecting, treating, neutralizing, stabilizing, storing or disposing of

sewage which is not a part of or connected to a sewage treatment works. See OWS (onsite wastewater system).

MM. INTERFACE AREA: The area immediately below the zone in which the original soil meets the imported fill material.

NN. LICENSED PROFESSIONAL ENGINEER: An engineer licensed in accordance with Section 12-25-114, C.R.S.

OO. LINER: A watertight membrane liner of at least 0.01 inch (10 mil.) thickness which is used to prevent effluent from entering the soil or groundwater table. Material shall be polyvinyl chloride or material of equal or greater integrity.

PP. LONG TERM ACCEPTANCE RATE (LTAR): The minimum absorption area (A) in square feet computed as a function of the design flow (Q) and the rate of soil acceptance over time according to the formula: A = Q/LTAR.

QQ. LOT: An area of land which is platted for development as part of a subdivision, the plat of which has been legally approved by the Board of County Commissioners and recorded in the office of the Clerk and Recorder, and, in exceptional circumstances as determined by Public Health, an additional area of land or easement necessary for the construction or operation of an OWS to serve the lot, and which area of land or easement is permanently servient to the lot for such purposes.

RR. MAJOR REPAIR: Repair, alteration or addition to the absorption area.

SS. MANUFACTURER: The person or firm that constructs or assembles onsite wastewater system components.

TT. MINI-SYSTEM: A system designed to accommodate only wastes from sinks, lavatories, tubs, showers, and laundry. (see also "grey water system")

UU. MINOR REPAIR: Repair or replacement of any portion of the system from the structure to the absorption area with the exception of repair or replacement of tank baffles and collapsed lines as depicted in the as-built drawings on file at Public Health.

VV. MOUND SYSTEM: An absorption field installed where any part of the effluent distribution system is installed above the original grade of the area used for absorption.

WW. ONSITE WASTEWATER SYSTEM (OWS), and the term "SYSTEM" where the context so indicates: An absorption system of any size or flow or a system or facility for collecting, treating, neutralizing, stabilizing, storing or disposing of sewage which is not a part of or connected to a sewage treatment works. See ISDS (individual sewage disposal system).

XX. OWNER: The person who is owner of record of the land on which an onsite wastewater system is to be designed, constructed, installed, repaired, modified, extended, or used.

YY. PERCOLATION TEST: A subsurface soil test at the depth of a proposed absorption field or similar component of an onsite wastewater system used to determine the water absorption capability of the soil, the results of which are normally expressed as the rate at which 1 inch of water is absorbed.

ZZ. PERFORMANCE REQUIREMENT: Any requirement established or accepted by Public Health to ensure future compliance with public health and performance goals of the community.

AAA. PERMEABILITY: The property of a material that permits movement of water through the material.

BBB. PERMIT: An official document issued by Public Health authorizing the construction, alteration, installation, use, or repair of an onsite wastewater system.

CCC. PERSON: Individual, partnership, firm, corporation, association or other legal entity and also the State, any political subdivision thereof, or other governmental entity.

DDD. PLOT PLAN: An accurate drawing or map indicating the dimensions, acreage, north direction, and location of property lines, building, wells, onsite wastewater systems, water courses, geographical features, and other pertinent information as required.

EEE. PRIVY: A structure allowing for the disposal of excreta not transported by a sewer, and which provides privacy and shelter, and prevents access to the excreta by flies, rodents or other vectors.

FFF. PROFESSIONAL GEOLOGIST: A person who is a graduate of an institution of higher education which is by a regional or national accrediting agency, with a minimum of 30 semester (45 quarter) hours of undergraduate or graduate work in a field of geology and whose post baccalaureate training has been in the field of geology with a specific record of an additional 5 years of geological experience to include no more than 2 years of graduate work.

GGG. REGULATIONS: Unless the context indicates otherwise, means the El Paso County Board of Health Onsite Wastewater Systems Regulations.

HHH. RENEWABLE PERMIT: A renewable and revocable permit to operate and maintain an onsite wastewater system in compliance with specific operational or performance requirements.

III. REPAIR: To replace or modify defective component(s) of a previously permitted existing onsite wastewater

system and replace it with approved component(s).

JJJ. SAND FILTER: A subsurface system that utilizes wastewater filtration or absorption or both, and that contains an intermediate layer of sand as filter material.

KKK. SANITARIAN or ENVIRONMENTAL HEALTH SPECIALIST: A person who is trained in physical, biological, and sanitary science to carry out inspection and education duties in the field of environmental health sanitation.

LLL. SEEPAGE BED or ABSORPTION BED: A subsurface soil absorption area which is wider than 3 feet, together with a system of approved perforated distribution pipe through which effluent may seep, leach or infiltrate into the soil.

MMM. SEEPAGE PIT: A type of soil absorption field dependent upon suitable soil containing a structural internal void and designed on the basis of side wall area. A type of soil absorption field dependent upon suitable soil at a depth greater than that of an absorption trench or bed, and designed on the basis of side wall area.

NNN. SEPTAGE: A liquid or semi-solid which includes normal household wastes, human excreta, animal or vegetable matter in suspension or solution generated from a septic tank serving a dwelling, building, or other establishment.

OOO. SEPTIC TANK: A watertight, accessible covered receptacle designed and constructed to receive sewage from a building sewer, to settle solids from the liquid, to digest organic matter, and store digested solids through a period of retention and allow the clarified liquids to discharge to other treatment units for final disposal.

PPP. SERIAL DISTRIBUTION: An arrangement of absorption trenches, seepage pits or seepage beds where effluent is retained to utilize the absorption capacity of a component before flowing into a succeeding component.

QQQ. SEWAGE: A combination of liquid wastes which may include chemicals, house wastes, human excreta, animal or vegetable matter in suspension or solution, or other solids in suspension or solution and which is discharged from a dwelling, building, or other structure.

RRR. SEWAGE TREATMENT WORKS: A system or facility for treating, neutralizing, stabilizing, or disposing of sewage, which system or facility has a designed capacity to receive more than 2,000 gallons of sewage per day, unless designed as an absorption system. The term "sewage treatment works" includes appurtenances such as interceptors, collection lines, out-fall and the outlet sewers, pumping stations, and related equipment.

SSS. STANDARD PENETRATION TEST: A dynamic soil test conducted according to ASTM D 1586 designed to provide information on the relative density of soils.

TTT. STATE WATERS: Any and all surface and subsurface waters which are contained in or flow in or through this State, except waters in sewerage systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all waters withdrawn for use, until all uses and treatments have been completed.

UUU. SUITABLE SOIL: A soil which will effectively treat and filter effluent by removal of organisms and suspended solids before the effluent reaches any highly permeable earth such as joints in bedrock, gravels, or very coarse soils and which meets percolation test requirements and has a vertical thickness of at least 4 feet.

WWW. SYSTEMS CONTRACTOR: A person engaged in the business of installation, renovation, and repair of onsite wastewater systems. A person engaged in and who holds himself out as a specialist in the installation, renovation, and repair of onsite wastewater systems.

XXX. UNIFORMITY COEFFICIENT: A value that is the ratio of D60 to D10 where D60 is the soil diameter of which 60% of the soil weight is finer, and D10 is the corresponding value at 10% finer. (A soil having a uniformity coefficient smaller than 4 is be considered "uniform" for purposes of this regulation.)

YYY. VAULT: A water tight, covered receptacle, which is designed to receive and store excreta or wastes either from a sewer or from a privy and is accessible for the periodic removal of its contents.

ZZZ. WASTEWATER POND: A designed pond that receives exclusively wastewater from a first stage treatment unit and which provides an additional degree of treatment.

SECTION 8.3: ADMINISTRATION AND ENFORCEMENT

A. General Sanitation Requirements: The owner of any property or structure where people live, work or congregate, or any property or structure designed or intended for those purposes, shall provide an adequate onsite wastewater system in good working order and constructed, installed, and maintained in accordance with these regulations. Under no condition shall sewage contaminated material, sewage or effluent be permitted to be discharged upon the surface of the ground or into waters of the State, unless the sewage or effluent meets the minimum requirements of these regulations, the Colorado Department of Public Health and Environment Guidelines, or the water quality standards of the Colorado Water Quality Control Commission, whichever are applicable. Abatement of any

nuisance conditions arising from a malfunctioning or defective onsite wastewater disposal system is the responsibility of the property owner.

B. Regulation Coverage:

1. **The El Paso County Board of Health Onsite Wastewater Systems Regulations adopted pursuant to the State of Colorado Board of Health Individual Sewage Disposal Systems Guidelines, and Section 25-10-104 (2), (3), and (4), C.R.S., shall govern all aspects of permits, performance, location, construction, repair, alteration, installation, and use of onsite wastewater systems of less than 2,000 gallons per day design capacity.**
2. **In the case of any onsite wastewater system with a design capacity of 2,000 gallons or more of sewage per day, site and plan approval from the Colorado Department of Public Health and Environment is required. However, unless the system is designed to discharge into State waters, these regulations shall govern all aspects of permits, performance, construction, alteration, repair, and installation.**
3. **If a system of 2,000 gallons or more per day discharges into State waters, the approved, conditionally approved with comments, or disapproved application will be submitted to the Water Quality Control Division, Colorado Department of Public Health and Environment for review. If approved by Public Health and the Water Quality Control Division, a discharge permit will be issued by the Water Quality Control Division.**

C. Authority to Administer and Enforce: Wherever the terms Board of Health, or Public Health are used in these regulations, said terms shall also include the Colorado Department of Public Health and Environment, or its designated authority, for the purpose of administering and enforcing the provisions of these regulations as Colorado Department of Public Health and Environment regulations where necessary to protect the public health and environment.

D. Primary Enforcement Authority: The primary responsibility for enforcement of the provisions of Article 10 of Title 25, C.R.S., and the regulations adopted under said Article shall be El Paso County Public Health, or the El Paso County Board of Health. In the event that Public Health or El Paso County Board of Health fails to administer and enforce the provisions of said Article, and the regulations adopted under said Article, the Colorado Department of Public Health and Environment may assume such functions of Public Health or the El Paso County Board of Health as may be necessary to protect the public health and environment.

E. Access to Site: For the purposes of conducting inspections, and enforcement of the regulations and the terms and conditions of any permit issued, representatives of Public Health are authorized to enter upon private property at reasonable times and upon reasonable notice for the purpose of determining whether or not onsite wastewater facilities and systems are functioning in compliance with Article 10 of Title 25, C.R.S., these regulations and the terms and conditions of any permit issued, and to inspect and conduct tests in evaluating any permit application. The owner or occupant of every property having an onsite wastewater system shall permit authorized representatives of Public Health access to the property to conduct required tests, take samples, monitor compliance, and make inspections.

F. Permit Requirements:

1. **Effective March 1, 1966, any person who wishes to install, alter or repair an onsite wastewater system in El Paso County, Colorado, shall obtain a permit from Public Health prior to commencing construction.**
2. **The lot or building site shall comply with the provisions of the El Paso County Land Development Code, as amended, including, but not limited to, minimum lot size, legality of the lot created, plat notes pertaining to onsite wastewater systems, and all other provisions deemed necessary for installation of an onsite wastewater system on such lot or building site.**
3. **The owner of any property utilizing a malfunctioning system is required to submit a repair permit application to Public Health immediately, or no later than 2 business days after receiving notice from Public Health that the system is not functioning in compliance with Article 10 of Title 25, C.R.S., or applicable regulations adopted thereunder, or otherwise, constitutes a nuisance or a hazard to public health. The permit shall provide for a reasonable period of time to conduct repairs. The owner shall notify Public Health when repairs have been completed, and Public Health shall inspect the system to ensure it is compliant with applicable laws and regulations. Public Health may issue a written statement authorizing emergency use of a malfunctioning system. An emergency use period shall not exceed the period specified in the repair permit. However, Public Health may extend the emergency use period in the event that repairs cannot be completed in a timely manner due to circumstances beyond the control of the owner. It is the responsibility of the owner to provide any documentation Public Health may require to grant an extension of an emergency use period.**
4. **A permit application for a new onsite wastewater system must include all information required by Public Health. A permit application to repair an onsite wastewater system shall be as complete as possible, but may be initially submitted without all required information. No installation, repair or modification of an onsite wastewater system is allowed until Public Health has approved the permit application and issued the permit.**

The following information must be provided with all onsite wastewater system permit applications to be considered for approval:

a. **Legal description of property.**
b. **Owner of property.**
c. **Owner's mailing address and daytime telephone number.**
d. **Type of building by use.**
e. **Source and type of water supply.**
f. **Lot size.**
g. **Proposed primary OWS site.**
h. **Plot plan.**
i. **Parcel number of property.**
j. **A designated alternate OWS site.**
k. **Original copy of the soil percolation test report. (If required).**
l. **Maximum potential number of bedrooms for single family dwelling(s).**
m. **Plans for or existence of garbage disposal.**
n. **Plans for or existence of clothes washer.**

5. **Soil Percolation Test Site:**
   a. **The property owner is responsible for ensuring that the soil percolation test site will be within the boundaries of his property and the proposed location of the system is compliant with the minimum horizontal distances required by Section 8.5 of these regulations.**
   b. **Before submitting an onsite wastewater system permit application to Public Health, the property owner shall verify that the soil percolation test site is entirely within the boundaries of his property, and on the same lot as the structure the onsite wastewater system it will serve.**
6. **Site Identification: Prior to the site inspection, the property and the site shall be identified in the following manner:**
   a. **The property shall be marked at the road access by a sign easily legible from the road.**
   b. **The percolation test site shall be marked by stakes a minimum of 3 feet in height. Stakes, or flags or ribbons affixed to the stakes shall be of a bright color that contrasts with the surrounding environment.**
7. **Site Inspection: After an application for an onsite wastewater system has been submitted, an environmental health specialist or a licensed professional engineer may visit the applicant's property to assess the suitability of the site. Such an assessment may include:**
   a. **Inspection of the premise.**
   b. **General soil conditions.**
   c. **General geological conditions/features.**
   d. **Intended land use.**
   e. **Population density (number of homes/area).**
   f. **Evidence of groundwater.**
   g. **Evidence of bedrock.**
   h. **Location and type of water supply.**
   i. **Determination as to tank size and required absorption area.**

8. **Additional Evaluation: When Public Health has determined that there is insufficient information for evaluation of an application or a proposed system, Public Health may require additional tests or documentation, including soil percolation tests.**
9. **Additional Hydrological, Geological, Engineering or Other Information: When specific evidence suggests that undesirable subsurface conditions exist, additional hydrological, geological, engineering or other information provided by a licensed professional engineer or geologist may be required to be submitted by the applicant. This requirement shall not affect the right of Public Health to develop its own information from its own source.**
10. **Determination: Public Health will review the onsite wastewater system permit application, any site inspection information, test results, and other information as required. If the information supports the determination that the proposed system will be compliant with the requirements of Article 10 of Title 25, C.R.S., and the regulations adopted pursuant thereto, an onsite wastewater system permit will be issued.**
11. **Inspection Stages: An onsite wastewater system permit may specify the stage of construction, installation, alteration, or repair at which time Public Health will require an inspection. Prior to the system being utilized, the owner, the owner's agent, or the systems contractor shall notify Public Health with notice that the installation is sufficiently completed to conduct an inspection to determine if the system is compliant with the**

permit requirements and with Article 10 of Title 25, C.R.S., and regulations adopted there under. If a request for an inspection is made, and the installation has not been completed, a return trip fee approved by the El Paso County Board of Health shall be charged to the owner or contractor who requested the inspection.

G. Permit Fees:

1. **The fee for an onsite wastewater system permit is required and payable upon submission of the permit application to Public Health.**
2. **Fees shall be assessed according to criteria approved by the El Paso County Board of Health, and shall be set at rates that recover operating costs incurred by Public Health to administer the onsite wastewater treatment system program.**
3. **The permit fees are non-refundable, but if Public Health believes that extenuating circumstances warrant a refund, Public Health is authorized to allow such refunds, or partial refunds, on a case by case basis.**
4. **Public Health is also authorized to waive any normally required permit fee, should it believe that to do so is in the best interests of the public health.**

H. Permits Requiring Engineer Design: No permits shall be issued for the following systems unless they are designed by a licensed professional engineer, and have been reviewed and approved by Public Health, or in some cases the CDPHE Water Quality Control Division:

1. **Systems discharging effluent into State waters.**
2. **Systems discharging effluent onto the surface of the ground.**
3. **Systems intended to serve commercial, institutional or governmental structures, businesses, industrial units or multifamily dwellings.**
4. **Absorption fields for which the locations cannot meet suitable soil or slope requirements.**
5. **Experimental systems.**
6. **Any system that does not or cannot meet regulation requirements.**
7. **Standard penetration tests with blow counts greater than 40, unless otherwise determined by a licensed engineer that specific soil characteristics do not necessitate a designed system. (See also, 8.6.C., page 20.)**
8. **Gravelless chambers installed greater than 60 inches (5 feet) deep.**

I. Expiration of Permits: The onsite wastewater system permit shall expire one year after its issuance if installation has not commenced. Any change in plans or specifications after the permit has been issued invalidates the permit, unless approval is secured from Public Health for such changes. An expired permit may be extended or renewed if:

1. **There has been no change in the plans and specifications of the proposed system as set out in the original application.**
2. **The use or zoning of the surrounding land has not changed so as to cause the original application not to be acceptable under these regulations.**
3. **The application for extension or renewal is submitted to Public Health not more than 45 days after the expiration of the original permit and meets all of the requirements of the original permit.**
4. **The extension, renewal or alteration of a permit is subject to a fee approved by the El Paso County Board of Health.**

J. Public Health Liability: The issuance of a permit and specifications of terms and conditions therein shall not constitute assumption or create a presumption that Public Health or its employees are liable for the failure of any system, or act as a certification that the equipment used in the system, or any component thereof, in its operation, or that the system for which the permit was issued ensures continuous compliance with the provision of Article 10 of Title 25, C.R.S., the regulations adopted thereunder, or any terms and conditions of a permit.

K. Notification for Inspection: When installation of an onsite wastewater system has been completed, the systems contractor or owner shall notify Public Health, and a representative of Public Health shall make a final inspection within 48 hours after receipt of notification, Saturdays, Sundays and holidays excluded. In cases where inclement weather or other adverse conditions preclude an inspection within 48 hours of notification, Public Health may conduct a final inspection when it is safe to do so.

L. Final Inspection: If upon final inspection of the system Public Health finds the system installed in accordance with these regulations and the permit, Public Health shall issue final approval for the completed system. If the system has been designed by or constructed under the supervision of a licensed professional engineer, the applicant shall require that said engineer within 30 days certify in writing to Public Health that construction and installation of the system has been completed in accordance with the terms of the permit and these regulations. In cases where the design engineer is deceased, no longer a practicing engineer, or is otherwise unable to provide such certification, Public Health may waive the required certification provided the plans and installation of the system comply with all

aspects of these regulations other than the certification. If the inspection discloses any significant departure from the description or design of the system as stated in the application and permit, or if any aspect of the system fails to comply with these regulations, or after 30 days an engineer's written certification has not been received, approval shall be withheld. Written notice of the deficiencies causing the disapproval shall be given to the owner with a set time period for correction. If at the end of the stated time period the deficiencies are not corrected, the original permit shall be deemed to be invalid. The permit then may be renewed upon payment of the fee as provided in Section 8.3:S. Another inspection shall be made upon notification that the deficiencies have been corrected.

M. Denial of a Permit, Disapproval of the System Plans, Disapproval of the System at Final Inspection or Granting of Variances:

1. **Notice of Denial or Disapproval: Public Health shall provide written notification to the owner should it deny the owner's permit application, disapprove the owner's onsite wastewater system plan, or disapprove the owner's installed onsite wastewater system. Such notice shall describe the deficiencies, and provide a reasonable time for correction. Service of such notice shall be provided by first class or certified mail, or by personal service. If the notice cannot be mailed or the mailed notice is returned, service may be made by posting the notice in a conspicuous place on or about the property in question.**
2. **Appeal to the Board of Health: Any person who is denied a permit or whose plans for an onsite wastewater system are disapproved or for disapproval of the system at final inspection may appeal to the El Paso County Board of Health as herein provided.**
3. **Variance Requests: Any person who receives a notification of denial or disapproval from Public Health may request a variance from the El Paso County Board of Health, by submitting a request to Public Health Executive Director.**
   - **a. The submission must include:**
     1) **A statement from the owner requesting that the El Paso County Board of Health consider a variance request.**
     2) **Identification of the property owner and property in question.**
     3) **The specific criteria from which a variance is being requested;**
     4) **Technical justification by a Colorado Licensed Professional Engineer or Professional Geologist, indicating that the specific conditions which exist, and/or the measures which will be taken, will result in no greater threat to health or environmental degradation than that achieved by compliance with the applicable laws and regulations.**
     5) **A discussion of alternatives considered in lieu of the requested variance;**
     6) **Technical support for the selected alternative, which may include a testing program, which confirms that the variance does not increase the risk to public health and to the environment; and**
     7) **A statement of the hardship, which creates the necessity for the variance. No variance will be allowed solely for economic gain.**
   - **b. Public Health will have the opportunity to review the variance request and to make comment on the request before the Board of Health.**
   - **c. The Board of Health may consult with Public Health or with other parties of its choosing prior to hearing any variance request.**
   - **d. If the Board of Health believes a variance request to be without merit, or believes that insufficient information is available to render an informed decision, the Board of Health may choose to not hear the request, or to request further information as it may deem necessary.**
   - **e. Prior to the Board of Health rendering any decision on a variance request, a Public Hearing must be held. The hearing shall be the subject of a Public Notice or notice shall be sent via certified mail, with a minimum 20-day reply time from the date of mailing, to all adjacent property owners.**
   - **f. The applicant has the burden of proof that the variance is justified and will pose no greater risk to public health and the environment than would a system meeting the applicable laws and regulations.**
   - **g. The Board of Health has the ability to impose requirements and conditions on any variance granted.**
   - **h. Any variance approval by the Board of Health shall be based upon a majority vote.**
   - **i. The applicant shall be notified, in writing, of the Board's decision. A notice of denial of a variance shall include those reasons which form the basis for the denial. A notice of approval of a variance shall include any conditions of the approval. The variance, and any conditions thereof shall be recorded on the deed to the property and any expenses associated with that recording shall be the responsibility of the property owner.**

4. Prohibitions on the Granting of Variance Requests:

a. **No variance will be issued to mitigate an error in construction involving any element of property improvements.**
b. **No variance will be issued where the property can accommodate a conforming onsite wastewater system.**
c. **No variance will be issued, which will result in setbacks to offsite physical features which do not conform to the minimum setbacks defined in Section 8.5:B of these regulations.**
d. **No variance will be issued, which reduces the 4-foot separation to ground water or bedrock unless designed by a Colorado licensed engineer, and approved by Public Health.**
e. **No variance from the horizontal setback from a well shall be given which does not also meet the variance requirements of the Board of Examiners of Water Well Construction and Pump Installation Contractors.**

N. Community Sewers: A permit to construct, alter, or repair an onsite wastewater system shall be denied if a municipal or sanitation district sewer exists within 400 feet, as measured by way of public access, or legal easement, to any part of the applicant's property and if the municipality or district agrees to provide sewer service. If, as a condition of service, an annexation of the property to a different political entity is required, connection to the community sewer is not required.

O. Experimental Systems: Except for designs or types of systems which have been approved by the Colorado Department of Public Health and Environment pursuant to Section 25-10-107(1), C.R.S., Public Health may approve an application for a type of system not otherwise provided for in Section 25-10-105(1)(e) through (j), C.R.S., only if the system has been designed by a licensed professional engineer, and only if the application provides for the timely installation of a backup system of a type described in said paragraphs in the event of a failure of the experimental system. Public Health shall not arbitrarily deny any person the right to consideration of an application for such a system, and shall apply reasonable performance standards in determining whether to approve such an application.

P. Prohibition of Onsite Wastewater Systems in Unsuitable Areas: The Board of Health may conduct a public hearing, after written notice to all affected property owners as shown in the records of the County Assessor and publication of notice in a newspaper of general circulation at least 10 days prior to the hearing, to consider the prohibition of permits for onsite wastewater systems in defined areas which contain or are subdivided for a density of more than 2 dwelling units per acre. The Board of Health may order such prohibition upon a finding that the construction and use of additional onsite wastewater systems in the defined area will constitute a hazard to the public health or the environment. In such a hearing, the Board of Health may request affected property owners to submit engineering and geological reports concerning the defined area and provide a study of the economic feasibility of constructing a sewage treatment works.

Q. Alternative Treatment Systems: Public Health may require alternative treatment systems in areas where scientific data has determined that existing onsite wastewater systems are negatively impacting the surface or ground water quality causing non-compliance with current Environmental Protection Agency standards, and or CDPHE Groundwater Regulations. The alternative treatment systems may be required for new or major repair permits issued in the defined area.

R. Renewable Permits: Public Health may require renewable permits in areas where scientific data has determined that existing onsite wastewater systems are negatively impacting the surface or ground water quality causing non-compliance with current Environmental Protection Agency standards, and/or CDPHE Groundwater Regulations. The current fee established by the Board of Health is required upon renewal.

S. Fees: Fees authorized in these regulations shall be set at such amounts as are deemed necessary to cover the operational expenses of the agency, but shall not exceed the maximum amounts specified in 25-10-107, CRS.

T. Location of Septic System: The house and the onsite wastewater system shall be located on the same lot. The onsite wastewater system shall not be installed in a flood plain as determined by the El Paso County Development Services Department and/or the Regional Building Department. No build areas as defined in the El Paso County Land Development Code are not approved for onsite wastewater systems unless designed by a licensed professional engineer and approved by Public Health.

U. Submission of Plans for Proposed Subdivisions: Plans for proposed subdivisions shall be submitted to Public Health for the review of proposed sewage disposal systems by an environmental health specialist, or a licensed professional engineer in accordance with requirements of these regulations. Public Health may require the owner and/or the developer to submit additional engineering or geological reports or data, and to conduct a study of the economic feasibility of a sewage treatment works prior to making its recommendations. No plan shall receive the approval of the El Paso County Board of County Commissioners unless Public Health has made a favorable recommendation regarding the proposed method of sewage disposal. Appeal of an unfavorable recommendation hereunder shall be in accordance with procedures set out Section 8.3:M.

V. Notice of Violation: Whenever Public Health determines that there has been a violation of any provision of these

regulations, notice of such violation shall be given to the responsible person or persons. Such notice shall be in writing, and shall describe the violation(s), provide a reasonable time for correction, and be addressed to the owner of the property in question. Service of such notice shall be provided by first class or certified mail, or by personal service. If the notice cannot be mailed or the mailed notice is returned, service may be made by posting the notice in a conspicuous place on or about the property in question.

W. Cease and Desist Order: After a hearing has been conducted in accordance with the El Paso County Board of Health Administrative Hearing Procedure, the Hearing Officer may issue an order to cease and desist from use of any system found to be noncompliant with Article 10 of Title 25, C.R.S., or with these regulations, or found to constitute a hazard to public health, or which has not otherwise received timely repairs under the provisions of Section 25-10-106 (i) and (j), C.R.S. Cease and desist hearings shall be conducted not less than 48 hours after written notice thereof is given to the owner or occupant of the property on which the system is located.

X. Regulation of Systems Contractors and Systems Cleaners:

HEALTH ADVISORY: Public Health recommends that people who work in environments where exposure to raw sewage is possible to contact their physician, and discuss the benefits of being properly vaccinated for hepatitis A.

1. Licensing of Systems Contractors:

a. No person shall install, or be hired to aid in the installation of, renovate or repair an onsite wastewater system unless he holds a valid systems contractor license, with the exception of the owner doing his own installation. Employees of a valid licensed system contractor shall not be required to be licensed. The current Board of Health approved fee is required for a systems contractor license. Licenses shall be valid for a period of three years, and shall expire on December 31st of the third year, when the current renewal fee shall be charged. A license that lapses because of failure to renew or that is revoked shall be subject to the fee established for new licenses upon reapplication.

b. Standard of Performance Required of Holders of Systems Contractor Licenses:

1) Applications for systems contractor licenses or renewals shall be made upon forms supplied by Public Health.

2) Prior to the issuance or renewal of a license, Public Health shall require the applicant to demonstrate adequate knowledge of these regulations.

3) At intervals not greater than three (3) years, all licensees shall be required to demonstrate adequate knowledge of these regulations. This may include, but is not limited to passing an exam prepared by Public Health and/or attending educational conferences conducted by Public Health.

4) Installation, renovation or repair of any onsite wastewater system shall be in compliance with these regulations and with the conditions set out in the installation permit.

5) During excavation, if bedrock or groundwater is encountered, all excavation must cease and Public Health is to be contacted for an evaluation to determine if additional tests are required.

6) Notice of a requested inspection shall be given by the license holder not less than 48 hours before the inspection is to be made.

7) A license holder shall have in his possession the onsite wastewater system permit at the time construction begins, and shall make the permit available at the time of final inspection.

8) When required by Public Health, the system contractor shall provide an as-built drawing of the system with drawing specifications provided.

c. Revocation or Suspension of a Systems Contractor License: A license may be revoked or suspended for failure to comply with these regulations or for other good cause shown. Revocation or suspension shall take place only after a hearing, which shall be conducted in accordance with Chapter 4: Administrative Hearing Procedure, of these regulations.

d. The Board of Health shall from time to time set qualification standards for licensed systems contractors.

2. Licensing of Systems Cleaners:

a. No person shall engage in the cleaning of onsite wastewater systems or the transportation of sewage to a disposal site unless he holds a valid systems cleaner license. Employees of a licensed systems cleaner shall not be required to be licensed. The current Board of Health fee for a systems cleaner license shall be collected at the time of application. Licenses shall be valid for a period of three years, and shall expire on December 31st of the third year, when the current renewal fee shall be charged. However, each pumper truck must be inspected by Public Health annually before October 31st. A license that lapses because of failure to renew or is revoked shall be subject to the current established license fee.

b. Standard of Performance for Systems Cleaners:

1) A license holder, when cleaning a septic tank or aeration plant, shall remove the liquid, sludge and scum, leaving

no more than a 3 inch depth of sewage in any compartment of a septic tank or aeration plant. Onsite wastewater systems with more than 1 septic tank shall have all compartments of each tank pumped as noted above.

2) **All vehicles used for the transport of sewage shall be inspected and approved by Public Health prior to use. All approved vehicles shall display an inspection sticker from Public Health on the vehicle windshield.**
3) **Septic tanks shall not be washed or disinfected after pumping.**
4) **The outlet tees or baffles shall be checked for proper installation and/or damage provided they can be seen as part of the routine pumping process. Missing or damaged tees or baffles on the outlet side of tanks shall be reported to the owner and Public Health.**
5) **A license holder shall maintain and operate his equipment to ensure that no spillage of sewage will occur during transportation, and that his employees are not subjected to undue health hazards. Hauling shall be accomplished by the use of an enclosed tank. The tank must be equipped with an approved method for determining the liquid level content; hoses used for pumping must be in good condition so as not to leak; tank manholes and all tank valves must not leak. Public Health shall inspect each tank used in the transportation of sewage. Operators of system cleaner trucks shall also be subject to random inspections to assure compliance with these regulations.**
6) **A license holder shall dispose of the sewage only at a municipal sewage treatment plant or other site approved by the Board of Health, and shall comply with all other applicable local codes and ordinances.**
7) **Prior to the issuance or renewal of a systems cleaner license, Public Health may require the demonstration of knowledge of these regulations.**

c. Revocation or Suspension of a Systems Cleaner License: A license may be revoked or suspended for failure to comply with these regulations or for other good cause shown. Revocation or suspension shall take place only after a hearing, which shall be conducted in accordance with Chapter 4: Administrative Hearing Procedure, of these regulations.

Y. General Prohibitions:

1. **No city or county shall issue to any person a permit to construct or remodel a building or structure which is not serviced by a sewage treatment works until a permit for an onsite wastewater system has been issued by Public Health.**
2. **No city or county certificate of occupancy shall be issued to any person for the use of a building which is not serviced by a sewage treatment works until a final inspection of the onsite wastewater system has been conducted by Public Health as provided for in Section 8.3:L., and the installation has received the approval of Public Health.**
3. **No onsite wastewater system presently in use which does not comply with the provisions of these regulations regarding minimum separation between the maximum seasonal level of the groundwater table and the bottom of an absorption field, shall be permitted to remain in use without compliance of these regulations after October 1, 1975.**
4. **Construction, alteration or repair of a cesspool is prohibited.**
5. **No more than one dwelling, commercial, business, institutional, or industrial unit shall be connected to the same onsite wastewater system unless such multiple connections were specified in the application submitted and in the permit issued for the system.**
6. **No person shall construct or maintain any dwelling or other occupied structure that is not equipped with adequate facilities for the sanitary disposal of sewage so as not to endanger the public health.**

Z. Unlawful Acts and Penalties:

1. **Any activity, operation, or condition which, after being ordered abated, corrected, or discontinued by Public Health, continues to be conducted or continues to exist in violation of the Individual Sewage Disposal Systems Act or these regulations is a Class 3 public nuisance according to Section 16-13-305 (1) (f), C.R.S. Such violations may include:**
   a. **Construction, alteration, installation, repairing or allowing the use of any onsite wastewater system without first having applied for and received a permit as provided for in Section 8.3:F.**
   b. **Constructing, altering, repairing or installing an onsite wastewater system in a manner which involves a known and material variation from the terms or specifications contained in the application or permit**
   c. **Failure to permit authorized representatives of Public Health to access property to conduct required tests, take samples, monitor compliance, and make inspections.**
   d. **Failure to comply with the provisions of a notice and order issued by Public Health.**
   e. **Violation of the terms of a cease and desist order which has become final under the terms of Section 8.3:W.**
   f. **Conducting a business as a systems contractor without having obtained the license provided for in Section 8.3:X.**
   g. **Conducting a business as a systems cleaner without having obtained the license provided for in Section 8.3:X.**

h. Willful failure to submit proof of proper maintenance and cleaning of a system if required by Public Health.

2. Upon determination that a person is in violation of the provisions of the Individual Sewage Disposal Systems Act or these regulations, Public Health may assess a penalty of up to fifty dollars ($50) for each day of violation. In determining the amount of the penalty to be assessed, Public Health shall consider the seriousness of the danger to the health of the public caused by the violation, the duration of the violation, and whether the person has previously been determined to have committed a similar violation.

AA. Saving Clause: The repeal of any regulation adopted hereunder shall not deny any right, action, or cause of action, which arose under existing regulation.

BB. Repeal Clause: All regulations adopted by the Board of Health prior to these regulations, re: onsite wastewater systems are hereby repealed.

CC. These regulations shall become effective 45 days after final adoption by the Board of Health.

SECTION 8.4: CALCULATION OF SEWAGE FLOW AND CHARACTERISTICS

A. Where gallons per day and pounds of biochemical oxygen demand (BOD5) per day can be obtained by measurement of existing conditions, such data shall be used. Public Health may require installation of a water meter located to measure flow into the onsite wastewater system .

B. For new facilities, the following "Table of Quantities and BOD5 Strength of Sewage" will be used as a guide to represent average conditions.

C. Maximum/design flow shall be considered as 150% of average flow and shall be the basis for design purposes unless otherwise established by evidence satisfactory to Public Health.

D. To calculate the sewage flow for dwellings and mobile homes, use a figure of 2 people per bedroom. In no event may a dwelling or mobile home be sized for less than 2 bedrooms.

E. In no event may the system be designed for a lesser capacity than the anticipated maximum daily sewage flow or treatment requirements of the sewage or waste in the system.

F. For the purpose of calculating sewage flow rates, no reductions shall be made for water saving fixtures, unless the system design includes an evapotranspiration bed.

G. Quantities and BOD5 strength of sewage for various types of uses shall be in accordance with the following table:

QUANTITIES AND BOD5 STRENGTH OF SEWAGE FOR VARIOUS TYPES OF USES

TYPE OF ESTABLISHMENT	*GALLONS/PERSON /DAY AVERAGE*	*LBS. BOD5/PERSON /DAY*
RESIDENTIAL		
Single Family Dwellings – Two People per Bedroom	75	.20
Separate distribution of flows – individual residential use		
Bath/shower	14.7	.014
Dishwasher	1.8	.002
Kitchen sink	4.4	.045
Additional for garbage disposal	1.4	.052
Laundry washer	19.5	.037
Lavatory	8.4	.021
Water closet	24.8	.029
Hotels and Motels – Per Room (Without Private Baths)	50	.15
RESIDENTIAL		
Hotels and Motels – Per Room (With Private Baths)	75	.15
Multiple Family Dwellings or Apartments	75	.20
Boarding and Rooming Houses	50	.15
Mobile Home Parks	75	.20
Per Space	300	.80
COMMERCIAL		
Airports – Per Passenger	5	.02
Per Employee	10	.06

Barber and Beauty Shops – Per Chair	**100**	**.70***
Bowling Alleys – Per Lane (Toilet Wastes Only)	**5**	**.03***
Bus Service Areas – Not Including Food	**5**	**.02**
Country Clubs – Per Member	**30**	**.02**
Per Employee	**20**	**.06**
Dentist Offices – Per Non-Wet Chair	**50**	**.14***
Doctor Offices – Per Doctor	**250**	**.80***
Factories and Plants – Exclusive of Industrial Wastes		
Per Employee Per 8 Hour Shift – No Showers	**20**	**.05**
Per Employee Per 8 Hour Shift – Showers Provided	**35**	**.08**
Food Service Establishments – Per Seat		
Restaurant – Open 1 or 2 Meals	**50**	**.06/meal served**

TYPE OF ESTABLISHMENT	*GALLONS/PERSON/DAY AVERAGE*	*LBS. BOD5/PERSON/DAY*
24 Hour Restaurant	75	.07/meal served
Restaurant with Paper Service Only	25	.01/meal served
Additional for Bars and Cocktail Lounges	30	.02
Drive In Restaurant – Per Car Space	50	.02
Kennels – Per Day	30	.02
Laundries, Self Service – Per Commercial Washer	400	.75
Office Buildings – Per Employee Per 8 Hour Shift	15	.06
Stores & Shopping Centers – Per Sq. Foot of Retail Space	.1	.01*
Service Stations – Per Toilet Fixture	250	.50*
Stadiums, Racetracks, Ball Parks – Per Seat	5	.02
Theaters – Movie, Indoor, or Auditorium	5	.02
Work or Construction Camps – Semi-Permanent, Without Flush Toilets	50	.17
INSTITUTIONAL (Does not Include Kitchen Wastewater Flows)		
Churches – Not Including Food	5	.01
Hospitals – Per Bed Space	250	.20
Nursing Homes – Per Bed Space	100	.17
Schools, Boarding	100	.17
Schools, Day – Without Cafeteria, Gym, Showers	15	.04
With Cafeterias, No Gym or Showers	20	.08
With Cafeterias, Gym and Showers	25	.10
Additional for School Workers	15	.06
RECREATIONAL AND SEASONAL		
Camps, Day – No Meal Served	15	.12
Luxury Resort	125	.17
Resort – Night and Day	50	.12
Campground – Seasonal Occupancy – Per Unit**	50	.12
Public Park – During Hours When Park is Open		
Flush Toilet – Per Fixture Per Hour	36	.04 lb./fixture
Urinal – Per Fixture Per Hour	10	.01 lb./fixture
Shower – Per Fixture Per Hour	100	.10 lb./fixture
Faucet – Per Fixture Per Hour	15	.04 lb./fixture
Swimming Pools and Bathhouses	10	.06
Travel trailer Parks – With Individual Water and Sewage Hookup – Per Unit**	50	.12

*** BOD5 levels needing further verification**

**** Laundry facilities are to be calculated on a per commercial washer basis in accordance with other elements of this table.**

SECTION 8.5: MINIMUM HORIZONTAL DISTANCES BETWEEN COMPONENTS OF A SYSTEM AND PHYSICAL FEATURES

A. Minimum, horizontal distances from the various components of a system to pertinent terrain features, including streams, lakes, water courses, springs, wells, subsoil drains, cisterns, water lines, suction lines, gulches, dwellings, other occupied buildings and property lines, shall be in accordance with the "Table of Minimum Horizontal Distances" below:

B. Wells, springs or potable water supply suction lines and all other constructed units listed in the table shall be installed or located in accordance with the minimum distance requirements provided in the table.

TABLE OF MINIMUM HORIZONTAL DISTANCES IN FEET BETWEEN COMPONENTS OF A SEWAGE DISPOSAL SYSTEM INSTALLED AFTER NOVEMBER 15, 1973, PERTINENT PHYSICAL FEATURES

	Spring, Wells, Suction Lines	Potable Water Supply Line	Dwelling Occupied Building	Property Lines, Piped or Lined Irrigation Ditch	Subsoil Drains, Intermittent Irrigation Lateral	Lake, Water Course, Irrigation Ditch, or Stream	Dry Gulches, Detention Ponds (6)	Septic Tank
Dispersal System Utilizing Aerosol Methods	100 (3)	10 (2)(4)	125	10	0	25 (3)	10 (3)	10
Seepage Pits or Slit Trench	100 (3)	50 (2)(4)	20	25	10	50 (3)	25 (3)	6
Absorption Trench, Seepage Bed, Sand Filter, Sub-surface Dispersal System, or Dry Well	100 (3)	25 (2)(4)	20	10	10	50 (3)	25 (3)	6 (5)
Unlined Sand Filter in Soil with a Percolation Rate Slower than 60 Minutes per Inch	100	25 (2)(4)	15	10	10	25	15	10
Unlined or partially Lined Evapotranspiration System Wastewater Pond, or Surface Disposal System Other Than Aerosol	100	25 (2)(4)	15	10	10	25	15	10
Lined Sand Filter	60	10 (2)(4)	15	10	10	25	10	5
Lined Evapotranspiration Field or Lined	60	10 (2)(4)	15	10	10	25	10	5
Pit Privy or Vault Privy	50	10 (2)(4)	15	10	10	25	10	--
Septic tanks, Treatment Plants, Dosing Tanks, Vaults	50 (2)	10 (2)(4)	5 (1)	10	10	50	10	--
Building Sewer or effluent Lines	50 (2)(4)	10 (2)(4)	0	10 (2)(4)	10 (4)	50 (2)(4)	10 (2)(4)	--

Note: The minimum distances shown above shall be maintained between the system components and the physical features described. Where soil, geological, or other conditions warrant, greater distances may be required by the Board of Health, or by the Water Quality Control Commission pursuant to Section 25-8-206, C.R.S. Components that are not water tight should not extend into areas of the root system of nearby trees. For repair or upgrading of existing systems where the size of the lot precludes adherence to these distances, the repaired facility shall not be closer to water supply components, or other physical features referenced in the table, than the existing facilities.

(1) Distance shown shall not apply to treatment plants or effluent lines where recycling is permitted.

(2) Crossings or encroachments may be permitted at the points as noted above provided that the water conveyance pipe is encased for a minimum distance of ten (10) feet on each side of the crossing. A length of pipe shall be used with a minimum Schedule 40 rating of sufficient diameter to easily slide over and completely encase the water conveyance. Ridged end caps of at least Schedule 40 rating must be glued or secured in a water tight fashion to the ends of the encasement pipe. The area in which the pipe passes through the end caps shall be sealed with an approved underground sealant compatible with the piping used.

(3) Add 8 feet additional distance for each 100 gallons per day of design flow over 1000 gallons per day as specified in the table.

(4) Encroachments may be permitted provided the water or wastewater conveyance pipe is encased as in (2) above, specified in the table.

(5) Setback does not apply to systems designed to utilize an absorption field-embedded septic tank.

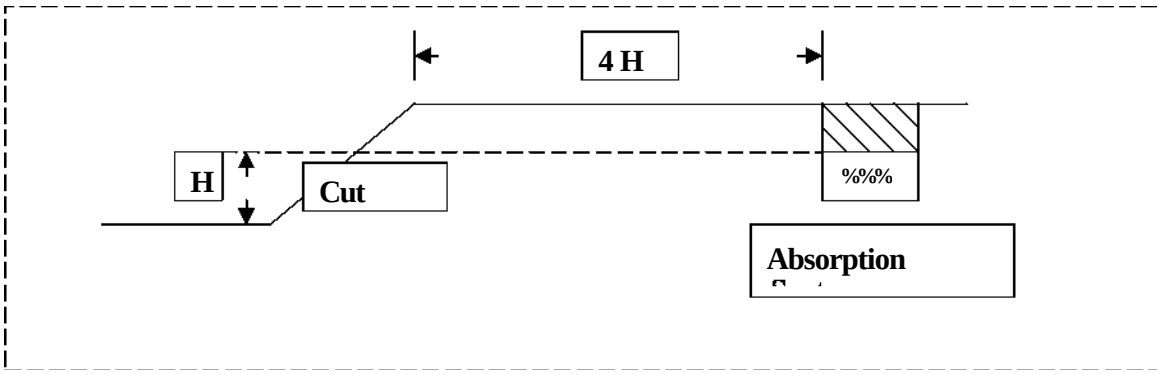
(6) Measured from the overflow level of the pond.

C. The minimum horizontal distance required from manmade cut banks and fill areas to onsite wastewater system components discharging effluent into or onto the surrounding soil shall be 4 times the height of the bank, measured from the bottom edge of the cut bank to the top of the absorption field, unless it can be demonstrated by a licensed professional engineer or a geologist that a mechanical or natural barrier will prevent lateral effluent surfacing. (See diagram below.)

SECTION 8.6: SOIL TEST

A. Location:

1. **Selection of a percolation test site on a parcel shall be the responsibility of the owner or owner's representative. Factors in determining the percolation test site shall include, but are not limited to those items listed that pertain to the site found in the Table of Minimum Horizontal Distances in Feet Between Components of a Sewage Disposal System Installed after November 15, 1973, Pertinent Physical Features, located in Section 8.5:A.-C. The future locations of landscaping features, driveways, parking areas, livestock containment areas, trees, and children play areas shall also be considered when selecting the test site.**
2. **Soil percolation tests shall be performed in at least 3 test holes in the area in which the absorption field is to be located, spaced uniformly over the proposed site, except there shall be no less than 1 test hole in any 1,200 square foot area of the absorption field.**
3. **If adverse soil conditions are encountered in the profile hole (bedrock, groundwater, unsuitable soil) at a depth of less than 60 inches, the soil test shall be performed within 14-18 inches of the interface area, or as determined by a licensed professional engineer.**
4. **The location of the soil profile hole shall be recorded with GPS instrumentation indicating the latitude and longitude (deg, min, sec) readings based on WGS-84 (NAD27) datum , and**
5. **The percolation test map shall include an accurate measurement from a fixed reference landmark.**



B. Dimensions: The percolation test holes shall most preferably be 6 inches in diameter. The diameter may vary from 4 to 12 inches in width or diameter where prohibitive soil or geological conditions exist. The holes shall be terminated at the depth of the proposed absorption field and the percolation tests shall be conducted within those soils.

C. Procedure: Percolation test holes shall be filled with water to a depth of 14 inches or more for at least 8 hours, but no more than 24 hours, prior to conducting the water percolation test, and shall be refilled with water if necessary to a depth of at least 14 inches prior to final measurement. Measure the time for the water to drop one inch within the lower 6 inches of the percolation test hole. The percolation rate shall be reported in minutes per inch drop. The date and time the holes were pre-soaked, and the date and time the measurement readings were performed must be included in the report. A standard penetration test shall be completed at the proposed depth of the absorption area, and at the termination of the profile hole boring. (See also, 8.3.H.7., page 11.)

D. Calculation: The field percolation rate shall be the average rate of the percolation tests after the rate has stabilized in all the test holes observed in the proposed absorption area. A percolation rate of between 5 and 60 minutes per inch is required, except as provided in Section 8.7:C.1.b.1. of these regulations. A field percolation rate determined by the test shall be used in calculating the absorption area required for the proposed system.

E. Performance of Percolation Tests:

1. **The percolation test shall be performed by or under the supervision of a licensed professional engineer or by a competent technician of Public Health unless the tests were previously performed by a licensed professional engineer and the results thereof submitted with the application for a permit.**
2. **If the applicant demonstrates to the satisfaction of Public Health that the system is not dependent upon soil absorption, the requirement for percolation tests may be waived.**
3. **Percolation tests performed prior to June 3, 1981, are not acceptable for a permit under these regulations without Public Health approval.**

4. **Percolation test holes for drywells and seepage pits shall be performed in the proposed soil stratas being utilized for the drywell or seepage pit. The test holes shall be at varying depths representative of the proposed depth of the drywell or seepage pit.**

F. Alternate Percolation Test: Alternate percolation test or other soil test procedures may be approved by Public Health providing the test results of alternate procedures are substantially equivalent to those determined using the test procedure detailed in this section.

G. Soil Profile: One soil profile hole shall be drilled or dug to provide observation of the soil profile in the area of the soil absorption field. The hole shall be at least 8 feet deep (17 feet for drywell or seepage pit). The hole may be terminated when groundwater or bedrock is encountered. The hole shall be prepared in such a way as to provide identification of the soil profile 4 feet below the bottom of the proposed depth of the soil absorption field.

H. Water Table: The location of the groundwater table shall be determined by one of the following methods:

1. **Direct visual observation of infiltrated water within an 8 feet boring (17 feet for drywell or seepage pit) or not less than 4 feet below the bottom of the absorption field shall be made after at least 8 hours.**
2. **Observation of soil in a boring or a trench of at least 8 feet depth, (17 feet for drywell or seepage pit) or not less than 4 feet below bottom of the absorption field for evidence of crystals of salts left by the groundwater table; or evidence of chemically reduced iron in the soil, reflected by a dull gray or mottled coloring. If ferric staining is present, the professional engineer shall state if the staining is of geologic formation or is currently under the influence of ground water.**
3. **Soil moisture tests indicating water saturation.**
4. **A back-hoe profile of at least 8 feet depth, or 17 feet for drywells or seepage pits, left open for 24 hours.**
5. **Other methods approved by Public Health.**
6. **A test hole evaluation showing a dry condition estimated or measured to be at least 4 feet below the bottom of a proposed soil absorption field during the wettest months may be considered prima facie evidence that the maximum seasonal groundwater table will be sufficiently below the bottom of the proposed absorption field.**

SECTION 8.7: COMPONENT DESIGN CRITERIA

A. Design Features (general):

1. **Reliability: Onsite wastewater systems shall be designed and constructed such that each component shall function, when installed and operated, in a manner not adversely affected by the normal operating conditions including erosion, vibration, shock, climatic conditions, and usual household chemical usage. Each component shall be free of non-functional protrusions or sharp edges, or other hazards, which could cause injury to persons, animals, or properties. Design shall be such as to exclude flies and rodents, and to prevent the creation of nuisances and public health hazards, and shall provide for efficient operation and maintenance.**
2. **Pipe Standards: All wastewater lines used in onsite wastewater systems shall be constructed of compatible pipe, bonding agent, and fittings. Where plastic pipe and fittings are used, the minimum wall thickness shall conform to ASTM Standard D 3034, SDR35, or equivalent. Perforated distribution pipe surrounded by rock within a soil absorption field shall have a minimum wall thickness conforming to ASTM Standard D 2729. Corrugated polyethylene pipe with smooth interior that meets ASTM F405 and AASHTO M252 specifications or equivalent may also be used. Tile, open-joint pipe, and cast iron pipe shall not be used in onsite wastewater systems.**

3. Plumbing Codes: Plumbing fixtures, grease traps, building sewers, vents, sewer lines, and other appurtenances shall be designed, operated and maintained so as to comply with the minimum requirements of the applicable and current plumbing code in force on the date of the onsite wastewater system permit application.

4. Electrical Equipment, if Used: All electrical work, equipment, and material shall comply with the requirements of the current National Electric Code in force on the effective date of these regulations, or those revisions of said Code, as adopted by the Colorado State Electrical and Plumbing Board.

5. Identification and Data Marking: A permanent type plate or other indelible marking inscribed so as to be easily read and visible for the purpose of inspection shall be provided on major components not constructed on the site where installed. Said inscription shall include the following:

a. **Name of manufacturer.**
b. **Model or serial number designation.**

c. **Maximum design capacity of the unit and the unit of measurement.**

6. **Structural Integrity: Tanks shall be so constructed and installed so as to withstand earth and hydrostatic pressures when full and when empty. All metal surfaces shall be properly coated to prevent corrosion. The Colorado Department of Public Health and Environment shall certify the structural integrity of all tanks, treatment units, and piping materials for use in onsite wastewater systems. When the Colorado Department of Public Health and Environment is satisfied and has issued certification, the Board of Health shall be entitled to rely thereon.**
7. **Water Tight Requirements: Water tight tanks, vaults, or other units, shall not allow infiltration of groundwater or surface water, and shall not permit the release of wastewater or liquids through other than designed openings.**
8. **Tank Anchoring: In locations where groundwater may cause instability of the septic tank, pumping chamber, vault, or other tanks in the onsite wastewater system due to flotation, the tank shall be anchored in such a manner as to provide stability when the tank is empty. The method of anchoring must be approved by Public Health prior to installation. Public Health may require the design of the anchoring system to be prepared by a licensed professional engineer.**
9. **Accessibility for Inspection and Maintenance: Each treatment unit shall be equipped with an access manhole located to permit periodic physical inspection, collection and testing of samples and maintenance of all components and compartments including but not limited to submerged bearings, moving parts, tubes, intakes, slots, filters, inlets and outlet baffles, and other devices.**
10. **Indicators of Failure for Systems Utilizing Mechanical Apparatus: A signal device shall be installed which will provide a recognizable indication or warning to the user that the system or component is not operating or malfunctioning. This indication or warning shall be in the form of a visual or audible signal, or both.**
11. **Serviceability: Components shall be so designed and constructed that, when installed in accordance with manufacturer's recommendations, they shall be capable of being easily maintained, sampled, drained, pumped, inspected and cleaned.**
12. **Sampling Access: Where a required final effluent sample cannot be easily obtained, a sampling well shall be constructed. The sampling well shall be accessible and provided with a properly secured cover.**
13. **Instructions: The manufacturer shall provide clear, concise instructions covering the unit which, when followed, will assure proper installation, and safe and satisfactory operation.**
14. **Surface Activity: The surface of the ground over the onsite wastewater system or any part thereof must be restricted to activity or use which will permit the system to function as designed and which will not contribute to compaction of the soil nor to structural loading detrimental to the capability of any component to function as designed.**
15. **Distribution Box: A distribution box, if used, shall be of sufficient size to equally distribute effluent to the lateral lines and shall be constructed with the inlet invert at least 1 inch above the level of the outlet invert. The outlet invert shall be 3 to 6 inches above the floor of the distribution box. The distribution box shall be placed level in a bed of concrete at least 24 inches by 24 inches in size.**
16. **Sewage Pumping System, Where Applicable:**
    a. **Non-clog pump openings shall have at least a 2-inch diameter solids handling capacity if raw sewage is pumped or at least 3/4 inch diameter solids handling capacity if previously settled effluent is pumped.**
    b. **Automatic liquid level controls shall be provided to start and shut-off pumps at a frequency required by the design.**
    c. **Pressure pipe shall be Schedule 40 PVC to accommodate pump discharge pressure and the pipe shall be sized to maintain a velocity of 2 or more feet per second.**
    d. **Automatic air release valves shall be installed at high points in the pressure line where necessary to prevent air locking. Check valves are not allowed unless approved by Public Health.**
    e. **A storage basin preceding the pump shall be provided to allow pump cycling commensurate with pump design capacity. The second compartment of the septic tank cannot be used as a pumping chamber without prior Public Health approval.**
    f. **When Public Health approves pumping from the second compartment of a septic tank, it shall be fitted with an approved effluent filter.**
    g. **The discharge line from the pumping chamber shall be protected from freezing by burying the pipe below the frost level or sloping the pipe to allow it to be self-draining.**
    h. **Electrical connections and devices (excluding the pump) shall not be located within the wet well of a pumping chamber. Such electrical connections shall be located on a pedestal adjacent to the pumping chamber.**

i. The manhole of a pumping chamber shall be at least 24 inches in diameter unless all the pumping equipment is equipped with quick-disconnects, and can be easily removed from the pumping chamber for servicing. B. Design Criteria (First Stage Treatment Units):

1. Septic Tank:

a. Minimum Capacities for Septic Tanks: A septic tank shall be constructed to permit detention of incoming sewage for a minimum of 48 hours or the capacity shall be based upon the number of bedrooms according to the following table: Septic Tank Size Based on Number of Bedrooms

Minimum Effective Liquid

Number of Bedrooms	*Tank Capacity* (Gallons)
2	1,000
3	1,250
4	1,500
Each additional bedroom	+ 250

b. Septic Tank Design Criteria:

1) **Except for mini-systems (grey water systems) the effective liquid capacity shall be no less than 1,000 gallons.**
2) **Inlet invert shall be at least 3 inches higher than the outlet invert.**
3) **Outlet tee or baffle shall extend above the surface of the liquid to within 1 inch of the underside of the tank top and shall extend at least 14 inches below the outlet invert.**
4) **The distance from the outlet invert to the underside of the tank top shall be at least 10 inches.**
5) **Liquid depth shall be a minimum of 30 inches and the maximum depth shall not exceed the tank length or 60 inches, whichever is less.**
6) **A septic tank shall have 2 or more compartments or more than one tank may be used in series to provide the following capacity arrangement. The first compartment of a septic tank shall hold no less than 1/2 of the required effective capacity.**
7) **The transfer of liquid from the first compartment to the second or successive compartment shall be made at a liquid depth of at least 14 inches below the outlet invert but not in the sludge zone.**
8) **At least one access no less than 20 inches across shall be provided in each compartment of a tank.**
9) **The liquid capacity in gallons must be clearly marked on the top surface of the tank.**
10) **Plans and specifications must be submitted and approved for all tanks fabricated on the site.**

c. Septic Tank Installation:

1) **Pipe meeting or exceeding ASTM Standard 3034, properly supported to prevent failure by settling, shall extend from the septic tank to the structure and to the absorption area. PVC SDR 35 and Schedule 40 PVC Pipe both meet this standard.**
2) **Septic tanks shall be installed level and on a solid base. The base of the septic tank excavation shall be compacted in the case of over-digging.**
3) **Roof drains, foundation drains, area drains or cistern overflows shall not enter the tank or any part of the treatment system.**
4) **The building sewer shall be laid with a minimum fall of 1/8 inch per foot. 1/4 inch fall per foot is recommended.**
5) **Bends in the building sewer shall be limited to 45-degree ells or long sweep quarter bends.**
6) **Building sewer clean-outs are required to be installed within 5 feet of the structure and at intervals not to exceed 100 feet in straight runs. An additional clean out is required when the cumulative change of direction exceeds 135 degrees.**
7) **Schedule 40 PVC pipe is required whenever the building sewer or effluent line is located under a driveway.**
8) **The inlet and outlet pipes shall be grouted and sealed with a waterproof material.**
9) **Septic tanks shall be provided with removable covers over the access ports. The manhole covers over the inlet and outlet compartments shall be no deeper than 8 inches below finished grade. The use of**

concrete or other materials approved by Public Health may be used to comply with this regulation. The riser design must be compatible with the lid. Where risers are used, the lids for the risers are also approved in place of lids for the tank.

10) No enclosed structure shall be constructed over the septic tank. No other structure shall be constructed in a manner that would prohibit access for servicing.

11) Septic tanks constructed of plastic or fiberglass shall be installed no deeper than the manufacturer's recommendations for maximum depth of soil over the tank, and shall be installed in accordance with all other manufacturer guidelines.

2. Aerobic Sewage Treatment System:

a. General Design: The shape and design of an aeration compartment, its inlet and outlet arrangements, baffling and air application shall:

1) Allow for intimate mixing of applied sewage, return solids, and applied air.

2) Prevent excessive short-circuiting of flow.

3) Prevent the deposition and buildup of solids in the aeration compartment.

b. Method of Aeration: The method of aeration shall be accomplished by mechanical aeration, diffused air or a combination of these. The method of aeration shall at all times maintain aerobic conditions at the maximum organic loading in both the aeration and settling compartments.

C. Design Criteria (Second or Later Stage Treatment Units):

1. Soil Absorption Field (general):

a. For a system treating and disposing of effluent through a soil absorption field, the method for calculating minimum absorption area shall be based upon the amount of suitable soil and the capacity of the soil to absorb liquids as established by the percolation test and upon design criteria and construction standards for such type of absorption field as set forth in these regulations.

b. Unless designed by a licensed professional engineer and approved by Public Health, no such system may be permitted in areas under any of the following conditions:

1) Where the soil percolation rate is slower than 1 inch in 60 minutes, or faster than 1 inch in 5 minutes, except that a percolation rate faster than 1 inch in 5 minutes in soil of sandy texture shall be permitted, or the percolation may be slowed by soil treatment.

2) Where the maximum seasonal level of the groundwater table is less than 4 feet below the bottom of the proposed absorption field.

3) Where bedrock exists less than 4 feet below the bottom of the proposed absorption field.

4) Where the ground-slope is in excess of 30 percent.

5) Where any portion of the proposed effluent distribution system is above original grade.

c. Soil building or replacement will be permitted to bring the soil within the requirements of suitable soil when designed by a licensed professional engineer.

d. Absorption Area Formula:

1) The minimum absorption area in square feet (A) for an onsite wastewater system shall be determined as a function of the design flow of sewage in gallons per day (Q), and the percolation rate in minutes per inch (t), according to the formula:

$$A = \frac{Q \times \text{square root of } t}{5}$$

(Note: Where the percolation rate is found to be faster than 5 minutes per inch in soils of sandy texture, the minimum value of the "t" for use in this formula shall not be less than "5".)

2) Additional Area: The absorption area so calculated shall be increased by not less than an additional 20% if wastes from a garbage disposal grinder are discharged into the system and by not less than an additional 40% if wastes from an automatic clothes washing machine are discharged into the system.

3) Long Term Acceptance Rates (LTAR): The minimum absorption area (A) in square feet may also be computed as a function of the design flow (Q) and the long term acceptance rate (LTAR) according to the formula:

$$A = \frac{Q}{LTAR}$$

LTAR's FOR WASTEWATER FOR SOIL ABSORPTION FIELDS

PERCOLATION RATE (Minutes/Inch)	*TYPICAL SOIL TEXTURES*	*LTAR* (Gallons/Sq. Foot/Day)
<5**	Gravel **	Not suitable
1 - 5	Coarse to medium sand	1.30
6 - 10	Fine sand to loamy sand	1.20
11 - 20	Sandy loam to loam	.72
21 - 30	Loam	.50
31 - 40	Loam to silty loam *	.40
41 - 60	Clay loam to clay *	.30
Over 60 **	Silty clay loam to silty clay	.20

*** Soils without highly expansive clays.**

****Design by a licensed professional engineer required.**

(Note: Percolation rates faster than 5 minutes per inch or slower than 60 minutes per inch require a licensed professional engineer design.)

e. Adjustment for Deep Gravel: The length of an absorption trench or seepage bed may be calculated by allowance for the side-wall area of additional depth of gravel in excess of 6 inches below the bottom of the distribution pipe according to the following formula:

$$L \times \frac{(W + 2)}{(W+1+2d)} = \text{adjusted length}$$

Where: L = length required prior to adjustment
W = width of trench in feet
d = depth of gravel below distribution pipe in feet
(See Appendix 9.)

f. Reduction in the soil absorption area may be allowed for gravelless soil absorption fields upon approval of the Colorado Department of Public Health and Environment, and at the discretion of Public Health. (See Appendix 11.)

g. The maximum reduction from all combined alternatives shall be no greater than 50% of the required soil absorption field.

h. The ground surface shall be graded to deflect precipitation or other outside water from the disposal area. The absorption area shall be protected against erosion.

i. Where absorption fields are to be installed in fill material, the fill must be specified by a licensed professional engineer.

j. If alternating systems utilizing diversion valves or other approved diversion mechanisms are installed, each system must be sized based on 50% of the total area required excluding the reductions given for dosing and gravelless systems. Reductions are not applicable to alternating systems; flow reductions may be taken where applicable.

2. Absorption Trench and Seepage Bed:

a. An absorption trench or seepage bed shall be of sufficient width and length or dimension to provide the required absorption area. An absorption trench or seepage bed shall be installed in the area and at the depth of the percolation test with a preferable maximum depth of 36 inches. The trenches shall be of near equal length, and with a minimum of 6 feet of undisturbed soil between trenches. The bottom of the trench or bed and distribution lines shall be level.

b. The absorption trench or seepage bed shall be surrounded by clean, graded gravel, rock, or material of equal efficiency which may range in size from 1/2 to 2 1/2 inches, and shall be placed at least 2 inches above the top of the distribution pipe to at least 6 inches below the bottom of the distribution pipe. If the distribution pipe is less than 4 inches in diameter, then the total depth of rock shall be a minimum of 12 inches with at least 6 inches under the pipe. The top of the placed gravel or such material used shall be covered with a layer of hay, straw or similar pervious material. An impervious covering shall not be used.

c. A final cover of soil suitable for vegetation at least 10 inches deep shall be placed from the top of the hay,

straw or similar pervious material to the finished surface grade of an absorption trench or seepage bed. The final cover shall be graded to deflect runoff water away from the disposal area.

- **d. In a trench or bed configuration an inspection port shall be installed at the opposite end of the absorption area from where effluent enters. If trenches are constructed, inspection ports shall be installed at the end of each individual trench. Inspection ports must extend to finished grade, and be fitted with a cap that can be removed easily with common tools, and be tamper-proof, such as a threaded plug/cap.**
- **e. In the case of an above ground system such as a mounded system, an impervious berm shall be constructed to prevent lateral flow of waste discharge outside of the absorption field. Machine tamping, rolling or hydraulic compaction of final cover shall not be permitted, however, hand tamping may be allowed where necessary to stabilize the soil to prevent erosion or the intrusion of extraneous water.**
- **f. If dosing is used in conjunction with an absorption trench or seepage bed system, the dosing chamber shall be sized to dose the field 3 to 4 times per day. If a lift station is required, it shall be water tight and have an alarm system installed.**
- **g. Absorption Trench: Perforated distribution pipe, when used for an absorption trench, shall extend the entire length of the trench. Pipe for gravity distribution shall be no less than 3 inches in diameter. Two or more trenches are preferred with a maximum length of 100 feet per trench. A minimum of 6 feet of undisturbed soil is required between trenches. The terminal ends of the perforated pipe shall be capped.**
- **h. Seepage Bed: The separating distance between the parallel distribution lines in a seepage bed shall not exceed 6 feet, and a distribution line shall be located within 3 feet of all side-walls of the seepage bed. Pipe for gravity distribution shall be no less than 3 inches in diameter. The terminal ends of distribution lines shall be looped with perforated pipe. There shall be a minimum of 6 feet of undisturbed soil between adjoining seepage beds.**

3. Absorption or Seepage Pits:

- **a. Absorption or seepage pits having adequate soil absorption may be permitted as an alternative where absorption fields are impractical, and where the subsurface conditions are otherwise suitable for pit installations. The capacity of the pit shall be computed on the basis of percolation tests made in each vertical stratum penetrated. The weighted average of the results shall be used to obtain a design figure. Soil strata in which the percolation rate is slower than 30 minutes per inch shall not be used for absorption or seepage.**
- **b. The effective area of the pit is the vertical wall area, based on dug perimeter of the pervious strata below the inlet. No allowance shall be made for impervious strata or bottom area. Pits shall be separated by a distance equal to 3 times the greatest lateral dimension of the largest pit. For pits over 20 feet in depth, the minimum space between pits shall be 20 feet. Pits shall be provided with both vertical side-wall and top supporting structural concrete or other material of equal structural integrity. Adequate safety protection shall be provided to protect against personal injury during construction or use.**

4. Drywells: Drywells shall be filled with clean, graded rock that may range in size from 1/2 to 2 1/2 inches in diameter. The rock shall extend from the bottom of the pit to at least 2 inches above the inlet pipe. At least one 4 inch perforated vertical standpipe will be attached to the end of the distribution line with a tee fitting. The vertical standpipe shall extend to the bottom of the drywell and up to the finished grade, and fitted with a removable cap to be used as an inspection pipe. The absorption area of the drywell shall be computed on the basis of percolation rates, or the long-term acceptance rates of each soil stratum penetrated. The weighted average of the results shall be used to obtain a design value. The effective area of the pit shall be calculated by adding the area of the side-walls below the horizontal inlet line and the area of the bottom of the pit, excluding any impermeable stratum penetrated. Drywells so sized may only be permitted in soils with a percolation rate faster than 60 minutes per inch. Drywells shall be separated by a distance equal to the depth of the excavation, or 10 feet, which ever is greater. Pre-cast concrete rings or other approved internal distribution systems are approved provided a 4 inch perforated vertical standpipe is installed in the center of the distribution system, and extends to the bottom with a splash block placed under the standpipe. The installation of a minimum 6 inches of gravel under the bottom precast ring may be used in lieu of the vertical standpipe. The use of rock in the interior portion of the distribution system is prohibited unless approved for use by a licensed professional engineer.

5. Serial Distribution System: A serial distribution system may be used in all situations where a soil absorption field is permitted and shall be used where the ground slope does not allow for suitable installation of a single level absorption field, unless a distribution box or dosing chamber is used. The horizontal distance from the side of the absorption field to the surface of the ground shall be adequate to prevent lateral flow and eruption of effluent above ground.

When a serial distribution system is used, the following design and construction procedures shall be followed:

a. **The bottom of each absorption field and its distribution line shall be level.**
b. **There shall be a minimum of 10 inches of ground cover over the gravel fill or chambers.**
c. **An absorption field shall follow approximately the ground surface contours so that variation in absorption field depth will be minimized.**
d. **There shall be a minimum of 6 feet (horizontal measurement) of undisturbed soil between adjacent absorption field trenches and between the septic tank or other treatment unit and the nearest absorption field.**
e. **Adjacent absorption fields shall be connected with a relief line or a drop box arrangement such that each trench fills with effluent to the top of the gravel before flowing to succeeding trenches.**

6. Evapotranspiration Disposal of Effluent: An evapotranspiration system may be used exclusively or in combination with a soil absorption field.

a. **An evapotranspiration system shall be designed by a licensed professional engineer who shall furnish design data for a complete review of the design.**
b. **Data to be furnished shall include, but shall not be limited to, liner material and bedding, properties of the soil in the evapotranspiration bed, and provision for vegetation cover.**
c. **When a high groundwater table, bedrock, fractured rock, or highly pervious material (percolation faster than 5 minutes per 1 inch) endanger the underground water, a durable and impermeable liner shall be installed with glued seams or specified overlaps in the bed to prevent the sewage effluent from entering the underlying formation or groundwater table.**
d. **An evapotranspiration system shall be located in an area of unobstructed sunshine.**
e. **The system bed shall be crowned and covered with a minimum of 4 inches of selected back fill material and with a vegetation cover.**
f. **Bed shall be protected to prevent damage from vehicular or pedestrian travel. The ground surface shall be graded to deflect precipitation and other outside water away from the disposal area.**
g. **The following formula may be used as a minimum guide for determining the area necessary for the total evapotranspiration of septic tank effluent:**

$$\text{Area in Square Feet} = \frac{\text{Design flow (in gal/day) X 586}}{\text{Lake evaporation rate at the site (in inches per year)}}$$

h. **As an alternative, a system may be designed on the basis of a monthly water balance for the system. Such a design would provide for total storage of average daily flows for all periods in which evapotranspiration is not shown to occur. The design shall also provide wicks (sand structures that penetrate through the rock media to the bottom of the bed) equal to 10% to 15% of the bed surface area. The wicks shall be uniformly spaced throughout the bed. Adequate surface area shall be provided to evaporate/transpire total annual average daily flows at a rate equivalent to local net lake evaporation over the remaining period of the year. If the system is designed as a percolation/evapotranspiration system, the amount of storage and evapotranspiration capacities may be reduced by the volume of effluent percolating into the soil.**

i. Sand used as cover in evapotranspiration/absorption beds shall meet the following gradation requirements and be approved by the design engineer:

Sieve Size	Percent (%) Passing
4	100
40	50-55
200	<15

(Note: Except for dwellings, if the system is designed for summer use only, as determined by Public Health, multiply the above area by 0.6 to obtain the required area.)

7. Sand Filter:

a. **The filtering material shall be clean, coarse sand, all passing a screen having 4 meshes to the inch. The sand shall have an effective size between 0.25 and 0.6 mm. The uniformity coefficient shall be 4.0 or less.**
b. **The sand shall be at least 2 feet deep below the distribution lines. The distributors and under-drain shall be surrounded by coarse screened gravel or crushed stone.**
c. **Under-drain effluent must then be discharged via a soil absorption field or be further treated as necessary to meet**

receiving water standards or those of Section 8.10, as applicable.

d. All of the gravel or stone shall pass a 21/2 inch screen and shall be retained on a 3/4 inch screen. Fine gravel 1/4 inch size or less may be used above and around the coarse material, both at the distributor and under-drains. The separating distance between parallel distribution lines shall not exceed 6 feet, and a distribution line shall be located within 3 feet of each filter side-wall. Pipe for gravity distribution shall be no less than 4 inches in diameter. The slope of the distributors shall be 0.4 percent where dosing tanks are not used and the slope of the under-drains 0.5 to 1.0 percent. It is required that the sand be thoroughly settled by flooding or other means before the distributors are placed at the final grade. The distributor and under-drains may be of agricultural tile, bell and spigot pipe, or perforated pipe.

e. The top of the sand shall be no less than 4 feet above the high ground water table for installations in which effluent percolates downward through the soil.

f. The minimum area for a sand filter shall be computed as a function of the maximum daily sewage flow according to the following table:

Loading Rates for a Sand Filter

Type of Service	Application Rate Gallons per Square Foot per Day
Without Garbage Disposal	1.15
With Garbage Disposal	.95

g. A dosing tank shall be provided where the total filter area exceeds 1,800 square feet. The size of the dose, or the net capacity of the dosing tank, shall be at least 75 percent of the volume of the distributors. 8. Wastewater Pond:

a. A wastewater pond may be used to provide an additional degree of treatment following first stage treatment. The pond shall be designed for a loading not to exceed 0.46 pound of BOD5 per 1,000 square feet of water surface area. Special design shall be required in each case in which non-domestic kinds of onsite wastewater system wastes will be received.

Maximum water depth in the pond shall not exceed 5 feet. The inside slope of the pond, dike or embankment shall not be steeper than 2:1 (2 feet measured horizontally for each foot measured vertically). A center inlet shall be provided.

b. Unless 4 feet of unsaturated soil exists beneath the bottom of the pond, said pond shall be constructed in impervious soil or be sealed to prevent excess seepage of wastewater. Only ponds exhibiting an exfiltration rate of 1×10^{-6} cm/second or less shall be deemed adequate to prevent excess seepage.

c. Adequate safety protection shall be provided, such as fencing and signs, to protect against personal injury.

d. Surface runoff shall be diverted away from the pond except where controlled by design.

9. Mound Systems: A mound soil absorption field shall be designed by a licensed professional engineer. The design shall be site specific and include specifications for all fill material, basal area size calculations, absorption area calculations, distribution networks, cap, topsoil, final grading, and other information pertinent to the construction of the system as may be requested by Public Helath.

a. The distribution system shall be designed for the uniform effluent application throughout the mound.

b. The effluent distribution system shall be graded to drain back to the dosing chamber or buried below frost line.

c. The final slope of the mound back-fill shall be no greater than 3 to 1 (3 feet horizontally to 1 foot vertically).

d. The mound shall be planted with suitable vegetative cover.

e. The mound shall not be subject to irrigation or compaction.

f. When gravelless soil absorption fields are used, a reduction in total number of units is allowed. However, the total square footage of the absorption area cannot be reduced. The gravelless units shall be uniformly spaced throughout the absorption area.

g. The absorption area of the mound shall be sized based upon the soil percolation rate conducted in the interface area of the soil.

10. Gravelless Soil Absorption Field: All gravelless soil absorption fields shall be approved by the Colorado Department of Public Health and Environment. Where permitted by Public Health, these systems shall be limited to only those absorption area reductions given through the Colorado Department of Public Health and Environment's

certification. The absorption area of a chamber type absorption field shall be equivalent to the footprint of the interior of the chamber (interior base area).

a. Where gravelless chambers are used, the installation shall be no deeper than 60 inches (5 feet) unless designed by a licensed engineer,

b. The sidewalls of the trench or bed must be raked to eliminate backhoe smear, and

c. Backfill must be compacted by walking in soil along the sides of the chambers to the top of the louvered sidewall.

11. Drip Irrigation or Low Pressure Pipe System: Drip irrigation or low pressure systems are allowed by Public Health and must be designed by a licensed professional engineer. All drip irrigation systems or low pressure pipe systems shall meet the following minimum requirements:

a. Trenching shall not occur when soils are wet.

b. Trench depth shall not exceed 30 inches and trench length shall not exceed 100 feet.

c. Drip irrigation and low pressure pipe system must be dosed.

d. The system shall only be utilized when a 4 foot separation can be maintained between the bottom of the trench and fractured bedrock and/or seasonal high groundwater table.

e. No irrigation shall be allowed over the absorption area.

12. Constructed Wetland Treatment: A constructed wetland treatment system shall be designed by a licensed professional engineer. The design shall be site specific and include specifications for loading, capacity, liner material, filter media, density and species of plant material, effluent level, final discharge type, and other pertinent information as requested by Public Health. The design shall include estimates of effluent quality at the inlet and outlet. Sampling ports or some other means of effluent sampling to demonstrate compliance with Section 8.10 of these regulations shall be required by Public Health. Sampling is to be paid for by the owner.

D. Design Criteria (Other Facilities):

1. Mini-system (grey water system): A mini-septic system may be considered to dispose of waste from sinks, lavatories, clothes washers, bathtubs, and showers, where approved means are in use to dispose of human excreta. The standard design requirements for conventional onsite wastewater systems prescribed by these Regulations shall apply, except that:

a. Design shall be based on a minimum volume of wastes not containing human excreta, or 25 gallons per day per person. Three days' retention time shall be provided for each mini-system tank.

b. Construction materials shall be such that the tank shall remain watertight.

c. Percolation tests shall be conducted and the minimum size of absorption area shall be calculated in accordance with these regulations.

d. The building drain and sewer pipe leading to the septic tank shall be a maximum of 2 inches in diameter to preclude a later tap for a water closet.

2. Vault: A vault shall have a minimum 1,000 gallon effective capacity and may be permitted under limited use occupancy for systems on property which cannot accommodate a conventional onsite wastewater system. A signal device (visual or audible system, or both) shall be installed to indicate when pumping is necessary.

3. Vault Privy: A vault privy shall be built to include fly-tight construction; a superstructure affording complete privacy; an earth mound around the top of the vault and below floor level that slopes downward away from the superstructure base; a floor and riser of concrete or other impervious material; and, with seats and covers of easily cleanable, impervious material, hinged, self-closing, and fly-proof. All venting shall be fly-proofed with No. 16 or tighter mesh screening. Effective capacity of the vault shall be no less than 400 gallons.

4. Incineration and Chemical Toilets: An incineration toilet, which may be used in connection with a mini-system (grey water system) by permit from Public Health, shall be designed and installed in accordance with all applicable federal, state, and local air pollution requirements. A portable chemical toilet, which may be used by a permit from Public Health, shall have a superstructure which meets the requirements of the paragraph titled Vault Privy. Use of a portable chemical toilet for permanently occupied buildings shall be prohibited except during construction or under emergency circumstances as determined by Public Health.

5. Slit Trench: A slit trench shall be located in suitable soil and shall be excavated approximately 1 foot wide and 2 feet deep for the required length. Excrement shall be covered with at least 2 inches of soil at least once a day or more frequently, if requested by Public Health. A superstructure of a temporary nature shall be provided to afford privacy. A silt trench shall be considered a temporary convenience to be used no longer than 7 days, and shall be back-filled with at least 1 foot of soil with additional allowance for settling to grade when use has been discontinued.

6. **Business, Commercial, Industrial, Institutional, or Multifamily Dwelling Waste Systems: Systems shall receive only such biodegradable wastes for treatment and disposal as are compatible with those biological treatment processes as occur within the septic tank and the soil matrix. Systems discharging wastes other than biodegradable wastes are prohibited unless approved by the Colorado Department of Public Health and Environment.**
7. **Systems for which data on design, operation and maintenance, based on use in Colorado, are limited or undetermined:**

a. Composting Toilets:

1) **Deposits of feces, urine, and readily decomposable household garbage that are not diluted with water or other fluids may be retained in a compartment, in which aerobic composting will occur. The compartment may be located, subject to Public Health or other applicable regulations or codes, within a dwelling or building provided the unit complies with the applicable requirement of these regulations, and provided the installation will not result in conditions considered to be a health hazard as determined by Public Health. The effective volume of the receptacle must be sufficient to accommodate the number of persons served.**
2) **Adequate additional volume shall be provided for the use of composting materials which shall not be toxic to the process or hazardous to persons and which shall be used in sufficient quantity to assure proper decomposition.**
3) **Compartment and appurtenances related to the unit shall include fly-tight construction and exterior ventilation as required by the plumbing code.**
4) **When the available effective volume is filled to 75% of capacity, residue from the unit shall be properly disposed of by acceptable solid waste practices.**
5) **If a system will be installed where low temperature may be a factor, design shall compensate for the effects of the low temperature.**
6) **Manufactured composting toilets shall bear the seal of approval of the National Sanitation Foundation, or an equivalent testing program, and are otherwise approved by the Colorado Department of Public Health and Environment. Composting toilets shall be operated according to the manufacturer's specifications.**

b. Systems Which Recycle Treated Wastewater for Potable Purposes: No system shall be permitted which will recycle wastewater for potable purposes except a system which shall consistently meet all of the sanitation and maximum contaminant level requirements of rules, regulations, and standards of the Colorado Department of Public Health and Environment, and Public Health.

c. Systems Which Recycle Treated Wastewater for Non-potable Purposes such as Flushing Water Closets or Urinals:

1) **That portion of the wastewater recycled for non-potable purposes such as flushing water closets or urinals must meet the treatment requirements of Section 8.10 of these regulations for effluent in which the possibility exists for occasional direct human contact.**
2) **No cross-connection to a pipe, fixture, or supply containing potable water shall be permitted.**

SECTION 8.8: MANUFACTURED UNITS UTILIZING MECHANICAL APPARATUS FOR TREATMENT OF SEWAGE

A. Onsite wastewater systems utilizing mechanical apparatus and furnished for installation in Colorado shall comply with the minimum requirements of criteria and construction standards set forth in these regulations.

B. No such unit utilizing mechanical apparatus and which is designed for discharge either upon the ground or beneath the ground surface or which may adversely affect State waters shall be permitted unless:

1. **The system is installed within a geographic area wherein a public, quasi-public, or private entity, or political subdivision is continually responsible for the efficient operation and maintenance of said unit; or,**
2. **The operator of the system insures an efficient operation of all mechanical and electrical component parts provided prior to and during continuing use.**

SECTION 8.9: APPROVAL OF SYSTEMS EMPLOYING NEW TECHNOLOGY

A. For the purposes of this Section 8.9 a system employing new technology is a system based on improvements and developments in technology of sewage disposal and not otherwise provided for in Section 25-10-105 (l) (e) through (j), C.R.S.

B. Certification:

1. Except as provided for in Section, 8.9:C upon application by a systems contractor, licensed professional engineer or manufacturer of an onsite wastewater system employing new technology, the Colorado Department of Public Health and Environment may hold a public hearing to determine whether the system for which application has been made has established a record of performance reliability which would justify approval of permits by Public Health in the same manner as which Public Health acts on applications for permits for systems which treat and dispose of effluent through an absorption field.

a. In any case where the Colorado Department of Public Health and Environment has received information that a system for which application for certification has been made is not reliable, the Colorado Department of Public Health and Environment shall hold a hearing pursuant to Section 8.9:B.1.

b. In no case shall the Colorado Department of Public Health and Environment deny certification without holding a hearing pursuant to Section 8.9:B.1.

c. Notice of the time and place of such hearing shall be given at least once, at least 20 days in advance thereof by publication in the Colorado Register, and by mailing thereof to all local boards of health, and to all persons who have expressed an interest therein, or who have requested to be placed on a list for notification which shall be kept by the Colorado Department of Public Health and Environment expressly for this purpose.

d. Any person may participate in the public hearing by presenting written or oral testimony at the discretion of the Colorado Department of Public Health and Environment. No person shall be denied an opportunity to participate at the hearing without good cause shown.

2. If the Colorado Department of Public Health and Environment determines, based upon reasonable performance standards and criteria that the system's reliability has been established, then the Colorado Department of Public Health and Environment shall certify the system and shall notify each local board of health of said certification.

3. Upon notice of certification, Public Health shall be entitled to consider a permit application for the certified system in the same manner as applications for systems that treat and dispose of effluent through an absorption field.

4. The Colorado Department of Public Health and Environment's determination on whether to grant certification shall be final agency action for the purposes of the Colorado Administrative Procedures Act, Sections 24-4-101 through 108, C.R.S.

5. A denial of certification shall be in writing with the reason for denial contained therein.

C. The Colorado Department of Public Health and Environment shall certify any system employing new technology for subsurface discharge without holding a public hearing pursuant to Section 8.9:B.1.when the system bears the National Sanitation Foundation Standard 40 Certification, or meets an equivalent testing program's standards.

D. Certification pursuant to this section shall not relieve the holder thereof, or the user of a certified system, from the responsibility of complying with these regulations and any applicable rules and regulations adopted pursuant to law.

E. If, at any time after an onsite wastewater system employing new technology has been certified pursuant to this Section 8.9, the Colorado Department of Public Health and Environment receives information that the system so certified does not meet the standards in these regulations or in any way constitutes a public health hazard, the Colorado Department of Public Health and Environment may, at its discretion, hold a public hearing to revoke certification. In holding this hearing, the Colorado Department of Public Health and Environment shall follow the same procedure as set forth in Section 8.9:B.1. The Colorado Department of Public Health and Environment's decision to revoke certification after the hearing shall be final agency action for the purpose of the Colorado Administrative Procedures Act.

F. Pending a final decision by the Colorado Department of Public Health and Environment on certification of an onsite wastewater system employing new technology or revocation of certification previously issued pursuant to this Section 8.9, Public Health may determine whether to issue a permit for the system pursuant to regulations adopted under Section 25-10-106 (l) (g), C.R.S.

G. Certification of systems under this Section 8.9 shall be specific to those model(s) certified pursuant to Section 8.9:B. and C.

SECTION 8.10: TREATMENT SYSTEMS OTHER THAN THOSE DISCHARGING THROUGH A SOIL ABSORPTION OR SAND FILTER SYSTEM AND NON-DISCHARGING SYSTEMS

A. General: Those onsite wastewater systems which will discharge effluent directly to the atmosphere, the ground

surface or below ground, or which employ aerobic principles of sewage treatment or a dispersal system, may be permitted only if designed by a licensed professional engineer. This Section 8.10 shall not apply to systems discharging below ground through a soil absorption field or sand filter system or to a non-discharging system.

B. Review of Application: Public Health shall review all applications for such systems that may result in discharge or drainage of effluent from the property of origin. No permit shall be issued for such a system if Public Health determines that a potential health hazard or private or public nuisance or undue risk of contamination exists. The Board of Health may, by regulations, authorize Public Health to review applications and issue permits for systems that do not permit the drainage of effluent off the property of origin.

C. Minimum Performance Criteria Required of All Systems Pursuant to Section 8.10

1. If effluent discharge is made into the atmosphere or upon the ground surface in areas in which the possibility exists for occasional direct human contact with the effluent discharge, the effluent at the point of sampling shall meet each of the following standards:

a. The geometric mean of the fecal coliform density shall not exceed 25 per 100 milliliters when averaged over any 5 consecutive samples, and no single sample result for fecal coliform shall exceed 200 per 100 milliliters.

b. The arithmetic mean of the standard 5-day biochemical oxygen demand (BOD5) shall not exceed 20 milligrams per liter when averaged over any 3 consecutive samples.

c. The arithmetic mean of the total suspended solids shall not exceed 40 milligrams per liter when averaged over any 3 consecutive samples.

2. If the effluent discharge is made into the atmosphere or upon the ground surface in an area so restricted as to protect against the likelihood of direct human contact with the discharged effluent, the effluent at the point of sampling shall meet each of the following standards:

a. The geometric mean of the fecal coliform density shall not exceed 500 per 100 milliliters when averaged over any 5 consecutive samples, and no single sample shall exceed 5,000 fecal coliform per 100 milliliters.

b. The arithmetic mean of the standard BOD5 shall not exceed 20 milligrams per liter when averaged over any 3 consecutive samples.

c. The arithmetic mean of the total suspended solids shall not exceed 40 milligrams per liter when averaged over any 3 consecutive samples.

3. If effluent discharge is made beneath the surface of the ground and discharge will not be made through suitable soil, either existing or constructed, or through a sand filter, the following standards shall be met:

a. There shall be at least 4 feet of soil between the maximum seasonal high water table and the level of effluent discharge.

b. The arithmetic mean of the BOD5 shall not exceed 60 milligrams per liter when averaged over any 3 consecutive samples.

c. The arithmetic mean of the total suspended solids shall not exceed 100 milligrams per liter when averaged over any 3 consecutive samples.

4. To determine compliance with the standards contained in this Section 8.10, samples shall be taken at least once per week, but no more frequently than once per day.

D. Methods of Analysis - Sampling Points: All effluent samples shall be analyzed according to the methods prescribed in the current edition of *Standard Methods for the Examination of Water and Wastewater* (American Public Health Association). Copies of the analytical methods allowed may be obtained, upon request, from the ISDS Program Coordinator, Colorado Department of Public Health and Environment, 4300 Cherry Creek Drive South, Denver, Colorado 80222-1530. The point of sampling shall be a location that is representative of final discharge from the system.

SECTION 8.11: EFFLUENT DISCHARGED TO STATE WATERS

Any system that will dispose of effluent by discharging into State waters shall be designed by a licensed professional engineer, and the application shall be submitted for preliminary approval to Public Health. Once approved, the application shall be forwarded to the Colorado Department of Public Health and Environment for issuance of a permit in compliance with all applicable regulations of the Water Quality Control Commission. Compliance with such a permit shall be deemed in full compliance with the onsite wastewater system regulations.

SECTION 8.12: INSTALLATION

A. General: Treatment units shall be set on a firm and level base except as otherwise provided in these regulations and shall be capable of accommodating flow with hydraulic efficiency.

B. Mechanical Components:

1. **Ventilation and Air System: Mechanical components shall be installed in a properly vented location and all vents, air intakes, and air hoses shall be protected from snow, ice, or water vapor accumulations.**
2. **Components Installation: Mechanical components installed in or at the unit must be protected against damage or impairment of their efficiency by flooding, foaming, or surcharging.**

C. Covers, Barriers, or Other Protection: All systems must be installed to include protection of openings against entrance of insects and rodents. Barriers shall be provided to prevent entrance by unauthorized persons.

SECTION 8.13: OPERATION AND MAINTENANCE

A. Responsibility: The owner and the party in possession of real property, upon which an onsite wastewater system is used, shall be jointly and severally responsible for operation and maintenance of the system unless jurisdiction for responsibility has been transferred to a public, quasi-public, or political subdivision. The person denying such responsibility shall bear the burden of proof for such denial upon establishment of ownership or possessory rights in the property served by the system.

B. Service Label: For treatment plants utilizing mechanical apparatus or under a service policy, a clearly visible, permanently attached label or plate giving instructions for obtaining service shall be placed at a conspicuous location.

C. Maintenance and Cleaning:

1. **When directed by Public Health, for the purpose of obtaining compliance with regulations, the owner or user of a system shall provide for maintenance and cleaning of an onsite wastewater system and shall notify Public Health upon completion of any maintenance work and report to Public Health, and submit such evidence of compliance with any maintenance and cleaning schedule in the form and as Public Health requires.**
2. **The Board of Health may adopt regulations for the scheduling of maintenance and cleaning of systems and practices adequate to insure proper functioning of acceptable systems, and may require proof of proper maintenance and cleaning, pursuant to any such schedules and practices, to be submitted periodically to Public Health by the owner of the system.**

D. Monitoring and Sampling:

1. **Reasonable periodic collection and testing by Public Health of effluent samples from onsite wastewater systems for which monitoring of effluent is necessary in order to ensure compliance with the provisions of rules and regulations may be performed not more than 2 times a year, except when required by Public Health in conjunction with an enforcement action.**
2. **Any owner or occupant of property on which an onsite wastewater system is located may request Public Health to collect and test an effluent sample from the system. Public Health may perform such collection and testing services.**
3. **A fee not to exceed that which is allowed by Section 25-10-101, *et. seq.* C.R.S., may be charged by Public Health for each sample collected and tested. Payment of such charge may be stated in the permit as a condition for its continued use.**

E. Disposal of Waste Materials: Disposal of waste material removed from a system in the process of maintenance or cleaning shall be accomplished at a site approved by the Board of Health which does not create a hazard to the public health, a nuisance or an undue risk of pollution and which complies with state and local regulations.

F. No Discharge is Permitted Which Does Not Comply with Rules and Regulations: No sewage or effluent shall be permitted to be discharged into or upon the surface of the ground or into State waters unless the sewage system and effluent meets the minimum requirements of applicable regulations.

G. Termination of Use of System: The contents of a septic tank, vault, or seepage pit, the use of which has been terminated, shall be properly disposed of whereupon the emptied tank, vault, or pit shall be filled with soil or rock, or Public Health may require the tank or vault to be removed and disposed of properly.

SECTION 8.14: FINDINGS ON APPEAL

A. Any applicant whose permit application has been denied by Public Health may request review of that application by the Board of Health.

B. A request for review shall be made within 60 days after denial of an application by Public Health.

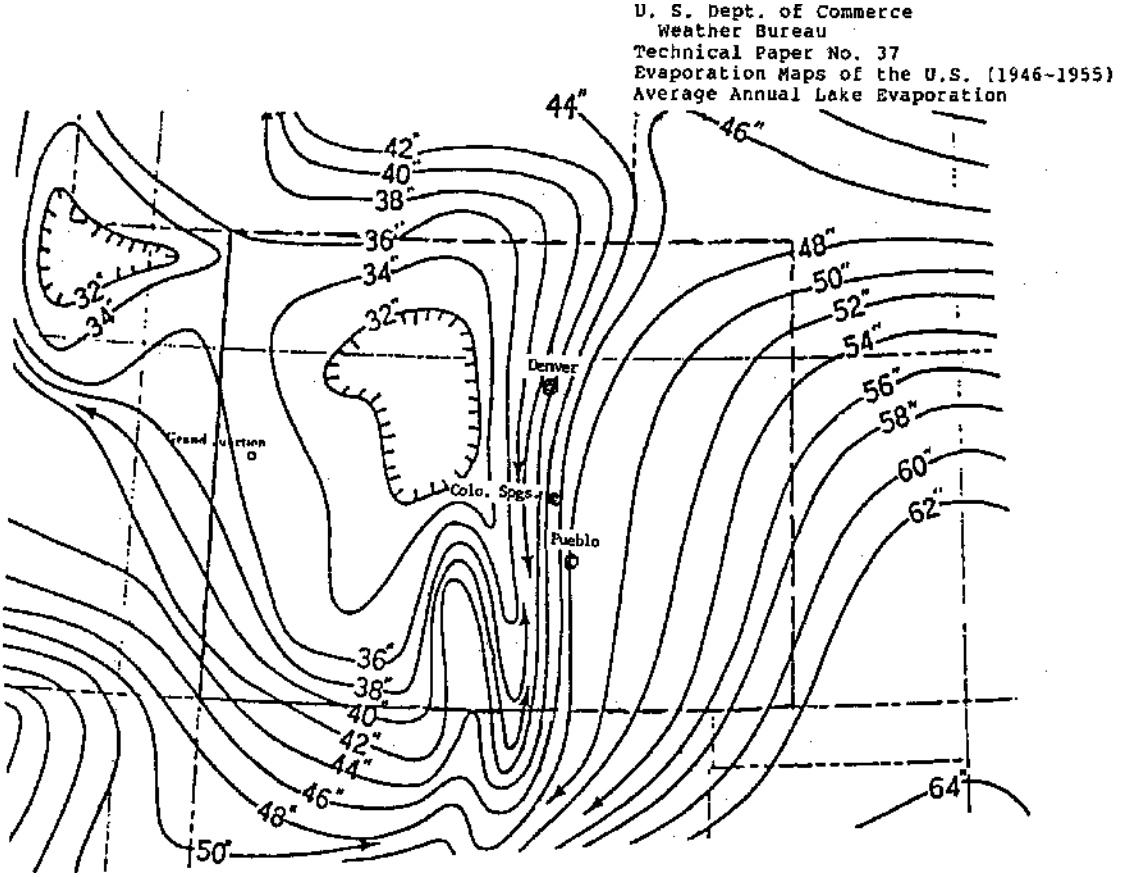
C. The applicant shall bear the burden of supplying the Board of Health with sufficient evidence to document that the denied system will be constructed and used in such a manner as to comply with the declaration and intent of these regulations, and all applicable State and local rules and regulations, and required terms and conditions in any permit issued pursuant thereto.

D. Such review shall be conducted pursuant to the requirements of Section 24-4-105, C.R.S.

(Note: These regulations were initially adopted by the El Paso County Board of Health October 1, 1973. Revised February 26, 1980, and effective April 12, 1980. Revised November 26, 1985, and effective January 11, 1986. Revised November 28, 1989, and effective January 12, 1990. Revised August 27, 1996, and effective October 11, 1996. Revised November 15, 2006, approved May 23, 2007, and effective: July 7, 2007. Revised February 15, 2011, and effective. June 27, 2011)

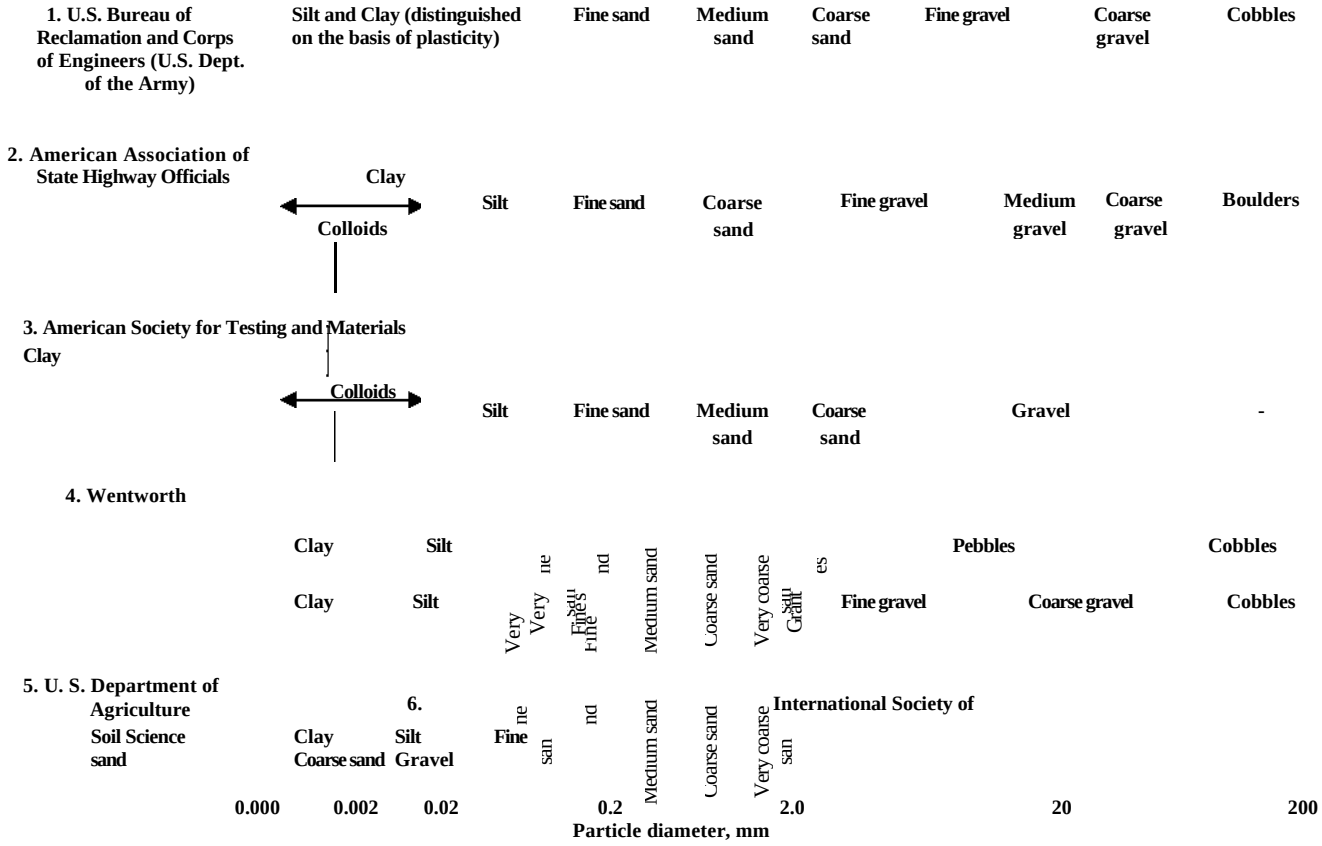
APPENDICES

APPENDIX 1: Evaporation Map - Average Annual Lake Evaporation



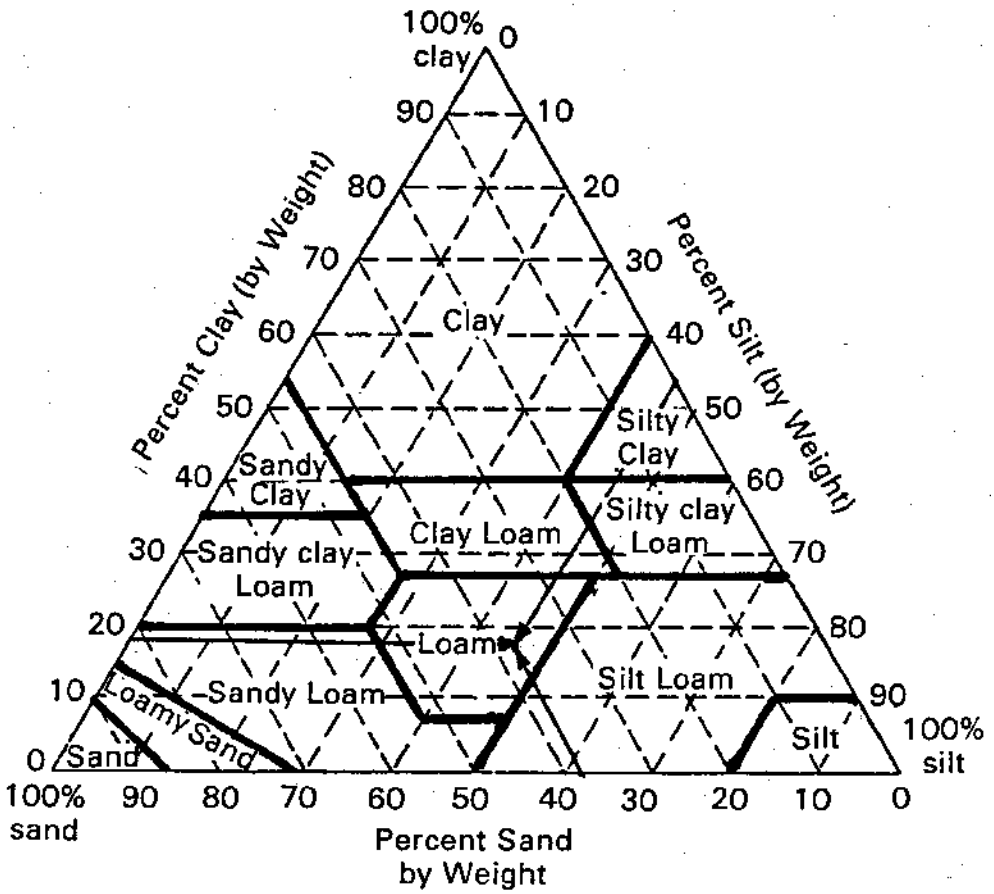
APPENDIX 2: Soil Classification System (Soil - Separation Size Limits)

NAMES AND SIZE LIMITS OF PRACTICAL-SIZE CLASSES ACCORDING TO SIX SYSTEMS



APPENDIX 3: Guide for Textural Classification

Textural Triangle Defining Twelve Textural Classes of the USDA
(Illustrated for a Sample Containing 37% sand, 45% silt, and 18% clay)



APPENDIX 4: Guide for Soil Compaction

The percent of relative compaction required will be equal to or greater than minimum values as shown in the following table for the various classes of soil and type of compaction.

Soil Classification AASHTO (M145)	*T99 Minimum Relative Compaction (%)	**T180 Minimum Relative Compaction (%)
A-1	100	95
A-3	100	95
A-2-4	100	95
A-2-5	100	95
All others	95	90

(Notes: * AASHTO - T99: Standard Test Procedure 5.5 lb. Rammer
**** AASHTO - T180: Standard Test Procedure 10 lb. Rammer**

1. **AASHTO: American Association of State Highway Transportation Officials**
2. **Source of Information: Soils Manual M. S. 10 - The Asphalt Institute**

APPENDIX 5: Geology

Section 34-1-201, C.R.S.: Definitions as used in this part, unless the context otherwise requires:

1. **GEOLOGIST: A person engaged in the practice of geology.**
2. **GEOLOGY: The scientific study of the origin, history, and structure of the Earth; investigation of the earth's crust and the rocks and other materials which compose it; and the applied science of utilizing knowledge of the earth's history, processes, constituent rocks, minerals, liquids, gases, and other materials for the use of mankind.**
3. **PROFESSIONAL GEOLOGIST: A person who is a graduate of an institution of higher education which is accredited by a regional or national accrediting agency, with a minimum of 30 semester (45 quarter) hours of undergraduate or graduate work in a field of geology and whose post baccalaureate training has been in the field of geology with a specific record of an additional 5 years of geological experience to include no more than 2 years of graduate work.**

(Source: L. 73, p. 610, Section 1; Section 51-3-1, C.R.S. 1963.)

Section 34-1-202, C.R.S.: Reports containing geologic information:

Any report required by law or by rule and regulation, and prepared as a result of or based on a geologic study or on geologic data, or which contains information relating to geology, as defined in Section 34-1-201(2), C.R.S., and which is to be presented to or is prepared for any state agency, political subdivision of the state, or recognized state or local board or commission, shall be prepared or approved by a professional geologist, as defined in Section 34-1-201(3). (Source: L. 73, p. 610, Sec. 1; Section 51-3-2, C.R.S. 1963.)

APPENDIX 6: Leach Area:

ABSORPTION AREA IN SQUARE FEET

PERCOLATION RATE	NUMBER OF BEDROOMS				
MINUTES	2	3	4	5	6
5	322	483	643	805	966
6	352	530	706	882	1058
7	381	571	762	952	1142
8	408	611	814	1018	1222
9	432	648	864	1080	1296
10	456	683	910	1139	1366
11	477	717	955	1194	1432
12	499	749	998	1246	1496
13	518	779	1038	1298	1557
14	539	808	1077	1347	1616
15	558	837	1115	1394	1674
16	576	864	1152	1440	1728
17	594	891	1187	1485	1781
18	611	917	1222	1528	1834
19	627	941	1256	1570	1883
20	643	966	1288	1610	1931
21	659	990	1320	1650	1979
22	675	1013	1350	1688	2026
23	691	1035	1381	1726	2072
24	706	1058	1411	1763	2117
25	720	1080	1440	1800	2160
26	734	1101	1469	1835	2203
27	749	1122	1496	1870	2245
28	762	1142	1523	1906	2286
29	776	1163	1550	1939	2326
30	789	1182	1578	1971	2366
31	802	1203	1603	2005	2405
32	814	1222	1629	2037	2443
33	827	1242	1654	2069	2482
34	840	1259	1680	2099	2518
35	851	1278	1704	2130	2555
36	864	1296	1728	2160	2592
37	875	1314	1752	2190	2627
38	888	1331	1776	2219	2662
39	899	1349	1798	2248	2698
40	910	1366	1821	2277	2720
41	922	1382	1845	2306	2766
42	933	1400	1867	2333	2800
43	944	1416	1888	2360	2834
44	955	1432	1910	2387	2866
45	966	1450	1931	2414	2898
46	976	1466	1954	2442	2930
47	987	1482	1974	2469	2962
48	998	1496	1995	2494	2994
49	1008	1512	2016	2520	3024
50	1018	1528	2037	2546	3054
51	1029	1542	2072	2571	3085
52	1038	1557	2077	2595	3115
53	1048	1573	2096	2621	3146
54	1058	1587	2117	2645	3174
55	1067	1602	2136	2671	3203
56	1077	1616	2155	2694	3232
57	1086	1630	2174	2718	3261
58	1096	1645	2194	2742	3290
59	1106	1659	2213	2765	3318
60	1115	1674	2230	2789	3346

APPENDIX 7: Type and Classes of Soil Structure

TYPES AND CLASSES OF SOIL STRUCTURE

	TYPE (shape and arrangement of peds)						
Class	Platelike, with one dimension (the vertical) limited and greatly less than the other two; arranged around a horizontal plane faces mostly horizontal	Prismlike, with two dimensions (the horizontal) limited and considerably less than the vertical; arranged around a vertical line; vertical faces well defined; vertices angular		Blocklike, polyhedronlike, or spheroids, or with three dimensions of the same order of magnitude, arranged around a point.			
				Blocklike; blocks or polyhedrons having plane or curved surfaces that are casts of the molds formed by the faces of the surrounding peds		Spheroids or polyhedrons having plane or curved surfaces which have slight or no accommodations to the faces of surrounding peds	
		Without rounded caps	With rounded caps	Faces flattened, most vertices sharply angular	Mixed rounded and flattened faces with many rounded vertices	Nonporous peds	Porous peds
	Platy	Prismatic	Columnar	(Angular) Blocky*	(Subangular) Blocky†	Granular	Crumb
Very fine or very thin	Very thin platy; <1 mm	Very fine prismatic; <10 mm	Very fine columnar; <10 mm	Very fine angular blocky; <5 mm	Very fine subangular blocky; <5 mm	Very fine angular; <1 mm	Very fine crumb; <1 mm
Fine or thin	Thin platy; 1 to 2 mm	Fine prismatic; 10 to 20 mm	Fine Columnar; 10 to 20 mm	Fine angular blocky; 5 to 10 mm	Fine sub ang blocky; 5 to 10 mm	Fine granular; 1 to 2 mm	Fine crumb; 1 to 2 mm
Medium	Medium platy; 2 to 5 mm	Medium prismatic, 20 to 50 mm	Medium columnar; 20 to 50 mm	Medium angular blocky; 10 to 20 mm	Medium subangular blocky; 10 to 20 mm	Medium granular; 2 to 5 mm	Medium crumb; 2 to 5 mm
Very coarse or very thick	Very thick platy; >10 mm	Very coarse prismatic; >100 mm	Very coarse columnar; >100 mm	Very coarse angular blocky; >50 mm	Very coarse subangular blocky; >50 mm	Very coarse granular; >10 mm	

Source: Soil Survey Staff 1960

*(a)Sometimes called nut. (b) The word "angular" in the name can ordinarily be omitted.

†Sometimes called nuciform, nut, or subangular nut. Since the size connotation of these terms is a source of great confusion to many, they are not recommended.

APPENDIX 8: NSF Standard 40

A copy of NSF Standard 40 can be reviewed at Public Health or at the Colorado Water Quality Control Division, Colorado Department of Public Health and Environment, 4300 Cherry Creek Drive South, Denver, Colorado 80222-1530.

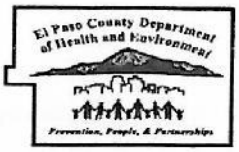
Coarse or thick	Thick platy; 5 to 10 mm	Coarse prismatic; 50 to 100 mm	Coarse columnar; 50 to 100 mm	Coarse angular blocky; 20 to 50 mm	Coarse subangular; 20 to 50 mm	Coarse granular; 5 to 10 mm

APPENDIX 9: Chart for Increased Gravel Depth Under Leach Pipe

Depth of Gravel Below Pipe in Inches	(Percentage of Length of Standard Trench) Trench Width 24 Inches	Trench Width 36 Inches
12	80	83
18	66	71
24	57	62
30	50	55
36	44	50
42	40	45

The standard absorption trench is one in which the filter material extends 2 inches above and 6 inches below the pipe. To use this table, use a trench 2 feet wide with 6 inches of gravel under pipe, 285 feet are required. If the depth of gravel is increased to 18 inches, keeping trench width at 2 feet, only 66% of 285 feet is required, or 188 feet.

APPENDIX 10: Sample Application



EL PASO COUNTY DEPARTMENT OF HEALTH & ENVIRONMENT

301 South Union Boulevard • Colorado Springs, CO • 80910-3123 •
(719) 578-3199 • Fax: (719) 578-3188

Record I.D. _____

**ALL PAYMENTS ARE DUE AT TIME OF SUBMITTAL IN CASH, CHECK, or MAJOR CREDIT CARD*

APPLICATION FOR AN ONSITE WASTEWATER SYSTEM PERMIT

☐NEW PERMIT ☐MINOR REPAIR PERMIT ☐MAJOR REPAIR PERMIT

Owner _____ Daytime Phone _____

Address of Property _____ City & Zip _____

Legal Description _____

Owner's MAILING Address _____ City, State & Zip _____

Lot Size _____ Tax Schedule # _____

Type of Building: ☐Frame ☐Modular ☐Mobile ☐Commercial ☐Manufactured ☐Other _____

Water Supply: ☐Well or Spring ☐Cistern ☐Public **Inside City Limits:** ☐No ☐Yes-City _____

☐**MAIL PERMIT - OR -** ☐**PICK UP PERMIT** ☐ **FAX - FAX TO AND #** _____

MAXIMUM POTENTIAL NUMBER OF BEDROOMS_____

Percolation Test Attached Y N Basement Y N Garbage Disposal Y N Clothes Washer Y N

I have supplied a plot plan as described on the back of this form. I acknowledge the completeness of the application is conditional upon such further mandatory and additional tests and reports as may be required by the Department to be made and furnished by an applicant for purposes of evaluating the application, and issuance of the permit is subject to such terms and conditions as deemed necessary to ensure compliance with rules and regulations adopted pursuant to C.R.S. 25-10-107 et. seq. I hereby certify all represented to be true and correct to the best of my knowledge and belief, and are designed to be relied on by the El Paso County Department of Health and Environment in evaluating the same for purposes of issuing the permit applied for herein. I further understand any falsification or misrepresentation may result in the denial of the application or revocation of any permit granted based upon said application and in legal action for perjury as provided by law.

OWNER'S/OWNER'S AGENT SIGNATURE _____ **Date** _____

You will be notified by telephone when your permit is ready for pick up. Please allow a minimum of 10 days for new septics.

DEPARTMENT OF HEALTH USE ONLY

Minimum Tank Capacity	Minimum Absorption Area	Date of Site Inspection
_____	_____	_____

REMARKS_____

EHS INSPECTOR _____ DATE _____ APPROVED _____ DENIED_____

CURRENT FEES AS APPROVED BY EL PASO COUNTY BOARD OF HEALTH

New Permit: $306.00 EPCDHE Charge + $23.00 CDPHE Surcharge + $147.00 EPC Planning Surcharge = $476.00

Major repair permit: $344.00 EPCDHE Charge + $23.00 CDPHE Surcharge = $367.00

Minor repair permit: $141.00 EPCDHE Charge + $23.00 CDPHE Surcharge = $164.00

DATE TO LAND DEVELOPMENT/WASTEWATER:_____

DATE TO FLOODPLAIN/ENUMERATIONS:

PLEASE COMPLETE THE BACK OF THIS FORM

V. 12/22/2010

1) We require an original of your **PERCOLATION (PERC) TEST** with an original licensed engineer's (PE) stamp and signature as well as a plot of the percolation test hole locations with measurements from a fixed reference point. (A faxed copy directly from the engineering firm to this office is acceptable.)

2) **PROPERTY ADDRESS OR LOT NUMBER MUST BE POSTED AND CLEARLY VISIBLE FROM ROAD. PERC HOLES MUST BE CLEARLY MARKED OR AN ADDITIONAL CHARGE FOR A RETURN TRIP TO THE SITE MAY BE ASSESSED.**

3) A PLOT PLAN must be drawn (not to scale) on an 8 ½ x 11 inch sheet of paper. The plot plan must include:

1) a north bearing
2) property lines
3) property dimensions
4) all buildings (proposed or existing)
5) proposed septic system site
6) alternate septic system site
7) driveway (proposed or existing and name of adjoining street)
8) Distance of percolation test to two property lines.

4) Initial any of the following features that apply to your property and **INCLUDE them on your PLOT PLAN.**

_____ Well(s)
_____ Cistern
_____ Adjacent property well(s)
_____ Water line
_____ Subsoil drain

5) Initial any of the following that are within 100 feet of your proposed septic system and **INCLUDE on your PLOT PLAN.**

_____ Spring(s)
_____ Pond(s)
_____ Dry Gulch(es)
_____ Lake(s)
_____ Stream(s)
_____ Natural drainage course(s)

6) GIVE COMPLETE DIRECTIONS TO THE PROPERTY FROM A MAIN HIGHWAY

V. 12/22/2010

APPENDIX 11: "Infiltrator" and "BioDiffuser" Absorption Area Sizing

There are several types of gravelless chambers used in El Paso County for onsite wastewater systems. Each type has its own specific square footage allowance. Each type of chamber may be installed in a trench or a bed configuration.

1. **15.5 square feet of absorption area per standard (3 feet by 6 feet) chamber, regardless of configuration.**
2. **Existing Colorado Department of Public Health and Environment approved square footage reductions will be reduced to a maximum of 40% in trenches, 25% in bed configurations.**
3. **Residential gravelless systems shall have a minimum of 465 square feet (18 standard chambers in a trench configuration), (23 standard chambers in a bed configuration). If other types of chambers are used, the equivalent number of chambers must be installed that is equal to the standard chamber square footage.**
4. **The use of a reduction in soil with a percolation rate slower than 1 inch in 60 minutes is not allowed.**

APPENDIX 12: Identifying System Failures

Onsite wastewater systems often give signs of problems before a complete failure occurs. Identifying these signs may give the homeowner an edge on preventing total system failure. Improperly functioning toilets, and slow running shower and sink drains usually indicate restricted water flow through the septic system. Inspection of your septic tank would be the first step in finding the problem. Watch for pooled water or saturated soil near the area of your absorption field. This usually indicates a non-functioning or saturated field. Often, when pooled water is not surfacing, a septic odor may be the only indicator of failure.

Approved by the Board of Health Jan. 21, 2009
Modified to remove "Septic" on the title page, change phone number, Aug. 30, 2010, MGR Modified for name change to El Paso County Public Health, Feb. 15, 2011.DSS