SAN • JUAN • BASIN

HEALTH

DEPARTMENT

ON-SITE WASTEWATER SYSTEM REGULATIONS 2011

(effective January 5, 2011)

This Regulation was originally adopted by the Board of Health in 1967.

Amended in 1973, 1974, 1981, 1986, 1989, 1997, 2003, 2006, and 2011.

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ON-SITE WASTEWATER SYSTEM REGULATIONS
SAN JUAN BASIN HEALTH DEPARTMENT

SECTION 1. TITLE AND POLICY

1.1 Title

These Regulations previously known as the On-Site Wastewater System Regulations (O.S.W.S.) 2006 shall be known as the On-Site Wastewater System Regulations (O.S.W.S.) 2011.

1.2 Policy

The San Juan Basin Health Department Board of Health declares the purpose of these Regulations is to protect the physical, mental, and environmental health of the people, to control communicable diseases and to regulate wastes from dwellings, businesses, industrial sites, and public buildings to protect water quality and the public health. These Regulations shall be applicable throughout Archuleta, La Plata and San Juan Counties and shall be enforced by the San Juan Basin Health Department and the Board of Health (SJBHD). These Regulations are designed to control the design, construction, location, and operation of on-site wastewater systems, the transportation, treatment and final disposal of sewage materials, and work performed by designers and installers of such systems.

The Board of Health declares its general policy is to require the use of public sewer systems where and whenever feasible, and to limit the installation of on-site wastewater systems to areas where public sewers are not feasible.

The local Board of Health has variance authority, in accordance with procedures established by the Colorado State Board of Health and authorized under Title 25, Article 10 C.R.S. 1973, as amended.

SECTION 2. DEFINITIONS

Absorption Lagoon: A reservoir which receives treated effluent for storage, evaporation and disposal. As of January 27, 2003, no on-site wastewater system permits will be issued for the installation of absorption lagoons.

Absorption System: A wastewater disposal or leaching field and adjacent soils or other systems for the treatment of sewage in an on-site wastewater system by absorption into the ground, this may include evapotranspiration.

Absorption Trenches: One or more trenches, not over three feet in width, in which sewage effluent is percolated into the soil.

Acceptable Design: A design of a tank, treatment plant, or system that meets the review criteria of San Juan Basin Health Department (SJBHD).

Adequate On-Site Wastewater System (OSWS): A system that is functioning in compliance with these Regulations and does not create a threat to the public health, a public nuisance or unnecessary pollution to the environment.

Advanced Treatment Unit (ATU): A treatment method using media and oxygen to reduce the biological oxygen demand of the sewage effluent leaving the treatment tank. Also, a treatment process that provides effluent quality in excess of primary treatment prior to discharge.

Alteration: Physically changing an onsite wastewater system by lengthening, shortening, widening, building over, or changing flows into the system by adding flow, living quarter, structures, or changing the use in a manner as to alter the wastewater system and prior specifications for which the system was originally permitted.

Applicant: A person who submits an application to install, construct, alter or repair an on-site wastewater system.

Approved: Official consent, given in writing, accepting completion by the San Juan Basin Health Department.

Authorization to Construct: Signatory authorization to begin a new or altered system installation.

Bedrock: A consolidated rock formation of impervious material, which may exhibit a jointed, fractured, or cohesive structure. It shall also include the above material in a decomposing state.

Board of Health: The officially appointed governing body of the San Juan Basin Health Department.

BOD5: (five day biochemical oxygen demand) The quantity of oxygen used on the biochemical oxidation of organic matter in 5 days at 20 degrees centigrade under specified conditions and reported as milligrams per liter (mg/L).

Building Sewer: 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, on-site wastewater system or other point of disposal.

CDPHE: Colorado Department of Public Health and Environment, hereafter called “CDPHE”. The state-level health department located at 4300 Cherry Creek Drive South, Denver, Colorado 80246-1530.

Cesspool: An underground receptacle, which receives untreated sewage from a building and permits the untreated sewage to seep into surrounding soils. Cesspools are prohibited in the state of Colorado.

Cluster Developments: A planned community where residences, or building envelopes, are grouped or clustered together, to facilitate efficient use and construction of shared infrastructure, within a parcel of greater size resulting in protected areas of contiguous open space.

Community Water System: A water system serving more than 15 taps or 25 people and being managed by a “Certified Operator” and approved under the permitting process of CDPHE.

Competent Technician: A person designated by the San Juan Basin Health Department who is qualified to conduct and interpret the results of a site evaluation and/or percolation test and design standard systems.

Composting Toilet: An approved 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.

Construction Inspection: An inspection of an assembled system, including field tests of pressurized systems, completed prior to backfill.

Constructed wetlands: A system, which utilizes various wetland plants to provide secondary treatment of wastewater through biological, physical and chemical processes.

Contour: A line drawn on a map connecting points of equal elevation (or value).

Continuous Supply of Water: Wells, municipal water systems, or any other water supply that provides an adequate quantity without hauling.

Department: The San Juan Basin Health Department.

Design Flow: The design flow is 150% of average daily flow as calculated by methods presented in these Regulations.

Dispersal System: A system for the disposal of effluent after final treatment in an on-site wastewater system by a method which does not depend upon or utilize the treatment capability of the soil.

Distributor: The seller and/or installer of aerobic sewage treatment systems, or septic systems or components for those systems.

Distribution Box: A watertight chamber, which receives wastewater from a septic tank or other primary treatment unit and from which effluent is distributed equally to individual laterals.

Division: The Environmental Health Division of San Juan Basin Health Department.

Dosing: A timed or volume based method of delivering effluent to a drainfield system.

Dosing Tank: A separate tank, which stores wastewater from a septic tank, intended to be discharged to a disposal area at a high periodic rate utilizing pressure (e.g., pump or siphon).

Dry Gulch: A natural swale or other drainage that carries water typically only during storm events and periods of runoff.

Drywell: A type of soil absorption system dependent upon suitable soil, filled with gravel and containing a system of approved distribution which is designed on the basis of sidewall and bottom absorption area.

Effective Size: A granular media that is sized such that not more than 10% of the media, by weight, is finer than the size specified.

Effluent: The liquid waste discharge from an on-site wastewater system or treatment tank.

Environmental Health Specialist: A person who is trained in physical, biological, and /or sanitary science to carry out duties in the field of environmental health.

Evapotranspiration (E.T.) System: A type of dispersal system that wholly or partially utilizes liquid evaporation and transpiration by vegetation as a means of effluent disposal.

Experimental System: Any new device or design on which further testing is required in order to provide sufficient information to determine the acceptability of the system.

Final Inspection: An inspection conducted by the Sanitarian to verify compliance with the permit instructions and design specifications upon completion of system installation. Approval, signifying a satisfactory Final Inspection, is required to obtain the certificate of occupancy (C.O.) from the County Building Department .

Floodplain, 100 Year: An area adjacent to a natural water course that is subject to flooding as the result of the occurrence of a one hundred (100) year storm, and is so adverse to past, current or foreseeable construction or land use as to constitute a significant hazard to public or environmental health and 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 Professional Engineer shall certify the floodplain elevation and/or location.

Floodway: That area of the floodplain in which the channel of the watercourse and those portions of the adjoining floodplain must be reserved 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 Professional Engineer shall certify the floodway elevation and/or location.

Geotextile: A synthetic fabric material, woven or non-woven, which may be used as a treatment surface, biomat formation (as used in geotextile sand filters (GSFs)), or used as cover over installed aggregate to maintain separation of backfill from the void zone in a drainfield system.

Geotextile Sand Filter (GSF) System: An in-situ filtration method of treatment using pre-assembled vertically pleated geotextile fabric sections over a bed of sand. Also known as Eljen pads.

Grey Water System: A system designed to collect, treat and dispose of liquid wastes from sinks, lavatories, tubs, showers and laundry or other approved plumbing fixtures excluding toilet fixtures.

Groundwater Table: The upper surface of groundwater in the zone of saturation of geologic formation.

Health Officer: The chief administrator and executive officer of the Department or his/her authorized representative.

Holding Tank: A watertight receptacle for the retention of sewage either before, during or after treatment.

Individual Sewage Disposal System: ("System" or "ISDS") A system for collecting, storing, treating, neutralizing, stabilizing, or disposing of sewage which is not a part of or connected to a sewage treatment works. Presently defined as an on-site wastewater system (O.S.W.S.).

Legacy Lot: A legal un-built, historic residential lot of one-half to less than one-acre in size, that does not meet one-acre minimum density requirements for a standard system.

Lateral terminal irrigation ditch: An irrigation ditch serving only the property being developed and does not flow through to any other property. The ditch is used only during times of active irrigation.

Limited Use Occupancy: The occupancy of a structure, dwelling, or property as a residence on less than a full-time, year round basis, i.e. no more than 90 consecutive days or a total occupancy of 120 days per calendar year.

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

Long Term Acceptance Rate (LTAR): The rate at which an effluent of a given quality can be applied to a specific soil, described further in rule 5.5.J.

Lot: A designated parcel, tract or area of land established by subdivision or as otherwise permitted by law, to be used, developed or built upon.

Lot Layout: A plan view site-sketch suitable for submittal with an application for OSWS. Suitable styles include plan views, plot plan, survey, I.L.C., aerial photographs, and sketches. Approximate scale and the location of proposed OSWS improvements and water supply infrastructure are required.

Malfunction or Malfunctioning System: An on-site wastewater system which is not operating properly or is not in compliance with the Colorado Individual Sewage Disposal Systems Act (Title 25, Article 10 C.R.S. 1973, as amended). Malfunctioning systems are described further in rule 3.17.A.

Manufacturer: The person or firm that constructs or assembles on-site sewage treatment system components.

Mound: A system elevated on fill material above original grade, typically applied to increase the separation between the system and limiting zones such as bedrock or groundwater.

On-Site Wastewater System (O.S.W.S.): A system for collecting, storing, treating, neutralizing, stabilizing or disposing of sewage which is not a part of or connected to a sewage treatment works.

Owner: The person who is owner of record of the land on which an on-site wastewater system is to be designed, constructed, installed, altered, or used.

Percolation Test: A soil test at the depth of a proposed absorption system, or other similar component, of an on-site wastewater system to determine the water absorption capability of the soil, the results of which are normally expressed as the rate at which one inch of water is absorbed.

Permeability: The property of a material which permits movement of water through the material.

Permit: A document issued by San Juan Basin Health Department authorizing the construction, alteration, installation, repair, and/or use of an on-site wastewater system.

Person: An individual, partnership, firm, corporation, association or other legal entity and also the state, any political subdivision thereof or other government entity.

Plat: An accurate drawing or map indicating the dimensions, acreage and location of property lines, buildings, wells, on-site wastewater systems, water courses, geographical features and other pertinent information as required.

Privy: A structure, allowing for the disposal of human excreta into a pit in the soil which provides privacy and shelter, and prevents access to the excreta by flies, rodents, or other vectors. These O.S.W.S. Regulations prohibit earthen pit privy installation. Vaulted privy's of concrete may be permitted under the circumstances described in rule 6.3.

Professional Engineer (P.E.): An engineer licensed in the state of Colorado in accordance with Section 12-15-111, C.R.S. 1973.

Qualified Professional: A registered or certified professional. In addition to engineers, examples include professional geologists, geotechnical professionals, hydro-geologists, sanitarians, soil scientists, and others who can perform percolation tests, limited site evaluation tasks, or inspections at the behest of a P.E., property owner, or the Department.

Repair Permit: Issued when repair to an existing system must be completed due to a malfunctioning system or mechanical components (filters, tanks, or piping) and inert components (e.g., berms, cover, or bedding). Not to be used for replacement systems or altering a system to accommodate increased flows or treatment.

Residential Strength Wastewater: Effluent from a septic tank or other treatment device with a BOD5 less than or equal to 300 mg/L, TSS less than or equal to 150 mg/L, and fats ,oils, and grease less than or equal to 25 mg/L.

Sand Liner: A subsurface system component, which utilizes wastewater filtration or absorption or both, which contains an intermediate layer of sand as filter material.

Sandy Soil: A soil having a high sand content, high infiltration rate, and a high rate of water transmission.

Sanitarian: (Environmental Health Specialist) A person who is trained in physical, biological and/or sanitary science to carry out duties in the field of environmental health.

Seepage Bed or Absorption Bed: A subsurface soil absorption area which is wider than three (3) feet, together with a system of approved distribution piping or gravel-less chambers through which effluent may seep, leach or infiltrate into the surrounding soil.

Seepage Pit: A type of soil absorption system dependent upon suitable soil, containing a structural, internal void, and designed on the basis of sidewall area.

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.

Serial Distribution: An arrangement of absorption trenches, seepage pits or seepage beds designed so that effluent is retained in each successive component designed to utilize the total effective absorption capacity of that component before flowing into the succeeding component.

Septage: A liquid or semisolid which includes normal household wastes, human excreta, animal or vegetable matter in suspension or solution generated from a residential septic tank system or from a commercial establishment that can demonstrate to the Department its septage meets the definition. Septage does not include chemical toilet residuals.

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 which is discharged from a dwelling, building, or other structure.

Sewer Line: A pipe or piping system capable of conveying sewage.

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 two thousand gallons of sewage per day, unless designed as an absorption system. The term "sewage treatment works" includes appurtenances such as interceptors, collection lines, outfall and outlet sewers, pumping stations, and related equipment.

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

Steep slope analysis: Includes a description of stability under increased hydraulic loading and potential for effluent breakout or creep on ground surface.

Standard System: A system containing a septic tank, drainfield, and a gravity or pressurized distribution system generally utilized where percolation rates range from 5 to 60 minutes per inch.

Steep Slope: A slope greater than 25%.

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 the percolation test requirements and has a vertical thickness of at least four feet below the bottom of the absorption area.

Systems Cleaner: A person who is engaged in the cleaning and pumping of on-site wastewater systems and removal of the residues deposited in the operation thereof; who is licensed by the Department.

Systems Contractor: A person engaged in the installation, renovation, and repairs of on-site wastewater systems; and who is licensed by the Department.

Temporary Emergency-Use Permit: A permit issued to provide relief for a violation, malfunction, or situation where it is not possible to properly remedy the situation immediately. The period of validity is described in rule 3.17.

TSS (total suspended solids): Solids in sewage that can be removed readily by standard filtering procedures and is reported as milligrams per liter (mg/L).

Uniform Pressure Distribution: A distribution technique using a pump or dosing siphon to provide even application of sewage effluent throughout the disposal area (as defined by a ten percent margin of variance and verified through hydraulic testing).

Uniformity Coefficient: The value which 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 would be considered "uniform" for purposes of this regulation).

Vault: A watertight, tank, approved by the Department, 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.

WQSA Policy #6: A CDPHE policy regulating densities of Onsite wastewater systems in larger business or residential clustered applications, where sewage flows are combined, the combined flows exceed 2,000 gallons per day, and the systems are separated to avoid a “Site Application” requirement from CDPHE.

SECTION 3. ADMINISTRATION AND ENFORCEMENT

3.1 General Sanitation Requirements

The owner of any structure where people live, work, or congregate shall insure that the structure contains adequate, convenient, sanitary toilet and on-site wastewater systems in good working order. Under no condition shall 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 this Regulation or the Water Quality standards of the Colorado Water Quality Control Commission (WQCC), whichever is applicable.

3.2 Inspections and Right of Entry

For the purpose of inspection and enforcing applicable rules and regulations and the terms and conditions of any permit issued, the Health Officer or his designee is authorized to enter upon private property at reasonable times and upon reasonable notice for the purpose of determining whether or not operating on-site wastewater facilities and systems are functioning in compliance with Title 25, Article 10 C.R.S. 1973, as amended, and applicable rules and regulations adopted pursuant thereto 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 on-site wastewater system shall permit the Health Officer or his designated agent access to the property to conduct required tests, take samples, monitor compliance, and make inspections.

3.3 Permit Application Requirements

A. Any person who wishes to install, alter, or repair an on-site wastewater system in Archuleta County, La Plata County, San Juan County, Colorado, or any other areas of authority, shall obtain a permit from the Health Officer and shall furnish the following information to the Health Officer prior to commencing any work on the system.

1. Legal description of the property.
2. Owner of the property.
3. Owner's mailing address and phone number.
4. County Parcel Number.
5. Systems Contractor name, address, and phone number.
6. Building permit application, when required.
7. Lot Layout (also known as plot plan or site plan)
8. Proposed use of building and property.
9. Type of water supply.
10. Applicant's signature.

B. In addition to the requirements of 3.3.A, prior to issuing the permit, the following information may be required:

1. Type of soil or soil classification.
2. Soil percolation (performed by a Qualified Professional) or hydraulic conductivity tests when necessary to the design of the disposal system.
3. Proximal location of bedrock.
4. Proximal location of the ground water table and seasonal high water level.
5. Type of the on-site wastewater system.
6. Defined area of the floodplain.
7. Design of the on-site wastewater system.
8. Such additional information as may be required by the Health Officer to assess suitability (e.g., surveys, topography maps, adjacent property information, soil studies, supporting rationale, published professional literature, Federal or state guidance).
9. All existing O.S.W.S. on the lot must be in compliance before the requested permits are issued for the additional system.

C. An on-site wastewater system permit shall be required for expanded use of an existing system. The system shall meet all current requirements. This includes any alteration to accommodate a recreational vehicle or other alteration of an original design or construction that results in increased flow or new configuration.

D. A permit fee shall be required of applicants for installation, alteration or repair of all on-site wastewater systems, payable at the time the application is submitted, revised, or updated. The fee shall not exceed that which is allowed by Title 25, Article 10 C.R.S. 1973, as amended. This fee shall be based on the average cost to the local health department for processing applications during the preceding calendar year. Any change in the ownership of a property, lot size, or in the intended use of a proposed sewer system may invalidate any permit issued for systems not yet installed.

E. Such permit fees, per Title 25, Article 10 C.R.S. 1973, as amended, are deemed necessary to properly process the request and therefore are not refundable except when the processing cost is less than the permit fee. Fees shall equal cost. An approved permit is valid for one year. Failure to fully complete an engineered design or the installation of any approved system within two years shall render the permit void or additional [current fee] charges.

F. A repair permit shall be required and a fee shall be charged for repair of an existing on-site wastewater system. If soil testing is performed by the Department, an additional fee shall be charged.

G. If conditions allow for the connection of a second structure, an alteration permit shall be required for the addition to an existing on-site wastewater system. Second dwellings may not be added to an existing lagoon.

H. The Department shall determine after review of the application, site inspection, test results, and other required information, whether the proposed system is in compliance with the requirements of applicable law and these Regulations. If determined to be in compliance, a permit to construct, alter or repair an on-site wastewater system will be issued.

I. One original complete engineering submittal, in hard copy, shall be submitted to the Department. Electronic submittals will not be printed or receive final approval. Professional engineer submittals shall include the following exhibits and be presented in the following format:

    1. Project Description.
    2. Site Vicinity Map.
    3. Lot Layout (including, but not limited to; property lines, water supply systems, disposal systems, wells, streams, lakes, ditches, structures, and other geographical features, including neighboring wells, water lines, and OSWS within 100 feet of the subject property.
    4. Notes, Calculations, and Specifications.
    5. Hydraulic Design where applicable (dosing and advanced treatment commonly require a hydraulic design).
    6. Font size must be 10 point or larger. Professional drawings are to be submitted on 11 x17” or 8.5 x 11” sheets. Drawings and calculations

should be on separate sheets when necessary as drawings that contain crowded excessive notes will not be reviewed.

7. Results of test-hole observations and percolation tests. Raw field data and logs may be requested. Locations of test and percolation holes must be illustrated and dates of the field observations must be included.

3.4 Acreage Requirements

A. Regardless of the acreage, no permit will be issued for an on-site wastewater system if there is not suitable space on the lot for 100% replacement of the original system when it fails.

B. Density of single-family-dwellings with onsite wastewater systems shall not exceed one per acre, with one exception. Legacy Lots, those lots platted historically which are (1/2) one-half to less than (1) one-acre in size, may be permitted provided the following site and treatment criteria are addressed:

1. The Legacy Lot was created historically, prior to year 2000.

2. All specifications, setbacks and site evaluation criteria as described within these Regulations must be compliant.

3. Water supply, on one-half to three-quarter acre lots may need to be sourced offsite (such as shared well, community system, or hauled water). An on-site wastewater system may be permitted in conjunction with an individual well only after Department examination and approval of site conditions, testing, and determination of the likely direction of groundwater flow.

4. Dosing and advanced treatment may also be required and is dependent on site conditions which affect onsite treatment or endanger water resources. These conditions include, but are not limited to; coarse soils or shallow water table, proximity or capacity to influence nearby waterways or fractured bedrock, and density of the neighboring OSWS(s) and thus potential to impact the underlying aquifer.

C. The on-site wastewater system must be on the same lot as the origin of the sewage unless excepted as specified under rule 3.14.D.

D. When necessary, consolidated or combined lot size must total a minimum of one acre and meet the requirements of rule 3.14 of these Regulations. Lots must be consolidated though the county planning process prior to the issuance of an on-site wastewater system permit.

E. Any land use change must meet county Planning and Building requirements prior to O.S.W.S. permit application submittal. All lot consolidation issues must be approved by the county planning department and properly executed prior to permit final approval.

F. Lots with existing habitable structures that are less than one acre are entitled to a permit to bring failing or malfunctioning on-site wastewater systems into compliance with these Regulations. The permit shall allow for a residence with an equal number of bedrooms as the existing residence. Lots less than one acre that have become vacant or have an uninhabitable residential structure (for greater than one-year) no longer qualify for a permit for an on-site wastewater system with one exception. Legacy Lots will be examined for suitability as described in rule 3.4.B above.

G. Dwellings must have an on-site wastewater system designed for a minimum of two (2) bedrooms.

3.5 Preliminary Investigation

After receiving an application for an on-site wastewater system permit, the Sanitarian shall review any information provided by a P.E., and/or visit the applicant's property to make a preliminary investigation and site evaluation report on behalf of the Department consisting of:

A. Inspection of the premises.

B. Verification of soil percolation or hydraulic conductivity tests.

C. General geological conditions.

D. The determination of the suitability of the site and of the proposed design based upon the land use in the area, the use to which the property is to be put; the size of the lot; verification of the ground water table, suitable soil, and depth to bedrock; the location of water supply systems; and the location of the disposal system with reference to wells, streams, lakes, ditches, structures, and other geographical features, including neighboring wells, water lines, and OSWS within 100 feet of the subject property.

E. When specific evidence indicates that subsurface conditions exist that may endanger the state waters, additional hydrological, geological, or engineering information provided by a Professional Engineer or Geologist, may be required.

F. When the Department has sufficient information to make one or more provisions of this section unnecessary, it may waive any or all of the above.

3.6 Types of On-site Wastewater Systems

A. The Department shall determine the type or types of on-site wastewater systems, which are suitable for the property. The Department may give a conditional approval for a permit for the proposed on-site wastewater system, or may deny issuance of a permit if the proposed system does not comply with these Regulations. Conditional approval shall set forth conditions for the issuance of a permit including effluent testing, cleaning or maintenance schedules, or other special conditions.

B. No permit shall be issued to the applicant or to a subsequent owner until the conditions have been met. No permits shall be issued for the following systems unless they are designed by a Professional Engineer and have been reviewed and approved by the Department:

1. Commercial systems which service business, institutions, industry, or multifamily dwellings (income properties) unless disposal is through an absorption system and the wastes are exclusively domestic type wastes. This exception can be reviewed by the Department.

2. Unsuitable soil. Absorption fields for which the location does not meet suitable soil requirements, or exceeds twenty-five percent slope, or contains shallow groundwater or shallow bedrock.

3. Experimental systems.

3.7 System Design – Greater than or Equal to 2000 Gallons per Day

Site approval and a discharge permit from the Colorado Department of Public Health and Environment (CDPHE) are required for a system with design capacity greater than or equal to 2,000 gallons per day.

If either the Department or the CDPHE disapprove of the application, no permit shall be issued. (See Section 10, Effluent Discharged to State Waters).

3.8 Permit Expiration

If both a building permit and an on-site wastewater permit are issued for the same property, and construction is not commenced prior to the expiration date of the building permit, the on-site wastewater permit shall expire at the same time as the building permit. If an on-site wastewater permit is issued for property on which no building permit has been issued, the on-site wastewater permit shall expire one year after the date of issuance if construction has not commenced or ownership has changed.

Any change in plans or specifications after the permit has been issued invalidates the permit, unless approval is secured from the Health Officer for such changes and noted on the permit. An expired permit may be extended or renewed under the following conditions:

A. There has been no change in the plans and specifications of the proposed system as set out in the original application; and

B. The use and applicable land use regulations of the lot and surrounding land, have not changed so as to cause the original application not to be acceptable under these Regulations; and

C. Additional fees may be charged for changes in design or location requiring additional site inspections and data evaluation.

D. An expired permit may not be extended to obsolete designs inconsistent with current regulations or suitability of the site.

3.9 Owner Responsibility

The property owner shall be responsible for proper installation and maintenance of the system and for abatement of any nuisance arising from its failure. The issuance of a permit and specifications of terms and conditions therein shall not constitute assumption or create a presumption that the Department or its employees may be liable for the failure of any system nor act as a certification that the equipment used in the system or any component thereof used in its operation or that the system for which the permit was issued insures continuous compliance with the provisions of Title 25, Article 10 C.R.S. 1973, as amended, the rules and regulations adopted thereunder, or any terms and conditions of a permit. Also see rule 3.22.

3.10 Certification of Existing O.S.W.S.

When requested by an individual or lending agency, the Department will make an inspection of the existing on-site wastewater system to determine if the system is functioning properly.

A. Systems older than 4 years of age in continual usage shall have the septic tank pumped, and the lid or covers replaced, but left exposed for inspection prior to approval. If the tank has been pumped within the last two years and verified by a pumping receipt, the pumping requirement may be waived.

B. A letter describing the observable condition and operation of the system will be issued. This letter does not imply any warranty on the part of the Department as to the overall condition or adequacy of the on-site wastewater system.

C. Statement of Existing (SOE – an affidavit): An SOE may be used by the Department to document the existence of a previously unknown, non-permitted O.S.W.S. Such O.S.W.S. must comply with applicable statutory and regulatory requirements. The SOE is a statement of the known system specifications provided by the owner to the Department. An SOE is not a permit and a permit may still be in order, following agency receipt of the SOE and site evaluation by the Department.

3.11 Inspections

A. Preliminary Inspections

The systems contractor or owner shall initiate the site evaluations and percolation tests by request. The site evaluations/percolation tests will be scheduled by mutual agreement with Department personnel. The Department will keep the results of tests and evaluations so long as it keeps such records.

B. Construction Inspections

1. The System Contractor or owner shall notify the Department when construction of an on-site wastewater system has been completed but not yet backfilled, and a representative of the Department may make a construction inspection within two working days or at a later time by mutual agreement. The Department may make an inspection at any time during the construction process. If the construction inspection is not made within the two working days following receipt of notice, or as otherwise arranged, the System Contractor may proceed to cover or complete the installation.

2. If upon inspection of the system the Sanitarian finds it has been installed in accordance with these Regulations and the permit, the Sanitarian shall issue approval for the system construction.

C. Final Inspection

If the Sanitarian's inspection(s) disclose any significant departure from information submitted on the application, or if any aspect of the system fails to comply with permit specifications or these Regulations, approval shall be withheld by the Department. Written or verbal notice of deficiencies causing the disapproval shall be given to the systems contractor. Upon notification by the contractor (or owner if applicable, as

in an owner install), that the deficiencies have been corrected and the system brought has been into compliance with these Regulations, a re-inspection will be made by the Department. A re-inspection fee shall be due and collected from contractor at this time.

If the system has been designed by or constructed under the supervision of a Professional Engineer (P.E.), the P.E. shall at this time provide an as-built drawing (within 10-days) and certify to the Department that construction, installation, and backfill of the system has been completed in accordance with the terms of the permit and these Regulations.

Once the as-built drawings and the engineer's certification have been received, the Department shall issue final approval. If an engineer's certification is not required, the Department shall issue final approval once the system is completed and backfilled in accordance with the Regulations and deficiencies if any, have been addressed and approved.

3.12 Right to Appeal

A. Notice of Denial

The Department will provide notice of the denial of a permit or disapproval of plans to the applicant (or P.E., as necessary) typically within 21 days of the site evaluation or receipt of a proposed design. The owner/applicant (or P.E.) may appeal in writing to the Department's Environmental Health Director in order to resolve, address, or correct noted deficiencies. Appeal to the Health Officer, may also be made if the denial stands or is not resolved by the Environmental Health Director.

B. Appeal to the Board of Health

Any person who is denied a permit or whose plans for an on-site wastewater system are disapproved by the Department may appeal to the Board of Health, within 60-days of receiving notice of denial, for review as provided herein:

1. A written statement explaining the request for review. This statement shall include the following:
    a. Property owner's name and address of the site.
    b. The proposed use of the property.
    c. The reason the review is requested, specifying hardships imposed by strict interpretation of these Regulations.
    d. Proof that existing systems are functioning properly and in compliance with applicable local regulations.

Note: Hardships must be an attribute of the property, not to a person or owner.

2. A site map(s), including the following:
    a. General location of the property.
    b. An ACCURATE drawing of the lot, adjoining lots and any property within a 100 feet radius of the proposed sewer site. This drawing must include the names of the property owners and the location of all wells, springs, waterways, surface waters, water lines, buildings, and roads.
    c. Designation of all slopes greater than 25% on the lot.

3. Proof of neighboring property owner notification:
    a. All owners of adjoining property and of any property within 100 feet of the proposed sewer site must be notified that a review is being requested.
    b. This notification can be by registered mail or by having the owners of the neighboring property sign a copy of the written statement explaining the request.
    c. The neighboring property owners will be given 10 days to respond.

4. Special circumstances may require additional information (example: geologic, access, photographs, etc.).

5. Appeal application and fee must be submitted at least two weeks prior to the Board of Health meeting date. Appeals will be scheduled as the Board of Health agenda allows.

C. Burden of Proof

The Burden of Proof is upon the applicant to show that granting the appeal would not injure adjacent properties, will not conflict with the purposes of these Regulations, and will not adversely effect the health of any person, based on current and potential allowable use.

D. Written Notification

Following review by the Board of Health, the applicant shall receive written notification (within 30 days), to include the following:

1. Findings of the Board of Health.

2. Facts upon which findings were based.

3. Reference to laws or regulations upon which Board of Health decision was based.

4. Conditions, which must be met as a condition of approval granted. Landowner may be required to file legal record of approval conditions, which must be drafted by an attorney and recorded with the County Clerk and Recorder.

Such review shall be conducted pursuant to the requirements of Section 24-4-105, C.R.S., 1973.

E. Finality of Denial

Denial shall become final upon determination by the Board of Health.

3.13 Rules Governing Properties near Community Sewers

Permits to construct, extend, or replace an on-site wastewater system shall be ordinarily denied if municipal or sanitation district sewers exist within 400 feet of the applicant's lot line, there is reasonable access, and if the municipality or district agrees to provide sewer service as provided for in Chapter 89, Article 5 C.R.S. 1973.

3.14 Proposed Subdivisions or Lot Consolidation

A. Plans

Plans for proposed subdivisions and lot consolidation shall be submitted to this Department for the review of proposed on-site wastewater systems in accordance with requirements of these Regulations and the requirements of the subdivision regulations of Archuleta, La Plata and San Juan Counties. The Health Officer shall require the subdivider to prove each lot has a suitable location for an on-site wastewater system prior to making recommendations. No plan shall receive the approval of the Board of County Commissioners unless the Department has made a favorable recommendation regarding the proposed method of sewage treatment.

B. Criteria

The subdivision or consolidation of lots shall meet the following criteria for approval for O.S.W.S.:

1. Each lot must have, and illustrate on a copy of the plat, an approved on-site wastewater system site that:
    a. Has at least 4000 square feet of usable drainfield space per dwelling.
    b. Meets all minimum setback distances.

c. Has no bedrock within 5 feet of the surface.
d. Has no groundwater at any time of the year within 5 feet of the surface of the ground.
e. Is out of floodways.
f. Has slopes less than 25%.
g. Is set back 25 feet from the top of steep slopes more than 25%.
h. Is outside of any other planned improvement area (building site, roadways, utility lines, etc.).

2. No tank inlets, tank outlets, manholes or piping shall be under high seasonal water table.

3. All existing O.S.W.S.(s) must be functioning as originally permitted. All non-functioning systems may be required to be brought into compliance before approval will be granted.

C. Required Submissions

Required submissions for approval include:

1. An accurate plat of the subdivision showing:
   a. Subdivision location.
   b. Lot sizes and dimensions.
   c. All existing buildings, wells, springs, surface water, waterways, water lines, on-site wastewater systems, slopes greater than 25%, and roads.
   d. All proposed or actual locations of water supplies, roads, road easements and other easements.
   e. Proposed locations of primary and replacement sites for onsite wastewater systems.
   f. All platted subdivisions containing land located in the floodway or floodplain shall have:
      1. Floodway and floodplain boundaries identified.
      2. A proven, suitable location on each lot for primary and replacement drain fields which is identified on the plat.

2. A statement regarding the proposed use of the property.

3. The distance to the nearest sewer main of a municipal or community system if within 1/4 mile.

4. Verification that the proposed subdivision plans have been submitted to the Planning Department for the Sketch Plan review.

5. Additional hydrological, geological or engineering information as required when evidence indicates that an on-site wastewater system may not be suitable or may endanger groundwater or surface water quality.

D. Cluster Developments

1. Each building envelope shall have a designated on-site wastewater site located on the platted envelope or on adjacent common ground.

2. On-site wastewater systems for clustered residences must be sub-surface.

3. The designated site must have sufficient area that meets the siting criteria as identified in rule 3.14.B and be recorded on the plat.

4. Flows from separate building envelopes cannot be combined unless:
   a. sewage flows are less than 2000 gallons per day (gpd);
   b. a quasi-public agency is responsible for system monitoring and repair;
   c. systems are engineer designed and approved by the Department.

5. Spacing of the on-site wastewater system must comply with CDPHE requirements for spacing as stated in WQSA Policy #6 when flows for the entire cluster development project are greater than 2,000 gallons per day.

6. The separation between wastewater areas and down-gradient wells must be a minimum of two hundred (200) feet, plus an additional eight (8) feet added for each one hundred (100) gallons per day of design flow over two thousand (2,000) gallons per day.

7. Any other condition that would constitute a public health concern must be resolved.

3.15 Regulation of System Contractors

A. Licensure

No person except the property owner shall excavate, install, renovate, or repair an on-site wastewater system unless he holds a valid Systems Contractor License issued by the Department. A homeowner intending to install one's own system, must complete the Department's installer training course. Licenses shall expire on December 31st of each year, and an annual renewal fee shall be charged. Any contractor who is put on probation or has a license, which lapses because of failure to renew or is revoked, shall be subject to the fee established for new licenses upon reapplication.

Contractors seeking licenses for the first time shall be required to complete the prescribed training courses before licenses are issued. Annual refresher training

shall be attended by all licensed contractors. Contractors who have had their licenses revoked or put on suspension shall be required to repeat the prescribed training courses before their licenses will be reinstated. Supervisors of installation work are each required to successfully complete the prescribed training courses. The licensee in-charge shall be present at the time of Department inspections.

B. Standard of Performance

Requirements of holders of Systems Contractor Licenses:

1. Applications for Systems Contractors Licenses or renewals shall be made upon forms supplied by the Department.

2. Prior to the issuance or renewal of a license the Health Officer may require the applicant to demonstrate adequate knowledge of these Regulations.

3. Installation, renovation or repair of any on-site wastewater system shall be in compliance with these Regulations and with the conditions set out in the installation permit issued by this Department.

4. The installer shall complete and deliver the permit to the owner within 7 days after the completion of an approved installation.

5. The installer or property owner shall have the permit in his possession at the time construction begins, and shall insure the permit is available at the time of final inspection so that final approval may be endorsed upon it.

6. Possession of a permit by a contractor does not constitute sole right to install that system. The property owner may secure the services of any licensed contractor of his/her choosing.

7. The Department shall periodically prepare and present modernization techniques and standards in the form of refresher training. License holders shall attend this training to maintain their license in good standing.

C. Revocation of a Systems Contractor License

A Systems Contractor's license may be revoked by the Department for failure to comply with these Regulations. Revocation may be appealed by requesting a hearing before the Board of Health. The license holder shall be given not less than 10 days notice of the hearing and may be represented at the hearing by counsel.

Revocation proceedings may occur upon, but not limited to, the following:

1. Installation of an O.S.W.S. without a permit.

2. Failure to obtain approval for an O.S.W.S. before covering.

3. Misrepresentation of facts or data in order to secure a permit or be granted approval.

4. Failure to notify the Department of failed or malfunctioning systems within their care or work.

Should a revocation hearing result in a decision to suspend or revoke a Systems Contractor's license, such decision, including a listing of violations and any conditions set forth by the Board of Health shall be forwarded in writing by registered or certified mail, return receipt requested, and deliverable only to the Systems Contractor.

3.16 Regulation of Systems Cleaners

A. Licensure

No person shall engage in the cleaning of on-site wastewater systems or the transportation of septage to a disposal site unless he/she holds a valid Systems Cleaner License. Employees of a valid licensed Systems Cleaner shall not be required to be licensed. Licenses shall expire on December 31st of each year, and an annual renewal fee shall be charged. A license, which lapses because of failure to renew or is revoked shall be subject to the fee established for new licenses upon reapplication. Application for a new license by a Systems Cleaner whose license has been revoked shall not be considered for at least one year after revocation.

B. Standard of Performance

1. A license holder, when cleaning a septic tank or aeration plant, shall remove the liquid, sludge and scum, leaving no more than three inches depth of sewage in a non-backflowing septic tank or aeration plant. In backflowing types of systems cleaning shall be effective in reducing solids and scum to the point of a near-new system.

2. A license holder shall maintain his/her equipment to insure that no spillage of septage will occur during transportation, and that his/her employees are not subjected to undue health hazards.

3. A license holder shall dispose of the collected septage only at a site designated by the Board of County Commissioners or the Board of Health.

4. All license holders must mark the vehicles which transport septage with their business name in 6 inch letters or larger.

5. The Health Officer may require the applicant to demonstrate adequate knowledge of rule 3.16 prior to the issuance of or renewal of a license.

6. When in the normal course of his/her work he/she observes damaged or metal septic tanks, cesspools, non standard equipment or sewage being discharged onto the ground or beyond the normal area of confinement, thereby creating a public health hazard, the cleaner shall notify the homeowner and the Department of any such hazard in writing.

7. A licensed cleaner (or licensed contractor) who performs work on malfunctioning or failed systems must notify the Department once prior to initiating the work. Failure to comply with these Regulations may subject the license holder to suspension or revocation proceedings.

8. The cleaner will provide to the homeowner a receipt listing the name, address, date, activity(s) performed, and any system deficiency(s), malfunction, or broken equipment observed, such as cracks, infiltration, overflows, or non-standard equipment. A copy of this receipt shall be provided to the Department, for system and permit records, upon Department request of the homeowner.

C. Revocation of a Systems Cleaner License

The procedures as described in rule 3.15.C shall be followed for revocation of a license.

3.17 Repair and Emergency Use Permits

The Health Officer may issue a repair permit and an emergency use permit to the owner or occupant of property on which a system is not functioning properly. When the Department has notified the owner or occupant of a non-compliant system or public health nuisance or hazard, said owner or occupant must make application for a repair permit within two business days. The permit shall provide for a specified period of time within which repairs will be made, at the end of which period the system shall be inspected by the Health Officer or designee to insure that it is functioning properly. Concurrently with the issuance of a repair permit, the Health Officer may issue an emergency use permit authorizing continued use of a malfunctioning system on an emergency basis for a period not to exceed the period stated. An emergency use permit may be extended, for good cause shown, in the event repairs may not be completed in the period stated in the repair permit through no fault of the owner or occupant.

A. Malfunctioning Systems

An on-site wastewater system is considered malfunctioning when it is failed, not operating properly or is not in compliance with the Colorado Individual Sewage Disposal Systems Act (Title 25, Article 10 C.R.S. 1973, as amended). Malfunctioning systems include, but are not limited to, the following:

1. Absorption systems and dispersal systems which seep or flow to the surface of the ground or into waters of the state.

2. Systems which have overflowed from any of its components.

3. Systems which fail to operate in accordance with design conditions and specifications.

4. On-site wastewater systems discharging effluent which does not comply with the applicable effluent discharge standards established by the Department, the Colorado State Board of Health and/or the Colorado Water Quality Control Commission.

5. Cesspools and un-permitted pit privies.

6. Treatment tanks which are in unsound condition.

7. Systems which do not comply with the provision of these Regulations regarding minimum separation between the maximum seasonal level of groundwater table and the bottom of an absorption system.

8. Systems causing a public health hazard or nuisance.

3.18 Notice of Violations

Whenever the Health Officer determines that there has been a violation of any provision of these Regulations, he/she shall give notice of such violation to the owner of the property. Such notice shall be in writing, shall list the violations, shall provide a specific time for correction, and be addressed to the owner and occupant of the property concerned. Service of such notice shall be as provided by the Colorado Rules of Civil Procedure, or by registered or certified mail, return receipt requested, deliverable to addressee only. If one or more persons cannot be found or served after a diligent effort to do so, or attempts by registered or certified mail have failed, service may be made by posting a notice in a conspicuous place on the property affected by the notice. In that case, the Health Officer shall include in the record a statement as to why the posting was necessary.

3.19 Cease and Desist Orders

The Health Officer may issue an order to cease and desist from the use of any system which is found by the Health Officer to be out of compliance with these Regulations or which otherwise constitutes a nuisance or hazard to public health and which has not received the timely repairs in accordance with the provisions of rule 3.17. Such an order may be issued only after a hearing which shall be conducted by the Health Officer 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. The owner or a representative may be present at the hearing. The order shall require that the owner or occupant bring the system into compliance or eliminate the nuisance or hazard within a reasonable period of time, not to exceed thirty days, or thereafter cease and desist from the use of the system. A cease and desist order issued by the Health Officer shall be reviewable in the district court for the county wherein the system is located and upon a petition filed by the owner not later than ten days after the order is issued.

3.20 Maintenance and Cleaning

When directed by the Department, for the purpose of obtaining compliance with rules and regulations, the owner or user of a system shall provide for the maintenance and cleaning of an on-site wastewater system and shall notify the Department upon completion of any maintenance work and report to said Department and submit such evidence of compliance with any maintenance and cleaning schedule as the Department requires. In order to insure working order, the minimum recommended pumping schedule for all tanks (septic, aeration, or vault) is every four (4) years.

3.21 Prohibition of On-Site 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 ten days prior to the hearing, to consider the prohibition of permits for on-site wastewater systems in defined areas which contain or are subdivided for a density of more than one dwelling unit per acre. The Board of Health may order such prohibition upon a finding that the construction and use of additional on-site 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 to provide a study of the economic feasibility of constructing a sewage treatment works.

3.22 General Prohibitions

For purpose of administration and enforcement of the Colorado Individual Sewage Disposal System Act (Title 25, Article 10 C.R.S. 1973, as amended), the following provisions of said Act specifying general prohibitions and penalties are set forth for ease of reference but not as guidelines herein:

A. 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 an application for a permit has been received and approved by the Department.

B. No city or county occupancy permit 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 on-site wastewater system has been made by the Sanitarian, as provided in rule 3.11 and the installation has received the final approval of the Sanitarian.

C. No on-site 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 system, shall be permitted to remain in use without compliance with these Regulations later than October 1, 1975.

D. Construction and/or use of cesspools and pit privies are prohibited.

E. Not more than one dwelling, commercial, business, institutional, or industrial unit shall be connected to the same on-site wastewater system unless such multiple connection was specified in the application submitted and in the permit issued for the system.

F. No person shall occupy any dwelling or any other structure which is not equipped with adequate allowable facilities for the sanitary disposal of sewage.

G. Unless permitted, RV units must be self-contained, mobile and to be set up only on a temporary basis.

H. It shall be considered a violation of these Regulations for an owner, agent, contractor, or otherwise, to intentionally misrepresent data or information to the Department. Any permit issued based upon such misrepresentation shall be deemed in violation of these Regulations and void.

3.23 Experimental Systems

Except for designs or types of systems which have been approved by the Department pursuant to C.R.S. 1973, 25-10-107 (1), the Board of Health may approve an application for a type system not otherwise provided for in paragraphs (e) to (j) of subsection (1) of C.R.S. 1973, 25-10-105 only if the system has been designed by a professional engineer, and only if the application provided 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. The Department 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. (25-10-107 [2]) C.R.S. 1973, as amended.

3.24 Penalties

Any person who commits any of the following acts or violates any of the provisions of this article commits a class I petty offense, as defined in section 18-1-107, C.R.S., 1973.

A. Constructs, alters, installs, or allows the use of any on-site wastewater system without first having applied for and received a permit as outlined in rule 3.3 or as provided for in 25-10-105, C.R.S. 1973, or 25-10-106, C.R.S., 1973.

B. Constructs, alters, or installs an on-site wastewater system in a manner which involves a knowing and material variation from the terms or specifications contained in the application or permit.

C. Violates the terms of a cease and desist order which has become final under the terms of rule 3.19, or the terms of 25-10-106, C.R.S., 1973.

D. Conducts a business as a Systems Contractor without having obtained the license provided for in rule 3.15 or provided for in 25-10-106.

E. Conducts a business as a System Cleaner without having obtained the license provided for in rule 3.16, or provided for in 25-10-108, C.R.S., 1973.

3.25 Jurisdiction

These rules and regulations are promulgated by the Board of Health of the San Juan Basin Health Department (Department) under the authority of 25-1-107, and 25-10-104, C.R.S., 1973.

3.26 Severability

If any regulation adopted thereunder or its application to any person or circumstances is held invalid, unconstitutional, void, or inoperative, such holding shall not affect other provisions or applications of these Regulations adopted hereunder. The Board of Health hereby declares that in these regards the regulation adopted hereunder are severable, and that the Board of Health would have adopted the remaining regulations hereof not withstanding such holding.

3.27 Saving Clause

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

3.28 Effective Date

The Board of Health adopted these Regulations on January 5, 2011, with an effective date of January 5, 2011.

SECTION 4. GENERAL TECHNICAL REQUIREMENTS

4.1 Calculation of Sewage Flow and Characteristics

A. Where gallons per day and pounds of biochemical oxygen demand (BOD) per day can be obtained by measurement of existing conditions, such data may be used.

B. For new facilities the "Table of Quantities and BOD Strength of Sewage" may be used as a guide to represent average conditions. (Appendix B)

C. Maximum flow shall be calculated at 150 percent of average daily flow and shall be the basis for design purposes unless otherwise established by evidence satisfactory to the Health Officer.

D. For residential structures, sewage flows are calculated at 2 people per bedroom with at least two bedrooms per dwelling for design purposes.

E. The Health Officer may, at his/her discretion, allow reduction in design flow for proven, permanently installed water conservation devices. Reduction rates will be based on flow information supplied to the Department for comparison with standard accepted rates for each fixture utilizing water conservation devices.

F. The reduction in sizing of an on-site wastewater system from all combined alternatives shall not exceed 50 percent of design flow.

G. The Health Officer may, at his/her discretion, require an increase of average daily flow of up to 100 gallons per person per day for high water use dwellings.

4.2 Soil Test

A. Location

Soil percolation tests shall be performed in at least (4) four test holes in the area in which the absorption system is to be located, spaced uniformly over the proposed site, except there shall be no less than one (1) test hole in any twelve hundred (1200) square foot area of the absorption system.

B. Dimensions

1. The percolation test holes should be six (6) inches in diameter, and thirty (30) inches deep, but may vary from four (4) to twelve (12) inches in diameter. The 30-inch depth may vary, with Department approval, where

prohibitive soil or geological conditions exist, the percolation tests shall be conducted within those soils comprising the four feet of acceptable soils beneath the bottom of the absorption field. The holes shall be terminated at the proposed depth of the absorption system.

2. One soil profile hole shall be drilled or dug to provide visual observation of the soil profile of the area of the soil absorption system. The hole shall be prepared at least eight (8) feet deep. 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 four (4) feet below the bottom of the proposed soil absorption system.

C. Procedure

Percolation test holes shall be completely filled with water at least 12 hours, but not more than 24 hours, prior to making the water percolation test, and shall be refilled with water, if necessary, to a depth of at least 14 inches prior to final measurement. The time is measured for the water to drop one inch within the lower six-inches of the percolation test hole. The percolation rate shall be reported in minutes of time per inch drop.

D. Calculation

The field percolation rate shall be the average rate of the percolation tests after rate has stabilized in all the test holes observed in the proposed absorption area. A percolation rate between five (5) and sixty (60) minutes per inch is required except as provided for in these Regulations.

E. Performance of Percolation Tests

1. The percolation test shall be performed by the Department, under the supervision of a Professional Engineer, or by a competent technician. These tests may have been previously performed and submitted with the application for the permit.

2. If the applicant demonstrates to the satisfaction of the Sanitarian that the system is not dependent upon soil absorption, the requirement for percolation tests may be waived.

F. Alternate Percolation Test

Alternate percolation test procedures may be approved providing the test results of alternate procedures are substantially equivalent to those determined using the test procedure detailed in this section.

4.3 Water Table

A. The separation between the maximum seasonal level of the groundwater table and the bottom of an absorption system shall be 4 feet or more.

B. If water table depth is suspected to be a problem, the Department may require evaluation or monitoring during the months of the highest water table prior to issuing the permit.

4.4 Suitable Soil Criteria

A. Has at least a four foot depth of permeable stratum below the bottom of the proposed absorption system.

B. Is located 4 ft. above the maximum seasonal ground water table.

C. Has the capacity to adequately disperse the designed effluent loading as determined by a field percolation rate of between 5 minutes per inch and 60 minutes per inch, or by other approved soil tests.

D. Does not exhibit inhibiting swelling characteristics.

E. Does not visibly exhibit a jointed or fractured pattern of an underlying bedrock.

F. Is not consolidated.

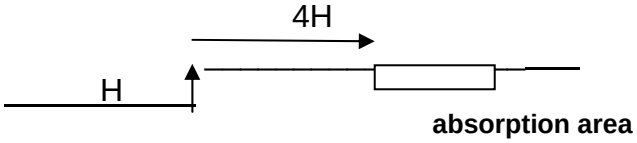
G. Acts as an effective filter for the removal of pathogenic organisms.

4.5 Horizontal Setbacks

Individual components of sewage systems shall have appropriate setbacks from natural and constructed features on the property. See Appendix A, "Minimum Horizontal Distances (in feet) between Components of an On-site Wastewater Treatment System and Pertinent Physical Features".

4.5.1 The minimum horizontal distance required from manmade cut banks and fill areas to on-site wastewater system components discharging effluent into or onto the surrounding soil shall be four (4) times the height of the bank, measured from the bottom of absorption field unless it can be demonstrated by a

Professional Engineer or a geologist that a mechanical or natural barrier will prevent lateral effluent surfacing. (see diagram below).



4.5.2. Minimum horizontal setbacks from natural steep slopes that are >25% shall be 25 feet.

4.6 Variance Procedure

A. An applicant may request the Board of Health to approve a variance from any requirement of these Regulations that is either more stringent than or not addressed by the State Guidelines.

B. Approval of such a variance shall be based upon evidence presented by the applicant showing that the variance:

1. would not be injurious to the public health, water quality or the environment; and

2. would prevent a substantial hardship to the applicant.

C. The Board of Health cannot approve variances from the State Guidelines.

SECTION 5. COMPONENT DESIGN CRITERIA

5.1 Design Features (General)

A. Reliability

On-site wastewater systems shall be designed and constructed so that each component shall function, when installed and operated, in a manner not adversely affected by normal operating conditions including erosion, vibration, shock, climatic conditions, and usual household chemicals. Each component shall be free of hazards, which could cause injury to persons, animals, or properties. Design shall preclude flies and rodents from accessing the system, shall prevent the creation of nuisances, public health hazards, and shall provide for efficient operation and maintenance.

B. 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 current legally adopted local plumbing code in force on the effective date of these guidelines or those revisions of said Code as are adopted by the State Plumbing Board.

C. Electrical Equipment

All electrical work, equipment, and material shall comply with the requirements of the current National Electrical Code as adopted by the State Electrical Board.

D. Identification and Data Marking

Major components not constructed on the site shall be marked with a permanent plate or other indelible marking to be easily read and visible for the purpose of inspection. Said inscription shall include the following:

1. Name of manufacturer
2. Model or serial number designated
3. Maximum design capacity of the unit and the unit of measurement.

E. Structural Integrity

Tanks shall be constructed and installed to withstand earth and hydrostatic pressures when full and when empty. All exposed metal surfaces shall be properly treated as to reduce and minimize corrosion (lid handles, bolts, clasps, or others).

F. Watertight Requirement

Watertight tanks, vaults, or other units, shall not allow infiltration of groundwater or surface water and shall not allow the release of wastewater or liquids through other than designed openings.

G. Accessibility - Inspection and Maintenance

Each treatment unit shall be equipped with an access manhole(s) 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, inlet and outlet baffles, and other devices. An access riser on the first compartment of the septic tank shall extend to the surface of the ground.

H. Indicators of Failure - 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 is operating but malfunctioning. This indication or warning shall be in the form of a visual or audible signal, or both. Separate circuits and breakers shall be provided for the alarm and pump.

I. 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.

J. 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.

K. Instructions

The manufacturer shall provide clear, concise instructions covering the unit which, when followed, will assure proper installations and safe and satisfactory operation.

L. Surface Activity

Surface activities over the on-site wastewater system or any part thereof, must be restricted to allow the system to function as designed and which will not contribute to compaction of the soil nor to structural loading detrimental to the components. Flow lines, force mains or other conduits of sewage conveyance must be sleeved for traffic where applicable.

M. Distribution Box

A distribution box, if used, shall be of sufficient size to equally distribute effluent to the heads of the distribution lines and shall be constructed with the inlet invert at least one (1) inch above the level of the outlet invert and installed to be stable under backfilling conditions. The distribution box shall be provided with a riser to the surface to facilitate re-adjustment of flows if necessary. The location of the distribution box shall be shown on as-built drawings.

N. Sewage and Effluent Pumping Systems

1. Non-clog pump opening shall have at least 2 inch diameter solids handling capacity where raw sewage is pumped or at least 1/2 inch diameter solids handling capacity if previously settled effluent is pumped.

2. Automatic liquid level controls shall be provided to start and shut-off pumps at a frequency required by the design.

3. Pressure pipe shall be of sufficient strength to accommodate pump discharge pressure and the pipe shall be sized to maintain a velocity of 2 or more feet per second.

4. Automatic air release valves shall be installed at high points in the pressure line where necessary to prevent air locking.

5. A storage basin preceding the pump shall be provided to allow pump cycling commensurate with the pump design capacity. The second compartment of the septic tank shall not be used as a pumping chamber unless it can be shown that the minimum 30-hour detention time will not be decreased and the pump is screened or provided with an approved filtering device to insure that only liquid effluent will be discharged.

6. Dosing tanks shall be watertight and shall be sized to dose an absorption system according to the following rates:

Suggested dosing frequencies for various soil textures

Soil texture	**Dosing Frequency**
Sand	4 Doses / Day
Sandy Loam	2 Dose / Day
Loam	Frequency Not Critical
Silty Loam	1 Dose / Day*****
Silty Clay Loam	1 Dose / Day*****
Clay*****	Frequency Not Critical

***** Long term resting provided by alternating fields is desirable and is recommended in these soils.

7. Dosing tanks shall be made of a durable, impermeable material. Steel or coated steel shall not be used.

8. The discharge line from the pumping chamber shall be protected from freezing by burying the pipe below frost level or sloping the pipe to allow it to be self-draining, or relieving the force main within the dose chamber through use of a weep hole.

O. Pipe Standards and Specifications

1. All wastewater lines used in on-site wastewater systems shall be constructed of compatible pipe, bonding agent and fittings. Where plastic pipe and fittings are used, the minimum wall thickness of the pipe shall conform to ASTM Standard D 3034, SDR35, or equivalent. Perforated distribution pipe surrounded by rock within a soil absorption system shall have a minimum wall thickness conforming to ASTM Standard 2729. Corrugated polyethylene pipe with a 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 on-site wastewater systems.

2. Pipe carrying combined sewage to the tank shall be not less than three inches in diameter, except for greywater systems. (see rule 6.1.A.)

3. The grade of the building sewer line shall be at least 1%. Bends in the building sewer line shall be limited to 45 degree ells, or long sweep quarterbends. Clean-outs between the house and tank shall be provided at intervals of not more than 100 feet. Minimum Schedule 40 or sleeved pipe is required whenever the building sewer line is located under a driveway. The building sewer installation shall meet all of the requirements of the legally adopted local plumbing code currently in effect. The tank inlet and outlet pipes shall be sealed with watertight materials.

4. Pipe meeting Schedule 40 PVC shall extend from any concrete treatment tank for a distance of at least five (5) feet from the inlet and outlet ends and must be adequately supported to prevent failures as a result of settling.

P. Floodplains

No new or expanded system shall be installed in a floodway. When a system is installed in a 100-year floodplain, the new or repaired system shall meet or exceed the requirements of the National Flood Insurance Program. The system as approved by the Health Officer shall be designed to minimize or eliminate infiltration of flood waters into the system, or discharge of the system into flood waters.

5.2 Design Criteria - Septic and Aeration Tanks

A. Construction of Septic Tanks

1. Septic tanks shall be adequately and durably constructed in such a manner as to resist excessive corrosion or decay. Septic tanks must be

approved by the Department and CDPHE. Septic tanks may be individually approved, in accordance with state and local criteria, if they have been designed by a Professional Engineer.

2. Metal or coated metal tanks are not approved. Other materials which result in an adequate and durable construction, and which resist excessive corrosion or decay may be approved.

B. Septic Tank Design

1. A septic tank shall be constructed to detain incoming sewage for a minimum of thirty (30) hours for subsurface disposal and a minimum of eighty (80) hours for absorption lagoon disposal. The capacity may also be based upon the number of bedrooms according to the following table:

Septic Tank Size (in gallons) is based upon the Number of Bedrooms

Number of Bedrooms	Subsurface Disposal	existing Absorption Lagoon
2 or less	1000	1000
3	1000	1500
4	1500	2000
5	1500	2500
Each additional	add 250	add 500

2. Except for greywater systems, the effective liquid capacity shall be no less than 1000 gallons.

3. Inlet invert shall be 3 inches higher than the outlet invert.

4. Outlet tee or baffle shall extend above the surface of the liquid to within one inch of the underside of the tank top and shall extend at least 14 inches below the outlet invert. All tank outlets shall be outfitted with effluent filters and the filter shall be fitted with a tee-bar handle that extends to the riser lid.

5. The distance from the outlet invert to the underside of the tank top shall be at least 10 inches.

6. 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.

7. A septic tank shall have two or more compartments or more than one tank may be used in series to provide the following capacity arrangement. The first compartment shall hold no less than 1/2 of the required effective capacity.

8. The transfer of liquid from the first compartment to the second or successive compartments shall be made at a liquid depth of at least 14 inches below the outlet invert but not in the sludge zone.

9. At least one access no less than 20 inches across shall be provided in each compartment of a tank.

10. The septic tank shall be provided with a minimum of 12 inches of cover and have a riser on the first compartment to the surface of the ground.

C. Aerobic / Advanced Treatment Tank

1. Sewage flow must not exceed the design capacity of the aeration plant.

2. The tank shall be approved by the National Sanitation Foundation (NSF), or equivalent, and shall be used according to manufacturer's recommendations.

3. Shall have a flood-proof motor.

4. Advanced treatment unit systems may be utilized in locations where traditional wastewater disposal means cannot be, or have not been approved. A maintenance contract shall thus be required for the use of advanced treatment unit (ATU) systems, in accordance with the approved design specifications. Monitoring and maintenance shall be completed in accordance with the design and specifications or as requested by Department. Failure to maintain an engineered ATU system constitutes a violation of the approved terms and conditions of the permit.

5.3 Septic Tank Installation Specifications

A. 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. Backfilling around a septic tank, aeration plant, lift station, holding tank or treatment unit shall be accomplished in a manner to prevent settlement and avoid undue strain on the tank and the pipes entering and leaving the tank. Plastic or fiberglass tanks will be bedded and buried in accordance with manufacturer’s instructions.

C. In locations where groundwater may cause instability to the septic tank, pumping chamber, vault, or other tanks in the on-site wastewater system due to flotation, the tank(s) shall be anchored in a sufficient manner to provide stability when the tank is empty. The method of anchoring must be approved prior to installation. A design of the anchoring system may be required to be prepared by a Professional Engineer.

D. Pipe meeting Schedule 40, or ABS equivalent shall extend from any treatment tank for a distance of at least five (5) feet from the inlet and outlet ends and must be adequately supported to prevent failures as a result of settling.

E. Abandoned septic tanks and vaults shall be pumped and filled with sand, or rock, or they shall be pumped and, removed or crushed in-place.

F. Septic tanks shall be provided with risers on both compartments, one each for the solids and effluent filter manholes.

5.4 Aerobic Sewage Treatment Systems

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.

5.5 Soil Absorption System (General)

A. For a system treating and disposing of effluent through a soil absorption system, 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 each type of soil absorption system set forth in these Regulations.

B. Soil absorption systems are not approved in the following areas unless designed by a Professional Engineer and approved by the Department:

1. Where the soil percolation rate is slower than one inch in sixty minutes or faster than one inch in five minutes except that a percolation rate faster than one inch in five minutes in soils of sandy texture may be permitted, if the percolation rate is slowed by soil replacement.

2. Where the maximum seasonal level of the groundwater table is less than four feet below the bottom of the proposed absorption system.

3. Where bedrock exists less than four feet below the bottom of the proposed absorption system.

4. Where the ground slope in the field area exceeds twenty-five percent, a slope stability analysis is required.

C. Soil building or replacement will be permitted to bring the soil within the requirements of suitable soil. Where absorption systems are to be installed in new, above-ground fill, the system must utilize uniform pressure distribution and be designed by a Professional Engineer.

D. Absorption Area: The minimum absorption area in square feet (A) for an on-site wastewater system shall be determined as a function of the estimated quantity of sewage flow in gallons per day (Q) and the percolation rate in minutes per inch (t), according to the formula:

$A = Q/5 \times \sqrt{t}$

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

E. Additional Area: The absorption area so calculated shall be increased by not less than an additional twenty (20) percent if wastes from a garbage grinder are discharged into the system and by no more than 40 percent if wastes from an automatic clothes washer are discharged into the system.

F. The maximum reduction from water conservation and effluent pre-treatment alternatives shall be no greater than 50% of the standard required soil absorption area, and in no case shall the maximum daily flow used for design purposes allow greater than 20% reduction for permanently installed water conservation devices.

G. Alternating Fields: A diversion valve or other approved diversion mechanism may be installed on the septic tank effluent line allowing alternating soil absorption systems. Each soil absorption system shall be a minimum of fifty (50%) percent of the total area required excluding the reductions given for dosing or pre-treatment systems. The diversion mechanism shall be readily accessible from the finished grade and shall be switched by owner on an annual basis.

H. Sandy backfill material may be required if the percolation rate is slower than 45 minutes per inch.

I. A minimum sewage absorption system may be approved by the Health Officer as prescribed in the following table:

TABLE 5-1 Sub-surface Absorption Area for Dwelling Use

Percolation Rate: Minutes/Inch	Minimum Absorption Area in square feet # of Bedrooms		
	1-2	**3**	**4**
5	250	375	500
6	266	399	532
8	298	447	596
10	330	495	660
12	358	537	716
13	372	558	744
14	386	579	772
15	400	600	800
16	407	611	814
18	420	630	840
19	426	640	854
20	433	649	866
22	447	670	894
27	480	720	960
30	500	750	1000
34	526	790	1053
40	566	850	1132
45	600	900	1200
48	620	930	1240
53	653	980	1306
60	700	1050	1400

Note: Dwellings must have an absorption bed designed for a minimum of 2 bedrooms.

J. Long Term Acceptance Rates

The minimum absorption area in square feet may also be computed as a function of the design flow and the Long Term Acceptance Rate (LTAR) according to the formula in Table 5-2 where Q= peak flow, and A= area:

Table 5-2 Long Term Acceptance Rates

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

LTAR'S for Wastewater for Soil Absorption systems

Percolation Rates Minutes per inch	Typical soil textures	Maximum Loading Rate gal/sq. ft. /day
1-5[#]	Coarse Sand & Gravel	Not Suitable
6-10	Fine Sand to Loamy Sand	1.0
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
60 - 120**	Silty Clay Loam to Silty Clay	.10 - 0.20
> 120**	site specific	.05 - 0.10

[#] unsuitable, soil amendment required
*Soils without highly expansive clays
**Lower rate, design by professional engineer and approval by Department required

5.6 Absorption Bed, Trench, and Serial Distribution

A. Absorption Bed or Trench

An absorption bed or trench shall be of sufficient dimension to provide the required absorption area. The bottom of the trench or bed and distribution lines shall be level and on contour.

When using rock and pipe, perforated distribution-pipe required for an absorption trench or seepage bed shall be placed the entire length of the trench or bed and shall be surrounded by clean graded gravel, rock or material of equal efficiency which may range in size from 1/2 inch to 2 1/2 inches. This gravel shall be a minimum of 12" deep throughout the trench or bed and shall be placed from at least 2 inches above the top of the distribution pipe to at least 6 inches below the bottom of the distribution pipe.

The separating distance between parallel perforated distribution lines in an absorption bed shall not exceed 6 feet and a perforated distribution line shall be located within 3 feet of each sidewall of the bed. The separation between different soil absorption systems shall be a minimum of six (6) feet from sidewall to sidewall.

Perforated pipe for gravity distribution shall be no less than 3 inches in diameter and preferably less than 100 feet in length. Perforated distribution pipes within the bed or trench should be no deeper than three feet of the finish grade. The bottom of the aggregate envelope must be entirely in native, previously undisturbed soil. Where the aggregate floor extends above the surface of natural grade, a Professional Engineer's design and Department approval is required. The terminal ends of lines shall be capped or looped and air vented where required.

The top of the placed gravel or such material used shall be covered with a layer of geotextile fabric, straw, hay, or other approved material. An impervious covering shall not be used. A final cover of soil suitable for vegetation at least 12 inches deep shall be placed from the top of the geotextile fabric, straw, hay, or similar pervious material to the finished surface grade of an absorption bed or trench.

Chamber systems will follow the same general excavation requirements but do not require geotextile fabric. The chambers are placed on the level ground surface and backfilled with the specified backfill material.

The final cover shall be graded to deflect runoff water away from the disposal area. 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.

Where percolation rates are slower than one inch in 45 minutes, a sandy backfill material may be required. Sand used in an infiltrative capacity in fine soils must be graded and contain less than 5 percent fines (200 sieve). Sand amendment in coarse soils (<5 minutes per inch) can contain up to 15 percent fines.

If dosing is used in conjunction with an absorption trench or seepage bed system, the dosing chamber shall be sized to dose the field multiple times per day in accordance with CDPHE or EPA guidance on dosing rates. No absorption beds may be deeper than 3 feet, measured from the bottom of the bed, on the downhill edge, unless designed by a P.E. and approved by the Department unless the percolation rate is <30 min / inch and vents are provided.

B. Absorption or Seepage Pits

These types of systems are generally prohibited. The Department will consider an exception to this prohibition only if the design contains a supporting rationale for use and incorporates additional treatment technology (e.g., an ATU).

C. Dry Wells

Dry wells may be permitted by the Department when designed and used in conjunction with pre-treatment or equivalent filtering technology. Operation and maintenance (O&M) requirements apply.

Dry wells shall be filled with clean, graded rock which may range in size from ½ to 2 ½ inches in diameter. The rock shall extend from the bottom of the pit to at least two (2) inches above the inlet pipe. At least one four (4) inch perforated vertical stand pipe will be attached to the end of the distribution line with a tee fitting. It shall extend to the bottom of the dry well and up to the finished grade and be fitted with a removable cap to be used as an inspection pipe.

The absorption area of the dry well shall be computed on the basis of percolation rates, or the long term acceptance rates of each stratum penetrated. The weighted average of the results shall be used to obtain a design value. The effective area of the pit will be calculated by adding the area of the sidewalls below the horizontal inlet line and the bottom of the pit, excluding any impermeable stratum penetrated. Dry wells so sized may only be permitted in soils with a percolation rate faster than sixty (60) minutes per inch.

Dry wells shall be separated by a distance equal to the depth of the excavation or ten (10) feet, whichever is greater.

D. Serial Distribution System

A serial distribution system may be used in all situations where a soil absorption system 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 system to the surface of the ground shall be adequate to prevent lateral flow and surfacing of effluent above ground. When serial distribution is used, the following design and construction procedures shall be followed:

1. The bottom of each absorption field and its distribution line shall be level.

2. There shall be a minimum of 12 inches of ground cover over the gravel fill.

3. An absorption field shall approximately follow the ground surface contours so that variation in absorption field depth will be minimized.

4. There shall be a minimum of 6 feet (horizontal measurement) of undisturbed earth between adjacent absorption fields and trenches. There shall be a minimum of 10 feet (horizontal measurement) between the septic tank or other treatment unit and the nearest absorption field.

5. 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.

E. Uniform Pressure Distribution (UPD)

UPD designs shall contain at minimum, specifications for hydraulic design, distribution and manifold piping, pipe and force-main volume, pump requirements, orifice size and spacing, anti-freeze measures, elevation profile, feet of head pressure at the point of distribution, as well as standard minimum information items as previously described (site plan, test hole and percolation test locations and results, application rates, setbacks, water supply, existing and proposed systems, and others).

Based on soils, the field shall be dosed one (1) to four (4) times per day. Dosing frequencies suggested by the CDPHE (Guidelines on Individual Sewage Disposal Systems) may be utilized or alternative rates may be proposed by a P.E. and reviewed and approved by the Department. The size of the dosing pump or siphon shall be selected to maintain a minimum pressure of one (1) psi or 2.3 feet at the distal end of each distribution line and flush at least 5 piping-volumes through the piping. For orifices smaller than 3/16 -inch diameter, the minimum pressure must be 2.16 psi (five feet of head) at the end of each distribution line in order to maintain clean distribution lines.

Maximum orifice perforation spacing shall be five (5) feet. An equivalent design that assures uniform distribution may be utilized with approval of the Department.

The dose volume of a pressure-distribution system must be equal to the drained volume of the force main and manifold, plus a volume that should be 10 times but must not be less than five times the distribution pipe volume.

Pressure distribution systems must be field-tested to verify uniform distribution and pressure. A test is typically demonstrated by equal squirt height measured at the orifice. The difference in head shall not be greater than 10 percent. Each lateral shall have a 3/16 inch hole drilled in the bottom of the pipe near the last orifice or within the dose chamber or both to provide for draining and freeze protection, if necessary.

Total infiltrative surface area is subject to standard area calculations however reductions are recognized, in accordance with reduction criteria described herein.

F. Prefabricated Geotextile Sand Filter (GSF) Pad-Systems

Geotextile fabric sand filter systems shall typically receive low-pressure uniform distribution throughout the system for even application of effluent over the entire pad layout. A minimum of six to eight pads per bedroom is required. Total infiltrative surface area is subject to standard area calculations however reductions are recognized, in accordance with reduction criteria as described herein.

5.7 Evapotranspiration Disposal of Effluent

An evapotranspiration system may be used exclusively or in combination with soil absorption.

A. An evapotranspiration system shall be designed by a Professional Engineer who shall furnish design data for a complete review of the design by the Department.

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 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 in the bed to prevent the sewage effluent from entering the underlying formation or groundwater table. Alternatively, the system may also be mounded to provide the necessary four-feet of separation to the limiting feature.

D. An evapotranspiration system shall be located in an area where there is optimal exposure to sunshine and wind.

E. The system bed shall be crowned and covered with a minimum of four (4) inches of selected top soil and vegetation cover.

F. Bed area shall be protected to prevent damage from vehicle or pedestrian travel. The ground surface shall be graded to deflect precipitation and other outside water away from the disposal area.

G. The maximum E.T. rate for design calculation shall be 0.05-0.20 gallon per square foot per day when used in conjunction with absorption in an evapotranspiration absorption bed (ETA) design. ETA designs must be reviewed and approved by the Department. Optimal site specific conditions can be considered (solar and wind exposures) for an optimal rate. Demonstrably nominal conditions dictate a lower rate. When evaporation/transpiration is the only means of volume removal from the system, the ET rate shall be based on

the lake evaporation rate for that altitude in accordance with A= (Q)(586) / (inches per year - lake evaporation rate).

H. Sand must be clean and graded. The sand (natural or screened) may be found to be acceptable provided tests (e.g., sieve analysis) are completed and less than 15 percent of the sand passes a no. 200 sieve.

5.8 Absorption Lagoons

A. As of January 27, 2003, no O.S.W.S. permits will be issued for the installation of absorption lagoons.

B. Any O.S.W.S. application that has not been previously approved for the installation of a surface lagoon must utilize subsoil technology.

C. Historic permits approved for surface lagoons, but which were not installed, are void and will be required to convert to subsoil technology as of January 27, 2004.

D. Permitted absorption lagoons were designed to be non-surface discharging. Any surface discharging (malfunctioning) lagoon must obtain a permit from the Department for replacement with a compliant subsurface system.

E. Any non-permitted, unauthorized absorption lagoon is illegal unless it clearly predates the O.S.W.S. permit program adopted by the Board of Health (1967) and is otherwise compliant with applicable statutes and regulations pertaining to waterway setbacks and other separation distances. Illegal lagoons must be replaced with a subsurface system.

F. Expansion of existing absorption lagoons will require the approval of the Department's Environmental Health Director, and will be limited to one additional bedroom. Second dwelling units will require the installation of a subsurface system or ATU.

G. To minimize mosquito larvae and the transmission of mosquito borne disease, homeowners must:

1. Apply an approved larvicide periodically to their absorption lagoon (anti-bacterial compounds are not larvicides and shall not be utlized).

2. Demonstrate approved, effective mosquito control techniques in and around the lagoon perimeter.

5.9 Pre-Existing Lagoons

Lagoons permitted prior to the adoption of these Regulations shall meet the following design criteria:

A. Septic tank(s) or aeration tank(s) shall be used in conjunction with an absorption lagoon. If the lagoon loading exceeds 0.46 lbs. BOD5 per 1000 ft2 or causes a nuisance condition, the lagoon will be required to be aerated.

B. Maximum lagoon depth shall not exceed 6 feet. Maximum Water Depth shall not exceed 5 feet with a minimum freeboard of 1 foot. If more than 50 percent of the lagoon is built above the existing ground level, the berm compaction shall be 90% ASTM D-698 or greater and certified by a Professional Engineer. The inside slope of the lagoon, dike or embankment shall not be steeper than 3H:1V upon repair or maintenance. A center inlet shall be provided. The outside slope of the lagoon shall not be steeper than 2H:1V. The ground must be scarified and all vegetation removed below the constructed berm to provide a bond with native material.

C. Lagoons shall be fenced with a durable fence of woven wire or equivalent to a height of 40 inches or greater. Posts must be no greater than 10 feet apart.

D. Surface runoff shall be diverted away from the lagoon except where controlled by design.

E. The absorption lagoon was designed to be non-surface discharging. The owner of any surface discharging lagoon (malfunctioning) must apply for a (replacement) permit for a compliant system.

F. There shall be four-feet of separation between the bottom of any existing lagoon and the maximum seasonal groundwater level in accordance with the minimum requirements under Title 25, Article 10 C.R.S. 1973, as amended.

5.10 Sand Filters

Use of discharging sand filters is prohibited. Construction of sand filters is not permitted, unless approved by the Board of Health and designed by a Professional Engineer.

5.11 Mound Systems

A mound soil absorption system shall be designed by a Professional Engineer and the design shall be site-specific and include specifications for 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 the Health Officer.

A. The distribution system shall be designed for uniform pressure distribution of effluent throughout the mound.

B. The effluent distribution system shall be constructed to prevent freezing through either drainage back to the dosing chamber, buried below frost line, or drain through to the field.

C. The final slope of the mound backfill shall be no greater than 3 to 1 (three [3] feet horizontally to one [1] foot vertically).

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

5.12 Gravel-less Soil Absorption Systems

A. All gravel-less system products and installation procedures shall be approved by the CDPHE. The absorption area of a gravel-less chamber shall be equivalent to the footprint of the interior of the chamber (interior base area). The Department may allow absorption area reductions when gravel-less technology is used.

B. With gravel-less chamber installation, one (1) inspection port shall be provided for each bed or trench.

C. The chambers shall be placed on a level floor following the manufacturer's installation instructions except where superseded by these Regulations.

D. Chamber installations shall follow the same basic construction techniques as absorption beds and trenches as provided in rule 5.5.

E. Chambers installed on sand beds shall be braced to resist subsidence or settling into imported sand.

5.13 Constructed Wetland Treatment

A constructed wetland treatment system shall be designed by a Professional Engineer, and the design shall be site specific and include specifications for: loading, capacity, liner material, filter media, density and species of wetland plants, effluent level, final disposal method, and other pertinent information as requested by the Health Officer. The design shall include estimates of effluent quality at the inlet and outlet. Any surface discharge of effluent must remain on the lot in which it was created. Sampling ports, or some other means of effluent sampling, to demonstrate compliance with rule 8.3 of these Regulations, shall be required by the Department. Sampling is to be paid for by the owner.

SECTION 6. REQUIREMENTS FOR ALTERNATE DISPOSAL SYSTEMS

6.1 Grey Water Systems

A grey water system may be permitted for cabins and other homes to dispose of waste from sinks, lavatories, laundry, dishwashers, and showers, where other approved means are currently in use to dispose of human excreta. The standard design requirements for conventional on-site wastewater systems prescribed by these Regulations shall apply except that:

A. The building drain and sewer leading to the septic tank shall comply with the minimum requirements of the current legally adopted plumbing code and shall not exceed 2 inches in diameter to preclude a water flush toilet being used later.

B. The effective liquid capacity of the septic tank shall be no less than three hundred (300) gallons or 30 hours of retention time (whichever is greater). A single compartment tank may be used if an effluent filter is included.

C. Grey water flows shall be calculated at a minimum of twenty-five (25) gallons per person per day for residences using hauled water, and forty (40) gallons per person per day for residences having a continuous supply of water. Changes of water use from hauled to continuous-supply requires an alteration permit to accommodate additional flow.

D. Grey water systems designed by the Department are for residential systems only.

E. Composting or incineration toilets used with grey water systems shall be approved by NSF or equivalent commercial or alternate agency approval.

6.2 Vault

A vault shall have a minimum 1000 gallons effective capacity and may be permitted under limited occupancy for water carriage sewage systems on property which cannot accommodate an on-site wastewater site and has no continuous supply of water or when a central sewer line is imminent. A signal device shall be installed to indicate when pumping is necessary. Pumping arrangements shall be made prior to installation.

6.3 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, which 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 and self-closing. 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. Vaults shall be of commercially manufactured reinforced concrete, plastic or fiberglass. No block construction of vaults will be allowed.

6.4 Pit Privy

Pit privies are prohibited for on-site wastewater. Any proposed privy for remote areas must be vaulted and contained. Any and all methods of sewage treatment and disposal must be permitted through the Department.

6.5 Incineration and Chemical Toilets

An incineration toilet, which may be used in connection with a grey water system by permit from the Department, shall be designed and installed in accordance with all applicable federal, state, and local air-pollution requirements.

Incineration toilets shall be approved by NSF or equivalent. A portable chemical toilet, which may be used by permit from the Department, shall have a superstructure which meets the requirements of rule 6.3 (Vault Privy). Use of a portable chemical toilet in permanently occupied buildings shall be prohibited except during construction or under emergency circumstances as determined by the Department.

6.6 Slit Trench

Slit trenches shall be considered a temporary solution for on-site wastewater, to be used no longer than 7 days. Remote group gatherings must apply for the utilization of a slit trench, and must be approved by the Department. Slit trenches may be utilized during emergency situations if the potential for groundwater contamination does not exist.

Slit trenches shall be excavated approximately one foot wide by two feet deep for the required length.

Excrement must be covered with at least 2 inches of soil at least once a day or more frequently if requested by this Department.

Slit trenches must be backfilled with at least one foot of soil to grade, with additional allowance for settling when use has been discontinued.

6.7 Commercial or Multi-Family Dwelling Systems

A. Performance criteria and construction standards for a system which will service commercial, business, institutional, or industrial property, or multi-family dwellings shall conform to these Regulations.

B. Such systems shall be designed by a Professional Engineer.

C. Systems shall receive only biodegradable wastes that are compatible with biological processes that occur in the septic tank and soil matrix.

SECTION 7. ALTERNATIVE TREATMENT SYSTEMS

SYSTEMS FOR WHICH DATA ON DESIGN, OPERATION, AND MAINTENANCE ARE LIMITED OR UNDETERMINED:

7.1 Composting Toilets

A. 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 the Department or other applicable regulations or codes, within a dwelling or building provided the unit complies with the applicable requirements of these guidelines, and provided the installation will not result in conditions considered to be a health hazard as determined by the Department. The effective volume of the receptacle must be sufficient to accommodate the number of persons served. Composting toilets shall be approved by the National Sanitation Foundation (NSF) or equivalent agencies.

B. 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.

C. Compartment and appurtenances related to the unit shall include fly-tight construction and exterior ventilation as required by the plumbing code.

D. When the available effective volume is filled to seventy-five percent (75%) of capacity, residue from the unit shall be properly disposed of by acceptable solid waste practices.

E. If a system will be installed where low temperature may be a factor, design shall compensate for the effects of the low temperature.

F. All composting toilets shall bear the seal of approval of the National Sanitation Foundation, or an equivalent testing program. Composting toilets shall be operated according to manufacturer's specifications.

7.2 Recycled Wastewater

A. That portion of the wastewater recycled for non-potable purposes such as flushing water closets or urinals must be approved by the Department.

B. No cross-connection to a pipe, fixture, or supply containing potable water shall be permitted.

C. No system shall be permitted which will recycle wastewater for potable purposes.

D. A structure which contains a wastewater recycling system shall also have a traditional wastewater system back-up, or the subject O.S.W.S. permit shall be conditional and non-transferable.

SECTION 8. NON-SOIL ABSORPTION AND NON-DISCHARGING SYSTEMS

8.1 General

Those 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 Professional Engineer. This Section of these Regulations shall not apply to systems discharging below the ground through a soil absorption system or to a non-discharging system.

8.2 Review of Application

The Board of Health shall review all applications for such systems which may result in discharge or drainage of effluent from the property of origin. No permit shall be issued for such a system if the Board of Health determines that a potential health hazard or private or public nuisance or undue risk of contamination. For systems discharging to State Waters, see Section 10.

8.3 Performance Criteria

The following minimum performance criteria shall be required for all systems pursuant to this Section of these Regulations. All systems falling into this Section will adhere to the specifications spelled out in the CDPHE (Guidelines on Individual Sewage Disposal Systems) for sampling frequency and compliance standards (at least once per week and up to once per day).

A. If effluent discharge is made into the atmosphere or upon 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 consistently meet each of the following standards:

1. The fecal coliform density shall not exceed twenty five (25) per one hundred (100) milliliters.
2. The standard 5 day biochemical oxygen demand (BOD5) shall not exceed twenty (20) milligrams per liter.
3. The total suspended solids (TSS) shall not exceed forty (40) milligrams per liter.

B. If 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 consistently meet each of the following standards:

1. The fecal coliform density shall not exceed five hundred (500) per one hundred (100) milliliters.
2. The standard 5 day biochemical oxygen demand (BOD5) shall not exceed twenty (20) milligrams per liter.
3. The total suspended solids (TSS) shall not exceed forty (40) milligrams per liter.

C. 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 standard shall be met:

1. There shall be at least four (4) feet of soil between the maximum seasonal high water table and the level of effluent discharge.
2. The standard 5-day biochemical oxygen demand (BOD5) shall not exceed sixty (60) milligrams per liter.
3. The total suspended solids (TSS) shall not exceed one hundred (100) milligrams per liter.

8.4 Methods of Analysis - Sampling Points

All effluent samples shall be analyzed according to methods prescribed in the latest edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association). The point of sampling shall be a location that is representative of final discharge from the system.

SECTION 9. MANUFACTURED UNITS AND MECHANICAL APPARATUS

9.1 Mechanical Systems

On-site wastewater systems utilizing mechanical apparatus and furnished for installation in Colorado shall comply with the minimum requirements and construction standards set forth in these Regulations.

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 shall insure and demonstrate efficient operation of all mechanical and electrical components. Demonstration shall include written proof of maintenance or third-party certification provided by homeowner to the Department.

No manufactured units, utilizing mechanical apparatus shall be permitted unless the CDPHE has certified the treatment system based upon its approval of independently certified laboratory results furnished by the manufacturer. The CDPHE shall certify any unit for subsurface discharge which bears the National Sanitation Foundation Standard 40 Certification or equivalent testing program, and is otherwise approved by the Department. The issuance of any such certificate shall not relieve the holder thereof or the user of the unit from the responsibility of complying with these Regulations and the applicable rules and regulations adopted pursuant to law.

SECTION 10. EFFLUENT DISCHARGED TO STATE WATERS

Any system which will dispose of effluent by discharging into State Waters shall be designed by a Professional Engineer and the application shall be submitted for preliminary approval to the Department. Once approved, the application shall be forwarded to the CDPHE Water Quality Control Division for issuance of a permit in compliance with all applicable regulations of the Colorado Water Quality Control Commission. Compliance with such a permit shall be deemed full compliance with all on-site wastewater system regulations.

SECTION 11. MECHANICAL COMPONENTS

Installations must meet or exceed manufacturer’s guidelines.

11.1 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.

11.2 Component Installation
Mechanical components installed in or at the unit must be protected against damage or impairment of their efficiency by flooding, foaming, or surcharging.

11.3 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.

11.4 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.

APPENDICES

Appendix A: Minimum Horizontal Distances (in feet) between Components of an On-site Wastewater Treatment System and Pertinent Physical Features

Appendix B: Quantities and BOD Strength of Sewage for various Types of Uses

REFERENCES

Colorado Board of Health, Guidelines on Individual Sewage Disposal Systems effective November 30, 2004.

Jefferson County Health Department. http://www.co.jefferson.co.us/jeffco/health_uploads/ehs/FINAL_COPY_ISDS_Regs_PDF_VERSION.pdf retrieved December 10, 2009.

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USEPA, EPA/625/R-00/008 Onsite Wastewater Treatment Systems Manual EPA/625/R-00/008 February 2002 Office of Water Office of Research and Development U.S. Environmental Protection Agency. February 2002. http://www.epa.gov/nrmrl/pubs/625r00008/html/html/625R00008chap4.htm.

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