



**Clear Creek County
On-site Wastewater Treatment System
Regulations**



Adopted: June 10, 2014
Effective Date: July 25, 2014

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CLEAR CREEK COUNTY Public and Environmental Health	Declaration	Section 1
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1. Declaration

In order to preserve the environment and protect the public health and water quality; to eliminate and control causes of disease, infection, and aerosol contamination; and to reduce and control the pollution of the air, land, and water, the Clear Creek County Board of Health declares it to be in the public interest to establish minimum standards and regulations for onsite wastewater treatment systems (OWTS) in Clear Creek County, State of Colorado and to provide the authority for the administration and enforcement of such minimum standards and regulations.

2. Purpose

The purpose of these Regulations as authorized by the On-site Wastewater Treatment System Act is to establish minimum standards for the location, design, construction, performance, installation, alteration, and use of OWTS within Clear Creek County, State of Colorado, including but not limited to permit application requirements; requirements for issuing permits; the inspection, testing, and supervision of installed systems; the maintenance and cleaning of systems; the disposal of waste material; and the issuance of cease and desist orders.

3. Authority

These Regulations are promulgated pursuant to the On-site Wastewater Treatment System Act, §25-10-101, et seq. C.R.S., and On-site Wastewater Treatment System Regulations 5 CCR 1002-43.

4. Applicability

These Regulations shall apply throughout Clear Creek County, including all municipalities, to all OWTS as defined herein, and the requirements in the Water Quality Control Act, Article 8, Title 25, et seq. C.R.S., and regulations adopted by the Colorado Water Quality Control Commission.

5. Severability and Savings Clause

The provisions of these Regulations are severable, and if any provisions or the application of the provisions to any circumstances are held invalid, the application of such provision to other circumstances and the remainder of these Regulations shall not be affected thereby.

6. Effective Date

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

CLEAR CREEK COUNTY Public and Environmental Health	Definitions and Acronyms	Section 2
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“Absorption system” means a leaching field and adjacent soils or other system for the treatment of sewage in an OWTS by means of absorption into the ground. See soil treatment area.

“Alteration” means modification of an onsite wastewater treatment system on the basis of: an increase in the volume of permitted flow; a change in the nature of permitted influent; or any change to one component of the system design which may include replacement or an increase, lengthening, or expansion of the treatment or dispersal system.

“Applicant” means a person who submits an application for a permit to construct, install, alter, repair, or use an OWTS. An applicant is either the owner or a person legally acting on behalf of the owner.

“Bed” means a below-grade soil treatment area consisting of a shallow excavation greater than three feet wide containing distribution media and more than one lateral.

“Bedrock” means continuous rock that underlies the soil or is exposed at the surface. Bedrock is generally considered impervious, but if fractured or deteriorated, it may allow effluent to pass through without adequate treatment.

“Biochemical Oxygen Demand, Five-Day” (BOD₅) means quantitative measure of the amount of oxygen consumed by bacteria while stabilizing, digesting, or treating biodegradable organic matter under aerobic conditions over a five-day incubation period; expressed in milligrams per liter (mg/L).

“Biochemical Oxygen Demand, Carbonaceous Five Day” (CBOD₅) means quantitative measure of the amount of oxygen consumed by bacteria while stabilizing, digesting, or treating the organic matter under aerobic conditions over a five-day incubation period while in the presence of a chemical inhibitor to block nitrification; expressed in milligrams per liter (mg/L).

“Board of Health” means the Board of County Commissioners for Clear Creek County, pursuant to 25-1-508, C.R.S.

“Building sewer” means piping that conveys wastewater to the first system component or the sewer main.

“Cesspool” means an unlined or partially lined underground pit or underground perforated receptacle into which raw household wastewater is discharged and from which the liquid seeps into the surrounding soil. Cesspool does not include a septic tank.

“Chamber” means an open, arch-shaped structure providing an open-bottom soil interface with permeable sidewalls used for distribution of effluent in a soil absorption system.

Section 2 Definitions

“Cistern” means a watertight, covered receptacle of nontoxic, food-grade material designed to store drinking water.

“Cleaning” means the act of removing septage or other wastes from a wastewater treatment system component or grease/waste from a grease interceptor.

“Colorado Plumbing Code” means Examining Board of Plumbers Rules and Regulations (3 CCR 720-1).

“Commission” means the Water Quality Control Commission created by section 25-8-201, C.R.S.

“Competent technician” means a person designated by the Department who is able to conduct and interpret the results of soil profile test pit excavations, profile holes, percolation tests, and site evaluations.

“Component” means a subsection of an OWTS; a component may include multiple devices.

“Composting toilet” means self-contained waterless toilet designed to decompose non-water-carried human wastes through microbial action and store the resulting matter for disposal.

“Consistence” means the degree and kind of cohesion and adhesion that soil exhibits and/or the resistance of soil to deformation or rupture under an applied stress.

“Covered transaction” means the conveyance of any real property served by an OWTS, excluding the following:

1. Change in ownership solely to include or exclude a spouse or children;
2. Transfer subject to life estate if the property reverts back to the grantor who created the life estate;
3. Transfer to effect foreclosure or forfeiture of real property (does not include the subsequent sale of the foreclosed property after being titled to the foreclosing person);
4. Transfer by redemption from a tax sale (does not include the subsequent sale of the property after being titled to the redeeming person);
5. Transfer creating or ending joint ownership if a transferee is an original transferor of the property;
6. Transfer of property containing premises that have been demolished or are otherwise uninhabitable;

Section 2 Definitions

7. Transfer for the vacation or granting of a public right of way;
8. Transfer from a person (transferor) to a trust (transferee) where the transferor is trustee(s) of transferee trust estate;
9. Properties with OWTS that have never been used; or
10. New homes that have not yet received a certificate of occupancy.

“Crest” means the highest point on the side of a dry gulch or cut bank.

“Deep gravel system” means a soil treatment area for repairs only where the trenches utilize a depth of gravel greater than six (6) inches below the distribution line and sidewall area is allowed according to a formula specified in these Regulations.

“Department” means the Environmental Health Department within the Clear Creek County Public and Environmental Health Department. Wherever the term “Department” is used in these Regulations, said term shall also include the Water Quality Control Division under its designated authority for the purposes of administering and enforcing the provisions of these Regulations where necessary to protect the public health and environment.

“Design” means

1. The process of selecting, sizing, locating, specifying and configuring treatment train components that match site characteristics and facility use as well as creating the associated written documentation; and
2. Written documentation of size, location, specification, and configuration of a system.

“Design capacity” See Flow, Design.

“Design flow” See Flow, Design.

“Design engineer” means a professional engineer who utilizes site evaluation and investigation information to select an appropriate OWTS and prepares a design document in conformance with these Regulations.

“Distribution” means the process of conveying wastewater or effluent to one or more components, devices, or throughout a soil treatment area.

“Distribution box” means a watertight component that receives effluent from a septic tank or other treatment unit and distributes effluent via gravity in approximately equal portions to two or more trenches or two or more laterals in the soil treatment area.

Section 2 Definitions

“Division” means the division of administration of the Colorado Department of Public Health and Environment of which the Water Quality Control Division is a part.

“Domestic wastewater” See Wastewater, domestic.

“Domestic Wastewater Treatment Works” means a system or facility for treating, neutralizing, stabilizing, or disposing of domestic wastewater which system or facility has a designed capacity to receive 2,000 gallons of domestic wastewater per day or more. The term "domestic wastewater treatment works" also includes appurtenances to such system or facility such as outfall sewers and pumping stations and to equipment related to such appurtenances. The term "domestic wastewater treatment works" does not include industrial wastewater treatment plants or complexes whose primary function is the treatment of industrial wastes, notwithstanding the fact that human wastes generated incidentally to the industrial process are treated therein. 25-8-103 (5), C.R.S.

“Dosing” means a high rate periodic discharge into a soil treatment area.

“Dosing, demand” means configuration in which a specific volume of effluent is delivered to a component based upon patterns of wastewater generation from the source.

“Dosing, pressure” means delivery of effluent under pressure to a component, device, or to a soil treatment area for even distribution.

“Dosing, timed” means a configuration in which a specific volume of effluent is delivered to a component based upon a prescribed interval, regardless of facility water use.

“Dosing siphon” means a device used for demand dosing effluent; which stores a predetermined volume of water and discharges it at a rapid rate, from a tank at a given elevation to a component at a lower elevation, accomplished by means of atmospheric pressure and the suction created by the weight of the liquid in the conveying pipe.

“Dosing tank” means a tank, compartment or basin that provides for storage of effluent from a septic tank or other treatment unit intended to be delivered to a soil treatment area at a high rate periodic discharge.

“Drainfield” See Soil treatment area.

“Drop box” means a device used for serial or sequential distribution of effluent by gravity flow to a lateral of a soil treatment area.

“Dry gulch” See Gulch, dry.

Section 2 Definitions

“Drywell” means an unlined or partially lined underground pit (regardless of geometry) into which drainage from roofs, basement floors, water softeners, or other non-wastewater sources is discharged and from which the liquid seeps into the surrounding soil.

“Effective Size” means the size of granular media such that not more than 10 percent by weight of the media is finer than the size specified.

“Effluent” means the liquid flowing out of a component or device of an OWTS.

“Effluent filter” See Effluent screen.

“Effluent line” means non-perforated pipe that conveys effluent from one OWTS component to the next.

“Effluent screen” means a removable, cleanable, or disposable device installed on the outlet piping of a septic tank for the purpose of retaining solids larger than a specific size and/or modulating effluent flow rate. An effluent screen may be a component of a pump installation. An effluent screen may also be installed following the septic tank but before higher level treatment components or a soil treatment area.

“Evapotranspiration/absorption system” means an unlined onsite wastewater treatment component that uses evaporation, transpiration, and absorption for dispersal of effluent.

“Evapotranspiration system” means an onsite wastewater treatment component with a continuous, impermeable liner that uses evapotranspiration and transpiration for dispersal of effluent.

“Experimental system” means a design or type of system based upon improvements or development in the technology of sewage treatment that has not been fully tested.

“Failure” means damage to a system component, structural member, or connection.

“Floodplain (100-year)” means an area adjacent to a stream which is subject to flooding as the result of the occurrence of a 100-year flood, 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 flood plain elevations.

“Floodway” means the channel of a river or other watercourse and the adjacent land areas that shall be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot or as designated by the FEMA or NFIP. In the absence of FEMA/NFIP maps, a professional engineer shall certify the floodway elevation and location.

Section 2 Definitions

“Flow, daily” means the measured volume of wastewater generated from a facility in a 24-hour period expressed as gallons per day.

“Flow, design” means the estimated volume of wastewater per unit of time for which a component or system is designed. Design flow may be given in the estimated volume per unit such as person per unit time that shall be multiplied by the maximum number of units that a facility can accommodate over that time.

“Flow equalization” means a system configuration that includes sufficient effluent storage capacity to allow for regulated flow on a daily or multi-day basis to a subsequent component despite variable flow from the source.

“Flow equalizer” means an adjustment device to evenly distribute flow between outlets in a distribution box or other device that may be out of level.

“Grease interceptor tank” means a watertight device located outside a facility designed to intercept, congeal, and retain or remove fats, oils, and grease from sources such as commercial food-service that will generate high levels of fats, oils, and greases.

“Graywater” means that portion of wastewater that, before being treated or combined with other wastewater, is collected from fixtures within residential, commercial or industrial buildings, or institutional facilities for the purpose of being put to beneficial uses authorized by the commission in accordance with section 25-8-205 (1) (g). Sources of graywater may include discharges from bathroom and laundry room sinks, bathtubs, showers, laundry machines, and other sources authorized by rule. Graywater does not include the wastewater from toilets, urinals, kitchen sinks, dishwashers, or non-laundry utility sinks. Graywater must be collected in a manner that minimizes household wastes, human excreta, animal or vegetable matter, and chemicals that are hazardous or toxic, as determined by the commission.

“Ground water” means that part of the subsurface water that is at or below the saturated zone.

“Ground water surface” means the uppermost limit of an unconfined aquifer at atmospheric pressure.

“Guidelines” means State Board of Health Guidelines on Individual Sewage Disposal Systems, 5 CCR 1003-6 – predecessor of Regulation 43, On-site Wastewater Treatment System Regulation, 5 CCR 1002-43.

“Gulch, dry” means a deep, narrow ravine marking the course of an intermittent or ephemeral stream.

Section 2 Definitions

“Health officer” means the chief administrative and executive officer of Clear Creek County Public and Environmental Health or the Board of Health appointed health officer for OWTS and their designated representative(s).

“Higher level treatment” means designated treatment levels other than treatment level 1.

“Individual Sewage Disposal System” means a term used for OWTS in Colorado regulations from 1973 until 2013.

“Infiltrative surface” means designated interface where effluent moves from distribution media or a distribution device into soil.

“Inspection port” means an access point in a system component that enables inspection, operation, and/or maintenance.

“Invert” means elevation of the bottom of the inside pipe wall or fitting.

“Lateral” means pipe, tubing, or other conveyance used to carry and distribute effluent.

“Leach field” See soil treatment area.

“Limiting condition” means a layer with low permeability, ground water surface, or other condition that restricts the treatment capability of the soil.

“Limited occupancy” means the occupancy of a structure or dwelling as a residence for no more than 90 consecutive days or a total occupancy of 120 days per year.

“Liner” means an impermeable synthetic or natural material used to prevent or restrict infiltration and/or exfiltration.

“Long-term acceptance rate” (LTAR) means design parameter expressing the rate that effluent enters the infiltrative surface of the soil treatment area at equilibrium, measured in volume per area per time, e.g. gallons per square foot per day ($g/ft^2/day$).

“Malfunction” means the condition in which a component is not performing as designed or installed.

“Manufactured media” See media, manufactured.

“Media” means solid material that can be described by shape, dimensions, surface area, void space, and application.

Section 2 Definitions

“Media, manufactured” means a synthetic media for distribution such as polystyrene blocks, beads or plastic grids.

“Media, treatment” means non-or slowly-degradable media used for physical, chemical, and/or biological treatment in an OWTS component.

“Mounded system” means an above-grade soil treatment area designed and installed with at least 12 inches of clean sand between the bottom of the infiltrative surface and the original ground elevation; that utilizes pressure distribution and includes a final cover of suitable soil to stabilize the surface and support vegetative growth.

“Nitrogen reduction” means a minimum 50 percent reduction of influent nitrogen strength which is the minimum objective of NSF/ANSI Standard 245 - Wastewater Treatment Systems - Nitrogen Reduction.

“On-Site Wastewater Treatment System” or **“OWTS”** and, where the context so indicates, the term "system" means an absorption system of any size or flow or a system or facility for treating, neutralizing, stabilizing, or dispersing sewage generated in the vicinity, which system is not a part of or connected to a sewage treatment works.

“Operating Permit” means a renewable permit that ensures specific operation and/or maintenance requirements for an existing OWTS that requires regular maintenance of mechanical or electrical treatment components or a system that is designed to meet specific wastewater treatment levels as set forth in these Regulations. More fully described in Section 6 of these Regulations.

“Operations and Maintenance Contract” or **“O&M contract”** means an agreement between a property owner and a third party service provider that ensures a system requiring an operating permit is functioning as designed.

“Operations and Maintenance Contractor” See Service Provider.

“OWTS Act” means the On-site Wastewater Treatment System Act, §25-10-101, et seq. C.R.S. and the On-site Wastewater Treatment System Regulation 5 CCR 1002-43.

“Owner” means the person who is owner of record of the land on which a system is to be, or is, designed, constructed, installed, altered, extended, or used.

“Percolation test” means a subsurface soil test at the depth of a proposed absorption system or similar component of an OWTS 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. The rate is expressed in minutes per inch.

Section 2 Definitions

“Performance standard” means minimum performance criteria for water quality and operation and maintenance established by the Water Quality Control Commission to ensure compliance with the public health and environmental goals of the Commission and the Department.

“Permeability” means the property of a material which permits movement of water through the material.

“Permit” means a permit issued by the health officer for the construction or installation, alteration, repair, continued operation of higher level treatment units or systems requiring regular inspection, or prior to a covered transaction for a property with an onsite wastewater treatment system.

“Person” means an individual, partnership, firm, corporation, association, or other legal entity and also the state, any political subdivision thereof, or other governmental entity.

“Pit Privy” means a privy over an unlined excavation.

“Pressure distribution” means application of effluent over an infiltrative surface via pressurized orifices and associated devices and parts (including pump, filters, controls, and piping).

“Privy” means an above grade structure allowing for the disposal of excreta not transported by a sewer and which provides privacy and shelter and prevents access to the excreta by flies, rodents, or other vectors.

“Professional engineer” means an engineer licensed in accordance with section 12-25-100, et seq. C.R.S.

“Professional geologist” means a person who is a graduate of an institution of higher education which is accredited by a regional or national accrediting agency, with a minimum of thirty semester (forty-five quarter) hours of undergraduate or graduate work in a field of geology and whose post-baccalaureate training has been in the field of geology with a specific record of an additional five years of geological experience to include no more than two years of graduate work. 23-41-208(1)(b),C.R.S. and 34-1-201(3), C.R.S.

“Proprietary product” means a manufactured component or other product that is produced by a private person. It may be protected by patent, trademark or copyright.

“Public domain technology” means a system that is assembled on location from readily available components and is based on well-established design criteria and is not protected by patent, trademark or copyright.

“Redoximorphic” means a soil property that results from the reduction and oxidation of iron and manganese compounds in the soil after saturation with water and subsequent desaturation.

Section 2 Definitions

“Regulation 43” means the On-site Wastewater Treatment System Regulation 5 CCR 1002-43 as authorized by the On-site Wastewater Treatment System Act, §25-10-101, et seq. C.R.S.

“Remediation system” means a treatment system, chemical/biological additive or physical process that is proposed to restore the soil treatment area of an OWTS to good performance.

“Restrictive layer” means horizon or condition in the soil profile or underlying strata that restricts movement of fluids. A restrictive layer may constitute a limiting soil/site condition.

“Riser” means a watertight vertical cylinder and lid allowing access to an OWTS component for inspection, cleaning, maintenance, or sampling.

“Rock-plant filter” means a designed system which utilizes treatment media and various wetland plants to provide treatment of wastewater through biological, physical, and chemical processes. Also called a constructed wetland.

“Sand filter” means a system that utilizes a layer of specified sand as filter and treatment media and pressure distribution.

“Sand filter, lined” means a sand filter designed for higher level treatment that has an impervious liner and under-drain below the sand layer. Lined sand filters may be intermittent / single pass where the effluent is distributed over the sand bed a single time before distribution to a soil treatment area, or recirculating where part of the effluent is returned to an earlier component for additional treatment before distribution to a soil treatment area.

“Sand filter, unlined” means a layer of sand used as a sand filter without a liner between the sand and the existing soil on which it is placed.

“Seepage pit” means an excavation deeper than it is wide that receives septic tank effluent and from which the effluent seeps from a structural internal void into the surrounding soil through the bottom and openings in the side of the pit.

“Septage” means a liquid or semisolid that includes normal household wastes, human excreta, and animal or vegetable matter in suspension or solution generated from a residential septic tank system. Septage may include such material issued from a commercial establishment if the commercial establishment can demonstrate to the health officer that the material meets the definition for septage set forth in this subsection. Septage does not include chemical toilet residuals.

“Septic tank” means a watertight, accessible, covered receptacle designed and constructed to receive sewage from a building sewer, settle solids from the liquid, digest organic matter, store digested solids through a period of retention, and allow the clarified liquids to discharge to other treatment units for final disposal.

Section 2 Definitions

“Sequential distribution” means a distribution method in which effluent is loaded into one trench and fills it to a predetermined level before passing through a relief line or device to the succeeding trench. The effluent does not pass through the distribution media before it enters succeeding trenches.

“Serial distribution” means a distribution method in which effluent is loaded into one trench and fills it to a predetermined level before passing through a relief line or device to the succeeding trench. The effluent passes through the distribution media before entering succeeding trenches which may be connected to provide a single uninterrupted flow path.

“Service Provider” means a person engaged in the business of servicing and maintaining higher level treatment units. Service providers shall hold a current National Association of Wastewater Technicians (NAWT) Operation and Maintenance credentials (Part 1 and 2) or equivalent. Effective January 1, 2015, service providers shall also have training relative to the specific system to be maintained or certification by the equipment manufacturer, if available. A property owner who meets these requirements may act as a service provider for their own higher level treatment system only and shall follow the same requirements as a service provider pursuant to Section 10.

“Sewage” means a combination of liquid wastes that may include chemicals, house wastes, human excreta, animal, or vegetable matter in suspension or solution, and other solids in suspension or solution, and that is discharged from a dwelling, building, or other establishment. Also see definitions regarding Wastewater.

“Sewage treatment works” has the same meaning as “domestic wastewater treatment works” under section 25-8-103, C.R.S.

“Site evaluation” means a comprehensive analysis of soil and site conditions for an OWTS.

“Slit trench latrine” means a temporary shallow trench for use as disposal of non-water-carried human waste.

“Soil” means

1. Unconsolidated mineral and/or organic material on the immediate surface of the earth that serves as a medium for the growth of plants and can potentially treat wastewater effluent; or
2. Unconsolidated mineral or organic matter on the surface of the earth that has been subjected to and shows effects of:
 - a) Pedogenic and environmental factors of climate (including water and temperature effects);
and
 - b) Macro and microorganisms, conditioned by relief, acting on parent material over a period of time.

Section 2 Definitions

“Soil evaluation” means a percolation test, soil profile, or other subsurface soil analysis at the depth of a proposed soil treatment area or similar component or system to determine the water absorption capability of the soil, the results of which are normally expressed as the rate at which one (1) inch of water is absorbed or as an application rate of gallons per square foot per day.

“Soil horizon” means layers in the soil column differentiated by changes in texture, color, redoximorphic features, bedrock, structure, consistence, and any other characteristic that affects water movement or treatment of effluent.

“Soil morphology” means

1. Physical constitution of a soil profile as exhibited by the kinds, thickness, and arrangement of the horizons in the profile; and by the texture, structure, consistence, and porosity of each horizon; and
2. Visible characteristics of the soil or any of its parts.

“Soil profile hole” means a hole dug or drilled near a proposed soil treatment area to locate bedrock or ground water, if present. Observations of soil cuttings may be made.

“Soil profile test pit excavation” means a trench or other excavation used for access to evaluate the soil horizons for properties influencing effluent movement, bedrock, evidence of seasonal high ground water, and other information to be used in locating and designing an OWTS.

“Soil structure” means the naturally occurring combination or arrangement of primary soil particles into secondary units or peds; secondary units are characterized on the basis of shape, size class, and grade (degree of distinctness).

“Soil texture” means proportion by weight of sand, silt, and clay in a soil.

“Soil treatment area” or **“STA”** means the physical location where final treatment and dispersal of effluent occurs. Soil treatment area includes drainfields and drip fields.

“Soil treatment area, alternating” means final treatment and distribution component that is composed of two soil treatment areas that are independently dosed.

“Soil treatment area, sequencing” means a soil treatment area having more than two sections that are dosed on a frequent rotating basis.

“State Waters” has the meaning set forth under section 25-8-103. C.R.S.

Section 2 Definitions

“Strength, wastewater” means the concentration of constituents of wastewater or effluent; usually expressed in mg/L.

“Suitable soil” means a soil which will effectively treat and filter effluent by removal of organisms and suspended solids before the effluent reaches any highly permeable earth such as joints in bedrock, gravels, or very coarse soils and which meets percolation test or soil test pit excavation requirements for determining long-term acceptance rate and has a vertical thickness of at least four (4) feet below the bottom of the soil treatment area unless the treatment goal is met by other performance criteria.

“System” means an onsite wastewater treatment system.

“Systems Cleaner” means a person engaged in and who holds himself or herself out as a specialist in the cleaning and pumping of OWTS and removal of the residues deposited in the operation thereof.

“Systems Contractor” means a person engaged in and who holds himself or herself out as a specialist in the installation, renovation, and repair of onsite wastewater treatment systems. For the purpose of this definition and of the Systems Contractor licensing requirements, a person who installs, renovates, or repairs more than one system in any 12 month period, and receives compensation of any kind for their services shall be deemed a Systems Contractor.

“Total suspended solids” means measure of all suspended solids in a liquid; typically expressed in mg/L.

“Transfer of Title” means change of ownership of a property.

“Transfer of title inspector” means a person engaged in the business of inspecting OWTS and who is a NAWT or NSF-certified onsite wastewater inspector or equivalent.

“Treatment media” See media, treatment.

“Treatment level” (TL) means defined concentrations of pollutants to be achieved by a component or series of components of an OWTS.

“Treatment unit” means a component or series of components where solids or pollutants are removed from wastewater or effluent from a preceding component.

“Trench” means

1. Below-grade soil treatment area consisting of a shallow excavation with a width of three (3) feet or less containing distribution media and one (1) lateral; and
2. Excavation for placement of piping or installation of electrical wire or conduit.

Section 2 Definitions

“Uniformity coefficient” means a value which is the ratio of D60 to D10 where D60 is the soil diameter of which 60 percent of the soil weight is finer and D10 is the corresponding value at 10 percent finer. (A soil having a uniformity coefficient smaller than 4 would be considered "uniform" for purposes of this regulation.)

“Use permit” means a document issued by the health officer for a covered transaction, approving the continued use of an existing OWTS.

“Vault” means a watertight, covered receptacle, which is designed to receive and store excreta or wastes either from a building sewer or from a privy and is accessible for the periodic removal of its contents. If the vault is intended to serve a structure or structures that are projected to generate a domestic wastewater flow of 2,000 gallons per day or more at full occupancy, the vault is a domestic wastewater treatment works. Vaults are onsite wastewater treatment systems intended for limited occupancy.

“Vault privy” means a privy over a vault.

“Visual and tactile evaluation of soil” means determining the properties of soil by standardized tests of appearance and manipulation in the hand.

“Volume, effective” means the amount of effluent contained in a tank under normal operating conditions; for a septic tank, effective volume is determined relative to the invert of the outlet; for a dosing tank, effective volume under normal conditions is determined relative to the invert of the inlet and the control off level.

“Wastewater, domestic” means combination of liquid wastes (sewage) which may include chemicals, household wastes, human excreta, animal or vegetable matter in suspension or solution, or other solids in suspension or solution which are discharged from a dwelling, building, or other structure.

“Wastewater, high strength” means

1. Influent having BOD₅ greater than 300 mg/L; and/or TSS greater than 200 mg/L; and/or fats, oils, and grease greater than 50 mg/L entering a pretreatment component (as defined by NSF/ANSI Standard 40 testing protocol);
2. Effluent from a septic tank or other pretreatment component that has BOD₅ greater than 170 mg/L; and/or TSS greater than 60 mg/L; and/or fats, oils, and grease greater than 25 mg/L and is applied to an infiltrative surface.

“Wastewater pond” means a designed pond which receives exclusively domestic wastewater from a septic tank and which provides an additional degree of treatment.

“Water Quality Control Commission” See Commission.

Section 2 Definitions

“Water Quality Control Division” See Division.

“Water supply” means the type (domestic, commercial, or agricultural) and source of the water supply for a building site that may consist of a well, public water system, or a cistern.

“Well” means any excavation that is drilled, cored, bored, washed, fractured, driven, dug, jetted, or otherwise constructed for the acquisition of groundwater for beneficial use, including infiltration galleries permitted as wells by the Colorado Division of Water Resources.

“Wetland, constructed” See Rock-plant filter.

“Wetlands” means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Section 2 Definitions

Table 2-1 Abbreviations and Acronyms

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
CBOD	Carbonaceous Biochemical Oxygen Demand
C.R.S.	Colorado Revised Statutes
CSA	Canadian Standards Association
CDPHE	Colorado Department of Public Health and Environment
gpd	gallons per day
ISDS	Individual Sewage Disposal System
LTAR	Long-term Acceptance Rate
mg/L	milligrams per Liter
MPI	Minutes Per Inch
NAWT	National Association of Wastewater Technicians
NSF	National Sanitation Foundation
O&M	Operations and Maintenance
OWTS	Onsite Wastewater Treatment System(s)
STA	Soil Treatment Area
TL	Treatment Level
TSS	Total Suspended Solids
UL	Underwriters' Laboratories

CLEAR CREEK COUNTY Public and Environmental Health	General Requirements and Prohibitions	Section 3
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1. General Requirements

- A. The owner of any structure or land site where people live, work, or congregate shall ensure that the structure or land site contains a properly functioning OWTS or sanitary sewer connection. Any toilet, sink, tub, shower, or any other fixture that discharges wastewater shall be connected to either the OWTS or sanitary sewer.
- B. All systems shall be designed by a professional engineer.
- C. If records do not exist for a property, it is the responsibility of the property owner to provide the Department with evidence of an existing, approved system and other information outlined in Section 4.10.

2. Design Capacity

- A. Any OWTS with design capacity less than 2,000 gpd shall comply with these Regulations and the OWTS Act, which shall govern all aspects of OWTS permits, performance, location, construction, alteration, installation, and use.
- B. Any OWTS with design capacity equal to or greater than 2,000 gpd shall comply with these Regulations, site location, and design approval in section 25-8-702, C.R.S., and the discharge permit requirements in the Water Quality Control Act, 25-8-501, et seq. C.R.S. Applicable Commission regulations include, but are not limited to, the following:
 - 1. Regulation 22 - Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works (5 CCR 1002-22).
 - 2. Regulation 41 - The Basic Standards for Ground Water (5 CCR 1002-41).
 - 3. Regulation 42 - Site-Specific Water Quality Classifications and Standards for Ground Water (5 CCR 1002-42).
 - 4. Regulation 61 - Colorado Discharge Permit System Regulations (5 CCR 1002-61).
 - 5. Regulation 62 - Regulations for Effluent Limitations (5 CCR 1002-62).
- C. The requirements for maintenance and standards of performance for systems equal to or greater than 2,000 gpd shall be determined by the site application approval and discharge permit.

3. Discharge to State Waters

- A. Any system that will discharge into state waters shall be designed by a professional engineer. The state discharge permit application shall be submitted for preliminary approval to the Board of Health.
- B. Once approved by the Board of Health, the state discharge permit application shall be submitted to the Water Quality Control Division for review in accordance with the Water Quality Control Act, §25-8-101, et seq. C.R.S, and all applicable regulations of the Water Quality Control Commission. Compliance with such a permit shall be deemed full compliance with these Regulations.

4. Access to Site

- A. For the purpose of inspecting and enforcing these Regulations and the terms and conditions of any permit issued and investigating and responding to complaints, the health officer is authorized to enter upon private property at reasonable times and upon reasonable notice for the purpose of determining whether or not an operating OWTS is functioning in compliance with the OWTS Act and these Regulations and the terms and conditions of any permit issued and to inspect and conduct tests in evaluating any permit application.
- B. The owner or occupant of every property having an OWTS shall permit the health officer access to the property to make inspections, conduct required tests, take samples, and monitor compliance.

5. Surface Activity

- A. Activity or use on the surface of the ground over any part of the OWTS shall be restricted to that which will allow the system to function as designed and which will not contribute to compaction of the soil or to structural loading detrimental to the structural integrity or capability of the component to function as designed.
- B. During construction, equipment shall be kept off of the ground surface above the soil treatment area and out of the excavation to prevent compaction. If compaction occurs, the disturbed or compacted soil shall be re-evaluated and new percolation tests may be required to be performed to the disturbed or compacted soil and the system redesigned if the parameters have changed.

6. Floodplains

- A. New OWTS and replacement OWTS installed in a 100-year floodplain shall meet or exceed the requirements of the Federal Emergency Management Agency (FEMA) and Clear Creek County Office of Emergency Management. Repairs of an existing system shall meet the requirements as reasonably feasible. The system as approved by the health officer shall be designed to minimize

Section 3 General Requirements and Prohibitions

or eliminate infiltration of floodwaters into the system and discharge from the system into the floodwaters.

- B. No new or expanded OWTS shall be installed in a floodway designated in a 100-year floodplain. For any system repair that may affect the floodway delineation, appropriate procedures shall be followed including revision of the floodway designation, if necessary.

7. General Prohibitions

- A. No person shall construct or maintain any dwelling or other occupied structure which is not equipped with adequate facilities for the sanitary disposal of sewage.
- B. All persons shall dispose of septage removed from systems in the process of maintenance or cleaning at an approved site and in an approved manner.
- C. No person may connect more than one dwelling, commercial, business, institutional, or industrial unit to the same OWTS unless such multiple connection was specified in the application submitted and in the permit issued for the system.
- D. Construction and use of cesspools, pit privies, slit trenches, or aerosol disposal systems is prohibited.
- E. No city shall issue to any person:
 - 1. A permit to construct or remodel a building or structure that is not serviced by a sewage treatment works until the health officer has issued a permit for an OWTS; and
 - 2. An occupancy permit for the use of a building that is not serviced by a sewage treatment works until the health officer makes a final inspection of the OWTS, provided for in section 25-10-106 (1) (h), C.R.S., and the health officer approves the installation.

8. Prohibitions of Systems in Unsuitable Areas

- A. The Board of Health may prohibit issuance of OWTS permits in accordance with applicable land use laws and procedures for defined areas in which the Board of Health determines that construction and use of additional OWTS may constitute a hazard to public health or water quality.
- B. If the Board of Health is going to prohibit the issuance of OWTS permits pursuant to Section 3.8.A, then it will conduct a public hearing, after providing written notice to all affected property owners as shown in the records of the Clear Creek County Assessor and publishing public notice in a newspaper of general circulation, at least 20 days prior to the hearing, to consider the prohibition of permits for systems in defined areas that contain or are subdivided for a density

Section 3 General Requirements and Prohibitions

of more than two dwelling units per acre. 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 an OWTS.

9. Community Sewers

- A. No OWTS permit will be issued to any person when the subject property is located within a municipality or special district that provides public sewer service, except where such sewer service to the property is not feasible in the determination of the municipality or special district, or the permit is otherwise authorized by the municipality or special district.

10. Subdivisions

- A. Any division of land pursuant to the Clear Creek County Subdivision Regulations that creates new parcels of less than five (5) acres occurring after May 14, 1990, shall be provided with central sewage treatment works. The health officer may require applicants to submit additional engineering and geologic reports or data, including a study of the economic feasibility of central sewage treatment works utilization.

11. Experimental Systems

- A. Except for designs or types of systems which have been approved by the Division pursuant to section 25-10-108 (1), C.R.S., the Department may approve an application for a type of system not otherwise provided for in these Regulations only if the system has been designed by a professional engineer, and only if the application provides proof of the ability to install a replacement OWTS in compliance with all local requirements in a timely manner in the event of a failure or malfunction of the experimental system.
- B. 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.

12. Fees

- A. Non-refundable permit and license application fees as established by the Board of Health shall be remitted to the Department at the time of application.
- B. Fees that are assessed to the permit shall be remitted prior to the final approval of the permit.

13. Material Incorporated by Reference

- A. Throughout these Regulations, standards and requirements by outside organizations have been adopted and incorporated through Regulation 43. The materials incorporated by reference cited herein include only those versions that were in effect as of June 30, 2013 and not later amendments to the incorporated material.

Section 3 General Requirements and Prohibitions

- B. Materials incorporated by reference are available for public inspection during normal business hours from the Water Quality Control Division, 4300 Cherry Creek Drive South, Denver, Colorado 80246. Copies may be purchased from the source organizations.

CLEAR CREEK COUNTY Public and Environmental Health	Permit Application Requirements and Procedures	Section 4
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1. Applicability

- A. No person or persons shall construct, install, alter, or repair a system within Clear Creek County unless such person holds a valid permit, issued by the health officer in the name of the property owner for the specific construction, installation, alteration, repair, or use proposed at the location described on the permit.
- B. A permit shall be required for the expanded use of an OWTS. The OWTS must be replaced or modified to handle the increased design flow unless it is determined that the existing system is adequately designed and constructed for the higher design flow rate.
- C. Minor repairs that will not negatively compromise that system’s integrity, design, or operation may be authorized by the health officer without the issuance of a permit, provided that the work will comply with all other aspects of these Regulations. Minor repairs include but are not limited to, repair or installation of vent pipes, observation ports, clean outs, sampling ports, distribution boxes, or less than five (5) feet of pipe. The health officer may require an inspection of the minor repair work.

2. Minimum Application Requirements

- A. An applicant shall submit a complete, written application on a form provided by the Department prior to installing, construction, altering, or repairing a system. Such application shall include the following forms and documentation:
 - 1. An application form containing:
 - a. Owner name and contact information;
 - b. Engineer and contractor name and contact information;
 - a. Physical address of the property and legal description;
 - c. Type of permit;
 - d. Type of system proposed; and
 - e. Type of water supply.
 - 2. The Report and Site Plan as detailed in Section 13.10, prepared by a professional engineer;
 - 3. The system design document as detailed in Section 13.11;

Section 4 Permit Application Requirements and Procedures

4. A legible, accurate site plan drawn to scale which shows:
 - a. Property boundary measurements with an indication of north direction and ground slope direction;
 - b. Location of both existing and proposed structures, walks, driveways, and proposed site of the system showing percolation test hole locations; and
 - c. Location of pertinent physical features on subject property and on adjacent properties as noted in Table A-1 of Appendix A.
5. When specific evidence suggests undesirable soil conditions exist, additional hydrological, geological, engineering, or other information may be required to be submitted. This requirement shall not prejudice the right of the Department to develop its own information from its own sources at its own expense.
6. Full fees pursuant to Section 3.12 shall accompany all OWTS permit applications; and
7. Other information, data, plans, specifications, and tests as required by the health officer.

3. Site and System Identification

- A. Before applying for an OWTS permit, the applicant shall ensure the following:
 1. The site shall be marked at the primary road access by a sign showing the property address in compliance with the Clear Creek County Addressing Policy;
 2. The corners of the property shall be marked with stakes set. The stakes shall have an exposed height of not less than two (2) feet and high visibility markings.
 3. The corners of the proposed soil treatment area shall be marked with stakes with an exposed height of not less than two (2) feet and high visibility markings. The stakes shall be marked to show that it represents the location of the soil treatment area; and
 4. If the onsite well has not been drilled, the well location or minimum well setback shall be marked by a stake with an exposed height of not less than two (2) feet. The stake shall be marked to show that it represents the location of the well.

4. Application Review and Permit Issuance

- A. The health officer will determine whether the information provided in the permit application, site and soil evaluations, assumptions and calculations, and design of the proposed OWTS are in

Section 4 Permit Application Requirements and Procedures

compliance with the requirements of the OWTS Act and these Regulations. If the submittal is determined to be in compliance with these Regulations, a permit will be issued.

- B. The permit will set forth the conditions relating to the installation, operation and maintenance of the system, including but not limited to, effluent testing, cleaning, or maintenance schedules or other special conditions.
- C. Unless specifically addressed in a permit condition, construction, installation, alteration, or repair of an OWTS shall otherwise be governed by all aspects of these Regulations.
- D. Prior to the approval of any permit, best management practices (BMPs) for erosion and sediment control shall be installed and maintained in accordance with the Clear Creek County Best Management Practices Manual.
- E. The permit shall expire one (1) year from the date of issuance, unless the renewal of a permit has been approved.

5. Changes in Plans or Specifications

- A. Any change in plans or specifications of the OWTS after the permit has been issued invalidates the permit unless the health officer has reviewed and approved the changes in writing.

6. Denial of a Permit

- A. If the health officer determines that the proposed system does not comply with these Regulations, the health officer will deny the permit.
- B. Written notice of the denial of a permit application will be given to the applicant by personal service or registered or certified mail, return receipt requested. Service will be complete as to the date of the certificate of mailing or hand delivery. The notice of denial will include reasons why the permit application was denied.
- C. The applicant can appeal the denial of the permit or request a variance pursuant to Section 11 of these Regulations.
- D. The denial shall become final upon the expiration of time for filing an appeal or a variance under Section 11 or when final action is taken on the appeal or variance, whichever is later.

7. Renewal of a Permit

- A. An unexpired permit may be renewed one time for one (1) year upon written request if:
 - 1. The original permit has not expired;

Section 4 Permit Application Requirements and Procedures

2. There have been no changes in the plans and specifications of the proposed system as set out in the original application;
3. The surrounding land, its use, or zoning have not changed so as to cause the original application not to be acceptable under these Regulations; and
4. Full fees pursuant to Section 3.12 shall accompany all OWTS permit applications.

8. Inspections

- A. During the installation of the OWTS, an inspection will be performed and approved by the health officer prior to back-filling for each stage that requires an inspection as specified in the permit.
- B. A maximum of five (5) inspections by the health officer will be permitted for each permit free of additional charge. Additional inspection fees will be assessed for each inspection after the fifth inspection.
- C. When each required inspection stage has been completed, the applicant or licensed Systems Contractor shall provide notice to the health officer and request an inspection. The notice and request for inspection shall be given at least one (1) business day prior to the requested inspection date. Inspections will be conducted by the health officer as soon as possible after the request is made. Inspections will not be conducted on days the county offices are closed.
- D. The applicant or licensed Systems Contractor shall assure reasonable and safe access for the inspection of any excavation required in the installation of the permitted system. For the purpose of these Regulations, a ladder is not considered reasonable and safe access.
- E. The inspection card shall be conspicuously posted at the job site. If the inspection card is not posted, an inspection will not be conducted and the applicant will be charged for additional inspections pursuant to Section 4.8.B. A fee for lost or missing inspection cards will be assessed.
- F. If any inspection reveals any deviation from the design of the permitted system or change in the proposed water supply, or if any aspect of the system fails to comply with the permit, no further progress shall be made under the permit until written approval by the design engineer is submitted to and approved by the health officer pursuant to Section 4.5.
- G. Under certain circumstances and upon prior approval by the health officer, if an inspection other than final inspection cannot be completed by the health officer, the design engineer for the system may perform one (1) inspection on behalf of the health officer. The inspection shall be documented by the design engineer in a report containing the engineer's stamp and the report shall be submitted to the Department prior to next required inspection.

Section 4 Permit Application Requirements and Procedures

- H. If upon final inspection, the health officer finds the system is installed in accordance with these Regulations and the permit conditions, has received the design engineer certification and as-built and all pertinent fees have been remitted, the health officer will approve the completed system.
- I. No OWTS shall be placed in use without a final inspection by the health officer.

9. Design Engineer Certification of Installations

- A. Prior to final approval of the system, the design engineer shall certify that the system was constructed in accordance with the permitted design and submit written approval to the health officer. The certification shall include, but not be limited to:
 - 1. Suitability of in situ, imported, or reconditioned site materials to provide adequate treatment of the effluent;
 - 2. Verification of the location of water table;
 - 3. Proper installation and operation of any pumps, siphons, or other mechanical or electrical appurtenances, if applicable;
 - 4. Proper installation of sampling and/or monitoring equipment, if applicable;
 - 5. Suitability of blasting in conformance with the submitted blasting plan, if applicable;
 - 6. Name of the licensed Systems Contractor who installed the system;
 - 7. Name of the service provider, if applicable; and
 - 8. Any other information required by the health officer.
- B. The engineer shall also provide an as-built, as detailed in Section 4.10.

10. As-Built Drawings

- A. Prior to final approval of the system, a scaled drawing shall be provided to the health officer by the design engineer showing the OWTS as installed or altered. Items shown on the as-built drawing should include at a minimum:
 - 1. Property boundary measurements with an indication of the north direction;
 - 2. Location of all dwellings from findable points;

Section 4 Permit Application Requirements and Procedures

3. Location of septic and dosing tanks and depths and their capacities and manufacturer names and models, as available;
4. Soil treatment areas and their dimensions, including depths;
5. Any clean outs, vent pipes, observation ports, diverter valves, or any appurtenance associated with locating and maintaining the system and its components;
6. Location of the water well or cisterns; and
7. Location of dry wells, infiltrator wells, or any other feature that may affect the system, as available.

11. Disclaimer

- A. The issuance of any permit and specifications of terms and conditions therein shall not constitute assumption of liability, nor create a presumption that the Board of Health, Department, or its employees may be liable for the failure or malfunctioning of any system. Permit issuance shall not constitute a certification that the system, the equipment used in the system or any component used for system operation will ensure continuous compliance with the provision of these Regulations or the OWTS Act or any terms and conditions of a permit.

CLEAR CREEK COUNTY Public and Environmental Health	Repair Permits	Section 5
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1. Applicability

- A. A property owner shall obtain a repair permit when an OWTS currently installed and in use requires repairs or alterations to only one (1) component of the entire system, such as a tank or field or piping. Any repair or alteration to an existing OWTS that would involve more than one component of the system or an expansion of the existing system is considered a new system.
- B. The owner of a property on which an OWTS is not in compliance with these Regulations shall apply for a repair permit within two (2) business days after receiving notice from the Department that the system is not functioning in compliance with the OWTS Act or these Regulations, or otherwise constitutes a nuisance or a hazard to public health or water quality. If a repair permit is issued for a non compliant or malfunctioning OWTS, repairs shall be made and completed within a reasonable amount of time, not to exceed 30 days.
- C. The owner of a property on which an OWTS is in compliance with these Regulations and repairing or altering the system pursuant to Section 5.1.A shall obtain a repair permit from the Department. The repair permit shall provide for a reasonable period of time within which repairs shall be made, not to exceed 90 days.
- D. The repair permit process shall comply with the applicable requirements of Section 4.

2. Minimum Application Requirements

- A. An applicant shall submit a complete, written application pursuant to Section 4.2, as applicable, prior to repairing or altering a system.

3. Application Review and Permit Issuance

- A. The application for the repair permit will be reviewed pursuant to Section 4.4. The repair permit will expire pursuant to Sections 5.1.B or C.

4. Emergency Use of a Malfunctioning OWTS

- A. Concurrently with the issuance of a repair permit, the health officer may conditionally authorize continued use of a malfunctioning system on an emergency basis for a period not to exceed the period stated in the repair permit. Emergency use of the system shall not further constitute a nuisance or hazard to public health.

5. Extension of a Repair Permit

- A. If conditions outside of the control of the applicant, such as weather or acts of god, limit the ability to complete all necessary repairs, the repair permit may be extended at the discretion of

Section 5 Repair Permits

the health officer provided such an extension does not constitute a nuisance or hazard to public health and only if the owner or occupant will continue to make repairs to the system.

CLEAR CREEK COUNTY Public and Environmental Health	Operating Permits	Section 6
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1. Applicability

- A. An operating permit shall be obtained for any system that requires maintenance be performed on an OWTS and/or mechanical or electrical components at regular intervals or for any system that is designed to provide higher level treatment as defined by these Regulations. Systems that incorporate pumps or lift stations only are exempt from the requirements of this section.

- B. An owner of such a system shall obtain an operating permit:
 - 1. At the time of system installation, repair, alteration, or upgrade to a system pursuant to this section;
 - 2. When a transfer of title inspection is conducted;
 - 3. At the expiration of a current O&M contract for system pursuant to Section 6.1.A; or
 - 4. By June 30, 2016, whichever comes first.

- C. An operating permit shall be maintained and renewed until:
 - 1. The system is abandoned for connection to a community sewer;
 - 2. The health officer authorizes the removal of the components requiring regular maintenance;
or
 - 3. The higher level treatment is abandoned and approved by the health officer pursuant to Section 6.1.D.

- D. The higher level treatment shall not be abandoned unless the OWTS will conform to the requirements for TL1 treatment level systems, including minimum distance setbacks set forth in Table A-1 of Appendix A and vertical separation from the STA infiltrative surface to any limiting condition set forth in Table A-2 of Appendix A.

2. Minimum Application Requirements

- A. An applicant shall submit a complete, written application on a form provided by the Department. Such application shall include at a minimum:
 - 1. Owner name and contact information;
 - 2. Service provider name and contact information;

Section 6 Operating Permits

3. Property address and legal description;
4. Location of the septic tank, higher level treatment system, soil treatment area, and other components;
5. Description of OWTS installed, including type, make, and model of the component(s) requiring maintenance;
6. Level of treatment to be provided;
7. Copy of the current O&M contract;
8. A report of the inspection and maintenance performed providing:
 - a. Dates system was inspected and/or maintained;
 - b. Name and contact information of inspector and/or maintenance provider;
 - c. Condition of system at inspection; and
 - d. Maintenance tasks performed.
9. Permits, if required by the local public health agency for the work performed;
10. Condition of system at completion of any maintenance activity; and
11. Full fees pursuant to Section 3.12 shall accompany all OWTS permit applications.

3. Application Review and Permit Issuance

- A. The health officer will determine whether the information provided as detailed in Section 6.2 is in compliance with the requirements of the OWTS Act and these Regulations. If the submittal is determined to be in compliance with these Regulations, an operating permit will be issued.

4. Inspection and Maintenance Requirements

- A. For higher level treatment systems or other components under an O&M contract, a clearly visible, permanently attached label or plate giving instructions for obtaining service shall be placed at a conspicuous location.

Section 6 Operating Permits

- B. Inspection and maintenance of the system shall be performed in accordance with the manufacturer's recommendations for proprietary systems or design criteria requirements for public domain technology or the following, whichever is more stringent:
1. All tanks shall be inspected to assure that they are structurally sound and that all components such as lids, baffles, tees, vents, effluent filters, and screens, etc. are present and in good working condition;
 2. The scum and sludge level in the tanks shall be measured and tanks shall be pumped if the scum and sludge depth exceeds 18 inches;
 3. Effluent filters shall be inspected and cleaned to assure proper function;
 4. Each motor and pump shall be inspected to assure that it is operating properly;
 5. Internal electrical connections shall be inspected to assure that they are not damaged or otherwise subject to corrosion or damage that could cause a failure or electrical short;
 6. The control panel and its appurtenances shall be inspected to assure that all components such as timers, event recorders or counters, audible and visual alarms, auto-dialers, etc. are functioning properly;
 7. Components intended to agitate or introduce air into the wastewater such as impellers, air jets, bubblers, air diffusers, aspirators, paddles, etc. shall be inspected to assure that they are functioning properly and are free from lint, hair, and other debris. Blowers or compressors shall be inspected to assure they are operating properly and that air filters are cleaned and replaced. If so equipped, the ammeter or voltage regulator shall be checked to verify that the motor is not drawing excess current;
 8. All components such as media filters, sand filters, suspended growth media, etc. shall be inspected to verify that there is no damage, excess sludge buildup, clogging, filter bridging, etc. and that spray or dispersal nozzles are free from debris and functioning properly;
 9. The STA, absorption, or evaporation system shall be inspected to verify that no wastewater is being discharged onto the surface of the ground and that it is not being impacted by erosion, excess vegetation, or compaction; and
 10. The service provider shall also note any unusual or abnormal conditions such as excessive or strong odors, noise, improper wastewater color, etc. that may indicate an operational problem with the system.

Section 6 Operating Permits

- C. The property owner shall maintain records of the activities completed as required in this section and submit all records and reports to the Department within seven (7) days of service.
- D. Maintenance shall take place:
 - 1. Every six (6) months for systems with mechanical parts or
 - 2. Every 12 months for systems with no mechanical parts.
- E. The health officer may require a revision to the maintenance frequency based on information contained in the required inspection reports.

5. Record Keeping

- A. All records and documentation pertaining to any work completed on a system pursuant to Section 6 shall be submitted to the Department within seven (7) days of completion of the work.

6. Renewal of an Operating Permit

- A. Prior to expiration of an existing operating permit, the owner shall submit an application to renew the permit, unless conditions pursuant to Section 6.1.C apply. Full fees pursuant to Section 3.12 shall accompany all OWTS permit applications

7. Revocation of an Operating Permit

- A. The health officer may request that the Board of Health revoke an operating permit for non-compliance with the permit conditions or the requirements of these Regulations.
- B. Revocation shall take place only after a hearing before the Board of Health. The operating permit holder shall be given no less than ten (10) days' written notice of the hearing sent by personal service or registered or certified mail, return receipt requested. The written notice shall specify the violations which are pertinent to the hearing.
- C. The operating permit holder will be given written notice of the decision and findings of the Board of Health. If the Board of Health finds violations, the written notice of decision will specify the violations to the operating permit holder. Such notices will be given to the operating permit holder by personal service or registered or certified mail, return receipt requested.

CLEAR CREEK COUNTY Public and Environmental Health	Use Permits	Section 7
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1. Applicability

- A. Prior to a covered transaction, the property owner of a residence or other building/facility served by an OWTS shall obtain a use permit, unless exempt as set forth in this section.
- B. When obtaining the use permit, if it is found the system is not functioning according to design, the system shall be repaired so that it is functioning in compliance of these Regulations. Appropriate permits shall be obtained pursuant to Sections 4 and 5.
- C. Owners of limited use occupancy dwellings shall be required to obtain a use permit to allow for continued limited use occupancy of the dwelling and that the system is functioning properly.
- D. Owners of limited bedroom use dwellings shall be required to obtain a use permit to ensure continued limited bedroom use of the dwelling and that the system is functioning properly.
- E. If the OWTS for a residential property was installed and approved by the health officer less than five (5) years between the date of property conveyance and issuance of the certificate of occupancy by the Building Department, a use permit shall not be required. If a component of the system is more than five (5) years old, a use permit shall be required for the entire system.
- F. Properties with systems that were installed but never connected to a dwelling or structure do not require a use permit.

2. Minimum Application Requirements

- A. Applications for a use permit shall be made on forms provided or approved by the Department prior to the covered transaction. Such application shall include the following forms and documentation:
 - 1. An application containing at minimum:
 - a. Owners name and contact information;
 - b. Physical address of the property and legal description;
 - c. Name of the transfer of title inspector and company;
 - d. Date and time of inspections;
 - e. Location of the septic tank, higher level treatment system, soil treatment area, and other components;

Section 7 Use Permits

- f. Type of system existing on the property; and
 - g. Type of water supply.
2. A septic tank inspection report completed from a licensed Systems Cleaner within the previous 12 months prior to the date of the transfer of title inspection and includes a septic tank pumping receipt, when applicable;
 3. An inspection report completed by a transfer of title inspector within the previous 12 months for the property, including details about any mechanical components such as pumps, alarms, or higher level treatment systems. Transfer of title inspectors for higher level treatment systems shall have training relevant to the specific system or certification by the equipment manufacturer;
 4. A copy of the current Operating Permit, as applicable;
 5. Full fees pursuant to Section 3.12 shall accompany all OWTS permit applications; and
 6. Any other information required by the health officer.

3. Criteria for Approval of a Use Permit

- A. The existing system shall meet the following criteria and conditions:
 1. All tanks shall be structurally sound and in good working order and provided with suitable lids;
 2. All internal devices and appurtenances such as tees, effluent screens, and baffles that were originally provided with the tank or added later shall be intact and in working order;
 3. Alarms, control devices, and other mechanical devices necessary for the operation of the system are present and in good working order;
 4. A soil treatment area, other means of subsurface wastewater treatment, evapotranspiration, or treatment system other than those discharging through a soil treatment area or sand filter is present and in good working order;
 5. There are no unapproved wastewater discharges from the system, dwelling, or structure;
 6. Any deficiencies noted in the inspection report(s) have been corrected with the necessary permits and inspections; and

Section 7 Use Permits

7. The system has not been altered from its design and configuration as documented in Department records.

4. Issuance of a Use Permit

- A. When the conditions set forth in Section 7.3 have been met, the Department will issue a use permit, setting forth the terms and conditions of approval, as appropriate:
 1. Statement of the size, type, and capacity of the existing system, and an as-built drawing, if available, from the Department records or inspection reports;
 2. Evidence of past failures or malfunctions within the previous three (3) years from the date of application as shown in the Department records;
 3. Circumstances of factors that may have affected the ability of the inspector to evaluate the system;
 4. Whether the system meets the permitting requirements of the Department; and
 5. Any other information the health officer deems appropriate, such as the existence of any permits on file with the Department.
- B. The use permit will remain valid until the date of the real estate closing or for a period of six (6) months, whichever comes first. Once the covered transaction has been completed, the use permit need not be renewed.

5. Renewal of a Use Permit

- A. Provided it has not expired, a use permit may be renewed one (1) time for a period of six (6) months upon completion of the appropriate form. Full fees pursuant to Section 3.12 shall accompany all OWTS permit applications.

6. Failure to Obtain a Use Permit

- A. If it is determined by the health officer that an OWTS cannot meet the requirements for issuance of a use permit, a letter will be issued by the health officer to the new property owner that a use permit was not obtained, stating why the use permit was not obtained, when applicable, and the property owner is responsible for maintenance of the system.

7. Revocation of a Use Permit

- A. The use permit shall be revoked if it determined that the system is no longer functioning in accordance with these Regulations or that false or misleading material statements were made on the application or inspection reports.

Section 7 Use Permits

- B. Revocation shall take place only after a hearing before the Board of Health. The use permit holder shall be given no less than ten (10) days' written notice of the hearing sent by personal service or registered or certified mail, return receipt requested. The written notice shall specify the violations which are pertinent to the hearing.

- C. The use permit holder will be given written notice of the decision and findings of the Board of Health. If the Board of Health finds violations, the written notice of decision will specify the violations to the use permit holder. Such notices will be given to the use permit holder by personal service or registered or certified mail, return receipt requested.

 <p>CLEAR CREEK COUNTY Public and Environmental Health</p>	<p>Systems Contractors and Owner Installers</p>	<p>Section 8</p>
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1. General Requirements for Systems Contractors

- A. Any person engaged in the business of installing, constructing, altering, or repairing an OWTS shall hold a valid Systems Contractor License issued by the Department. Employees of a licensed Systems Contractor need not be individually licensed, but the licensed Systems Contractor shall be onsite, supervising unlicensed employees.

- B. An applicant for a Systems Contractor License shall pass a test that demonstrates knowledge of these Regulations. The license shall be valid only as long as the person passing the test remains employed by the Systems Contractor. Full fees pursuant to Section 3.12 shall accompany all Systems Contractor License applications.

- C. The license period shall be valid for one (1) year from the date of issuance. A license that lapses because of failure to renew or is revoked shall be subject to the fee established for a new license upon re-application. If the date of re-application is more than one (1) year after the date the license expired, the applicant shall also be required to comply with Section 8.1.B.

- D. Systems Contractors shall, at a minimum:
 - 1. Verify that a permit to install an OWTS has been issued by the health officer prior to commencing installation and maintain a copy of the permit, the engineering design and specifications, and inspection sign-off card;

 - 2. Post the permit inspection sign-off card at the building site in a conspicuous and accessible location. Approval or denial of inspections will be recorded on this card. Inspections will not be conducted by the health officer if this card is not posted at the building site;

 - 3. Verify that there have been no changes in the site conditions under which the permit was issued prior to commencing construction, installation, alteration, or repair. If any condition on the permit, design documentation, or requirements provided for in these Regulations cannot be met, the Systems Contractor shall notify the health officer before proceeding with the installation, alteration, or repair;

 - 4. Perform all work in compliance with these Regulations and the conditions specified on the permit and supporting engineering design; and

 - 5. Suspend work and notify the health officer should there be any change in site conditions after construction begins that would prevent the installation of the system in accordance

Section 8 System Contractors and Owner Installers

with permit conditions or as otherwise provided for in these Regulations. Construction may resume only after written authorization by the health officer.

E. License Revocation and Suspension

1. The Board of Health may revoke or suspend a Systems Contractor License for failure to comply with these Regulations.
2. Revocation or suspension shall take place only after a hearing before the Board of Health. The licensed Systems Contractor shall be given no less than ten (10) days' written notice of the hearing sent by personal service or registered or certified mail, return receipt requested. The written notice shall specify the violations which are pertinent to the hearing. A licensed Systems Contractor shall stop all work until the Board of Health reaches a decision after the hearing.
3. The licensed Systems Contractor will be given written notice of the decision and findings of the Board of Health. If the Board of Health finds violations, the written notice of decision will specify the violations to the licensed Systems Contractor. Such notices will be given to the licensed Systems Contractor by personal service or registered or certified mail, return receipt requested.
4. A suspended license will be reinstated after completion of the suspension period that was determined by the Board of Health, not to exceed six (6) months, at which time the licensed Systems Contractor will be given written notice of the reinstatement of their license. Such notices will be given to the licensed Systems Contractor by personal service or registered or certified mail, return receipt requested. The license shall still expire at the end of the one (1) year period stated on the license.
5. A Systems Contractor License may reapply for a new license after revocation only after the Systems Contractor has demonstrated to the health officer the conditions that caused the revocation have been corrected or rectified.

2. Requirements for Owner-Installers

- A. The owner of a property for which an OWTS permit has been issued may install that system without holding a Systems Contractor License provided that the owner has passed a test that demonstrates their knowledge of these Regulations, has signed the Owner-Installer Affidavit, and paid the full fees pursuant to Section 3.12.
- B. Owner-installers shall be responsible for complying with all applicable requirements of these Regulations.

Section 8 System Contractors and Owner Installers

- C. No portion of the work for an owner-installed system shall be subcontracted to any other person who will be compensated for that work unless that subcontractor is a licensed Systems Contractor.

CLEAR CREEK COUNTY Public and Environmental Health	Systems Cleaners	Section 9
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1. General Requirements for Systems Cleaners

- A. Any person engaged in the cleaning or pumping of septic tanks, vaults, holding tanks, or other components of an OWTS or transporting sewage to a disposal site shall hold a valid Systems Cleaner License from the Department. Employees of a licensed Systems Cleaner need not be individually licensed but the licensed Systems Cleaner shall be onsite, supervising unlicensed employees.

- B. An applicant for a Systems Cleaner License shall pass a test that demonstrates knowledge of these Regulations. The license shall be valid only as long as the person passing the test remains employed by the Systems Cleaner. Full fees pursuant to Section 3.12 shall accompany all Systems Cleaner License applications.

- C. The license period will be valid for one (1) year from the date of issuance. A license that lapses because of failure to renew or is revoked will be subject to the fee established for a new license upon re-application. If the date of re-application is more than one (1) year after the date the license expired, the applicant shall also be required to comply with Section 9.1.B.

- D. Systems Cleaners shall, at a minimum:
 - 1. Remove the liquid, sludge, and scum from all compartments of the tank, leaving no more than a three (3) inches of sewage sludge in the bottom of the tank;

 - 2. Inspect the tees, baffles, aerator unit, pumps, alarms, filters, siphons, and other internal or external components of the tank(s) being pumped and notify the property owner if any of these components are damaged or missing;

 - 3. Inspect and clean any filters or other device which require routine maintenance and cleaning, if necessary;

 - 4. Maintain their equipment so that no spills occur during pumping or transportation and that their employees are not subjected to health hazards from exposure to the sewage;

 - 5. Dispose of the collected sewage only at sites approved by the health officer, such as a permitted wastewater treatment plants; and

 - 6. Maintain records of the activities completed as required in this section, including the volume of septage pumped, date and address for each septic tank pumped, and the date and disposal site for all collected sewage. The health officer may require a Systems Cleaner to provide documentation regarding their disposal methods and practices.

Section 9 System Cleaners

7. Prior to pumping any tank or any other component the Systems Cleaner shall observe to see if the liquid level within the tank is either above or below the inlet or outlet inverts and note this condition on their inspection report as an indication that the STA may either be saturated or the tank may be leaking.
8. Systems Cleaners shall submit all records and reports required under this section to the Department within seven (7) days of cleaning.

E. License Revocation and Suspension

1. The Board of Health may revoke or suspend a Systems Cleaner License for failure to comply with these Regulations.
2. Revocation or suspension will take place only after a hearing before the Board of Health. The licensed Systems Cleaner shall be given no less than ten (10) days' written notice of the hearing sent by personal service or registered or certified mail, return receipt requested. The written notice shall specify the violations which are pertinent to the hearing. A licensed Systems Cleaner shall stop work until the Board of Health reaches decision after the hearing.
3. The licensed Systems Cleaner will be given written notice of the decision and findings of the Board of Health. If the Board of Health finds violations, the written notice of decision will specify the violations to the licensed Systems Cleaner. Such notices will be given to the licensed Systems Cleaner by personal service or registered or certified mail, return receipt requested.
4. A suspended license will be reinstated after completion of the suspension period that was determined by the Board of Health, not to exceed six (6) months, at which time the licensed Systems Cleaner will be given written notice of the reinstatement of their license. Such notices will be given to the licensed Systems Cleaner by personal service or registered or certified mail, return receipt requested. Such suspension period shall not exceed six months. The license shall still expire at the end of the one (1) year period stated on the license.
5. A Systems Cleaner License may reapply for a new license after revocation only after the Systems Cleaner has demonstrated to the health officer the conditions that caused the revocation have been corrected or rectified.

CLEAR CREEK COUNTY Public and Environmental Health	Service Providers	Section 10
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1. General Requirements for Service Providers

- A. Any person engaged in the business of servicing or maintaining an OWTS shall hold a valid National Association of Wastewater Technicians (NAWT) Operation and Maintenance credential or its equivalent. Additional training for higher level treatment specific systems for which the service provider maintains is required by the Department.

- B. The Service Provider shall maintain and provide to the Department a current, valid credential pursuant to Section 10.1.A.

- C. Service Providers shall, at a minimum:
 - 1. Perform inspection, maintenance, and sampling set forth in the operating permit;
 - 2. Provide a copy of their inspection report and sampling results to the property owner;
 - 3. Report to the Department the findings of their inspection, including any malfunctions, and sample results;
 - 4. Report to the Department any additional alarm condition or service calls;
 - 5. Report to the Department if an operation and maintenance contract has terminated prior to the original termination date as set forth on the operating permit; and
 - 6. Follow the guidelines as required by the certification which the Service Provider holds.

- D. The operations and maintenance report provided by the Service Provider shall include, at a minimum:
 - 1. The date(s) a system was inspected and/or maintained;
 - 2. Name and contact information of the service provider;
 - 3. Condition of system at inspection;
 - 4. Maintenance tasks performed;
 - 5. Condition of system at completion of any maintenance activity; and
 - 6. Any of the items as required in Section 10.1.C.

Section 10 Service Providers

- E. If required for the work performed, applicable permits shall be applied for pursuant to Sections 4 and 5 of these Regulations.
- F. Service Providers shall submit all reports required under this section and Section 6, if applicable, to the Department within seven (7) days of service.

CLEAR CREEK COUNTY Public and Environmental Health	Board of Health Administrative Procedures	Section 11
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1. Variances

- A. The purpose of this section is to provide a procedure for the Board of Health to consider variances from the design and/or siting requirements of these Regulations.

- B. Any person whose OWTS application has been denied by the health officer pursuant to Section 4.6 may request a variance from these Regulations by the Board of Health. The variance application shall be filed with the Department 30 days after receipt of the notice of denial.

- C. Prohibitions on Granting Variances
 - 1. Variances shall not be granted:
 - a. Where the property can accommodate a conforming OWTS;
 - b. To mitigate an error in construction involving any element of property improvements;
 - c. If it will result in a setback reduction to an offsite physical feature that does not conform to the minimum setbacks defined in Table A-1 of Appendix A without the written consent of the owner of property of said feature. Property lines are considered offsite features;
 - d. If it reduces the separation to ground water or bedrock based on the level of treatment as provided in Table A-2 of Appendix A;
 - e. If it reduces the horizontal setback from a well, unless it also meets the variance requirements of the Board of Examiners of Water Well Construction and Pump Installation Contractors;
 - f. For systems that shall be expanded to provide for additional volume; or
 - g. Solely for economic gain to the property owner.

- D. Criteria for Approval of Variances
 - 1. The Board of Health may grant variances from the provisions of these Regulations where it is necessary to provide a functional system if the following criteria are met:

Section 11 Board of Health Administrative Procedures

- a. Granting the variance does not endanger the public health, safety, and welfare and will result in no greater risk to the public health and environment than a system meeting these Regulations. Consider the following:
 - i. Does granting the variance negatively impact water quality or the environment more than a system meeting these Regulations; and
 - ii. Does granting the variance create a nuisance.
 - b. Granting the variance does not result in the substantial impairment of these Regulations;
 - c. Granting the variance will comply with all applicable state regulations; and
 - d. By reason of exceptional topographic conditions or other extraordinary and exceptional situation or condition of such piece of property, the strict application of such regulation would result in peculiar and exceptional practical difficulties to, or exceptional and undue hardship upon the owner of such property.
- E. Variance Submittal Requirements
1. Variance applications shall include the following:
 - a. A site-specific request identifying the specific Regulation(s) from which a variance is being requested;
 - b. Technical justification by a professional engineer or professional geologist, which indicates the specific conditions which exist and/or the measures which will be taken that support a finding that the variance will result in no greater risk than that associated with compliance with the requirements of these Regulations. Examples of conditions which exist, or measures which might be taken, include but are not limited to the following: evidence of a natural or manmade physical barrier to the movement of effluent to or toward the feature from which the variance is requested; placement of a manmade physical barrier to the movement of effluent to or toward the feature from which the variance is requested; soil replacement with sand filter media to reduce the infiltration rate of the effluent such that the travel time of the effluent from the soil treatment area to the physical feature is no less than the travel time through the native soils at the prescribed setback and treatment level 2;
 - c. A discussion of alternatives considered in lieu of the requested variance;

Section 11 Board of Health Administrative Procedures

- d. Technical documentation for selected alternative, which may include a testing program, which confirms that the variance does not increase the risk to public health and to the environment; and
- e. A statement of the hardship that creates the necessity for the variance.

F. Variance for an Existing System

1. When a proposed variance for a system repair or upgrade would result in encroachment on minimum distances to physical features on neighboring properties, the hearing procedures in Section 11.1.G shall be followed.
2. For the repair of or upgrade to an approved existing system where the existing system does not meet the required separation distances and where the size of the lot precludes adherence to the required distances, a variance to the separation distances may be requested. The repairs or upgrade shall be no closer to features requiring setbacks than the existing facilities. Variances requesting setbacks no closer than existing setbacks do not have to provide technical justification from a professional engineer or professional geologist.

G. Hearing Procedures

1. Every application for a variance shall be made to the Board of Health on a form provided by the Department and shall include all data and documentation that supports the variance request so as to provide all of the information necessary for clear understanding and intelligent action by the Board of Health.
2. The applicant shall bear the burden of supplying the Board of Health with sufficient evidence to document that the variance is justified and meets the criteria for approval.
3. An application fee, as established by the Board of Health, shall accompany all applications.
4. After an application is received, the Board of Health will conduct a hearing at a regularly scheduled meeting to consider the variance. All adjacent property owners will be mailed written notice of the hearing at least 20 days before the hearing.
5. The Board of Health will take action by resolution to approve, approve with conditions, or deny a request. The required findings and any conditions imposed by the Board of Health on an approval, and the reasons for a denial, will be stated in the resolution. A copy of the resolution will be mailed to the applicant.

Section 11 Board of Health Administrative Procedures

6. The variance, and any conditions thereof, will be recorded with the office of the Clear Creek County Clerk and Recorder.

2. Appeal of OWTS Applications Denied by the Health Officer

- A. Any person whose OWTS application has been denied by the health officer pursuant to Section 4.6 may appeal the decision to the Board of Health. The appeal shall be filed with the Department 30 days after receipt of the notice of denial.
- B. The request shall be made in writing and shall state the facts upon which the applicant bases their request for review, the reasons entitling them to relief and the specific relief or outcome that they seek.
- C. The applicant shall bear the burden of supplying the Board of Health with sufficient evidence to document that the health officer erred in its denial of the permit and the proposed system meets these Regulations.
- D. The variance process, not the appeals process, should be followed if the proposed system does not meet these Regulations.
- E. An application fee, as established by the Board of Health, shall accompany all applications.
- F. Hearing Procedures
 1. After an appeals request is received, the Board of Health will conduct a hearing at a regularly scheduled meeting to consider the appeal. The applicant will be mailed written notice of the hearing at least 20 days before the hearing sent by registered or certified mail, return receipt requested.
 2. The Board of Health will take action by resolution to uphold or overrule the denial of the permit. The findings by the Board of Health will be stated in the resolution. A copy of the resolution will be mailed to the applicant by registered or certified mail, return receipt requested.

3. Appeal of Board Decisions

- A. An applicant may seek judicial review of the Board of Health's decision under the provisions of §25-1-515 C.R.S.

CLEAR CREEK COUNTY Public and Environmental Health	Enforcement	Section 12
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1. Primary Enforcement Responsibility

- A. The primary responsibility for enforcement of the provisions of the OWTS Act and these Regulations shall lie with the Department.

- B. In the event that Department fails to administer and enforce the provisions of the regulations adopted under the OWTS Act, the Division may assume such functions of the Department as may be necessary to protect the public health and environment pursuant to 25-10-110, C.R.S.

2. Notice of Violations

- A. Whenever the health officer determines there has been a violation of any pertinent provision of these Regulations, the health officer will give written notice of such violation to the property owner. Such Notice of Violation will specify the violation(s), provide a reasonable time for correction, not exceed 30 days, and be addressed to the owner of the property concerned.

- B. The written Notice of Violation will be given to the property owner by personal service or registered or certified mail, return receipt requested. Service will be complete as to the date of the certificate of mailing or hand delivery.

- C. If service is made by posting the Notice of Violation in a conspicuous place, the health officer shall include in the record a statement as to why the posting was necessary.

- D. The property owner shall apply for a repair permit within two (2) business days of receipt of the Notice of Violation or the health officer may proceed with a cease and desist order.

- E. If all documentation pursuant to Section 4.2 has not been submitted to the health officer within seven (7) days of the submission of the application, the health officer may proceed with a cease and desist order.

- F. Upon receipt of a Notice of Violation for a malfunctioning system, the property owner shall pump the septic tank and provide documentation of the pumping to the Department within seven (7) days of the pumping. Additional pumping of the septic tank may be required during the repair process if the health officer determines that the malfunction continues to constitute a nuisance or hazard to public health.

3. Stop Work Notice

- A. If work is done without a permit issued by the health officer, the health officer shall post a stop work notice on the property and issue a Notice of Violation. Work cannot continue until the health officer issues the appropriate permit. Failure to cease work shall result in a cease and desist order and suspension or revocation of the Systems Contractor's license.

4. Cease and Desist Orders

- A. The health officer may request that the Board of Health issue an order to cease and desist from the use of any OWTS or sewage treatment works which is found by the health officer not to be in compliance with these Regulations or the OWTS Act or is found to constitute a hazard to public health or has not otherwise received timely repairs under the provisions of section 25-10-106 (1) (j), C.R.S.
- B. Such an order may be issued only after a hearing which will be conducted by the Board of Health not less than 48 hours after written notice thereof is given to the owner of the property on which the system is located. The order shall require that the owner bring the system into compliance or eliminate the health hazard within a reasonable period of time, not to exceed 30 days, or thereafter cease and desist from the use of the system.
- C. After the health officer verifies the OWTS or sewage treatment works is in compliance with these Regulations or the hazard to public health has been eliminated, the health officer will schedule a hearing with the Board of Health to lift the cease and desist order. The health officer may issue a letter allowing temporary use of the OWTS or sewage treatment works while the Board of Health hearing to lift the order is pending.
- D. A cease and desist order issued by the health officer will be reviewable in the district court for the county wherein the system is located and upon a petition filed not later than ten (10) days after the order is issued.

5. Penalties

- A. Any person who commits any of the following acts or violates any of the provisions of this section commits a Class 1 petty offense as defined in section 18-1.3-503, C.R.S.:
 - 1. Constructs, alters, repairs, installs, or permits the use of any OWTS without first having applied for and received a permit pursuant to Sections 4 and 5 of these Regulations and section 25-10-106, C.R.S.;
 - 2. Constructs, alters, or installs an OWTS in a manner which involves a knowing and material variation from the terms or specifications contained in the application, permit or variance;
 - 3. Violates the terms of a cease and desist order that has become final under the terms of Section 12.4, above, and section 25-10-106 (1) (k), C.R.S.;
 - 4. Conducts a business as a systems contractor without having obtained the license provided for in Section 8.1 of these Regulations and section 25-10-109 (1), C.R.S.;

Section 12 Enforcement

5. Conducts a business as a systems cleaner without having obtained the license provided for in Section 9.1 of these Regulations and section 25-10-109 (2), C.R.S.;
6. Falsifies or maintains improper records concerning system cleaning activities not performed or performed improperly; or
7. Willfully fails to submit proof of proper maintenance and cleaning of a system as required by these Regulations.

CLEAR CREEK COUNTY Public and Environmental Health	Site Characterization and Design Requirements	Section 13
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1. Site and Soil Evaluation

- A. A site and soil evaluation shall be conducted for each property on which an OWTS is proposed, to determine the suitability of a location to support an OWTS, and to provide the design engineer a sound basis to select the most appropriate OWTS design for the location and application.

- B. Each site evaluation shall consist of:
 - 1. Preliminary investigation;
 - 2. Reconnaissance;
 - 3. Detailed soil investigation; and
 - 4. Report and site plan.

2. Preliminary Investigation

- A. A preliminary investigation shall review documented information relative to the site and anticipated conditions. Information gathered as part of the preliminary investigation shall include, but is not limited to:
 - 1. Property Information:
 - a. Address;
 - b. Legal description;
 - c. Existing structures; and
 - d. Location of existing or proposed wells on the property.
 - 2. Department records;
 - 3. Published site information, including topography and soil data;
 - 4. Location of physical features, on and off the property that will require setbacks as identified in Table A-1 of Appendix A, if applicable;

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5. Preliminary soil treatment area size estimate based on information on existing or planned facility and these Regulations;
6. Additional information that may be useful to the specific evaluation as available:
 - a. Survey;
 - b. Easements;
 - c. Floodplain maps;
 - d. Geology and basin maps and descriptions;
 - e. Aerial photographs;
 - f. Climate information; and
 - g. Delineated wetlands maps.

3. Reconnaissance Visit

- A. A reconnaissance visit to the property shall evaluate the topography and other surface conditions that will impact the selection and location and design of the OWTS, including:
 1. Landscape position;
 2. Topography;
 3. Vegetation;
 4. Natural and cultural features; and
 5. Current and historic land use.

4. Soil Investigation

- A. Soil investigations to determine the long-term acceptance rate of a soil treatment area shall be either:
 1. Visual and tactile evaluation of two or more soil profile test pit excavations; or
 2. Percolation tests plus one or more soil profile holes or one or more soil profile test pit excavations.

5. Soil Profile Test Pits

- A. If percolation tests are performed, at least one (1) soil profile hole shall be evaluated to determine whether current ground water levels and/or bedrock is encountered within eight (8) feet of the ground surface. A visual and tactile evaluation of a soil profile test pit excavation as described in Section 13.7 may be substituted for a profile hole. Following three (3) years after the effective date of Regulation 43, a visual and tactile evaluation of a soil profile test pit excavation shall be used instead of a soil profile hole when percolation tests are performed to determine long-term acceptance rates.
- B. If visual and tactile evaluations of soil are performed without percolation tests to determine long-term acceptance rate:
 - 1. Evaluation of two (2) or more soil profile test pit excavations shall be performed to determine soil types and structure, restrictive layers, evidence of seasonal high ground water, and best depth for the infiltrative surface;
 - 2. At least one (1) of the soil profile test pit excavations shall be performed in the portion of the soil treatment area anticipated to have the most limiting conditions; and
 - 3. The total number of soil profile test pit excavations required is based on the judgment of the competent technician.

6. Percolation Tests

- A. The percolation testing shall be performed by a trained person under the supervision of a professional engineer or by a competent technician as provided in Section 13.13.
- B. Soil percolation tests shall be performed in at least three (3) test holes in the area in which the soil treatment area is to be located, spaced reasonably evenly over the proposed area. There shall be no less than one (1) test hole provided in every 1,200 square foot area of soil treatment area.
- C. If the likely depth of a proposed infiltrative surface is uncertain, percolation tests shall be performed at more than one (1) depth to determine the depth of the infiltrative surface.
- D. The percolation test hole shall have a diameter of 8 to 12 inches and be terminated a minimum of six (6) inches and a maximum of 18 inches below the proposed infiltrative surface.
- E. If a change of soil type, color, or structure is present within those soils comprising the depth of soil below the infiltrative surface as required in Table A-2 of Appendix A for vertical separation, a

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minimum of two (2) soil percolation holes shall be terminated in the changed soil and percolation tests shall be conducted in both holes.

- F. The percolation tests shall be conducted using the hole preparation, soil saturation, and rate measurement procedures described below.

1. Preparation of Percolation Test Holes

- a. Excavate the hole to the depth and diameter required.
- b. Carefully scrape the bottom and sides of the hole with a knife blade or sharp instrument to remove any smeared soil surfaces and provide a natural soil interface into which water may percolate.
- c. Remove all loose soil from the hole.
- d. Add two (2) inches of very coarse sand or fine gravel to protect the bottom of the hole from scouring and sediment.

2. Preparation of Percolation Test Holes

- a. The hole shall be presoaked adequately to accomplish both saturation, which is filling the void spaces between the soil particles, and swelling, which is the intrusion of water into the individual soil particles.
- b. To presoak the hole, carefully fill the hole with clean water to a minimum depth of 12 inches over the gravel placed in the bottom of the hole. In most soils, it is necessary to refill the hole by supplying a surplus reservoir of clean water, possibly by means of an automatic siphon, to maintain water in the hole for at least four (4) hours and preferably over night. Determine the percolation rate 24 hours after water is first added to the hole. This procedure is to ensure that the soil is given ample time to swell and to approach the condition it will be in during the wettest season of the year. In sandy soils containing five (5) percent or less particles passing the #200 sieve, by weight, the swelling procedure is not essential and the test may be conducted after the water from one (1) filling of the hole has completely seeped out of the hole.

3. Percolation Rate Measurement

- a. With the exception of sandy soils containing five (5) percent or less particles passing the #200 sieve, by weight, percolation rate measurements shall be made on the day following the presoak procedure.

Section 13 Site Characterization and Design Requirements

- b. If water remains in the percolation test hole after the swelling period, adjust the depth to approximately six (6) inches above the gravel in the bottom of the hole. From a fixed reference point, measure the drop in water level over a series of 30 minute intervals. The drops are used to calculate the percolation rate.
 - c. If no water remains in the hole after the swelling period, carefully add clean water to bring the depth of water in the hole to approximately six (6) inches above the top of the gravel in the bottom of the hole. From a fixed reference point, measure the drop in water level at 30 minute intervals for four (4) hours, refilling to six (6) inches over the top of the gravel as necessary. The drop in water level that occurs during the final 30-minute period is used to calculate the percolation rate. If the water level drops during prior periods provide sufficient information, the procedure may be modified to suit local circumstances. The requirement to conduct a four (4) hour test under this section is waived if three (3) successive water-level drops do not vary by more than 1/16 inch; however, in no case shall a test under this section be less than two (2) hours in duration.
4. Special Requirements for Sandy and Special Soils
 - a. In sandy soils or other soils in which the first six (6) inches of water seeps out of the hole in less than 30 minutes, after the 24 hours swelling period, the time interval between measurements shall be taken as ten (10) minutes and the test conducted for one (1) hour. The drop that occurs during the final ten (10) minutes shall be used to calculate the percolation rate.
 - b. If the soil is so sandy or coarse-textured that it will not retain any water, then the infiltration rate shall be recorded as less than one (1) minute per inch.
 - c. The Department may identify soil types in its area, for which it shall require different procedures such as extra presoaking to obtain a valid percolation rate.
5. Percolation Rate Determination and Reporting
 - a. The field percolation rate shall be the average rate of the percolation rates determined for all percolation test holes observed in the proposed soil treatment area in minutes per inch. The average percolation rate determined by the tests shall be used in determining the LTAR for the proposed system from Appendix C.
 - b. The technician performing the percolation tests shall furnish an accurate scale drawing, showing the location of the soil profile holes or soil profile test pit excavations and percolation holes tied to lot corners or other permanent objects. The drawing shall meet the criteria in Section 13.11. The information in Section 13.11.C.6 through 13.11C.10 may be included but is not required for this drawing. All holes shall be

Section 13 Site Characterization and Design Requirements

clearly labeled to relate to the information provided for the profile test pits and percolation tests.

6. Percolation Test Waiver

- a. If the applicant demonstrates to the satisfaction of the health officer that the system is not dependent upon soil absorption, the requirement of percolation tests may be waived.

7. Alternate Percolation Testing

- a. Alternate percolation test procedures may be approved, provided the test results of alternate procedures are substantially equivalent to those determined using the test procedures described in this section.
- b. Prior approval from the health officer of alternate percolation test procedures is required.

7. Visual and Tactile Evaluation of Soil Requirements

- A. Each soil profile test pit excavation observed at the proposed soil treatment area shall be evaluated under adequate light conditions with the soil in an unfrozen state.
- B. The soil observations shall be conducted at or immediately adjacent to the location of the proposed soil treatment area, but if possible, not under the final location of a trench or bed.
- C. The soil observation method shall allow observation of the different soil horizons that constitute the soil profile.
- D. Soil profile test pit observations shall be conducted prior to percolation tests to determine whether the soils are suitable to warrant percolation tests and, if suitable, at what depth percolation tests shall be conducted.
- E. The minimum depth of the soil profile test pit excavation shall be to the periodically saturated layer, to the bedrock, or four (4) feet below the proposed depth of the infiltrative surface, whichever is encountered first.
- F. The soil type at the proposed infiltrative surface of the soil treatment area or a more restrictive soil type within the treatment depth shall be used to determine the LTAR from Appendix C. The treatment depth is two (2) to four (4) feet depending on the required thickness for the treatment level below the infiltrative surface from Table A-2 of Appendix A.

Section 13 Site Characterization and Design Requirements

- G. Soils data, previously collected by others at the site can be used for the purposes of an OWTS design at the discretion of the health officer. Previous soils data shall be verified, at a minimum, by performing an evaluation of a soil profile test pit excavation.

8. Determination of a Limiting Layer

- A. Soil descriptions for determination of a limiting layer shall include:
 - 1. The depth of each soil horizon measured from the ground surface and a description of the soil texture, structure, and consistency of each soil horizon;
 - 2. Depth to the bedrock;
 - 3. Depth to the periodically saturated soil as determined by:
 - a. Redoximorphic features and other indicators of water levels, or
 - b. Depth of standing water in the soil observation excavation, measured from the ground surface, if observed, unless redoximorphic features indicate a higher level.
 - 4. Any other soil characteristic that needs to be described to design a system, such as layers that will restrict permeability.

9. Percolation Hole and Profile Test Pit Marking

- A. The engineer or technician conducting the percolation tests shall, upon completion of the tests, flag or otherwise mark each hole or pit to allow easy location by others. Percolation holes and profile test pits shall remain open until after evaluation by the health officer unless otherwise approved. Excavations shall be suitably protected to prevent access by unauthorized persons.

10. Report and Site Plan

- A. A written report shall describe the results of the preliminary investigation, reconnaissance, and detailed evaluations. The report may be in text and/or tabular form and shall include a drawing locating features relative to the proposed OWTS location and test locations. The report may be included as part of the OWTS design document. The report shall include, but is not limited to:
 - 1. The name, address, telephone number, e-mail address, credentials, and qualifications of the individual conducting the site evaluation;
 - 2. Preliminary and detailed evaluations, providing information from the surface site characteristics assessment and soils investigation;
 - 3. Dates of preliminary and detailed evaluations;

Section 13 Site Characterization and Design Requirements

4. A graphic soil log, to scale, indicating depth of drill hole or excavation, soil description and classification, depth to ground water encountered during drilling or excavation, type of equipment used to drill the profile hole or excavate the soil profile test pit, date of soils investigation, name of investigator, and company name;
5. Setback distances to features listed in both tables of Appendix A, existing on the site or within applicable setback limits, whichever is greater; and
6. A drawing created to a scale that provides the complete property boundary lines. Minimum drawing size shall be 8.5 by 11 inches and maximum of 11 by 17 inches. If the property is too large to adequately indicate and label the profile test pits and percolation test holes, a detail of the portion of the site containing the soil profile test pits and percolation test holes shall be submitted. If the property is too large to adequately show site evaluation information, a detail drawing that includes the information required from the site and soil evaluation that will impact the location of the OWTS shall be submitted. Drawings shall indicate dimensions, have a north arrow, and graphic scale and include:
 - a. Horizontal and vertical reference points of the proposed soil treatment area; soil observations; percolation testing results and pertinent distances from the proposed OWTS to all required setbacks, lot improvements, easements; ordinary high water mark of a pond, creek, stream, lake, wetland, or other surface waters and detention or retention ponds; and property lines;
 - b. Contours or slope direction and percent slope;
 - c. The location of any visible or known unsuitable, disturbed, or compacted soils;
 - d. The estimated depth of periodically saturated soils and bedrock or flood elevation, if applicable; and
 - e. The proposed elevation of the infiltrative surface of the soil treatment area, from an established datum (either ground surface or a benchmark).
7. Anticipated construction-related issues;
8. An assessment of how known or reasonably foreseeable land use changes are expected to affect the system performance, including, but not limited to, changes in drainage patterns, increased impervious surfaces, and proximity of new water supply wells; and

Section 13 Site Characterization and Design Requirements

9. A narrative explaining difficulties encountered during the site evaluation, including but not limited to identifying and interpreting soil and landform features and how the difficulties were resolved.

11. Design Document

- A. The report and site plan may be attached to the design document or the report and site plan may be combined with the design information as a single document.
- B. The design document shall include a brief description of the facility and its proposed use, basis and calculations of design flow and influent strength.
- C. The design document shall contain all plan detail necessary for permitting, installation, and maintenance, including:
 1. Assumptions and calculations for each component;
 2. A scale drawing showing location of each OWTS component and distances to water, physical and health impact features requiring setbacks as set forth in Table A-1 of Appendix A, including all wells less than 200 feet from the proposed STA;
 3. Layout of soil treatment area, dimensions of trenches or beds, distribution method and equipment, distribution boxes, drop boxes, valves, or other components used;
 4. Depth of infiltrative surface of soil treatment area, depth of the septic tank, depth of other components;
 5. Specifications of each component, a design for the wastewater pumping system, if applicable;
 6. Specifications for septic tanks or other buried components shall include loads due to burial depth, additional weight or pressure loads, and highest elevation of ground water. Resistance to local water composition such as high sulfates shall be included in the specification if such conditions exist at the site;
 7. References to design manuals or other technical materials used;
 8. Installation procedures;
 9. Operation and maintenance manuals or instructions; and
 10. Other information that may be useful such as photos and cross-section drawings.

12. Site Protection

- A. During construction, the proposed soil treatment area and replacement area, if any, shall be protected from disturbance, compaction, or other damage by staking, fencing, posting, or other effective method.

13. Qualifications for a Competent Technician

- A. Technicians performing percolation tests shall have the following competencies:
 - 1. Set up equipment;
 - 2. Perform and run percolation tests according to the procedure in these Regulations; and
 - 3. Record results and calculate percolation rates.
- B. The health officer may approve training for percolation testing.
- C. Technicians performing visual and tactile evaluation of soil shall have the following competencies:
 - 1. Identify soil types by hand texturing and observation;
 - 2. Identify presence or absence of soil structure;
 - 3. Identify grade of soil structure;
 - 4. Recognize evidence of highest seasonal water surface;
 - 5. Identify layers and interfaces that will interfere with effluent movement;
 - 6. Determine the most promising depth for infiltrative surface of OWTS and for percolation tests, if used; and
 - 7. Understand basic principles of OWTS siting and design.
- D. Possible demonstrations of competence in visual and tactile evaluation of soil:
 - 1. Degree in soil science, agronomy, geology, other majors if a course(s) in soil morphology was included; or
 - 2. Attendance at training or workshop for soil evaluation for OWTS including both class and field work.

Section 13 Site Characterization and Design Requirements

- E. The Division shall approve training for visual and tactile evaluation of soil.

CLEAR CREEK COUNTY Public and Environmental Health	Wastewater and Flow Strength	Section 14
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1. Wastewater Flows

- A. The health officer may require the installation of a meter to measure flow into the facility or the OWTS.
- B. Reduction in flow rates shall not be permitted for the installation of water-saving plumbing fixtures.

2. Single-Family Residential Homes

- A. Table 14-1 provides the design flows for single-family residential dwellings.
- B. Design flow per person shall be 75 gallons per day (gpd).
- C. For homes with more than three (3) bedrooms, the assumed number of persons shall be six (6) persons (first 3 bedrooms x 2 persons per bedroom) plus one (1) additional person for each bedroom more than three (3) bedrooms.
- D. The minimum design flow for the repair or replacement of an OWTS of an existing one-bedroom dwelling or a dwelling where designated bedrooms are not identified, shall be one-bedroom unless bedrooms are added to the dwelling.
- E. If a dwelling has unfinished areas or has space that can be converted into a bedroom that can meet building code requirements, the Department will consider this a limited bedroom use dwelling. The number of bedrooms in a limited bedroom use dwelling cannot exceed the number of bedrooms in the OWTS design. Owners of a limited bedroom use dwelling shall maintain a current Limited Bedroom Use Agreement with the Department. The Limited Bedroom Use Agreement shall be recorded with the Office of the Clear Creek County Clerk and Recorder.
- F. Limited Bedroom Use Agreements shall be maintained until the number of potential bedrooms does not exceed the number of bedrooms designed for the system, as approved by the health officer. Termination of the Limited Bedroom Use Agreement shall be recorded with the Office of the Clear Creek County Clerk and Recorder.

Table 14-1 Minimum Single-Family Residential Design Flows

# Bedrooms	Occupancy (# of Persons)	Design Flow (gallons/day)
2	4	300
3	6	450
4	7	525
Each additional	Add 1	Add 75

3. Auxiliary Buildings

- A. If a single-family home has an auxiliary building, such as a non-commercial shop with plumbing fixtures, the flow may be conveyed to the OWTS of the home or to a separate OWTS constructed to handle the flow from the auxiliary facility.
- B. If the flow from the auxiliary building is only generated by residents of the home, it shall be assumed that the OWTS for the home will be adequately sized to include the auxiliary building if the flows are combined.
- C. If the auxiliary building will have users in addition to residents and the flow from the auxiliary building will flow to the OWTS of the home, the design flow of the home must include the increased use. The design flow for such auxiliary building shall be for at least one (1) bedroom, unless otherwise specified and shall be included in the design.
- D. If the auxiliary building has a separate OWTS, the facility shall be sized on the basis of Appendix B and a septic tank detention time of no less than 48 hours.

4. Multi-Family and Commercial Onsite Wastewater Treatment Systems

- A. Design flow values and strengths for multi-family and commercial systems shall be determined from Appendix B; or
- B. An analysis of flows and strengths from at least three (3) comparable facilities or from the facility, if it is an existing facility, shall be submitted to the health officer for approval. The analysis shall include:
 - 1. Metered water flows for inside use only for at least a year, or if use is seasonal, for a full season. If metered flows are less than full capacity, they shall be paired with actual use in units of persons present or meals served or other units as appropriate so that an actual daily rate per unit can be determined. The daily rate per unit times the number of units at full occupancy shall be the design flow;

Section 14 Wastewater Flow and Strength

2. TSS and BOD₅ or CBOD₅ tests at times of full use. At least three (3) samples taken at least one (1) week apart are required; and
 3. Explanation and justification for the comparability of the tested facilities with the proposed facility.
- C. An OWTS that will serve a business, commercial, industrial, or institutional property or a multi-family dwelling shall:
1. Be designed by a professional engineer;
 2. Receive only such biodegradable wastes for treatment and distribution as are compatible with those biological treatment processes as occur within the septic tank, any additional treatment unit and the soil treatment area; and
 3. Receive authorization by rule or a Class V underground injection permit from the United States Environmental Protection Agency (EPA) before an application for an OWTS permit is approved if the system may receive non-residential wastewater or is otherwise covered by the EPA underground injection control program.

5. Flow Equalization

- A. Flow equalization may be used if a facility has flows that vary from day to day by more than four (4) times the average flow.
- B. The highest peak assumed shall be at least equal to the full capacity of the facility. If that peak exceeds 2,000 gpd, the design shall also comply with the provisions of Section 3.2.
- C. The stored flow shall be distributed to the soil treatment area before the next greater-than-average peak.
- D. Flow equalization may be used only if:
 1. The facility is non-residential;
 2. The facility is only used for one purpose;
 3. Flows will follow a predictable pattern; and
 4. There is a long-term expectation that size and pattern of the flows will remain the same.
- E. Timed pressure distribution shall be used. The soil treatment area reduction for timed pressure distribution shall not be used in addition to the flow equalization reduction.

Section 14 Wastewater Flow and Strength

- F. Contingency plans shall be made for expanding the capacity of the OWTS in the event of changed use at the facility.

6. Wastewater Strength

- A. Table 14-2 includes levels of treatment that can be achieved by various OWTS components, excluding the soil treatment area. Systems qualifying for these treatment levels except TL1 produced by a septic tank alone shall be approved under Section 19 of these Regulations.
- B. CBOD₅ strength shall be reduced to TL1 treatment level or lower before applying to a soil treatment area.

Table 14-2 Treatment Levels and Wastewater Strength

Treatment Level	CBOD ₅ * (mg/L)	TSS (mg/L)	Total Nitrogen (mg/L)
TL 1**	145	80	60-80
TL 2	25	30	60-80
TL 2N	25	30	>50% reduction***
TL 3	10	10	40-60
TL 3N	10	10	20 mg/L

Note: **bold** areas indicate higher treatment levels

*If concentrations of organic material are submitted in BOD₅ without data in CBOD₅, the data in BOD₅ shall be multiplied by 0.85 to estimate CBOD₅ levels.

**Domestic septic tank effluent prior to soil treatment or higher level treatment has a wide range of concentrations. These values are typical, but values used for design shall account for site-specific information.

***NSF/ANSI Standard 245 – Wastewater Treatment Systems – Nitrogen Reduction requires reduction of 50 percent rather than an absolute value.

<p>CLEAR CREEK COUNTY Public and Environmental Health</p>	<p>Minimum Separation Distances</p>	<p>Section 15</p>
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1. Setback Requirements

- A. Horizontal distances from the various components of an OWTS to pertinent terrain features listed in Table A-1 of Appendix A shall be installed or located in accordance with the minimum distance requirements provided. The setback requirements are applicable for minimum system performance and treatment levels with specific modifications allowed for higher treatment levels as provided in Table E-1 of Appendix E. The minimum distances shall be maintained between the OWTS components and the pertinent terrain features described. Where soil, geological, or other conditions warrant, greater distances may be required by the Board of Health or by the Water Quality Control Commission pursuant to 25-8-206, C.R.S. and applicable regulations.
- B. For repairs to existing OWTS where the size of lot precludes adherence to these distances, the proposed STA shall not be closer to setback features than the existing OWTS, as reviewed and approved by the health officer per Section 18.13.B. Components that are not watertight should not extend into areas of the root system of nearby trees.
- C. Minimum vertical separation distance between the STA infiltrative surface and the restrictive layer or the required depth of soil comprising the STA shall be four (4) feet, except as provided for in Table A-2 of Appendix A.

2. Modifications and Reductions

- A. The designing professional engineer may select a higher level of treatment to be applied to the STA when necessary in order to accommodate the site conditions.
- B. If modified setback distances are required, rationale for the modified setbacks shall be provided and include the following at a minimum:
 - 1. An analysis of the intended uses of impacted surface and/or ground waters;
 - 2. An explanation of why the standard setback(s) cannot be met;
 - 3. Contacting adjacent property owners for potential conflicts with property line encroachments; and
 - 4. An analysis of potential impacts that the system location may have on building foundations and other potentially affected features.
- C. Reductions in separation distances with higher level treatment shall include provisions for operation and maintenance for the life of the system, as described in Section 6.

3. Dry Gulches, Cut Banks, and Fill Areas

- A. Separation distances to dry gulches, cut banks, and fill areas in Table A-1 of Appendix A shall apply unless the professional engineer or professional geologist determines by observation of the exposed slope of the dry gulch or cut bank or by profile holes or soil profile test pit excavations that a restrictive layer is present that will direct or allow the effluent from the soil treatment area to move laterally and surface.
- B. A lesser distance may be used if it can be demonstrated by a professional engineer or professional geologist that the use of a barrier, such as a minimum 30 mil PVC liner placed between the soil treatment area and the slope of the dry gulch, cut bank, or fill area will prevent effluent surfacing laterally.
- C. The separation distance between a component and the crest of a dry gulch or cut bank shall be evaluated for potential erosion or slope instability if the component and the slope are too close together. If there is potential for erosion or instability, the separation distance shall be increased until the risk is minimized.
- D. If the natural grade at or within 35 feet of the absorption system is greater than 30 percent, then the absorption system shall conform to the following specifications:
 - 1. A 30 mil PVC liner shall be placed on each end and on the down slope side of the absorption system excavation to a depth of a minimum of six (6) feet below grade unless otherwise approved by the health officer, in a manner such that all exposed soils are covered;
 - 2. A berm shall be constructed in accordance with the Clear Creek County Best Management Practice Manual upslope of the absorption system to divert surface water run-off from the absorption system; and
 - 3. All disturbed areas shall be seeded after completion of the absorption system installation.

CLEAR CREEK COUNTY Public and Environmental Health	Component Design Standards	Section 16
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1. General Standards

- A. An OWTS shall be designed and constructed to achieve the treatment level specified by the design.
- B. The OWTS shall be designed and constructed such that each component shall function, when installed and operated, in a manner not adversely affected by normal operating conditions including erosion, corrosion, vibration, shock, climactic conditions, and usual household chemicals.
- C. Each OWTS component shall be free of non-functional protrusions or sharp edges or other hazards which could cause injury to persons, animals, or properties.
- D. The OWTS design shall be such as to exclude flies and rodents and other vectors and to prevent the creation of nuisances and public health hazards, and shall provide for efficient operation and maintenance.
- E. All components used in the system shall be approved by the design engineer.
- F. All components shall be installed and used in accordance with the recommendation of the manufacturer or the requirements of these Regulations, whichever is more stringent.

2. Accessibility for Inspection, Maintenance, and Servicing

- A. Each treatment component, including, septic, dosing, and pump tanks, of an OWTS other than the soil treatment area shall be equipped with access manholes with risers that extend to or above final grade, located to permit periodic physical inspection, collection and testing of samples and maintenance of all components and compartments.
- B. Septic tanks shall have risers a minimum of 24-inch diameter over each access manhole made of corrosion-resistant material and all risers shall extend to or above final grade.
- C. Each riser lid brought to the surface shall have a secure closing mechanism, such as a lock, special headed bolts or screws, or sufficient weight to prevent unauthorized access.
- D. Each access riser lid shall have a watertight connection to prevent infiltration or exfiltration.
- E. Components that require access for maintenance shall include but not be limited to submerged bearings, moving parts, pumps, siphons, valves, tubes, intakes, slots, distribution boxes, drop boxes, cleanouts, effluent screens, filters, inlet and outlet baffles, aerators, treatment equipment, and other devices.

Section 16 Component Design Standards

- F. Components shall be designed and constructed so that, when installed, they will be easily maintained, sampled, and serviced according to the manufacturer's recommendations. Easy physical access to treatment components by maintenance personnel and equipment shall be provided, such as but not limited to, extending access points to at least six (6) inches below the top of the riser and clear of any protrusions that may prevent easy removal of necessary components.

3. Sampling Access

- A. If sampling for testing or as a requirement for a permit will be required of effluent from a component other than the soil treatment area, an accessible sampling point shall be provided.
- B. If sampling of the treated wastewater from the soil treatment area will be required for testing or as a requirement for a permit, a monitoring well or wells shall be constructed. Monitoring wells shall be located down gradient from the soil treatment area, accessible, and provided with a properly securable cover at or above the ground surface. Monitoring wells up gradient of the system may also be required. Lysimeters or other collection devices under the soil treatment area may be used instead of a monitoring well if approved by the health officer or other issuer of a permit.

4. Plumbing Codes

- A. Plumbing fixtures, building sewers, vents, sewer lines, and other appurtenances shall be designed, operated, and maintained so as to comply with the minimum requirements of the most recently revised locally enforceable plumbing code.

5. Electrical Equipment

- A. All electrical work, equipment, and material shall comply with the requirements of the currently applicable National Electrical Code as designated by the State Electrical Board Rules and Regulations (3 CCR 710-1).
- B. Electrical components shall be protected from moisture and corrosive gases.
- C. Splice Boxes
 - 1. Splice boxes shall be located outside the pump system access riser and be accessible from the ground surface.
 - 2. No wire splices shall be made inside the tank, dosing chamber, or riser. Wire splicing shall be completed with corrosion-resistant, watertight connectors.

6. Indicators of Capacity

- A. A signal device shall be installed in all vaults or holding tanks to provide a warning to the user that the liquid level in the vault or holding tank has reached a maximum of 75% capacity. The signal device shall meet the requirements of Section 20.2.

7. Indicators of Failure for Malfunctioning for Systems Utilizing Mechanical Apparatus

- A. 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.
- B. This indication or warning shall be a visual signal or an audible signal or both and shall be located in a centralized area within visual and audible range of the system user. A signal or message may also be sent remotely to a maintenance provider.
- C. If located on the exterior of a structure, the signal device shall be enclosed in a waterproof housing and shall have a sound pressure level of at least 80 decibels (dB) measured at 24 inches from the housing.

8. Component Operating Instructions

- A. The manufacturer of proprietary treatment units utilizing mechanical components shall provide clear, concise written instructions covering the components which, when followed, shall assure proper installation and safe and satisfactory operation and maintenance.
- B. If the OWTS uses public domain technology, the design engineer shall provide clear, concise written instructions covering the components which, when followed, shall assure proper installation and safe and satisfactory operation and maintenance.

9. Pipe Standards and Bedding Requirements

- A. All wastewater lines used in an OWTS shall be constructed of compatible pipe, primer, bonding agent, and fittings.
- B. Where unperforated plastic pipe and fittings are used for gravity flow, the minimum wall thickness of the pipe shall conform to ASTM Standard D 3034 or equivalent or greater strength. Schedule 40 pipe is preferred.
- C. Perforated distribution pipe surrounded by rock within a soil treatment area shall have a minimum wall thickness and perforations conforming to ASTM Standard D 2729 or equivalent or greater strength. Corrugated polyethylene pipe with smooth interior that meets ASTM F405 or AASHTO M252 specifications or equivalent may be used.

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- D. Schedule 40 or pipe of equivalent or greater strength shall be used for the placement of piping under driveways or roadways and in instances where sewer line setback distances are granted a variance for any reason.
- E. Tile pipe, open-joint pipe, and cast iron pipe is prohibited for use in an OWTS.
- F. Pressure pipe shall be rated for the intended use to accommodate pump discharge pressure.
- G. All system piping, except for distribution laterals within the STA, shall be bedded with select material before final inspection by the health officer. Select bedding material shall consist of loose, granular material, free from stones, clods, frozen soil, or other deleterious material. Select material may consist of on-site job-excavated or imported material. Bedding material shall be mechanically compacted to support piping.

10. Sewer Lines

- A. Except for pressurized systems, sewer lines shall be installed such that gravity flow is maintained throughout the length of the line.
- B. If the tank consists of a sealed vault, the grade of the building sewer shall be sufficient to assure gravity flow into the tank.
- C. Bends in the sewer line between the structure and the first treatment components shall be limited to 45 degree ells or long sweep 90 degree bends.
- D. There shall be at every change of direction greater than 45 degrees or at least one clean-out for every 100 feet of four inch sewer line and every 75 feet of three inch sewer line. The clean-out shall be of the same material as the pipe, extend at least 12 inches above final grade and fitted with a removable cap.
- E. Building sewer clean-outs shall be located outside of the dwelling, unless the Department has received written approval from the appropriate building department the clean out has been located inside the dwelling, extend at least 12 inches above final grade, and be fitted with a removable cap.
- F. Non-pressurized sewer lines shall have a minimum diameter of three (3) inches.
- G. The inlet and outlet pipes of the septic tank shall be grouted and sealed with watertight materials.

11. Distribution Boxes

- A. A distribution box, if used, shall be of sufficient size to distribute effluent equally to the lateral lines of a trench or absorption bed system. The box shall be constructed with the inlet invert at least one (1) inch above the level of the outlet inverts. Flow equalizers or similar devices shall be used to adjust the flow between lines. Access to the box shall be provided with a manhole riser with access lid at or above grade if the top of the box does not reach final grade. The distribution box should be level.

12. Drop Boxes

- A. In sequential or serial distribution, a watertight box may be used to transfer the effluent to the following trench when the effluent in a trench has received the designed level for overflow to the next trench. A drop box shall have a riser at or above final grade, if the top of the drop box does not reach final grade. Outlet lines in sequential distribution shall be designed and installed so that they may be capped off for resting periods. The drop box shall be level.

13. Step-Down/Relief Lines

- A. In sequential or serial distribution, an unperforated pipe may be used to transfer the effluent to the following trench when the effluent in a trench has received the designed level for overflow from that trench.

14. Wastewater Pumping Systems

- A. Pumps
 - 1. Non-clog pump opening shall have at least two-inch diameter solids handling capacity where raw wastewater is pumped. A pump opening shall not have more than 3/4 inch diameter solids handling capacity if previously settled effluent is pumped.
 - 2. Pumps shall be certified to the applicable UL or CSA electrical safety standard, bear the seal of approval of CSA, UL, or an equivalent testing program and be constructed of corrosion resistant materials.
 - 3. Grinder pumps shall also be certified to NSF/ANSI Standard 46 and bear the seal of approval of the NSF or equivalent testing and certification program.
- B. Floats and Switches
 - 1. Automatic liquid level controls shall be provided to start and shut off pumps at a frequency or level specified in the design.

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2. Floats shall be mounted on a stem free of hindrances that would prevent adjustment and separate from the pump discharge piping to allow for removal, adjustment, and replacement of the float without removing the pump.
3. Float switches shall be certified to the applicable UL or CSA electrical safety standard, bear the seal of approval of CSA, UL, or an equivalent certification program and be constructed of corrosion resistant materials.

C. Location of Pump or Siphon

1. A pump may be, or a dosing siphon shall be, installed in a separate tank following the septic tank and be of sufficient volume to allow siphon cycling commensurate with the design capacity. The use of a three compartment septic tank, sized to provide effective volume in the first two compartments with the pump in the third compartment is acceptable.
2. The second compartment of the septic tank shall not be used as the pump tank unless it can be demonstrated to the satisfaction of the health officer that the minimum 48 hours detention time will not be decreased and the pump is screened or provided with an approved filtering device to assure that only liquid effluent will be discharged.
3. Pumps shall be installed on a solid base with a minimum of eight (8) inches from the bottom of the pumping chamber to elevate the pump intake above any sludge layer.

D. Pump or Siphon Discharge Piping

1. The discharge line from the pumping or siphon chamber or tank shall be protected from freezing by burying the pipe below frost level or sloping the pipe to allow it to be self-draining. Drainage shall be provided through the bottom of the pump or through a weep hole located in the discharge line prior to exiting the tank.
2. The pump discharge piping shall have a quick disconnect that is accessible within the riser to allow for easy pump access and removal.
3. The pipe shall be sized to maintain a velocity of two (2) or more feet per second.
4. Automatic air/vacuum release valves shall be installed at high points in the pressure line where necessary to prevent air or vacuum locking and allow self draining of the lines.
5. In-vault pumps shall be provided with quick-disconnect joints to allow for routine removal for maintenance and replacement as well as a surrounding screen of filter for pumps placed in the second compartment of septic tanks.

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E. Controls

1. The pump system shall have an audible and visual alarm notification in the event an excessively high water condition occurs.
2. The pump shall be connected to a control breaker separate from the high water alarm breaker and from any other control system circuits.
3. The pump system shall have a switch so the pump can be manually operated.
4. The pump system for pressure dosing and higher level treatment systems shall have a mechanism for tracking either the amount of time the pump runs or the number of cycles the pump operates.
5. Control panels shall be UL listed.

15. Effluent Screens

- A. An effluent screen shall be installed in all septic tanks in new installations and repairs where the septic tank is replaced.
- B. If a pump or dosing siphon is used to remove septic tank effluent from the final compartment of the septic tank, an effluent screen shall be provided prior to the pump or siphon inlet. A pump vault equipped with a filter cartridge may be considered equivalent to an effluent screen preceding the pump.
- C. The effluent screen shall be cleaned at manufacturer-recommended intervals, or more often, if use patterns indicate.
- D. Effluent screens shall comply with the requirements of Section 16.2.F.

16. Floor Drains

- A. Floors drains from any facility, workshop or garage shall not be connected to any OWTS unless that system consists solely of a sealed vault or holding tank.

CLEAR CREEK COUNTY Public and Environmental Health	Septic Tanks and Vaults	Section 17
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1. Watertightness and Testing

- A. Septic tanks, vaults, pump tanks, other treatment components, risers, and lids shall not allow infiltration of ground water or surface water and shall not allow the release of wastewater or liquids through other than designed openings.
- B. Acceptable watertightness testing methods performed at a manufacturer’s site or in the field include water filling the tank or vacuum testing.
- C. Testing of septic tanks shall be performed and evaluated as specified in Section 9 of ASTM C1227-12 for concrete tanks or in Standard IAPMO/ANSI Z1000-2007 for other prefabricated septic tanks.
- D. Each unit shall be inspected in the field for conditions that may compromise its watertightness. The inspection shall be performed after the tank installation but before backfilling.
- E. If the inspection in the field indicates that the tank may be damaged or is not watertight, the health officer may require that the tank be tested for watertightness by the tank manufacturer or the licensed Systems Contractor.

2. Tank Anchoring

- A. In locations where ground water or floodwaters may cause instability problems to the septic tank, vault or other treatment unit in the OWTS due to flotation, that component or unit shall be anchored in a manner sufficient to provide stability when the tank is empty. Risers shall be included in the buoyancy calculations.
- B. If a manufacturer provides recommendations for anchoring designs, they may be used if they meet the conditions present at the site.
- C. If a manufacturer does not provide recommendations for provisions to compensate for buoyancy or if the professional engineer chooses to provide his/her own designs, the anchoring system design shall be prepared by the professional engineer.

3. Identification and Data Marking

- A. All tanks and treatment units shall be permanently and legibly marked in a location for the purpose of inspection that is readily visible when inspected before backfilling. The marking inscription shall include the following:
 - 1. Name of manufacturer;

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2. Model or serial number, if available;
3. Effective volume and unit of measure;
4. Maximum depth of earth cover and external loads the tanks is designed to resist; and
5. Inlet and outlet identifications, if relevant.

4. Liquid Capacities for Septic Tanks

- A. Sizing for residential capacity for new installations shall be based upon the number of bedrooms and whether internal dosing siphons or pumps are provided.
- B. For multi-family and non-residential applications, a septic tank shall be sized to permit detention of incoming wastewater design flows for a minimum of 48 hours.
- C. For systems that remove toilet waste for separate treatment, tank capacity may be less than 1,000 gallons if it provides a minimum of 48 hours retention time.
- D. Minimum tank size for new installations other than for a single-family residence is 400 gallons.

Table 17-1 Minimum Septic Tank Capacity

Number of Bedrooms	Total Tank Capacity (gallons)	1st Compartment Capacity (min)
3 or less	1,000	500
4	1,250	625
5	1,500	750
Each Additional	Add 250	Add 125

5. Tank Design and Dimension Criteria

- A. The manufacturer shall provide sufficient information to demonstrate that the tank will meet the design specification.
- B. A septic tank shall have two or more compartments or more than one tank may be used in series. The first compartment of a two-compartment tank or the first tank in a series shall hold no less than one-half of the required effective volume.
- C. The inlet invert shall be at least two (2) inches higher than the outlet invert.
- D. An inlet tee or baffle shall be provided and shall extend above the surface of the liquid at least five (5) inches and shall extend a minimum of eight (8) inches below the liquid surface.

Section 17 Septic Tanks and Vaults

- E. The outlet tee or baffle shall extend at least 14 inches below the outlet invert and, if needed, be modified to accommodate an effluent screen. The outlet tee or baffle that accommodates an effluent screen shall be located so that the effluent screen has sufficient clearance to be removed through the access opening with a riser in place.
- F. The distance from the outlet invert to the underside of the tank top shall be at least ten (10) inches.
- G. Liquid depth of a septic tank shall be a minimum of 30 inches and the maximum depth shall not exceed the tank length.
- H. The transfer of liquid from the first compartment to the second or successive compartment shall be made at a liquid depth of between 35 and 40 percent of the liquid depth measured from the liquid surface. Liquid transfer shall not be made in the sludge zone.
- I. At least one (1) access manhole no less than 20 inches across shall be provided in each compartment of a septic tank.
- J. A septic tank shall have a minimum of 25 square feet of liquid surface area and have at least a six-foot separation between inlets and outlets. Septic tanks in series, combined, shall have a minimum of 25 square feet of liquid surface area and the sum of the distances between inlets and outlets of all tanks shall be at least six (6) feet. The requirements for liquid surface area and separation between inlet and outlet may be waived for tanks with less than 750 gallons effective volume.

6. Structural Design – General Requirements

- A. The design of each tank model and size by each manufacturer shall be certified by a professional engineer as complying with these design and structural requirements and the watertightness standard of these Regulations.
- B. Certification by a professional engineer shall be submitted to the Division for acceptance.
- C. All seams or connections including between tank and risers shall be sealed to be watertight.

7. Structural Design - Concrete Tanks

- A. Concrete septic tanks shall comply with the structural design criteria of ASTM C1227-12 (Standard Specification for Precast Septic Tanks).
- B. Tank slab lids or mid-seam tanks shall be sealed to be watertight.

8. Structural Design - Fiberglass, Fiberglass-Reinforced Polyester, and Plastic Tanks

- A. All fiberglass, fiberglass-reinforced polyester, and plastic tanks shall meet the minimum design and structural criteria of IAPMO/ANSI Z1000-2007 (American Standards for Prefabricated Septic Tanks).
- B. All tanks shall be sold and delivered by the manufacturer or manufacturer's designated representative, preferably completely assembled. On-site tank assembly will be allowed on an as-needed basis.
- C. Tanks shall be structurally sound and support external forces as specified in standard referenced above when empty and internal forces when full. Tanks shall not deform or creep resulting in deflection of more than five (5) percent in shape as a result of loads imposed.
- D. All tanks shall be constructed of sound, durable materials, and not be subject to excessive corrosion, decay, frost damage, or cracking.

9. Structural Design - Metal Tanks

- A. Metal tanks are prohibited.

10. Grease Interceptor Tanks

- A. All commercial food service facilities and other facilities generating fats, oils, and greases in their waste shall install a grease interceptor tank.
- B. Grease interceptor tanks shall treat only those portions of the total wastewater flow in which grease and oils are generated.

11. Oil/Water Separators

- A. Unless the system consists of a sealed vault or holding tank, discharges from oil/water separators shall not be conveyed to the OWTS.

12. Installation of Septic Tanks

- A. Septic tanks shall be transported, handled, and set in accordance with the manufacturer's recommendations so as to avoid undue strain on the tank and the pipes entering and exiting the tank.
- B. Septic tanks shall be installed on a solid base and shall be level.
- C. Septic tanks shall be installed at least five (5) feet from soil treatment areas or evaporation systems.
- D. Risers shall meet the requirements of Section 16.2.

Section 17 Septic Tanks and Vaults

- E. Roof drains, foundation drains, water softener discharge lines, area drains, or cistern overflows shall not enter any tanks or any part of the system and shall be placed in a manner which diverts water away from the system.
- F. All septic tanks shall be installed so that sufficient access is provided for routine maintenance and pumping of each compartment of the tank.
- G. The tank shall be completely covered by backfill and no portion of the tank except for the risers and lids may remain exposed.
- H. All areas disturbed by the installation of the septic tank shall be re-graded and re-seeded to control erosion.

13. Dosing

- A. Unless otherwise provided for in these Regulations, dosing will be required for all new installations and for repairs where the existing septic tank is being replaced or upgraded.
- B. Dosing may be accomplished by means of a dosing siphon or a pump and may be demand or time based.
- C. Dosing is not required for new systems with a design flow of less than 150 gallons per day or where TL1 effluent is to be applied and topography or other conditions will not allow the use of a dosing siphon.
- D. Dosing for repairs is not required for systems where the engineer provides justification that dosing would be more detrimental to the system.
- E. A pump may be, or a dosing siphon shall be, installed pursuant to Section 16.14.
- F. The dose calculation shall be sized to account for the daily flow and dosing frequency.

<p>CLEAR CREEK COUNTY Public and Environmental Health</p>	<p>Soil Treatment Areas</p>	<p>Section 18</p>
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1. General Requirements

- A. The size and design of the Soil Treatment Area (STA) shall be based on the results of the site and soil evaluation, design criteria, and construction standards for the proposed site and OWTS selected.

2. Calculation of Infiltrative Surface of a Soil Treatment Area

- A. The infiltrative surface of a trench or bed receiving any treatment level of effluent is only the bottom area. No sidewall credit is allowed except in deep gravel trenches and seepage pits that are permissible in repairs.
- B. Long Term Acceptance Rates (LTARs) are shown in Appendix C.
- C. Factors for adjusting the size of the STA are in Tables 18-1 and 18-2.
- D. The required area for a STA is determined by the following formula:

$$\text{Required STA (sq ft)} = \frac{\text{Design Flow (gpd)}}{\text{LTAR (gpd/sq ft)}}$$

- 1. The adjusted STA is the required STA multiplied by the Size Adjustment Factors.
- 2. The Size Adjustment Factors for methods of application are in Table 18-1.
- 3. The Size Adjustment Factors for types of storage / distribution media are in Table 18-2.
- 4. A required soil treatment area receiving TL1 treatment level effluent may be multiplied by one factor from Tables 18-1, Table 18-2 or both.
- 5. A soil treatment area receiving TL2, TL2N, TL3 or TL3N treatment level effluent shall be pressure dosed. The distribution mediation in Table 18-2 may be used for distribution of higher level treatment system effluent, but an additional reduction factor from Table 18-2 shall not be used.

3. Allowable Soil Treatment Area Reductions and Increases

- A. The STA size determined by dividing the design flow rate by the LTAR may be adjusted by factors for method of treatment, soil treatment area design, and type of distribution media.

Section 18 Soil Treatment Areas

- B. For the purpose of the Table 18-1, a “baseline system,” i.e. adjustment factor of 1.0, is considered to be Treatment Level 1 (TL1) effluent dosed to a gravel or tire chip filled trench.
- C. The maximum reduction from all combined reductions including higher level treatment shall be no greater than 50 percent of the baseline system required for a soil treatment area.
- D. Reductions for the higher level treatment categories listed in Appendix C shall only apply provided the system is inspected and maintained as specified in the requirements of Section 6.

Table 18-1 Size Adjustment Factors for Application Methods in STA

Type of Soil Treatment Area	Method of Effluent Application from Treatment Unit Preceding Soil Treatment Area		
	Gravity	Dosed (Siphon or Pump)	Pressure Dosed
Trench	1.1	1.0	0.9
Bed	1.2	1.1	1.0

Table 18-2 Size Adjustment Factors for Types of Distribution Media in STA Accepting Treatment Level 1 Effluent

Type of Soil Treatment Area	Type of Storage/Distribution Media Used in Soil Treatment Area		
	Rock or Tire Chips	Manufactured Media Other Than Chambers	Chambers
Trench or Bed	1.0	0.9	0.7

4. Design of Soil Treatment Areas- General Requirements

- A. The infiltrative surface and distribution lines shall be level.
- B. The infiltrative surface shall be no deeper than four (4) feet unless adequate treatment at a deeper level can be demonstrated and is approved by the health officer. The depth will be measured on the downslope side of the trench or bed excavation.
- C. Trenches shall follow the ground surface contours so variations in infiltrative surface depth are minimized. Beds shall be oriented along contours to the degree possible.
- D. Pipe for gravity distribution shall be no less than three (3) inches in diameter.

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- E. A final cover of soil suitable for vegetation at least ten (10) inches deep shall be placed from the top of the geotextile or similar pervious material in a rock and pipe system, chamber, or manufactured media up to the final surface grade of the soil treatment area.
- F. Following construction, the ground surface shall be graded to divert stormwater runoff or other outside water from the soil treatment area. The area shall be protected against erosion. Subsurface drains upslope of the STA may be installed to divert subsurface flow around the area.
- G. Backfilling and compaction of STAs shall be accomplished in a manner that does not impair the intended function and performance of the storage/distribution media and soil and distribution laterals, allows for the establishment of vegetative cover, minimizes settlement, and maintains proper drainage.
- H. Soil replacement is permitted to bring the soil within the requirements of suitable soil. Added soil shall meet the specifications of sand filter media, as specified in Section 19.3.A.1 All added soil shall be completely settled prior to installation of components as specified and approved by the design engineer. The loading rate for sand filters shall be used. Pressure distribution shall be used.
- I. The design engineer may select the level of treatment to be applied to the STA that is necessary in order to accommodate the site conditions, if higher treatment for the purpose is required.

5. Distribution Lines

- A. Distribution between lines in a STA shall be as even as possible. Uneven settling of portions of the distribution system following construction shall be addressed by provisions in the design to adjust flows between lines.
- B. Distribution lines shall be a maximum of 150 feet long.
- C. Distribution lines longer than 100 feet shall be pressure dosed or the application of the effluent shall be at the center of the line.
- D. The end of a distribution pipe shall be capped, unless it is in a bed or trenches in a level soil treatment area, where the ends of the lines may be looped.

6. Inspection Ports

- A. An inspection port accessible from ground surface shall be installed at the terminal end of each trench or bed. The bottom of the inspection port tube shall extend to the infiltrative surface and not be connected to the end of the distribution pipe. That portion of the tube in contact with the distribution media shall be perforated. Inspection ports in chambers may be installed according to manufacturer's instructions if the infiltrative surface is visible or can be measured from the inspection port.

Section 18 Soil Treatment Areas

- B. At least one (1) inspection port connected to the distribution pipes shall be provided for each trench or bed.
- C. The top of inspection ports may be below the final grade of the surface if each has a cover at the surface such as a valve box for a lawn irrigation system.

7. Trenches

- A. Trenches shall be three (3) feet wide or less.
- B. The separating distance between trenches shall be a minimum of six (6) feet sidewall-to-sidewall.
- C. Perforated distribution pipe used in a trench shall be as close to the center of the trench as possible.
- D. Perforations shall be oriented downward unless pressure distribution is used and provision for pipe drainage is included.

8. Beds

- A. Maximum width for a bed shall be 12 feet, unless the bed receives effluent meeting TL2 treatment level or better or for repairs to existing systems as provided in Section 18.13.C.
- B. The separating distance between beds shall be a minimum of six (6) feet sidewall-to-sidewall.
- C. The separating distance between parallel distribution lines in an absorption bed shall not exceed six (6) feet and a distribution line shall be located within three (3) feet of each sidewall and endwall of the absorption bed.

9. Serial and Sequential Distribution

- A. A serial or sequential distribution system may be used where the ground slope does not allow for suitable installation of a single level soil treatment area unless a distribution box or dosing chamber is used.
- B. The horizontal distance from the side of the absorption system to the surface of the ground on a slope shall be adequate to prevent lateral flow and surfacing.
- C. Adjacent trenches or beds shall be connected with a stepdown/relief line or a drop box arrangement such that each trench fills with effluent to the top of the gravel or chamber outlet before flowing to succeeding treatment areas.

10. Storage/Distribution Media

A. Rock and Pipe

1. The pipe shall be surrounded by clean, graded gravel, rock, or other material of equal efficiency which may range in size from 1/2 inch to 2 1/2 inches that meets ASTM D448 (AASHTO M43) Size 2-5. At least six (6) inches of gravel, rock or other material shall be placed below the pipe. The gravel, rock, or other material shall fill the trench around the pipe and at least two (2) inches above the top of the distribution pipe.
2. The top of the placed gravel or such material used shall be covered with non-woven permeable geotextile meeting a maximum thickness rating of 2.0 ounces per square yard or equivalent pervious material. An impervious covering shall not be used.

B. Tire Chips

1. The pipe may be surrounded with clean, uniformly-sized tire chips.
2. Tire chips shall be nominally two (2) inches in size and may range from 1/2 inch to a maximum of four (4) inches in any one direction.
3. Wire strands shall not protrude from the tire chips more than 3/4 inches.
4. Tire chips shall be free from balls of wire and fine particles less than two (2) millimeters across.

C. Chambers

1. Installation shall be according the manufacturer's instructions provided that those instructions are no less stringent than these Regulations.
2. Chambers shall be installed with the base on the infiltrative surface.
3. Effluent may be distributed by gravity or pressure dosing.
4. A distribution pipe shall be placed extending the entire length of the chambers and may be either suspended or left in contact with the ground.

D. Manufactured Media

1. Manufactured media shall be installed with the base on the infiltrative surface.

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2. Installation shall be according the manufacturer's instructions provided that those instructions are no less stringent than these Regulations.
3. Effluent may be applied by pressure distribution only if the manufacturer specifies suitability of the product for that use.

E. Pressure Distribution

1. Design of pressure distribution systems shall include:
 - a. Dose size and frequency for flows and soil or media long-term acceptance rate;
 - b. Pipe diameter and strength requirements;
 - c. Orifice size and spacing; and
 - d. Distal pressure head.
2. Cleanouts shall be installed at the end of each line.

F. Drip Distribution System

1. The infiltrative surface area shall be calculated using the long-term acceptance rate for the site or a more conservative value if recommended by the manufacturer.
2. Driplines shall be installed on manufacturer's spacing recommendations.
3. Drain back shall be provided for all drip lines, pipes, and pumps.
4. Provisions shall be made to minimize freezing in the distribution lines, driplines, relief valves, and control systems.
5. Provisions shall be made for backflushing or other cleaning.

11. Sand Filters

- A. Sand filters, such as a lined intermittent sand filter or recirculating sand filter, may be used as a pre-treatment system where the treated effluent is collected and dispersed to a soil treatment area or where site conditions require importing treatment media, such as an unlined sand filter, a soil replacement system, or a mounded system.

12. Sequencing Zone Systems

- A. Sequencing zone systems have more than two (2) soil treatment area sections that are dosed on a frequent rotating basis.
- B. The combined size of the zones shall equal the minimum size of the STA as calculated in Section 18.2.
- C. Where soil conditions are similar between the sections, each section area shall be the same size. If soil conditions are such that long-term acceptance rates are different, each section may be sized for the same dose, but different long-term acceptance rates.
- D. An automatic distribution valve shall be used.
- E. Dosing of each system shall be evaluated by the design engineer based on projected daily flow rates, number of zones, and soil types.

13. Repairs to Existing Systems

- A. When space is not available or if there are other site limitations that preclude other soil treatment area options for OWTS repairs, wide beds, deep gravel trenches, and seepage pits may be considered for repairs only. Other options are vaults or higher level treatment systems.
- B. Repairs or upgrades of existing OWTS where the size of lot precludes adherence to these distances, a repaired OWTS shall not be closer to setback features than the existing OWTS, as reviewed and approved by the health officer.
- C. Wide Beds
 - 1. For repairs, beds may be wider than 12 feet without being required to receive effluent meeting TL2 treatment level quality or better.
- D. Deep Gravel Trenches
 - 1. For deep gravel trenches or beds, the length of an absorption trench or bed may be calculated by allowance for the sidewall area of additional depth of gravel in excess of six (6) inches below the bottom of the distribution pipe according to the following formula:

$$\text{Adjusted Length} = L \times \frac{(W+2)}{(W+1+2D)}$$

Where:

L = length of trench prior to adjustment for deep gravel

W = width of trench or bed in feet

Section 18 Soil Treatment Areas

D = additional depth in feet of gravel in excess of the minimum required six (6) inches of gravel below the distribution pipe

- a. The maximum allowable additional depth is five (5) feet.
- b. Percolation tests and soil profile hole or soil profile excavation test pit evaluations shall be performed at the proposed infiltrative surface depth.
- c. The reduction in field size area with the use of chambers shall not be applied to deep gravel systems.

E. Alternating Systems

1. An alternating system may be used only for repairs to existing systems when the existing STA is retained and a new one is added.
2. An alternating system shall have two (2) zones that shall be alternated on an annual or more frequent basis.
3. A maximum of 25 percent of the minimum total required STA infiltrative surface may be allocated to the existing STA. Size adjustment factors for methods of effluent application or type of distribution media shall not be allowed.
4. A diversion valve or other approved diversion mechanism shall be installed on the septic tank effluent line allowing STA zones to be alternated.
5. The diversion mechanism shall be readily accessible from the finished grade.

F. Seepage Pits

1. Seepage pits may be used only for repairs to existing systems, if the potential for risk to public health and water quality is low.
2. The construction of new seepage pits for the treatment and dispersal of onsite wastewater on new sites is prohibited unless the design includes higher level treatment of at least TL2 treatment level.
3. If risk is low in the determination of the health officer, a seepage pit without higher level treatment may be used.
4. If the risks are not low, higher level treatment of at least TL2 treatment level shall be attained prior to discharge to these systems for final disposal.

Section 18 Soil Treatment Areas

5. A seepage pit shall consist of a buried vertical cylinder with holes in the wall.
6. Pits shall be provided with both vertical sidewall and top supporting structural concrete or other material of equal structural integrity.
7. The excavation shall be larger than the cylinder by at least 12 inches on each side.
8. The space between the cylinder wall and the edge of the excavation shall be filled with rock ranging in size from 1/2 inch to 2 1/2 inches.
9. The capacity of the pit shall be computed on the basis of long-term acceptance rates determined for each stratum penetrated. The weighted average of the results shall be used to obtain a design figure.
10. Soil strata in which the percolation is slower than 30 minutes per inch shall not be used for absorption or seepage. These strata shall not be included in the weighted average to determine the long-term acceptance rate.
11. The infiltrative surface of the pit is the vertical wall area (based on dug perimeter) of the pervious strata below the inlet plus the bottom area inside the vertical cylinder.
12. Pits shall be separated by a distance equal to three times the greatest lateral dimension of the largest pit. For pits over 20 feet in depth, the minimum space between pits shall be 20 feet.

 <p>CLEAR CREEK COUNTY Public and Environmental Health</p>	<p>Higher Level Treatment Systems</p>	<p>Section 19</p>
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1. General Requirements

- A. Higher level treatment systems may be public domain technology systems or proprietary systems.
- B. Public domain technology systems shall be designed, installed, and maintained according to established criteria and additional criteria established by the Department. When design criteria are not specifically provided in these Regulations, the criteria used in the design shall be from a reference commonly used as an industry standard and the criteria shall be cited in the design.
- C. Proprietary systems shall be designed, installed, and maintained according to manufacturer’s instructions and additional criteria identified by CDPHE as part of their Technology Review and Acceptance process pursuant to Section 43.13 of Regulation 43
- D. Reductions to soil treatment area or separation distances listed in Table A-1 of Appendix A may only apply provided when the system is inspected and maintained as specified in the requirements of Section 6. The owners of properties with higher level treatment systems shall obtain and maintain an operating permit issued by the Department.
- E. For higher level treatment systems or other components under an O&M contract, a clearly visible, permanently attached label, or plate giving instruction for obtaining service shall be placed at a conspicuous location.
- F. Soil treatment areas for higher level treatment systems shall be pressure dosed.
- G. All systems shall be capable of accommodating all anticipated flows and organic loads.
- H. 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.
- I. All systems shall be installed to include protection of openings against entry of insects, rodents, other vectors, and unauthorized people.

2. Treatment Levels for Higher Level Treatment Systems

- A. Treatment levels for proprietary treatment systems shall be assigned by CDPHE based on their Technology Review and Acceptance process and shall be used to size the STA in accordance with Section 18.
- B. Treatment levels for public domain higher level treatment systems are identified in Table 19-1.

Section 19 Higher Level Treatment Systems

Table 19-1 Treatment Levels for Public Domain Higher Level Treatment Systems

Type of System	Treatment Level	Design Criteria
Mounded Sand Filters (mound systems)	TL2	Section 19.3.D
Lined Sand Filters (single pass)	TL3	Section 19.3.B
Lined Sand Filters (recirculating)	TL3N	Section 19.3.E

3. Sand Filters

A. Intermittent (Single Pass) Sand Filters

1. The filtering material used in a sand filter shall be clean, coarse sand, all passing a screen having four (4) meshes to the inch. The sand shall have an effective size between 0.25 and 0.60 mm. The uniformity coefficient shall be 4.0 or less. Material meeting ASTM 33, for concrete sand, with one (1) percent or less fines passing 200 mesh sieve may be used.
2. The sand below the distribution lines shall be at least two (2) feet deep.
3. Distribution system
 - a. Dispersal of effluent to the surface of the sand filter shall be by a pressurized distribution system for equal distribution.
 - b. Pipes used to disperse the effluent shall be surrounded by washed coarse screened gravel or crushed stone. All of the gravel or stone shall pass a 2 1/2-inch screen and shall be retained on a 3/4-inch screen.
 - c. Manufactured media may be used as an alternative to gravel or stone.
 - d. The separation distance between parallel distribution lines shall not exceed six (6) feet, and a distribution line shall be located within three (3) feet of each filter sidewall.
4. Application Rates
 - a. When receiving wastewater that meets TL1 treatment level, a maximum sand filter application rate of 1.0 gpd/ft² shall be used.
 - b. When receiving wastewater that meets TL2, TL2N, TL3, or TL3N treatment levels, the sand filter shall be sized based on the long-term acceptance rate for Soil Type 1.
 - c. An intermittent sand filter shall not be used to treat wastewater that does not conform to TL1 treatment level or better.

Section 19 Higher Level Treatment Systems

B. Lined Sand Filters

1. Lined sand filters shall have an impervious liner on the sides and bottom of the filter. The liner shall consist of a 30 mil thickness PVC material or equivalent.
2. A minimum four-inch diameter under-drain pipe shall be used. The under-drain pipe shall be surrounded by washed coarse screened gravel or crushed stone. All of the gravel or stone shall pass a 2 1/2 inch screen and shall be retained on a 3/4-inch screen. Manufactured media may be used as an alternative to gravel or stone.
3. Under-drain effluent collected below the sand filter shall be dispersed to a soil treatment area. The soil treatment area receiving the sand filter effluent may be sized with a long-term acceptance rate for TL3 treatment level effluent.

C. Unlined (Open Bottom) Sand Filters

1. The bottom of the sand filter receiving TL1 treatment level shall be no less than two (2) feet above the high ground water surface or bedrock for installations in which effluent percolates downward through the soil.
2. The bottom of the sand bed receiving effluent greater than TL1 treatment level shall be at or above the high ground water surface or bedrock.
3. An unlined sand filter is to be sized based on Section 18.2 or the LTAR as set forth in Appendix C, whichever results in the larger area.

D. Mounded Sand Filters (Mound Systems)

1. Effluent introduced into a mounded sand filter shall be pre-treated to TL1 treatment level or better.
2. When the infiltrative surface area of the media receiving wastewater effluent is above the natural ground surface, the system shall be considered a mounded sand filter.
3. Mounded sand filters shall conform to Section 19.3.C for unlined (open bottom) sand filters.
4. The basal area and linear loading rate shall be determined from the loading rate for the soil type under the mound and the slope of the site.
5. The final slope of the mound shall be no greater than three (3) feet horizontal to one (1) foot vertical.

Section 19 Higher Level Treatment Systems

6. The surface of the mounded area shall be planted with a suitable vegetative cover that does not require irrigation.
7. If the thickness of the sand is at least two (2) feet, the treatment level for mounded sand filters is TL2 treatment level and it does not need an additional two-foot unlined sand filter.

E. Recirculating Sand Filters

1. A recirculating sand filter shall have an impervious liner on the sides and bottom of the filter. The liner shall consist of a 30 mil thickness PVC material or equivalent.
2. A minimum four-inch diameter under-drain pipe shall be used. The under-drain pipe shall be surrounded by washed coarse screened gravel or crushed stone. All of the gravel or stone shall pass a 2 1/2 inch screen and shall be retained on a 3/4 inch screen. Manufactured media may be used as an alternative to gravel or stone.
3. Filter media effective size (D10) shall range from 1.0 to 1.50 millimeter and the uniformity coefficient (D60/D10) shall be less than 4.0. Fines passing a 200 mesh sieve shall be less than one (1) percent. Material meeting ASTM C33, for concrete sand, with one (1) percent or less fines passing 200 mesh sieve may be used.
4. Sand depth shall be a minimum of two (2) feet.
5. Typical loading rates are 3.0 to 5.0 gal/sq ft/day. Rate shall not exceed 5.0 gal/sq ft/day.
6. Design re-circulation ratios may be 3:1 to 5:1.
7. Effluent collected from the sand filter shall be discharged to a STA. The STA receiving the sand filter effluent may be sized with a LTAR for TL3N treatment level effluent.

CLEAR CREEK COUNTY Public and Environmental Health	Alternate Disposal Systems	Section 20
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1. General Requirements

- A. Design criteria and construction standards for alternate systems shall meet the requirements in Section 16.

2. Vaults

- A. Vaults for full time use in new construction are prohibited where a property can accommodate an OWTS with a STA. Vaults for full time use may only be permitted when a failing OWTS cannot be replaced and has been approved by the Board of Health.
- B. Vaults may be permitted for limited use occupancy on a property which cannot accommodate an OWTS with STA.
- C. Owners of a limited use occupancy dwelling shall maintain a current Limited Use Occupancy Dwelling Agreement with the Department. The Limited Use Occupancy Dwelling Agreement shall be recorded with the Office of the Clear Creek County Clerk and Recorder.
- D. Limited Use Occupancy Dwelling Agreements shall be maintained until the dwelling has a system that no longer requires limited use occupancy as approved by the health officer. Termination of the Limited Use Occupancy Dwelling Agreement shall be recorded with the Office of the Clear Creek County Clerk and Recorder.
- E. Vaults may be permitted if the facility is on land where the installation of an OWTS with STA is not permitted and has been approved by the Board of Health.
- F. Vaults may be permitted for systems where some of the wastewater flows are separated, such as toilet wastes only, into a vault. The portion not retained in the vault shall be treated in an adequately-sized OWTS.
- G. Vaults for non-residential use shall have a minimum 500 gallon effective volume or be capable of holding a minimum of the two (2) day design wastewater flow, whichever is larger.
- H. Vaults for residential use shall have a minimum 1,000 gallon effective volume or be capable of holding a minimum of the two (2) day design wastewater flow, whichever is larger.
- I. A visual or an audible signal device or both, indicating the vault is at 75 percent capacity, shall be installed to indicate when pumping is necessary.
- J. A tripping device, which activates at 85 percent capacity, shall be installed to effectively eliminate the water supply to the building being served by the vault.

Section 20 Alternate Disposal Systems

- K. Vaults shall meet the strength and watertightness requirements for septic tanks as defined in Section 17, except that that vault shall contain a single compartment and no effluent outlet shall be provided.
- L. Prefabricated fiberglass, fiberglass-reinforced polyester and plastic tanks may be used as vaults, if the tank manufacturer provides testing criteria certifying them for this use.
- M. Vaults shall be tested for watertightness in accordance with Section 17.1. One-piece or seamless vaults need not be tested.
- N. Vaults shall be located in an area that is easily accessible for routine pumping during all seasons of the year.
- O. The owner of a system that includes a vault shall obtain and maintain a contract with a licensed Systems Cleaner for the routine pumping of the vault. The owner shall maintain copies of all pumping receipts for a period of three (3) years and shall furnish copies to the Department upon request.

3. Vault Privy

- A. Vault privies may be allowed at the discretion of the health officer but shall be prohibited for residential uses.
- B. A vault privy shall be built to include:
 - 1. Fly- and rodent-tight construction;
 - 2. A superstructure affording complete privacy;
 - 3. An earth mound around the top of the vault and below floor level that slopes downward away from the superstructure base;
 - 4. A floor and a riser of concrete or other impervious material with hinged seats and covers of easily cleanable, impervious material;
 - 5. Venting that is fly-proofed with No. 16 or tighter mesh screening; and
 - 6. An effective volume of the vault shall be no less than 500 gallons and constructed of concrete or plastic.
- C. The vaults for privies shall meet the general requirements of vaults detailed in Section 20.2 except for wastewater flow separation.

4. Pit (Non-Vaulted) Privies

- A. The construction and use of pit privies is prohibited.

5. Composting Toilets

- A. A composting toilet may be used for toilet waste where an OWTS treating the wastewater remaining after the separation of the toilet wastes must meet all minimum design and construction standards for a TL1 OWTS based on the volume and character of wastes for the fixtures and the number of persons to be served. The compartment may be located within a dwelling or building provided that the unit complies with the applicable requirements of these Regulations and the most recently revised, locally enforceable plumbing code, and provided the installation will not result in conditions considered to be a health hazard. Compartment and appurtenances related to the unit shall include fly-tight and vector-proof construction and exterior ventilation.
- B. An approved composting toilet shall treat deposits of feces, urine, and readily decomposable household garbage that are not diluted with water or other fluids and are retained in a compartment in which aerobic composting will occur.
- C. The effective volume of the receptacle shall be sufficient to accommodate the number of persons served in the design of the unit installed. The effective volume of the unit shall include sufficient area 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.
- D. Residue from the composting toilet shall be removed when it is filled to 75 percent of capacity. Residue from the unit shall be properly disposed of by methods recommended by the manufacturer and acceptable to the health officer. Disposal methods shall prevent contamination of water and not cause a public health nuisance. Disposal using solid waste practices is recommended.
- E. If a system will be installed where low temperature may be a factor, design, and installation shall address the effects of the low temperature.
- F. Composting toilets shall be operated according to manufacturer's specifications.
- G. Only manufactured composting toilets meeting NSF/ANSI Standard 41 and bear the seal of approval of the NSF or an equivalent testing and certification program may be installed.

6. Incinerating Toilets

- A. An incinerating toilet may be used for toilet waste where an OWTS is installed for treating wastewater remaining after removal of toilet waste. The compartment may be located within a dwelling or building provided that the unit complies with the applicable requirements of these Regulations and the most recently revised locally enforceable plumbing code, and provided the installation will not result in conditions considered to be a health hazard. Compartment and appurtenances related to the unit shall include fly-tight and vector-proof construction and exterior ventilation.
- B. An approved incinerating toilet shall be designed and installed in accordance with all applicable federal, state, and local air-pollution requirements and manufacturer's instructions.
- C. Incinerating toilets shall meet the requirements of NSF P157 and bear the seal of approval of the NSG or an equivalent testing and certification program.

7. Portable Chemical Toilets

- A. A portable chemical toilet may be used with permitted approval from the health officer.
- B. Use of a portable chemical toilet in permanently occupied buildings is prohibited except during construction or under emergency circumstances as determined by the health officer. Proper ventilation of a chemical toilet used inside shall be required.

8. Graywater

- A. Regulations addressing graywater treatment and re-use are currently being developed by the Colorado Department of Health and Environment. Specific Requirements for these systems are pending, and the adoption and implementation process of these Regulations (No.86) at the State level are projected to be completed in 2015. Currently, the standard design requirements for conventional OWTS apply to buildings with graywater systems.

9. Rock Plant Filters (Constructed Wetland)

- A. Rock plant filters shall meet the requirements set forth in Section 43.11.D of Regulation 43.

10. Other Treatment Systems

- A. Treatment systems other than those discharging through a STA or sand filter system, including systems that utilize evapotranspiration or wastewater ponds, shall meet the requirements of Sections 43.12.B-C and 43.12.H of Regulation 43 and shall be approved by the Board of Health.

 <p>CLEAR CREEK COUNTY Public and Environmental Health</p>	<p>Systems Maintenance and Abandonment</p>	<p>Section 21</p>
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1. Responsibility

- A. The owner shall be responsible for proper maintenance of an OWTS and for abatement of any nuisance arising from its malfunction, unless the responsibility has been contractually assigned to a tenant or a third party or a public, quasi-public or political subdivision, and that contract is on file with the Department.
- B. The owner of a system utilizing higher level treatment shall ensure that the OWTS is operating, maintained, and performing according to the required standards for the designated treatment level. The owner shall maintain an active O&M contract with a service provider at all times
- C. Any person denying responsibility for the proper operation and maintenance of an OWTS shall bear the burden of proof for such denial upon establishment of ownership or possessory rights for the property served by the system.

2. Maintenance and Cleaning

- A. Unless required as a condition of approval or set forth in an operating permit, the following inspection and maintenance schedule is recommend for all OWTS to ensure good work order:

Table 21-1 Maintenance Recommendations

Type of System	Inspection or Maintenance	Cleaned or Pumped
Septic tanks	Annually	Every 2-4 years
Vaults, privy vaults, holding tanks	Annually	Between 75-85% capacity
Aeration, mechanical, or higher level treatment units	Per operating permit conditions	
New technology devices	Per permit conditions or maintenance agreement	

3. Monitoring and Sampling

- A. For an OWTS for which monitoring of effluent is required, the Department or delegated third party shall collect and test effluent samples to ensure compliance with the provisions of these Regulations.
- B. Sampling may be required by the Department in conjunction with an enforcement action.
- C. When the health officer does not have sufficient information for evaluation of the performance of the system, as a permit condition, the health officer may require performance testing for a period not to exceed five (5) years following installation.

Section 21 Systems Maintenance and Abandonment

- D. Any owner or occupant of property on which an OWTS is located may request the Department to collect and test an effluent sample from the system. The Department may perform such collection and testing services. The owner or occupant shall pay for these services.
- E. If the health officer or a delegated third party collects and tests effluent samples, a fee not to exceed that which is allowed by the OWTS Act may be charged for each sample collected and tested. Payment of such charge shall be stated in the permit as a condition for its continued use.
- F. Conditions when a Department can require routine monitoring:
 - 1. Indications of inadequate performance;
 - 2. Location in sensitive areas; and/or
 - 3. Experimental systems.
- G. Sampling and analysis shall be performed according to American Public Health Association, American Water Works Association, and Water Environment Federation: Standards Methods for the Examination of Water and Wastewater, 21st edition.

4. Disposal of Waste Materials

- A. Disposal of waste materials (excluding liquid wastes and sludge) removed from a system in the process of maintenance or repair may be accomplished at the site in a manner that complies with State and local regulations, provided it does not create a hazard to public health, a nuisance or risk of pollution of surface or ground water. Liquid wastes and sludge shall be removed by a licensed Systems Cleaner for proper disposal.

5. Termination of Use of a System

- A. A septic tank, vault, or holding tank shall be abandoned in the following manner:
 - 1. The tank may be completely removed and the parts disposed of safely;
 - 2. If the tank will remain in place:
 - a. Electrical lines, if present shall be removed;
 - b. The inlet and outlet lines shall be capped or removed;
 - c. The tank shall be pumped to remove as much waste as possible;

Section 21 Systems Maintenance and Abandonment

- d. The bottom of the tank shall be broken so that the tank neither floats nor fills with water;
 - e. The top shall be collapsed and the sides may be broken into the void; and
 - f. The remaining void shall be filled with gravel, sand, or compacted soil; re-graded to match the surrounding topography and re-vegetated.
- B. An absorption bed or trench, mound, or ET system may be abandoned in place by disconnecting and capping the inlet line.
- C. A seepage pit, cesspool, or other system that contains a large internal void shall be abandoned by pumping out the liquid contents, capping, or removing the inlet line, then either collapsing the void or filing with soil or other inert materials to prevent subsidence or collapse.
- D. A non-vault privy shall be abandoned by pumping any liquid material from the privy pit, treatment with quicklime or other disinfectant, then back-filing the pit with soil or inert materials. A privy structure may remain in place provided that the stool is removed and a solid floor placed in the structure.
- E. The health officer may require abandonment of a tank or other system component that constitutes a hazard to public health.

Appendix A Minimum Separation Distances

 <p>CLEAR CREEK COUNTY Public and Environmental Health</p>	<p>Minimum Separation Distances</p>	<p>Appendix A</p>
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Table A-1 – Minimum Horizontal Distances in Feet between Components of an OWTS and Water, Physical, and Health Impact Features

	Drinking water wells, springs, suction lines	Drinking water lines	Drinking water cisterns	Dwelling, occupied building	Property lines	Subsurface drains, dry well, storm water infiltration	Lake, water course, irrigation ditch, stream, wetland	Dry gulches, cutbank, fill area	Septic tank
Septic tanks, higher level treatment unit, dosing tanks, vault	50 ¹	10 ¹	25	5	10	10	50	10	-
Building sewer or effluent lines	50 ¹	10 ¹	25 ¹	-	10	10 ¹	50 ¹	10 ¹	-
STA trench or bed, unlined sand filter, sub-surface dispersal system, seepage pit	200 ² (100) ^{2,3,6}	25 ¹	25	20	10	25	50 ^{2,4}	25 ^{5,7}	5
Lined sand filter, ET field or outside of berm lined wastewater pond	60	10 ¹	25	15	10	10	25	10	5
Unlined sand filter in soil with a percolation rate slower than 60 minutes per inch, unlined or partially lined ET system, outside of berm unlined wastewater pond	100	25 ¹	25	15	10	25	25 ²	15	10
Vault privy	50	10 ¹	25	15	10	10	25	10	-

1. Crossings or encroachments may be permitted at the point as noted above provided that the water or wastewater conveyance pipe is encased for the minimum setback distance on each side of the crossing. A length of pipe shall be used with a minimum Schedule 40 rating of sufficient diameter to easily slide over and completely encase the conveyance. Rigid end caps of at least Schedule 40 rating shall be glued or secured in a watertight fashion to the end

Appendix A Minimum Separation Distances

of the encasement pipe. A hole of sufficient size to accommodate the pipe shall be drilled in the lowest section of the rigid cap so that the conveyance pipe rests on the bottom of the encasement pipe. The area in which the pipe passes through the end caps shall be sealed with an approved underground sealant compatible with the pipe being used.

2. Except for systems with effluent that meets TL3N treatment level, add eight (8) feet additional distance for each 100 gallons per day of design flows between 1,000 and 2,000 gallons per day, unless it can be demonstrated by a professional engineer or geologist by a hydrologic analysis or the use of a barrier, consisting of a minimum 30 mil PVC liner or equivalent, that contamination will be minimized.
3. Minimum setback of 100 feet permitted for systems receiving TL2N, TL3 or TL3N treatment level effluent.
4. Minimum setback of 25 feet permitted for systems receiving TL2N, TL3 or TL3N treatment level effluent.
5. Minimum setback of 10 feet permitted for systems receiving TL2N, TL3 or TL3N treatment level effluent.
6. Minimum setback of 100 feet permitted upon submission of a written report demonstrating compliance with the provisions of Appendix D.
7. The separation distance between the STA and the crest of a dry gulch or cut bank will be evaluated for potential erosion or slope instability; if there is potential for erosion or instability, the separation distance shall be increased until the risk is minimized.

Table A-2 – Minimum Vertical Separation between STA Infiltrative Surface and Groundwater or a Limiting Layer in Feet

Type of STA	Treatment Levels				
	TL1	TL2	TL2N	TL3	TL3N
Unlined Sand Filters	2	0 ²	0 ²	0 ²	0 ²
Trenches or Beds	4 (3) ¹	3	2	2	2

TABLE NOTES

1. If pressure dosed.
2. The bottom of the sand layer shall be at or above the high ground water surface or bedrock for installations in which effluent is percolated downward through the soil.

CLEAR CREEK COUNTY Public and Environmental Health	Wastewater Flows and Strength	Appendix B
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1. Estimates of Wastewater Flow

A. The table in this section provides standardized estimates of wastewater flows and strength from various facilities. Actual, documented flows from similar facilities may be used for design purposes if they meet the requirements of Section 14.4. Flow from facilities not referenced in this table shall be as set forth in Regulation 43, Table 6-2.

Table B-1 – Single of Multi Family Dwellings

Bedrooms	gal/day	lbs /BOD ₅ / day	Bedrooms	gal/day	lbs /BOD ₅ / day
1*	150	0.40	4	525	1.4
2	300	0.80	5	600	1.6
3	450	1.20	additional, add	75	0.20

*may be used only for existing dwellings that either have only one (1) bedroom or where separate bedrooms are not provided within the structure.

Table B-2 – Single of Multi Family Dwellings (Fixture Flow)

FIXTURE	gal/day	lbs /BOD ₅ / day	FIXTURE	gal/day	lbs /BOD ₅ /day
Water closet	24.8	.029	Kitchen sink*	5.8	.052
Clothes washer	19.5	.037	Lavatory	8.4	.021
Bath/shower	14.7	.014	Dishwasher	1.8	.002
TOTAL FLOW PER PERSON PER DAY				75	0.2

*includes garbage disposal

Table B-3 – Non-Residential or Commercial Facilities

PUBLIC ACCOMMODATIONS	GPD	BOD₅ (lbs per day)
Hotels and motels per room without private baths	50	.15
Hotels and motels per room with private baths	75	.15
Multiple-family dwellings or apartments	75	.20
Boarding and rooming houses per room	50	.15
Mobile home (per person)	75	.20
Mobile home park (per space)	300	.80
COMMERCIAL WASTEWATER	GPD	BOD₅ (lbs per day)
Facilities with short-term or transient visitors such as fairgrounds per person attending; ball parks, race tracks, stadiums, theaters or auditoriums, per seat	5	.02
Barber and beauty shops, per chair	100	.70*
Country club, per member	30	.02
County club, per employee	20	.06
Dental offices, per non-wet chair	50	.14*
Medical offices, per doctor	250	.80*
Factories and plants exclusive of industrial wastewater, per employee per eight-hour shift – no showers	20	.05
Factories and plants exclusive of industrial wastewater, per employee per eight-hour shift - showers provided	35	.08
Kennels, per run	30	.20
Laundries, self-service, per commercial washer	400	.75
Office buildings, per employee per eight-hour shift	15	.06
Service stations, per toilet fixture	250	.50*
Stores and shopping centers, per square foot of retail space	.1	.01*
FOOD SERVICE ESTABLISHMENTS	GPD	BOD₅ (lbs. per day)
Restaurant open 1 or 2 meals, per seat	50	.06/meal
24-hour restaurant, per seat	75	.07/meal served
Restaurant with paper service only, per seat	25	.01/meal served
Additional for bars and cocktail lounges, per seat	30	.02
Drive-in restaurant, per car space	50	.02
INSTITUTIONS W/O KITCHENS UNLESS OTHERWISE NOTED	GPD	BOD₅ (lbs per day)
Religious institutions, per person	5	.01
Hospitals, per bed space	250	.20
Nursing homes, per bed space	100	.17
Schools, Day, without cafeteria, gym or showers	15	.04
Schools, Day, with cafeterias, no gym or showers	20	.08
Schools, Day, with cafeterias, gym and showers	25	.10

Appendix B Wastewater Flows and Strengths

Schools, Day, additional for employees	15	.06
RECREATIONAL AND SEASONAL FACILITIES	GPD	BOD₅ (lbs per day)
Camps, day, no meals served	15	.12
Luxury resort, per person	125	.17
Resort night and day, per person	50	.12
Campground, per campsite**	50	.12
Public park flush toilet, per fixture per operating hour	36	.04 lbs./ fixture
Public park urinal, per fixture per operating hour	10	.01 lbs./fixture
Public park shower, per fixture per operating hour	100	.10 lbs./ fixture
Public park faucet, per fixture per operating hour	15	.04 lbs./ fixture
Swimming pools and bathhouses, per user	10	.06
Travel trailer parks, per unit (water and sewage hookup)**	50	.12
Travel trailer park, per unit (no water and sewage)**	50	.12

*BOD₅ levels need further verification.

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

2. Multiple Flow Factors

For design purposes, estimates of sewage flow rates may require inclusion of several flow factors from the above table. Examples:

Daily sewage flow rate for a 30-run dog kennel with 3 employees would be calculated as follows:

$$\begin{array}{rcl}
 30 \text{ runs} \times 30 \text{ gal / run / day} & = & 900 \text{ GPD} \\
 3 \text{ employees} \times 15 \text{ gal / employee / day} & = & \underline{+45} \text{ GPD} \\
 \textbf{TOTAL DAILY SEWAGE FLOW} & & \textbf{945 GPD}
 \end{array}$$

Daily sewage flow rate for a 2,000 sq. ft. retail store with 5 employees and public restrooms would be calculated as follows:

$$\begin{array}{rcl}
 5 \text{ employees} \times 15 \text{ gal / employee / day} & = & 75 \text{ GPD} \\
 2,000 \text{ sq. ft} \times 0.1 \text{ gal / sq. ft. / retail space} & = & \underline{+200} \text{ GPD} \\
 \textbf{TOTAL DAILY SEWAGE FLOW} & & \textbf{275 GPD}
 \end{array}$$

Appendix C Long Term Acceptance Rates

	Long Term Acceptance Rates	Appendix C
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Table C-1 – Long Term Acceptance Rates

Soil Type, Texture, Structure and Percolation Rate Range					Corresponding Long Term Acceptance Rate (LTAR) in gallons per sq. ft. per day				
Soil Type	USDA Soil Texture	USDA Soil Structure-Shape	USDA Soil Structure-Grade	Percolation Rate (MPI)	Treatment Level 1 ¹	Treatment Level 2 ¹	Treatment Level 2N ¹	Treatment Level 3 ¹	Treatment Level 3N ^{1,3}
0	Soil Type 1 with more than 35 percent rock (>2 mm) and Soil Types 2-5 with more than 50 percent rock (>2 mm)	--	0 (Single Grain)	<5	1.0 (minimum 3-foot deep unlined sand filter required ²)	1.0 (minimum 2-foot deep unlined sand filter required ²)			
1	Sand, Loamy Sand	--	0	5-15	0.80	1.25	1.25	1.40	1.40
2	Sandy Loam, Loam, Silt Loam	PR (Prismatic) BK (Blocky) GR (Granular)	2 (Moderate) 3 (Strong)	16-25	0.60	0.90	0.90	1.00	1.00
2A	Sandy Loam, Loam, Silt Loam	PR, BK, GR 0 (none)	1 (Weak) Massive	26-40	0.50	0.70	0.70	0.80	0.80
3	Sandy Clay Loam, Clay Loam, Silty Clay Loam	PR, BK, GR	2, 3	41-60	0.35	0.50	0.50	0.60	0.60
3A	Sandy Clay Loam, Clay Loam, Silty Clay Loam	PR, BK, GR 0	1 Massive	61-75	0.30	0.40	0.40	0.50	0.50
4	Sandy Clay, Clay, Silty Clay	PR, BK, GR	2, 3	76-90	0.20	0.30	0.30	0.30	0.30
4A	Sandy Clay, Clay, Silty Clay	PR, BK, GR 0	1 Massive	91-120	0.15	0.20	0.20	0.20	0.20
5	Soil Types 2-4A	Platy	1, 2, 3	121+	0.10	0.15	0.15	0.15	0.15

1. Treatment levels are defined in Tables 14-2 and 19-1.
2. Unlined sand filters in these soil types shall provide pathogen removal. Design shall conform to Section 19.3.
3. Higher LTAR for TL3N treatment level may be allowed for OWTS required to have a discharge permit, if the capability of the design to achieve a higher LTAR can be substantiated.

CLEAR CREEK COUNTY Public and Environmental Health	Guidelines for Distance Reductions	Appendix D
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For this Appendix, the following terms and definitions shall apply:

“Affected well” means a water well that will be located less than 200 feet, but more than 100 feet from any STA, existing or proposed that receives TL1 or TL2 treatment level effluent.

“Annular space” means the void between the outside of the well casing and the walls of the well bore hole.

“Grout” means any material, approved by the State Board of Examiners of Water Well Construction and Pump Installation Contractors, that is used to form a permanent impermeable seal in the annulus between the casing and the borehole wall or between two strings of casing, or that is used in plugging, sealing, and abandoning boreholes or wells.

1. General Requirements

- A. A site-specific surface and subsurface geological report is required in support of a request for a minimum separation between wells and STA receiving TL1 or TL2 treatment level effluent that is less than 200 feet but more than 100 feet.
- B. A minimum of one (1), eight (8) foot deep excavation is required within or immediately adjacent to the proposed STA. All excavations shall remain open for inspection by the health officer unless previously arranged and shall be suitably protected to prevent unauthorized entry. Excavations are not required when the reductions is for an off-site, existing STA.

2. Reduction Based on Suitable Soil Conditions

- A. If the onsite investigation documents the presence of eight (8) feet of suitable soil as defined by these Regulations, a distance separation of not less than 100 feet between wells and STA receiving TL1 or TL2 treatment level effluent shall be permitted.
- B. Blasting to install the system shall not be permitted.

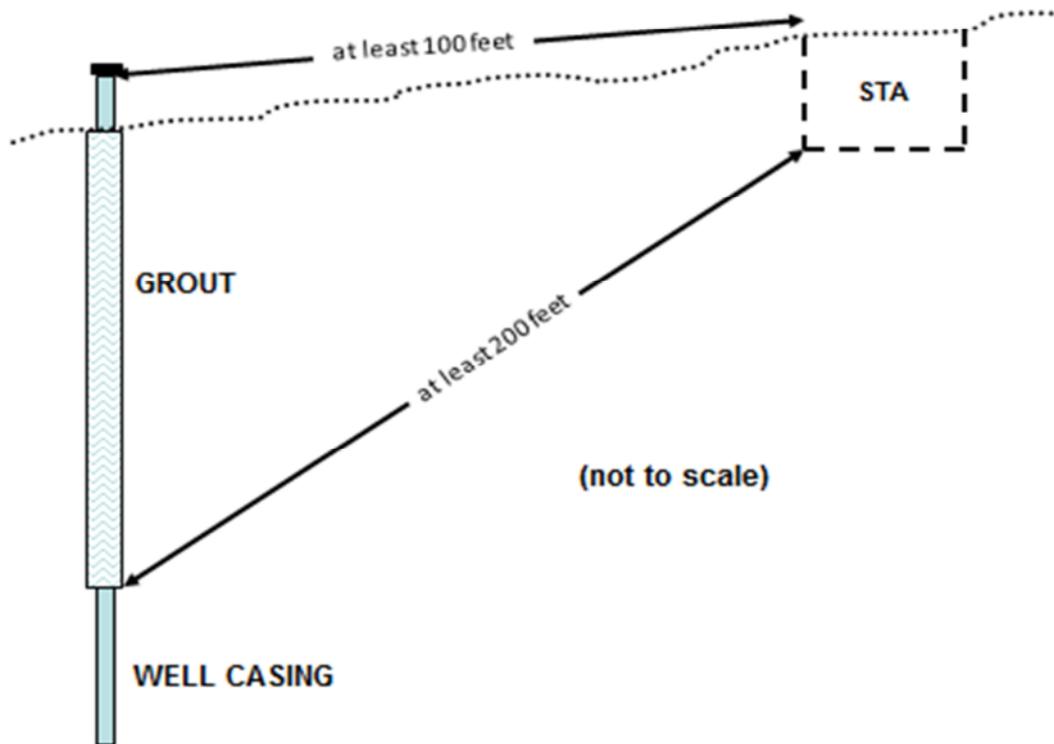
3. Reduction Based on Impermeable Bedrock Conditions

- A. If the onsite investigation documents the presence of less than eight (8) feet of suitable soil as defined in Regulations, but the soil layer is underlain by impermeable, un-fractured bedrock with no visible conduits for effluent flow, a distance separation of not less than 100 feet between wells and STA receiving TL1 or TL2 treatment level effluent shall be permitted.
- B. Blasting to install the system shall not be permitted.

4. Reduction Based on Well Grouting

- A. If the onsite investigation fails to document any of the soil or geological conditions in Section 2 and 3 of this Appendix, a minimum separation distance between a well and STA receiving TL1 or TL2 treatment level effluent of not less than 100 feet shall be permitted provided that an impervious grout is placed within the annular space of the affected well sufficient to maintain a 200 foot diagonal separation distance between the bottom of the grout and the STA as shown in Figure 1.

Figure 1 - Determination of 200-Foot Minimum Separation Distance



Between Deep-Grouted Well and STA

- B. In support of such a request, the design engineer shall:
1. Provide a scaled drawing showing the depth to which the grouting shall extend to assure the required 200 foot diagonal separation;
 2. Specify the type of grouting materials to be used;
 3. Specify the manner in which the grout will be introduced into the annular space; and

Appendix D Guidelines for Distance Reductions

4. Determine the volume of the grout required to fill the annular space.
- C. The health officer may require the design engineer to certify that the grouting has been done in accordance with their proposal.
- D. Such a reduction will not be allowed where a higher level treatment system can be installed to meet the required minimum setback. However, if the onsite well will be grouted to allow a distance of less than 200 feet to an off-site onsite wastewater treatment system, the grouting may also be used in support of a request for a reduced setback to the onsite well.

5. Written Report Requirements

- A. A written report in support of the proposed distance reduction shall be prepared by or under the supervision of a professional geologist or professional engineer and submitted to the Department at the time of application for a permit to install an OWTS.
- B. The report shall detail all site-specific surface and subsurface geologic information and relate such information to regional geology and hydrology. This information shall include, at a minimum:
 1. A description of the thickness and characteristics of surficial deposits; and
 2. A scaled geologic log of the highest wall of the open excavation, showing surficial and bedrock units, weathering zones and fracture or joint sets.

6. Other Methods for Allowing Distance Reductions

- A. The Board may consider the use of other methods for determining the suitability of distance reductions as a variance from the requirements of these Regulations.

 <p>CLEAR CREEK COUNTY Public and Environmental Health</p>	<p>Summary of Treatment Level Options</p>	<p>Appendix E</p>
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A. The installation of an OWTS providing higher level treatment as set forth in Table 14-2 and Section 19 allows for various distance reductions and other considerations, providing the engineer with a variety of options in the design and placement of such a system. These options are summarized below (TL1 treatment level is not considered higher level treatment but is provided for comparison purposes):

Table E-1 – Summary of Treatment Level Options

Treatment Levels (from Table 14-2)	Method of Dosing (See Section 17.13)	STA maximum bed width (in ft)	Operating permit required (See Section 6)	Minimum Distance Setbacks in feet (Table A-1 of Appendix A)			Minimum separation in feet between STA infiltrative surface and ground water or limiting layer (Table A-2 of Appendix A)	
				STA to wells – on or off-site	STA to surface waters	STA to dry gulch	Standard bed or trench	Unlined Sand Filter
TL1	Pump or siphon ¹	12 ⁴	NO	200	50	25	4 (3) ²	2
TL2	Pressure Only	N/A	YES				3	0 ³
TL2N	Pressure Only		YES	100	25	10	2	0 ³
TL3				TL3N				

1. Dosing is not required if due to topography a siphon will not function properly, or for system designs with a flow rate of 150 gpd or less.
2. Allowed with pressure dosing.
3. The bottom of the sand layer shall be at or above the high groundwater surface or bedrock for installations in which effluent is percolated downward through the soil.
4. Except for repairs to existing systems per Section 18.13.C.