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BUREAU OF WATER

RESOLUTION NO. 2010 23 L

A RESOLUTION AMENDING THE LABETTE COUNTY SANITATION CODE FOR REGULATION OF SANITATION ACTIVITIES, SYSTEMS, OPERATION OF PROVATE WATER SYSTEMS AND DISPOSAL OF SOLID WASTES, WITHIN ALL UNINCORPORATED AREAS IN LABETTE COUNTY, KANSAS AND INCORPORATING BY REFERENCE THE AMENDED CODE AND AMENDING RESOLUTION NO. 101394.

WHEREAS, the Board of County Commissioners pursuant to K.S.A. 19-3701 et seq. conducted a public hearing in regard to proposed amendments to the Labette County Sanitation Code; and

WHEREAS, the Board of County Commissioners having heard interested parties and determining that the Labette County Sanitation Code as amended is necessary for the protection of the health and welfare of the public;

NOW THEREFORE, BE IT RESOLVED BY THE GOVERNING BODY OF LABETTE COUNTY, KANSAS:

SECTION 1.

There is hereby incorporated by reference for the protection of the health and welfare of the pubic within the unincorporated area of Labette County, Kansas the Labette County Sanitation Code as amended this 30th day of June, 2010.

No fewer than three copies of the LABETTE COUNTY SANITATION CODE, as amended shall be marked or **stamped "Official Copy as incorporated by RESOLUTION No. 2010 23 L of Labette County, Kansas,"** and such copies shall be filed in the office of the Labette County Health Department and one copy in the Office of the Labette County Clerk to be open to inspection and available to the public at all reasonable business hours, provided that such official copies may not be removed from *the said depositories.* All *county* officials requiring the use of the LABETTE COUNTY SANITATION CODE as amended, shall be supplied, at the expense of the *County*, such number of official copies of such policies as may be deemed expedient by the Governing Body.

SECTION 2.

Resolution No. 101394 adopting the Labette County Sanitation Code is hereby amended. Should this Resolution be in conflict with any previous resolution(s) of the Board of County Commissioners of Labette County, Kansas, that only the conflicting part of any previous resolution(s) and not the previous resolution(s) in total be declared void and ineffective.

SECTION 3.

This Resolution shall take effect and be in force from and after its publication in the official county newspaper.

PASSED AND ADOPTED by the Board of County Commissioners, this 30th day of June, 2010.

ATTEST: SEAL OF LABETTE CO. KANSAS

Linda Schreppel, County Clerk

Brian C. Kinzie, Chairman

Jack W. Martin, Commissioner

Lonie R. Addis, Commissioner

The enclosed Labette County Sanitary Code has been officially adopted by the Labette County Board of Commissioners.

Brian C. Kinzie

Signature Brian C. Kinzie
Chairman, Board of County Commissioners

June 30, 2010
Date

Attest: [signature]
Labette County Clerk

Return to:

KDHE-Watershed Management Section
1000 SW Jackson, Suite 420
Topeka, KS 66612-1367

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LABETTE COUNTY SANITATION CODE

Adopted: October 13, 1994

By: Board of County Commissioners:

C.L. Fish, Chairman
Dale McBride
Lonie R. Addis

Revised: June 30, 2010

By: Board of County Commissioners

Brian C. Kinzie
Jack W. Martin
Lonie R. Addis

For Information Contact:

Labette County Health Department
P.O. BOX 786
Parsons, KS 67357
Phone: 620-421-4350

SANITATION CODE

Labette County, Kansas

INDEX

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

SANITATION CODE

LABETTE COUNTY, KANSAS

CHAPTER 1

ADMINISTRATIVE PROCEDURES

SECTION 1-1: AUTHORITY AND POLICY:

1-1.1: Legal Authority: This code is adopted under the authority granted to the Board of County Commissioners by K.S.A. 19-3701 et seq., as amended.

1-1.2: Declaration of Finding and Policy: The Commissioners find that the provision of adequate and reasonable control over the environmental conditions in the county is both necessary and desirable. The adoption of this Sanitation Code is to eliminate and prevent the development of environmental conditions that are hazardous to health and safety, and to promote the economical and orderly development of the land and water resources of the county. For these reasons and objectives, it will be the policy of the Board of County Commissioners to, from time to time at the discretion of the Board, add to, amend or revise this Sanitation Code to provide current regulation of practices that may affect the health, safety or general welfare of the residents of this county.

1-1.3: Purpose: The purpose and intent of this Section is to prescribe the administrative procedures to be followed in administering and enforcing this Sanitation Code, or any amendments thereto, and to prescribe rules and regulations for controlling practices that may affect the health, safety or general welfare of the residents in this county.

1-1.4: Title: This Code shall be known and referred to as the Labette County Sanitation Code.

1-1.5: Applicability: The administrative procedures prescribed in this chapter shall be followed in administering this Code and any amendments thereto.

1-1.6: Effective Date: This Code was adopted October 13, 1994 and revised June 30, 2010.

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

SECTION 1-2: DEFINITIONS: The following words, terms and phrases appear in one or more chapters of this Code and thus have general application and usage. Words, terms and phrases appropriate or applicable to specific chapters within this Code may be found in that particular chapter.

1-2.1: Administrative Agency: "Administrative Agency" means the entity authorized to implement and enforce the provisions of this Sanitation Code. The Administrative Agency for Labette County is designated as the Labette County Health Department.

1-2-2: Administrative Rules: "Administrative Rules" means those rules and regulations contained in Chapter One of this Sanitation Code which prescribe general procedures to be followed in the administration of the Sanitation Code adopted by Labette County, Kansas.

1-2.3: Agricultural Purposes: "Agricultural Purposes" means a purpose directly related to the production of livestock or crops for commercial sale.

1-2.4: Authorized Representative: "Authorized Representative" means any person who is designated by the Administrative Agency to administer this Sanitation Code or any portion thereof.

1-2.5: Board of County Commissioners: "Board of County Commissioners" means the Board of County Commissioners of Labette County, Kansas.

1-2.6: Board of Health: "Board of Health" means the Labette County Board of Health.

1-2.7: Code: "Code" means any model or standard published compilation of rules in a book, pamphlet or regulation format which has been prepared by a technical association, a Federal agency, this State or any agency thereof, any municipality of this State, any political subdivision of this State, or any regional agency within this State. Such codes may address, but shall not be limited to, management, food management, swimming pools, hot tubs and spas, mass gatherings, general construction guidelines, and tattoo or massage parlors.

1-2.8: Health Officer: "Health Officer" means the Labette County Health Officer, as appointed by the Board of County Commissioners, or his duly authorized representative.

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

1-2.9: Hearing Officer: "Hearing Officer" means an individual, appointed by the Board of County Commissioners to hear appeals from decisions made by the Health Officer relating to the enforcement and administration of this Sanitation Code.

1-2.10: Person: "Person" means an individual, corporation, partnership, joint venture, association, trust, state or political subdivision thereof, Federal or State agency, municipality, commission, interstate body or other legal entity recognized by law as the subject of rights and duties.

1-2.11: Premise: "Premise" means any lot or tract of land and all buildings, structures or facilities located thereon.

1-2.12: State Department of Health: "State Department of Health" means the Kansas Department of Health and Environment.

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MAY 17 2010

Kansas Department of
Health and Environment

SECTION 1-3: ADMINISTRATIVE POWERS AND PROCEDURES:

1-3.1: Right of Entry: Representatives of the Administrative Agency shall have the power and authority to enter into premises, public or private, for purposes of inspecting for compliance with this Sanitation Code.

1-3.2: Permits and Licenses:

1-3.2.1: Applications for Permits and Licenses: Every person required by this Sanitation Code to obtain a permit or license shall make application for such permit or license to the Administrative Agency on such forms as may be required by the Administrative Agency.

1-3.2.2: Issuance of Permit or License: After receipt of an application as required by this Sanitation Code, the Administrative Agency shall begin such investigation as deemed necessary to determine whether the permit or license should be issued or denied and shall issue or deny the permit or license within 30 days of such receipt. If the permit or license is denied, the Administrative Agency shall send the applicant a written notice and state the reasons for the rejection.

1-3.2.3: Permit Nontransferable: No permit or license required by this Sanitation Code shall be transferable, nor shall any fees required and paid therefore be refundable.

1-3.2.4: Permit Revocation: All permits issued hereunder are subject to revocation for reasons of noncompliance or misrepresentation.

1-3.2.5: Standard Fees: The Administrative Agency shall establish and make available to the general public a schedule of fees for all permits and licenses required by this Sanitation Code, and said fees shall be paid to the Administrative Agency and shall be deposited by the Administrative Agency to the Labette County General Fund. The Administrative Agency shall not process any application for a permit or license until the required fee has been paid. No fees for permits or licenses required by this Sanitation Code may be waived.

1-3.3: Notices, Orders, and Appeals:

1-3.3.1: Notice of Violations: When the Administrative Agency shall determine that there has been a violation of any provision of this Code, notice of such violation shall be issued to the person responsible. Such notice shall:

APPROVED
MAY 17 2010
Kansas Department of
Health and Environment

(1) Be in writing,

(2) Include a statement of why the notice is being issued and a description of the specific violation(s),

(3) Allow a reasonable period of time for performance of any work required by the notice, and

(4) Be properly served upon the owner or agent. Such notice shall be deemed to be properly served when a copy thereof has been sent by registered mail to the last known address of the owner or agent.

1-3.3.2: Appeal for Hearing: Any person aggrieved by any notice or order issued by the Administrative Agency under the provisions of this Sanitation Code may request, and shall be granted, a hearing on the matter before the Hearing Officer; provided such person shall file with the Administrative Agency, within 10 working days after the date of issuance of the notice or order, a written petition requesting a hearing and setting forth the grounds upon which the request is made. The filing of the request for a hearing shall operate as a stay of the notice or order. Upon receipt of the petition, the Administrative Agency shall confer with the Hearing Officer and set a time and place for such hearing and shall give the petitioner written notice thereof. At such hearing, the petitioner shall be given an opportunity to show why such notice or order should be modified or withdrawn.

The hearing shall be commenced no later than 10 working days after the date on which the petition was filed; provided that, upon request of the petitioner or the Administrative Agency the Hearing Officer may postpone the hearing beyond such 10-day period when, in the judgment of the Hearing Officer, the petitioner or the Administrative Agency has submitted justifiable reason for such postponement.

1-3.3.3: Report of Hearing: Within 10 working days after any hearing required by this Sanitation Code, the Hearing Officer shall submit the findings of such hearing in writing to the Administrative Agency. The findings shall include a recommendation that the order in question be sustained, modified, or withdrawn. Upon receipt of the report of the Hearing Officer, the Administrative Agency shall consider the report and issue an order confirming, modifying, or withdrawing the original notice or order. The new order, along with a copy of the findings of the Hearing Officer, shall be delivered to the appellant in the same manner as is provided for in Section 1-3.3.1 herein.

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

1-3.4: Emergency Orders: Whenever the Health Officer or the Board of Health finds that an emergency exists which requires immediate actions to protect the public, the Administrative Agency shall issue an order reciting the existence of such emergency and specifying the action to be taken to meet or mitigate the effects of such emergency. Such Emergency Orders shall be effective immediately and shall not be subject to appeal or stay of action. Any person to whom such an Emergency Order is directed shall comply therewith immediately.

1-3.5: General Provisions:

1-3.5.1: Enforcement Procedure: The County Attorney shall enforce the provisions of this Sanitation Code and is hereby directed to file appropriate actions for such enforcement upon request of the Administrative Agency. Actions of injunction, mandamus, and quo warranto may be utilized for enforcement of this Sanitation Code and shall be governed by the provisions of the Kansas Code of Civil Procedure.

1-3.5.2: Penalties: In addition to, and independently of, the enforcement of procedures in Section 1-3.5.1 herein, any violation of any provision of this Sanitation Code shall be deemed to be an unclassified misdemeanor, except where a separate classification is provided for by law or by this Sanitation Code, and shall be punishable by a fine not to exceed Two Hundred Dollars ($200.00) for each offense. In the case of continuing violations, each day's violation shall constitute a separate offense.

1-3.5.3: Disclaimer of Liability: This Sanitation Code shall not be construed or interpreted as imposing upon the County or any of its officials or employees (1) any liability or responsibility for damages to any property, or (2) any warranty that any system, installation, disposal facility or portion thereof that is constructed, modified, or repaired under permits, inspections, applications or orders required or authorized by this Sanitation Code will function properly.

1-3.5.4: Separability: If any clause, sentence, paragraph, section or subsection of this Sanitation Code shall, for any reason, be adjudged by any court of competent jurisdiction to be unconstitutional and invalid, such judgment shall not affect, repeal or invalidate the remainder thereof, but shall be confined in its operation to the clause, sentence, paragraph, section or subsection thereof so found unconstitutional or invalid.

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

1-3.6: Records:

1-3.6.1: Permit Applications: Applications for permits or licenses required by this Sanitation Code shall be filed with the Administrative Agency and shall be maintained in the records of the Administrative Agency for as long as the applicable system, facility or structure remains in use.

1-3.6.2: Official Actions: A written record of all official actions taken on applications for permits or licenses required by this Sanitation Code shall be kept on file in the Administrative Agency.

1-3.6.3: Notices and Orders: A written record of all notices and orders issued by the Administrative Agency, including the date of issue, the person whom issued, the complete contents of the notice or order, and such background information as may be deemed appropriate, shall be maintained on file within the Administrative Agency.

1-3.6.4: Proceedings of Hearings: The proceedings of all hearings, including findings and decisions of the Hearing Officer, together with a copy of every notice and order related thereto, shall be maintained on file in the Administrative Agency. Transcripts of the proceedings of hearings need not be transcribed unless a judicial review of the decision is sought.

1-3.7: Payment of Fines: Any fines or penalties assessed under the provisions of this Sanitation Code shall be paid to the County Treasurer of Labette County, Kansas, and shall be deposited by the County Treasurer into the Labette County General Fund.

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MAY 17 2010

Kansas Department of
Health and Environment

CHAPTER 2

ON-SITE WASTEWATER MANAGEMENT

SECTION 2-1: PURPOSE AND INTENT:

Sewage is a potential source of disease and a potential hazard to the public health, safety, and welfare. It is the purpose of this chapter to provide minimum standards for the location, design, construction, maintenance, and use of on-site wastewater systems, and the removal and disposal of materials removed from such facilities within the legal boundaries of Labette County, Kansas.

SECTION 2-2: APPLICABILITY:

The provisions of this chapter shall apply to all unincorporated areas located within Labette County, Kansas.

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

SECTION 2-3: DEFINITIONS:

2-3.1: Nuisance: "Nuisance" means any condition or activity which has or threatens to have a detrimental effect on the general health or welfare of the public at large, or any member thereof, or which disturbs the peace or interferes with the private enjoyment of property.

2-3.2: Private Sewerage System: "Private Sewerage System" means any system which does not hold a Kansas Department of Health and Environment (KDHE) wastewater permit, and includes wastewater disposal systems which function by soil absorption, evaporation, transpiration, subsurface disposal, holding tanks, ponding, or any combination of the above.

2-3.3: Sanitary Privy: "Sanitary Privy" means a covered facility with a water-tight vault designed to receive, store and provide for periodic removal of non-water carried wastes from the human body.

2-3.4: Sanitary Service: "Sanitary Service" means the pumping and/or removal of sewage, sludge, human excreta, or other waste from privies, vaults, septic tanks, or private sewerage systems; and/or the transportation of such material to a point of final disposal.

2-3.5: Sewage or Domestic Waste: "Sewage" or "Domestic Waste" means all water-borne wastes produced at family dwellings in connection with ordinary family living, and similar type wastewater produced at offices, churches, industrial and commercial firms, exclusive storm water, foundation drains, cooling water, industrial and commercial wastewater.

2-3.6: Sewerage System: "Sewerage System" means any system, along with the attendant pipes and appurtenances thereof, designed or constructed to collect, store, treat and/or dispose of domestic, industrial or other commercial waste.

2-3.7: Vaults/Holding Tanks: "Vault/Holding Tank" means a water-tight receptacle for the retention of sewage either before, during or after treatment or initial disposal.

2-3.8: Wastewater: "Wastewater" means any water-borne discharge from any domestic plumbing fixture or appliance, or from any industrial or manufacturing process, plumbing fixture, appliance or machinery.

APPROVED
MAY 17 2010
Kansas Department of
Health and Environment

SECTION 2-4: PROHIBITED PRACTICES:

2-4.1: Use of Non-Approved Private Systems: No person shall use, or cause to be used, any alternative wastewater system, septic system, or privy constructed after the adoption of this Sanitation Code until it has been inspected and approved by the Administrative Agency or if, regardless of the date the system was constructed, it:

a. has been enjoined as a public health nuisance or hazard by a court of competent jurisdiction.

b. fails to comply with the provisions of the Sanitation Code and written notice thereof has been given by the Administrative Agency;

c. discharges inadequately treated wastes, sewage or wastewater so that it flows onto or is allowed to collect upon the surface of the ground, except in specifically-approved surface ponds or lagoons, or in any way contaminates any river, creek, stream, or other natural waterway, or

d. causes, or provides a source for, vector breeding, produces offensive odors, or creates or sustains any condition that is prejudicial to health or comfort, or creates a nuisance.

2-4.2: Use of Private Sewerage Systems within 400 Feet of Public Sewers: No private sewerage system shall be constructed within 400 feet of an existing public sewer unless the Administrative Agency finds that connection to such a sewer system is not feasible and that a private sewerage system, meeting the requirements of this Sanitation Code, can be constructed on the property.

2-4.3: Location of Private Sewerage Systems Below Full Flood Pool: No portion of a private sewerage system shall be installed or located below the flood pool elevation of any reservoir, public or private, unless written approval is obtained from the Administrative agency and any other agency having jurisdiction over such lake or reservoir.

2-4.4: Location of a Private Sewerage System within 50 Feet of a Well: No portion of a private sewerage system shall be constructed or located within 50 feet of a private water well or a pump suction line from a private water well.

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

SECTION 2-5: REQUIREMENTS FOR PRIVATE SEWERAGE SYSTEMS:

2-5.1: Approval of Plans: After adoption of this Sanitation Code, no person shall develop or construct any private sewerage system until the plans and specifications for such system have been reviewed and approved by the Administrative Agency. All onsite wastewater systems shall be designed, constructed and operated in accordance with standards set fourth in KDHE Bulletin 4-2 "Minimum Standards for Design and Construction of Onsite Wastewater Systems" published March, 1997, as amended, by KDHE and Kansas State University Agricultural Experiment Station and Cooperative Extension Service. KDHE Bulletin 4-2 is hereby adopted by reference and is included here in as an Appendix to this Code." References utilizing currently approved technology may be used as a guide by the Administrative Agency in reviewing and approving plans for private sewerage systems. All plans submitted for approval shall contain, at a minimum:

a. complete scale drawing of the proposed system, including complete data as to the size of the proposed lot, the exact location of the sewerage system, including all tanks, pipes and appurtenances,

b. drawings showing the location, in relation to the proposed sewerage system, of all public or private water lines, water wells, or sewer lines,

c. results of current soil percolation tests,

d. a description of the soil type and the depth to impervious rock and the depth to groundwater, and

e. a written projection of the number of gallons of wastewater to be discharged into the sewerage system each day.

2-5.2: Permits: No person shall construct or modify, or permit to be constructed or modified, any private sewerage system until a permit for such construction or modification has been issued by the Administrative Agency.

2-5.3: Maintenance: All persons, with or without a permit from the Administrative Agency, who use a private sewerage system shall be responsible for the proper operation and maintenance of such sewerage system and shall maintain the same in good and proper working order and condition so that it functions in accordance with the requirements of this Sanitation Code. Whenever the Administrative Agency shall find any private sewerage system malfunctioning, the owner thereof shall be ordered, at the sole expense of the owner thereof, to correct the condition within a reasonable period of time.

APPROVED
MAY 17 2010
Kansas Department of
Health and Environment

2-5.4: Suitable Site: No site shall be approved if:

a. connection to an approved public sewerage system is feasible or the site violates the provisions of any other section of this Sanitation Code.

b. the site is, considering overall size, the location of existing or proposed structures and the location of existing well and water lines, too small to allow for the construction of an acceptable sewage treatment system according to the construction guidelines contained in this Sanitation Code.

c. the soil, topography, or geology of this site are unacceptable as established in the "Environmental Health Handbook", KAS, KSU, KDHE, August 1992.

d. the soil depth, measured to the first limiting layer, is less than (4) feet and the proposed system incorporates a lateral absorption field.

2-5.5: Construction Approval: All private sewerage systems developed or modified after the effective date of this Sanitation Code must be inspected and approved by the Administrative Agency for compliance with the approved plans; no portion of any such system shall be covered or made inaccessible to inspection prior to approval.

2-5.6: Annual Inspections: Any private sewerage system which incorporates a lagoon or waste stabilization pond shall be subject to an annual inspection by the Administrative Agency and shall be subject to an annual inspection fee as specified in the fee schedule published by the Administrative Agency. Such annual inspections shall address, at a minimum:

a. maintenance of the lagoon or pond and the associated dykes,

b. maintenance of adequate fencing,

c. general condition of the lagoon or pond, including algae or plant growth, wave action, odor, and depth,

d. maintenance and location of signs indicating that the pond contains sewage,

e. general conformance of the lagoon or pond with the construction standards set forth in Section 2-9 of this Sanitation Code, and

f. such other factors as may be deemed appropriate by the Administrative Agency.

2-5.7: Property Resale, Refinance or Transfer: No person shall sell, refinance or transfer any property which utilizes an on-site wastewater system without first having the Administrative Agency inspect and approve the on-site system. Failed systems must be brought into Code compliance. In some cases, a failed system may require a site and soil evaluation. The inspection shall consist of, but is not limited to, the following:

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

a. The tank shall be pumped;

b. The tank shall be checked for proper size, cracks, and presence of correct inlet and outlet baffles;

c. Properly sized and installed absorption fields;

d. Evidence of effluent discharge promoting or contributing to an environmental health risk or hazard; and

e. Wastewater stabilization pond (lagoon) will be checked for proper maintenance, fence, gate, lock and any requirements set forth in the Code.

SECTION 2-6: REQUIREMENTS FOR SANITARY PRIVIES:

2-6.1: Approval of Plans: No person shall construct or modify, or permit to be constructed or modified, any privy until the plans and specifications therefore have been approved by the Administrative Agency.

2-6.2: Approval of Construction: No person shall use or make available for use, or allow to be used, any newly constructed or modified privy until the construction has been inspected by the Administrative Agency for compliance with the approved plan.

2-6.3: Proper Maintenance: No person shall use, or offer for use, or allow the use of, any privy which is not maintained in a clean and sanitary condition or which does not conform to the provisions of this Sanitation Code.

2-6.4: Vault Required: No person shall construct or use, nor permit to be constructed or used, any privy which does not incorporate in its construction and operation a watertight vault for the containment of sewage and wastes.

2-6.5: Location:

a. No privy shall be constructed or installed less than 100 feet from an existing public or private water well, or a suction line from such public or private water well.

b. No privy shall be constructed, reconstructed, or maintained on any premise served by a public water supply, or on which water is delivered to any building under pressure, unless special permission for use of such privy is obtained from the Administrative Agency and from all homeowners within 250 feet of the proposed privy.

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

SECTION 2-7: SANITARY SERVICES:

2-7.1: Permit Required: No person shall remove or transport any wastes from any private sewerage system or privy unless he holds a valid permit from the Administrative Agency for the transporting of such wastes.

2-7.2: Contracting with Unlicensed Persons Prohibited: No person responsible for operating or maintaining a private sewerage system or privy shall contract with any person for sanitary services unless the person proposing to provide such services holds a valid permit from the Administrative Agency for hauling or transporting wastes.

2-7.3: Minimum Standards for Sanitary Service Equipment: All equipment used for rendering of sanitary service(s) shall be of watertight construction and maintained in good working condition to ensure that all materials removed from private sewerage systems or privies will be transported to an approved point of disposal without spillage or leakage of waste materials.

2-7.4: Licensing Requirements: No person shall be granted a permit or license for the transporting of sewage or waste from any private sewerage system unless and until:

a. all equipment to be used in the provision of such sanitary services has been inspected and approved by the Administrative Agency, and

b. the applicant has filed with the Administrative Agency and approved plan for the legal and proper disposal of any wastes hauled.

c. The license holder shall comply with any applicable federal, state, and local regulations or laws including, but not limited to, those set forth now or hereafter adopted in 40 CFR Part 503 regulations Standards for the Use or Disposal of Sewage Sludge, volume 58, number 32, page 9388, of the Federal Register, February 19, 1993, as amended.

2-7.5: Revocation of License: Any license granted for the transporting of wastes or sewage may be revoked for:

a. failure to comply with the provisions of the disposal plan originally filed with the Administrative Agency,

b. improper disposal of any sewage, sludge, or waste hauled by the licensee or any employee of the licensee, or

c. use of unauthorized or improper equipment which allows for leakage or spillage of the wastes.

2-7.6: Term of License: Each license or permit issued under Subsection 2.7.4 herein shall be valid for a period of one (1) year. No new license or permit, or extension of an existing permit, shall be granted until the equipment used in the provision of such sanitary services has been reinspected and reapproved by the Administrative Agency.

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

SECTION 2-8: REQUIREMENTS FOR SUBDIVISION DEVELOPMENT: After adoption of this Sanitation Code, no person shall develop any subdivision until the plans and specifications for wastewater and sewage treatment or management for such subdivision have been reviewed and approved by the Administrative Agency.

SECTION 2-9: CONSTRUCTION STANDARDS FOR WASTE STABILIZATION PONDS/SEWAGE LAGOONS:

2-9.1: Minimum Size: Waste Stabilization Ponds shall, at a minimum, be constructed in a square of sufficient size to provide a minimum of 80 feet, when measuring from the outside toes of opposing dikes, for a home with 1 to 2 bedrooms. **(See Diagram 2-9a)** For a 3-bedroom home, this measurement shall be increased to 90 feet. For a home with 4 or more bedrooms, this measurement shall be increased to 100 feet. Where, in the opinion of the Administrative Agency, and regardless of the size of the home or the number of bedrooms incorporated in the design, soil conditions combined with projected water usage require a larger capacity, these dimensions may be increased.

2-9.2: Depth: No Waste Stabilization Pond shall be excavated to a depth greater than five feet below the surface of the surrounding ground.

2-9.3: Dikes: Waste Stabilization Ponds shall be completely enclosed by dikes which shall be at least 3 feet higher than the surface of the surrounding ground surface and shall have sloping sides on both the interior and exterior of the dike, sloping at no less than 3 feet of lateral movement for each foot of vertical drop.

2-9.4: Linings: Where soil percolation rates exceed 1 inch of fall per hour, the Administrative Agency may require that the bottom and interior sides of the waste stabilization pond be lined with compacted clay of sufficient thickness to reduce the soil absorption rate to 1 inch or less per hour.

2-9.5: Fencing: All Waste Stabilization Ponds shall be enclosed by a fence, at least 4 feet in height and located along the outside edge of the dikes, constructed of chain link or 2x4 welded wire or 2x4 woven wire and of sufficient strength to keep children and small animals out of the pond area.

2-9.6: Gates: Each Waste Stabilization Pond shall include in the fencing at least one gate, which shall be lockable, of adequate size to allow the entrance of a mower or other maintenance equipment.

2-9.7: Signs: Each Waste Stabilization Pond shall, on at least two opposite sides of the pond, incorporate, on the fencing, a set of signs which shall indicate, at minimum, "WARNING! This pond contains RAW SEWAGE KEEP OUT." **(See Diagram 2-10.)**

2-9.8: Inflow Lines: Inflow lines to Waste Stabilization Ponds shall be constructed so that the normal inflow of sewage to the full pond occurs near the center of the pond at least two feet below the surface of the normal water level. Inflow lines may be constructed of plastic, tile or steel pipe with a minimum diameter of 4 inches.

APPROVED

MAY 17 2010

ansas Department of
alth and Environment

2-9.9: Roof Drainage: Roof drainage may be included in the drainage to the Waste Stabilization Pond provided that a shut-off is incorporated with the design so that such roof drainage may be diverted away from the pond when required to prevent overflow or impairment of required freeboard.

2-9.10: Cleanout Required: Each Waste Stabilization Pond shall incorporate a cleanout **(See Diagram 2-9)** in the drain line, which cleanout shall be located not more than 10 feet from the residence or other structure from which the discharge originates.

2-9.11: Distance from Property Lines: No Waste Stabilization Pond shall be constructed where the distance from the centerline of any portion of the nearest dike to any adjoining property line is less than 100 feet, provided that this distance may be reduced to not less than 75 feet if written permission for such variance is obtained from each adjoining property owner affected by the reduction and such variance is granted by the Administrative Agency.

2-9.12: Distance to Wells and Water Lines: No Waste Stabilization Pond shall be located within 100 feet, measured from the centerline of the nearest section of the dike to the closest edge of the well, of any private or public water well, nor shall any such pond be located within 25 feet of any public or private water transmission line(s).

2-9.13: Incorporation of a Septic Tank: Waste Stabilization Ponds may incorporate a septic tank as part of the overall waste handling system, but incorporation of a septic tank shall not be required.

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SECTION 2-10: MAINTENANCE OF WASTE STABILIZATION PONDS/SEWAGE LAGOONS:

2-10.1: Plant Growth: The pond area, including the interior and exterior portions of the dikes, shall be kept free of weed growth, reeds, trees, and brush.

2-10.2: Mowing: The dikes, on both the interior and exterior sides, shall be seeded to grass and shall be mowed regularly so that the height of the grass is not allowed to exceed 12 inches.

2-10.3: Signs: Warning signs, as required by Section 2-9.7, shall be maintained so that they are clearly visible and clearly readable.

2-10.4: Freeboard: A minimum freeboard of two feet, measured from the top of the dike to the surface of the water in the pond, shall be maintained in each Waste Stabilization Pond. Should freeboard be reduced to less than 2 feet for any reason, including heavy rainfall, the owner of the Waste Stabilization Pond or sewage lagoon shall be required to promptly report such condition to the Administrative Agency and shall take such remedial action as the Administrative Agency may require.

2-10.5: Maintenance of Dikes: Dikes shall be maintained in a state which is as near the original post-construction appearance as possible. Dikes shall be seeded to grass and shall be kept clear of weeds, bushes, and trees. Any burrowing or digging, whether on the interior or exterior side of the dike(s), shall be promptly repaired.

2-10.6: Fencing: Fencing around the Waste Stabilization Pond shall be maintained in a condition which will prevent the unauthorized entry of children and animals. Gates will be maintained in a good working order and shall be kept locked except during periods of mowing or other maintenance.

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SECTION 2-11: CONSTRUCTION STANDARDS FOR SEPTIC TANK/LATERAL FIELD SYSTEMS:

2-11.1: Chamber Lateral Lines: Chamber lateral lines shall be level for the entire length of the lateral line. No single lateral line shall exceed 100 feet in total length.

2-11.2: Chambers: Each trench shall be excavated and leveled with a minimum width of 24 inches, and a minimum depth of 24 inches. Make sure that the trenches are level. Verify that the trench is level using a level, transit, or laser.

2-11.3: Earth Backfill: The trench shall be backfilled with soil so that the chamber is covered by a minimum of 12 inches of soil. The backfill should also include 6 inches of additional soil above grade to allow for settling.

2-11.4: Separation of Lateral Lines: Trenches for chamber lateral lines shall be separated by at least six feet of undisturbed soil when measuring from wall to wall of adjoining (parallel) trenches. There shall be at least 10 feet of separation between the wall of any trench and any property line or right-of-way. No lateral line shall be laid within 20 feet of the foundation of any permanent structure.

2-11.5: Vent required: Where the septic tank is installed more than 10 feet from the foundation of the residence or other structure which generates the discharge, a vent shall be installed between the septic tank and the structure.

SECTION 2-11-A: ROCK AND PERFORATED PIPE LATERALS OPTIONAL

2-11-A.1: Length of Lateral Lines: The total length of lateral lines shall be determined according to the assumed water usage specified in Table 2-11. Sufficient lateral line shall be constructed to provide for adequate absorption and treatment at a maximum load of no more than one-half gallon of water per day per square foot of bottom area in the lateral line trench, except that, where a shallow trench is used, the maximum loading per square foot shall be 3/8 gallon per square foot. **(See Diagram 2-11a and 2-11b)** No Single lateral line shall exceed 100 feet in total length.

2-11-A.2: Depth of Trenches for Lateral Lines: Standard trenches (See Diagram 2-11a) shall be dug to a depth of 36". Where approval for shallow trenches has been obtained from the Administrative Agency, the trench depth may be reduced to 24". **(See Diagram 2-11b)**

2-11-A.3: Slope of Lateral Lines: Lateral lines shall be laid so that the line falls no more than 4 inches per 100 feet of lateral line.

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2-11-A.4: Rock fill: The bottom of each trench shall be filled with clean crushed rock, using rock ½" to 1 ½" in diameter, to a depth of 12 inches (8 inches for shallow trench construction). The lateral line shall be laid on this rock bed and shall then be covered with at least 6 inches (2 inches for shallow trenches) of rock overfill. **(See Diagram 2-11a and 2-11b)**

2-11-A.5: Soil Barrier Required: A filter fabric (at least 3 ounce nylon or five ounce polypropylene) shall be placed over the rock in the lateral line trench prior to any backfilling with the earth. Materials relatively impervious to air and moisture are not permitted. **(See Diagram 2-11a and 2-11b)**

2-11-A.6: Earth Backfill: After the soil barrier filter fabric has been installed, the remainder of the trench shall be backfilled with soil so that the soil barrier is covered by a minimum of 12 inches of soil. For shallow trench construction, this will require that at least 3 inches of additional soil be mounded over the trench. **(See Diagram 2-11b)**

2-11-A.7: Separation of Lateral Lines: Trenches for lateral lines shall be separated by at least six feet undisturbed soil when measuring from wall to wall of adjoining (parallel) trenches. There shall be at least 10 feet of separation between the wall of any trench and any property line or right-of-way. No lateral line shall be laid within 20 feet of the foundation of any permanent structure.

2-11-A.8: Type of Lateral Lines: Lateral lines shall be constructed of 4-inch agricultural drain tile or perforated non-metallic pipe.

2-11-A.9: Vent required: Where the septic tank is installed more than 10 feet from the foundation of the residence or other structure which generates the discharge, a vent shall be installed between the septic tank and the structure.

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TABLE 2-11

ASSUMED WATER USAGE

Size of Home	Assumed Usage
1-Bedroom Home	150 gallons/day
2-Bedroom Home	300 gallons/day
3-Bedroom Home	450 gallons/day
4-Bedroom Home	600 gallons/day

(For additional bedrooms, add 150 gallons/day of estimated water usage per bedroom.)

SECTION 2-12: SIZE OF SEPTIC TANK: For homes with assumed water usage, according to Table 2-11, of 300 gallons per day or less, a septic tank with a minimum capacity of 1000 gallons shall be installed. For homes with assumed usage of 600 gallons per day, a septic tank with a minimum capacity of 1,200 gallons shall be installed. For homes with assumed usage of 750 gallons per day or greater, a tank with a minimum capacity of 1,500 gallons shall be installed. "Tanks sized at three times daily flow are recommended and shall be required when garbage disposals are used." Therefore a three bedroom home with a garbage disposal would require a 1,350 gallon septic tank and a 4 bedroom home with a garbage disposal would require an 1800 gallon tank.

SECTION 2-13: DESIGN STANDARDS FOR SEPTIC TANKS: Septic tanks shall be water tight and may be constructed of precast or poured-in-place concrete, vitrified clay, or coated steel. Coated steel tanks shall conform with the requirements of Commercial Standard 177-62. Precast reinforced concrete tanks shall have minimum wall thickness of 2 1/2" and shall be reinforced with steel to facilitate handling. Tanks shall be free of cracks or other evidence of structural failure. Poured-in-place concrete tanks shall have a minimum well thickness of 5" and shall be reinforced with 3/8" steel bars on 12" centers, both horizontally and vertically. No. 9 reinforcing steel mesh may also be used. Removable slab covers or 20" square manholes shall be provided for all septic tanks. Where the top of the tank is more than 18 inches below the finished grade, a manhole shall be extended above the top of the tank so that the manhole cover is not more than 18 inches below the finished grade. The invert of the inlet shall be at least three inches above the liquid level in the tank. The inlet shall be provided with a vented tee or baffle extending at least six inches below the liquid level in the tank. The outlet tee or baffle shall extend above the liquid level within one inch of the top of the tank and below the liquid level to a point equal to 40 percent of the depth of the liquid in the tank. All septic tanks installed must appear on the KDHE state list of approved septic tanks.

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SECTION: 2-14: In existing and unusual cases where compliance with the requirements of this Code is not feasible, the Administrative Agency shall have the authority to waive the requirements, provided reliable information is furnished to show that such waiver does not and will not impair ground or surface water and will not endanger or compromise the environment or public health.

Request for exception to any of the rules and regulations as set out within this Code shall be submitted to the Agency in writing and shall contain all information relevant to the request.

CHAPTER 3

WATER SUPPLIES

SECTION: 3-1: PURPOSE AND INTENT: The provisions of this chapter are for the purpose of regulating and controlling the development, maintenance and use of potable Semi-public Water Supplies and Private Water Systems in Labette County, Kansas, in order that the public health will be protected and the contamination or pollution of the water resources of the county will be prevented.

SECTION 3-2: APPLICABILITY: The provisions of this chapter shall apply to all unincorporated area located in Labette County, Kansas.

SECTION 3-3: DEFINITIONS:

3-3.1: Domestic Uses: "Domestic Uses" means the use of water by any person or family unit or household for household purposes, or for the watering of livestock, poultry, farm and domestic animals used in operating a farm, or for the irrigation of lands not exceeding a total of two acres for the growing of gardens, orchards and lawns.

3-3.2: Potable Water: "Potable Water" means water free from impurities in amounts sufficient to cause disease or harmful physiological effects in humans and conforming with the latest drinking water standards by the Kansas Department of Health and Environment.

3-3.3: Semi-Public Water Supply: "Semi-Public Water Supply" means any water supply used for domestic purposes serving two (2) to nine (9) residential units (rental or under separate ownership) on a piped system and serving less than 25 persons per year.

3-3.4: Public Water Supply: "Public Water Supply" means any water supply system that is used for domestic purposes by ten (10) or more users or serves an average of twenty-five (25) individuals daily at least sixty (60) days out of the year.

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3-3.5: Private Water Supply: "Private Water Supply" means a system that provides water for domestic uses, which serves not more than one dwelling on a daily basis.

SECTION 3-4: REQUIREMENTS FOR WATER SUPPLY SYSTEMS:

3-4.1: Permits: No person shall develop any private, or semi-public water supply system until a permit for such system has first been obtained from the Administrative Agency.

3-4.2: Approved Plans: No permit to develop or operate a private, or semi-private water supply shall be issued until the plans for such system have been submitted to and approved by the Administrative Agency.

SECTION 3-5: REQUIREMENTS FOR PUBLIC WATER SUPPLIES:

3-5.1: State Permit: No person shall operate a public water supply without obtaining a permit from the Kansas Department of Health and Environment (KDHE). A copy of the permit shall be filed with the Administrative Agency.

3-5.2: State-Approved Plans: No person shall construct any public water supply on any property subject to the provisions of this code until the plans and specifications have been submitted to and approved by the Kansas Department of Health and Environment (KDHE). A copy of the plans and specifications shall be filed with the Administrative Agency.

SECTION 3-6: REQUIREMENTS FOR SEMI-PUBLIC WATER SUPPLIES:

3-6.1: Construction: No person shall construct a semi-public water supply until the plans for such water supply have been reviewed by the Administrative Agency and a permit has been issued by the Administrative Agency for such water supply. All water lines within the semi-public system shall conform with the minimum separation distances shown in Table 3-1.

3-6.2: Continued Operation: No person shall operate or maintain a semi-public water supply that has been:

a. constructed or reconstructed after October 19, 1994, until it has been inspected and a permit issued by the Administrative Agency.

b. temporarily or permanently enjoined as a public health nuisance by a court of competent jurisdiction.

c. found by the Administrative Agency not to comply with the provisions of this code and a written notice thereof has been given to the owner or his/her agent.

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3-6.3: Use of a Semi-Public Water Supply: In addition to the requirements of Section 3-7, which pertain to private water wells, the following shall be done and reviewed by the Administrative Agency prior to the issuance of a permit, to assure water quality for the public:

a. an initial and at least annual Bacterial Analysis testing specifically for the presence of fecal coliform bacteria,

b. a partial Chemical Analysis done initially and every three (3) years thereafter, and

c. other tests, such as screenings for pesticides, volatile organic chemicals, and/or heavy metals as required by, and at the discretion of, the Administrative Agency.

SECTION 3-7: REQUIREMENTS FOR PRIVATE WATER SUPPLIES:

3-7.1: Permit Required: No person shall drill, develop, or construct any private water supply well on any premises subject to the regulations of this code until he/she has obtained a permit therefore from the Administrative Agency.

3-7.2: Location: All private water wells used as sources of water for domestic purposes shall be separated from the specified sources of pollution by distances equal to or greater than those shown in Table 3-1 below. Such distances may be increased by the Administrative Agency to provide assurance that the well(s) will not become contaminated from any of the sources shown in Table 3-1.

TABLE 3-1

AREA/SOURCE	MINIMUM SEPARATION
Absorption Field for septic tank effluent:	50 Feet
Sanitary Privy	100 Feet
Septic Tank:	100 Feet
Barnyard, stable, animal pen, manure pile, chicken coop, etc:	50 Feet
Streams, lakes, or ponds:	50 Feet
Sewer lines, not constructed of cast iron or other equally tight construction:	50 Feet
Sewer lines, if constructed of cast iron or other equally tight construction:	25 Feet

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3-7.3: Construction: The enforcement of this section of this Sanitation Code shall be regulated in accordance with K.A.R. 28-30-1 through K.A.R. 28-30-10, as amended. Recommended standards for design, construction, location, and practices consistent with currently-approved technology shall be followed.

SECTION 3-8: REQUIREMENTS FOR SUBDIVISION DEVELOPMENT: After the adoption of this Sanitation Code, no person shall develop any subdivision until the plans and specifications for any associated public or private water supply system(s) have been submitted to and approved by the Administrative Agency.

CHAPTER 4

SOLID WASTE DISPOSAL FACILITIES

SECTION 4-1: PURPOSE AND INTENT: The management of solid waste(s), including the operation of public and private land filling operations, is necessary to protect the general environment and the health and general welfare of the public at large. It is the purpose of this chapter to provide minimum standards for the operation of solid waste disposal facilities and for the disposal of general solid waste(s) within the legal boundaries of Labette County, Kansas, as well as to allow for routine inspection of solid waste disposal facilities and their daily operations.

SECTION 4-2: APPLICABILITY: The provisions of this chapter shall apply to all unincorporated areas within Labette County, Kansas.

SECTION 4-3: DEFINITIONS:

4-3.1: Administrative Agency: "Administrative Agency" means the Labette County Health Department and designated representatives thereof.

4-3.2: Hazardous Waste: "Hazardous Waste" means waste, or any combination of wastes, which, because of its quantity, concentration, or other physical, chemical, biological, or infectious characteristics, has been determined by the Kansas Department of Health and Environment to cause or significantly contribute to mortality or irreversible or incapacitating illness. Hazardous waste includes substances which, when improperly treated, handled or disposed of, can cause damage to the general environment.

4-3.3: Solid Waste: "Solid Waste" means garbage, refuse, and other discarded materials including, but not limited to, solid, semi-solid, sludges, liquid, and contained gaseous waste materials resulting from industrial, commercial, agricultural, and/or domestic activities. The term "solid waste" does not include materials otherwise classified as hazardous waste.

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Health and Environment

4-3.4: Solid Waste Disposal Facility: "Solid Waste Disposal Facility" means any landfill, incinerator, composting operation, transfer station, or other location where solid wastes from one or more residential premises or commercial, agricultural manufacturing or municipal operations are consolidated, stored, salvaged, burned, buried, reclaimed, or otherwise processed.

4-3.5: Leachate: "Leachate" means water or other fluids, from whatever source derived, which has been allowed to percolate from, soak through, seep out of or otherwise come into contact with solid wastes or hazardous wastes contained in any waste storage area in any type of solid waste disposal facility.

4-3.6: Nuisance: "Nuisance" means any condition or activity which has or threatens to have a detrimental effect of the general health or welfare of the public at large, or any member thereof, or which disturbs the peace or interferes with the private enjoyment of property.

4-3.7: Open Dumping: "Open Dumping" means the disposal of solid waste or hazardous waste by any means other than those methods specifically authorized herein.

4-3.8: Generator: "Generator" means any person who produces or brings into existence any type of solid waste or hazardous waste.

4-3.9: Person: "Person" means any individual, partnership, firm, joint venture, company, association, corporation, trust, or municipality.

4-3.10: Agricultural Purposes: "Agricultural Purposes" means a purpose directly related to the production of livestock or crops for commercial sale.

SECTION 4-4: GENERAL PROVISIONS:

4-4.1: (a) It shall be unlawful for any person in Labette County, Kansas to:

(1) Dispose of any solid waste by open dumping, except that this provision shall not prohibit:

(A) the use of solid wastes in normal farming operations or in the processing or manufacturing of other products in a manner that will not create a public nuisance or adversely affect the public health, or

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MAY 17 2010

Kansas Department of
Health and Environment

(B) an individual from dumping or depositing solid waste(s) resulting only from such individual's own residential or agricultural activities onto the surface of land owned by such individual and used for agricultural purposes where such dumping does not create a public nuisance, a health hazard or an adverse effect upon the environment.

(2) construct, operate, alter, or open a solid waste disposal facility, public or private, without a permit which may or may not be required by the Board of County Commissioners of Labette County, Kansas.

(3) operate any solid waste disposal facility, public or private, in any manner not consistent with the specifications of the permit for such operation or in any manner not consistent with the provisions of K.S.A. 65-3401 et seq., as amended, where applicable to such facility: Article 28-29 of the Kansas Administrative Regulations, as amended, where applicable to such facility; this Sanitation Code; or any order of the Board of County Commissioners.

(4) store, collect, transport, process, or dispose of solid waste(s) in any manner which creates a public nuisance,

(5) refuse or otherwise hinder entry, examination, or inspection of any solid waste disposal facility, public or private, by any agent or employee of the Administrative Agency, after such agent or employee has identified and given notice of their purpose.

(b) No person shall be held responsible for failing to secure a permit or for illegal operation of a solid waste disposal facility due to the dumping or depositing of any solid waste(s) upon property owned or leased by such person when such dumping occurred without their expressed or implied consent, permission or knowledge.

(c) Any person violating any provision of subsection (a) of this section shall be guilty of an unclassified misdemeanor and, upon conviction thereof, shall be punishable as provided by law and shall be subject, in addition to any other penalty provided by law, to a civil penalty of up to Two Hundred Dollars ($200.00) for every such violation, as provided for in Section 1-3.5 of this Sanitation Code. In the case of civil penalties imposed for continuing violations, every day that such violation(s) continues shall be deemed a separate violation.

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Health and Environment

(d) Title to solid waste collected, processed or disposed of in accordance with the provisions of this Sanitation Code shall vest in the owner of the solid waste management/disposal activity, area or facility in which the solid waste is placed. Solid waste produced from a discrete source and disposed of in ways other than in accordance with this Sanitation Code, or applicable State statutes or regulations, shall remain the property of the generator and the generator, in addition to any civil penalties specified herein, shall be liable for removal of the waste, restoration of the area in which the waste was disposed and to provide for lawful disposal of the waste. It shall not constitute a defense to the generator that the generator acted through an independent contractor in the transportation or disposal of the solid waste.

4-4.2: Control of Leachate: Every solid waste disposal facility, including private disposal facilities on ground used for agricultural or other purposes, in which solid waste is collected, stored, processed, burned, buried, or otherwise processed shall provide or construct a containment ditch, pool, or other approved leachate collection system of sufficient size and capacity to insure that leachate from the solid waste collection or disposal area is retained at the disposal site and is not allowed to flow into any stream, creek, river, or other waterway or into any type of water impoundment. Leachate collection systems shall be lined with clay or other impervious material to prevent seepage of any leachate into groundwater supplies.

4-4.3: Hazardous Wastes Prohibited: No solid waste disposal facility, public or private, shall accept for disposal, storage, transportation, or processing any type of hazardous waste unless approval for such activity has been and remains to be properly permitted and approved by the Kansas Department of Health and Environment.

4-4.4: Limitation of Private Facilities of Generators: No generator of solid waste shall operate a private solid waste disposal facility for any waste, hazardous or otherwise, unless such facility has first obtained a permit as required herein and has complied with the requirements of K.S.A. 65-3407, as amended, regarding permits from the State of Kansas.

4-4.5: Limitations of Burning: No generator of solid waste or operator of any solid waste disposal facility, public or private, shall engage in or allow the burning of refuse or solid waste except as specifically authorized, on specific burning permits issued by the Kansas Department of Health and Environment, where such permits are required by law, and except where specifically approved, in advance of any such burning operation, by the Administrative Agency. Copies of all such permits and the applications therefore, shall be filed with the Administrative Agency upon receipt and prior to the commencement of any burning operations. Any other permits notwithstanding, the Administrative Agency may order the operator to suspend, either temporarily or permanently, all or any activities related to the burning of solid waste(s).

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MAY 17 2010

Kansas Department of
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SECTION 4-5: ADMINISTRATIVE PROCEDURES:

4-5.1: Application for Permit: Persons desiring to operate a solid waste disposal facility, public or private, shall apply to the Administrative Agency for a permit which may or may not be required. Applications shall be submitted on such forms as may be required by the Administrative Agency. Each such application shall, at a minimum, include:

(a) a detailed scale drawing of the disposal site and all appurtenant structures and existing or proposed operations,

(b) a detailed description of the disposal and processing methods to be used as such solid waste disposal facility,

(c) a list of the equipment available for operation of the proposed solid waste disposal facility,

(d) a detailed description of the leachate collection system to be installed and used at such solid waste disposal facility,

(e) a detailed description of the type(s) of solid waste(s) to be handled at such facility and the sources of generators of such solid waste(s),

(f) complete copies of any additional applications to be filed, when required, with the Kansas Department of Health and Environment for permits to process solid waste, burn solid waste, or to handle, transport, dispose of, store or process hazardous waste,

(g) results of soil sampling and testing indicating the soil type(s), depth of topsoil and average depth to either groundwater or impermeable rock formations, and

(h) an area map showing the relationship of the proposed disposal site to municipalities, commercial operations, manufacturing facilities, and single- or multi- family residences.

4-5.2: Review of Applications: The Administrative Agency shall review all applications submitted under subsection 4-5.1 of this section and shall have the right to require any additional information deemed necessary prior to processing the application. Once all information regarding the applications has been received, the Administrative Agency shall:

(a) physically inspect the site of the proposed solid waste disposal facility,

(b) provide all residents within 1 mile of the proposed site with an opportunity to comment upon the proposed facility, and

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MAY 17 2010

Kansas Department of
Health and Environment

(c) refer the application, once all processing has been completed, to the Board of County Commissioners for approval or disapproval. Applications referred to the Board of County Commissioners shall include both the comments obtained by virtue of Section 4-5.2(b) and the written recommendations of the Administrative Agency.

4-5.3: Action by the Board of County Commissioners: The Board of County Commissioners shall review all applications submitted to them by the Administrative Agency and may, at their discretion, refer such application to any advisory board organized for the purpose of reviewing solid waste management practices and procedures. The Board of County Commissioners, notwithstanding an additional review or referral, shall consider the original application and all comments or recommendations thereon and shall, within 90 days of the date that the application was first submitted to the Board of County Commissioners, either approve or disapprove the same.

4-5.4: Licenses: Any application submitted hereunder may be denied at the sole discretion of the Board of County Commissioners. Any application which is approved shall be issued a license by the Administrative Agency, which shall be issued a license by the Administrative Agency, which license shall specifically state the activities approved by the Board of County Commissioners.

4-5.5: Revocation of Permits or Licenses: Any permit of license issued under this section may be revoked by the Board of County Commissioners for misrepresentation, failure to comply with the provisions of this Sanitation Code, failure to operate a public solid waste disposal facility in accordance with the regulations published by the State of Kansas, revocation of applicable State licenses or permits, failure to pay any licensing fee(s) required by this Sanitation Code, or for any other reason deemed proper by the Board of County Commissioners.

4-5.6: Licensing Fees: The licensing fee for solid waste disposal facilities whether private single-family solid waste disposal facilities or public or multi-family solid waste disposal facilities, shall be set by the Administrative Agency in the Schedule of Fees which shall be paid to the Administrative Agency with the original application for licensure and annually thereafter on or before the anniversary date of the issuance of the original license. All such fees collected by the Administrative Agency shall be deposited by the Administrative Agency to the Labette County Health Fund.

4-5.7: Inspections: Every solid waste disposal facility licensed under this Sanitation Code shall be subjected to inspection by the Administrative Agency at any time. Such inspection may be scheduled in advance or may be unannounced, at the discretion of the Administrative Agency. In connection with such inspections, the Administrative Agency:

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MAY 17 2010

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Health and Environment

(a) shall provide to the operator, within 30 days following such inspection, written notice of any problems or deficiencies noted and the corrective action(s) required as a result of such deficiencies,

(b) maintain a file of all such inspections and all correspondence related thereto,

(c) perform such follow-up inspections as may be deemed necessary by the Administrative Agency, and

(d) file, with the Board of County Commissioners, a written report of any deficiencies which remain uncorrected for longer than 60 days following the first inspection at which the deficiencies were noted.

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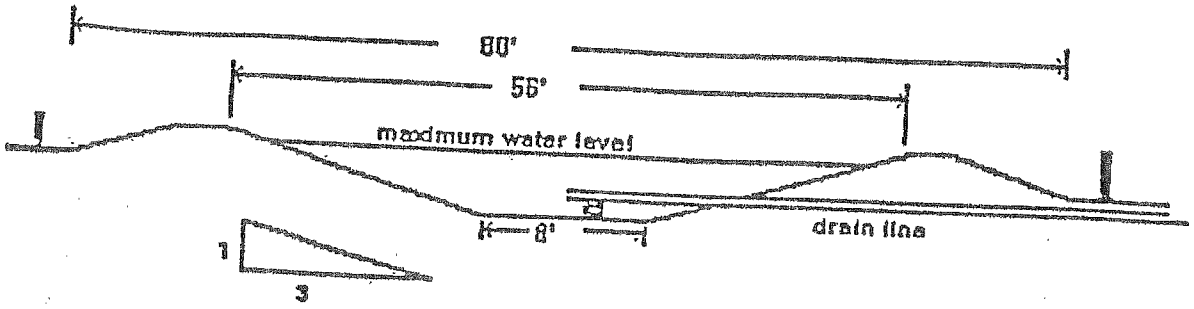
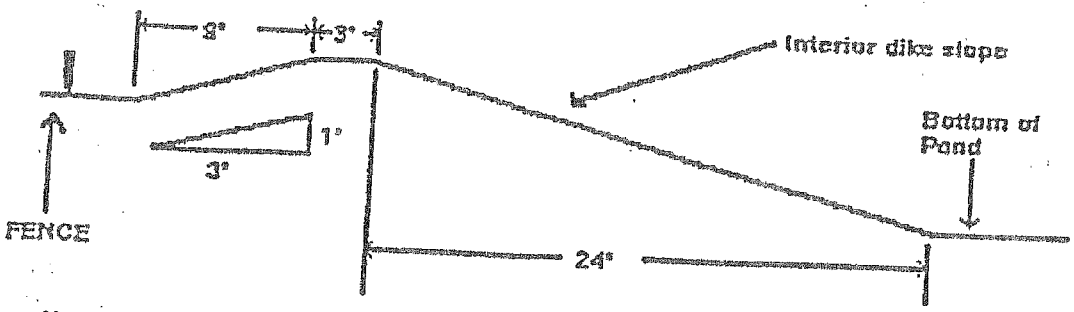
Diagram 2-9a: Waste Stabilization Pond - General Pond Construction



Additional information:

a. dikes should extend 3' above normal ground surface
b. maximum pond depth at center of pond is 5'
c. at maximum water level, water surface should be 2' below top of dike
d. fencing around pond should be wire with minimum opening of 2"x 4"
e. fence should incorporate a gate (minimum 4') large enough to allow mower entry.

Diagram 2-9b: Design of dike slopes:



NOTE: Overall pond will be 80' from outside toe to outside toe of opposing dikes.
Center (bottom) square of pond will be 8' on each side.
Pond dikes extend 3' above normal ground surface.
Fence is constructed outside the dikes (leave room for mower inside fence).

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Diagram 2-9c
General Layout and Design

c: Waste Stabilization Pond - General Layout

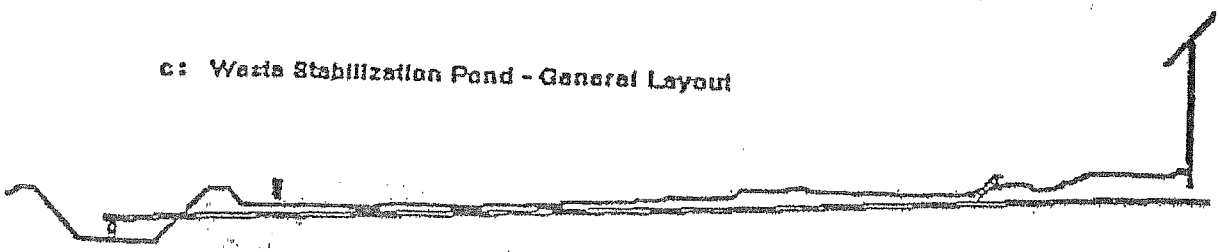

Diagram 2-9 d. Waste Stabilization Pond - Aerial View

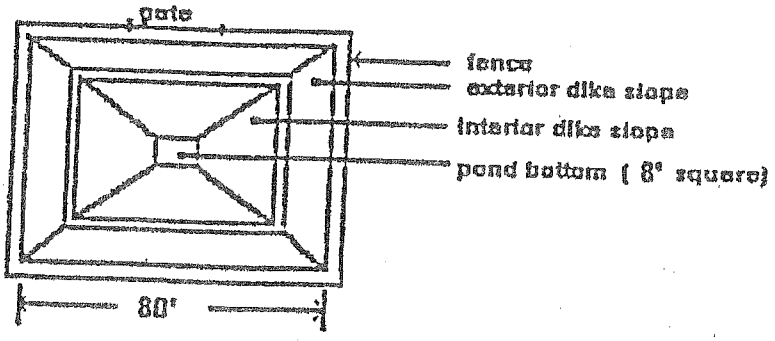

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Diagram 2-9e: Waste Stabilization Pond - Overall Appearance

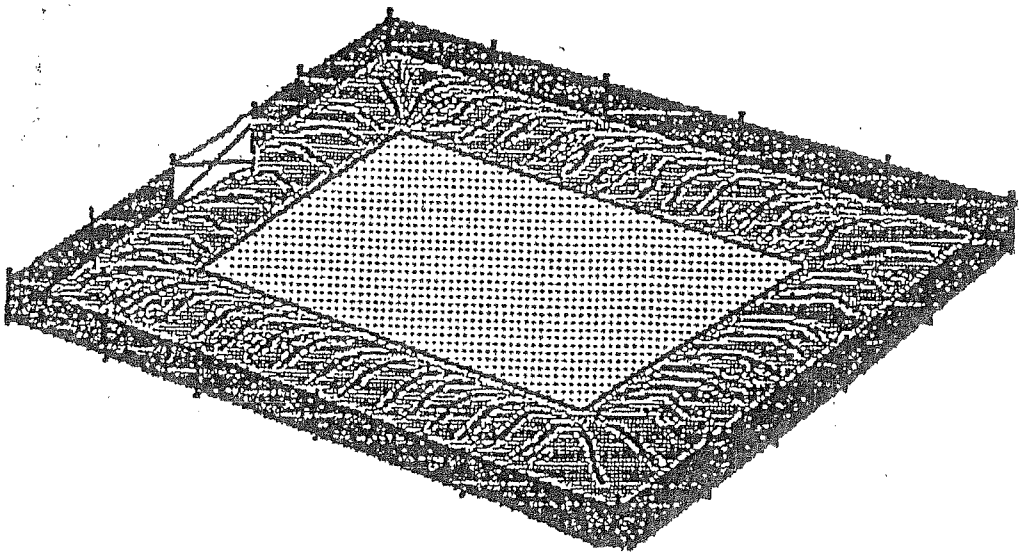
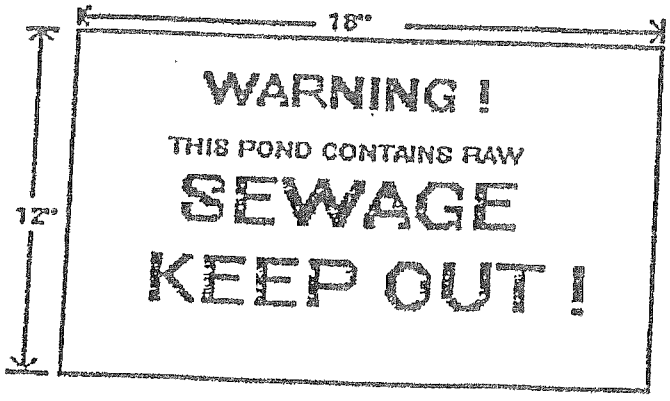


Diagram 2-10

Warning Sign - Waste Stabilization Ponds



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MAY 17 2010
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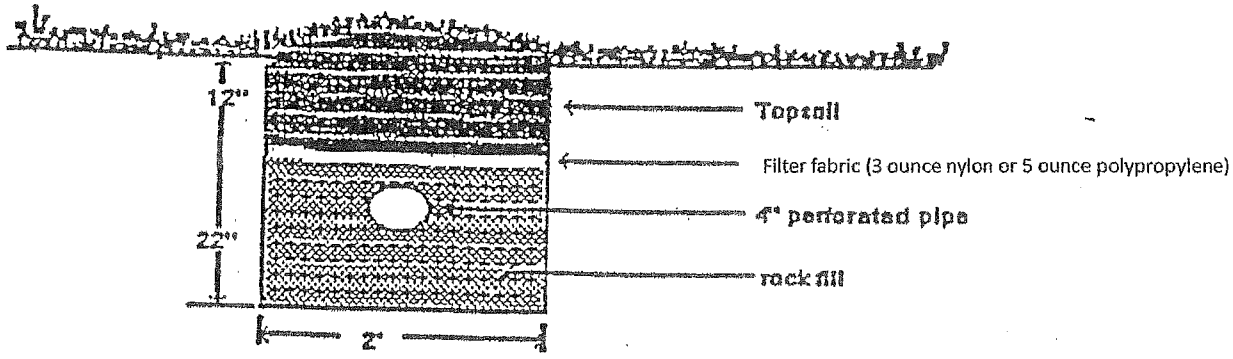
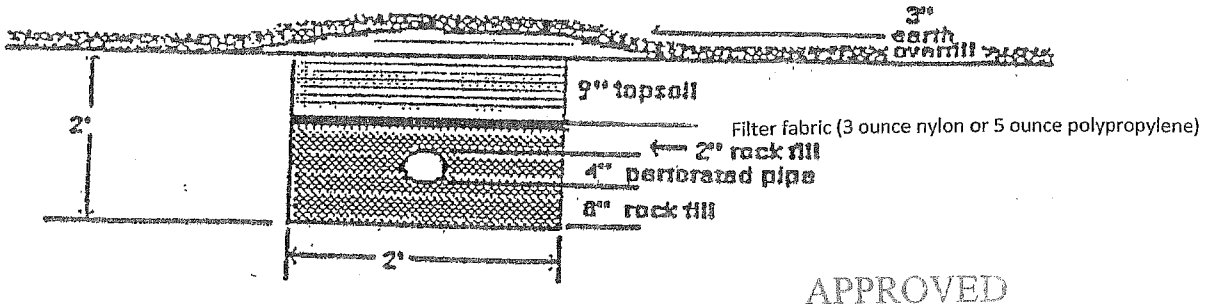
Health and Environment

DIAGRAM 2-11a: Lateral Lines: Standard Trench Construction



Overall trench depth: 3'
Amount of rock fill above pipe: 6"
Maximum Loading: 1/2 gallon per square foot.

DIAGRAM 2-11b: Lateral Fields: Shallow Trench construction.
(NOTE: Use of Shallow Trenches requires longer lateral lines.)



Maximum Loading: 3/8 gallon per square foot.

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MAY 17 2010
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Appendix A

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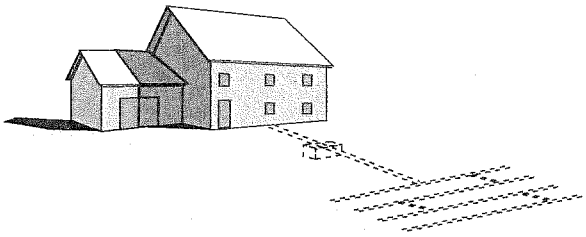
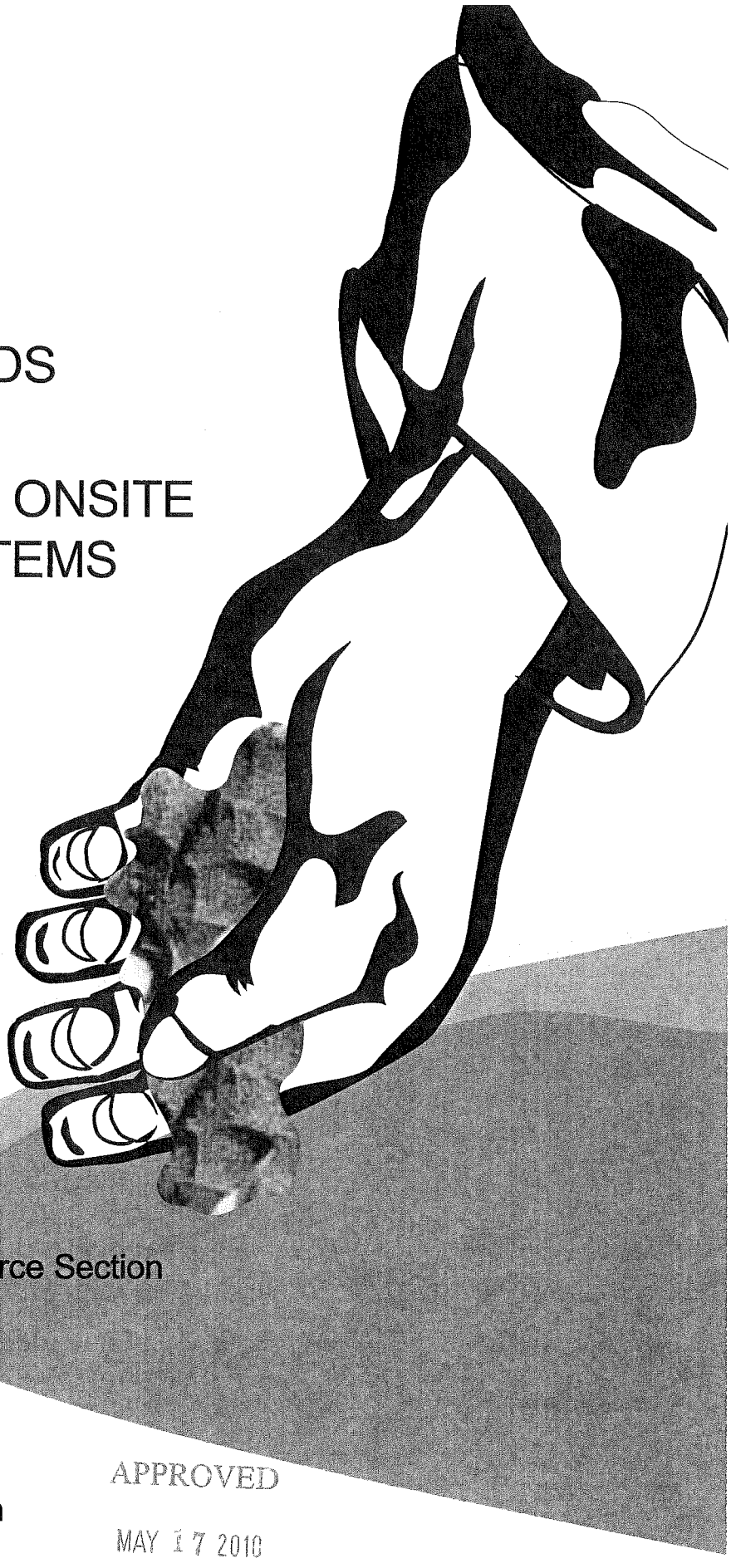
Department of Health and Environment

Bulletin 4-2, March 1997

MINIMUM STANDARDS FOR DESIGN AND CONSTRUCTION OF ONSITE WASTEWATER SYSTEMS





Bureau of Water—Nonpoint Source Section
Forbes Field, Bldg. 283
Topeka KS 66620
(785) 296-4195

In Cooperation with
K-State Research and Extension

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Table of Contents

Tables

Figures

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MAY 17 2010

Kansas Department of
Health and Environment

Introduction

Kansas Administrative Regulations (K.A.R. 28-5-6 to 9) authorize the Kansas Department of Health and Environment (KDHE) to establish minimum standards for septic tank–lateral fields. KDHE bulletin 4-2: *Minimum Standards for Design and Construction of Onsite Wastewater Systems* fulfills that purpose. The minimum standards presented in this document are intended to ensure domestic wastewater is managed so that:

- Quality of surface and groundwater is protected for drinking water, recreation, aquatic life support, irrigation, and industrial uses.
- A breeding place or habitat will not be created for insects, rodents, and other vectors that may later contact food, people, pets, or drinking water.
- Wastewater will not be exposed on the ground surface where it can be contacted by children and/or pets, creating a significant health hazard.
- State and federal laws and local regulations governing water pollution or wastewater disposal will be met.
- Nuisance conditions or obnoxious odors and unsightliness will be avoided.

Bulletin 4-2 is not intended to provide an in-depth discussion of the rationale for these standards. For more information, see the *Environmental Health Handbook* and resources identified therein as well as other references in Appendix B (page 16). Most county health departments have a copy of this handbook, or copies are available at cost from Kansas State University, Extension Biological and Agricultural Engineering (see Appendix B).

Local governments have the authority to adopt minimum requirements (codes) for onsite wastewater management systems, to approve individual plans, to issue permits for construction, to issue permits for operation, and to grant variances. County sanitary (environmental) codes specify local design and permitting requirements. Compliance with these requirements helps prevent illness caused by environmental contamination and protects surface and groundwater.

Some local requirements, such as those in wellhead protection or sensitive groundwater areas, may be more stringent than those established in Bulletin 4-2. Often, these stricter requirements provide greater protection of public health and the environment, especially where water resources are vulnerable to contamination.

Sanitary codes are adopted and administered by local government usually through county health departments. The local administering authority should always be contacted before any time or money is invested in system design, plans, installation, or repairs.

If there is no local code, landowners are required to comply with Kansas Administrative Regulations (K.A.R.) 28-5-6 to 9 and minimum standards in this bulletin. If no assistance is available from the health department or other local authority, contact your county Extension Office or KDHE, Bureau of Water, phone (785) 296-4195, or the nearest KDHE District Office (see inside back cover).

K.A.R. 28-5-6 stipulates that all domestic wastewater shall be discharged to an approved sewage collection system or an approved lagoon, septic system, or alternative system. Domestic wastewater means all waterborne wastes produced at family dwellings in connection with ordinary living including kitchen, toilet, laundry, shower, and bath tub wastewater. It also includes similar type wastewater, produced at businesses, churches, industrial, and commercial facilities or establishments.

Wastewater from a home shall be discharged to a properly designed and maintained septic tank-soil absorption field or wastewater pond, an approved alternative treatment and disposal system, or a permitted sewage treatment plant. Seepage pits, cesspools, and dry wells (rat holes) are not permitted. This bulletin provides information on conventional soil absorption fields, wastewater ponds, and alternatives that may be considered when conventional absorption fields or ponds are not suitable.

Bulletin 4-2 covers five basic elements of proper septic tank-lateral field system design:

1. wastewater flow,
2. soil and site evaluation,
3. septic tank standards, for design, construction and installation,
4. lateral field design and construction, and
5. system maintenance.

This bulletin also addresses basic principles for wastewater ponds.

This bulletin is intended to provide information on treatment of domestic wastewater. Domestic wastewater excludes surface runoff from roof, paved areas, or other surfaces; subsurface drainage from springs, foundation drains, and sump pump; or cooling water. Industrial or commercial wastewater (from shops, manufacturing, car washes, etc.) is not permitted to be discharged to an onsite soil absorption system, so it shall not be mixed with domestic wastewater.

By following the standards established in Bulletin 4-2 and your county's sanitary code, you actively contribute to protecting the environment and quality of life for your family, your neighbors, your community, and other Kansans. Your contribution is appreciated!

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MAY 17 2010

Kansas Department of
Health and Environment

Wastewater Flows

One major concern in the design of household wastewater systems is the quantity of wastewater generated daily. The system must have enough capacity to accommodate and treat this total flow. Normal contributions to this flow will come from bathroom, kitchen, and laundry facilities. Kansas regulations require that all domestic wastewater be treated and disposed through the onsite system. Surface runoff from roofs and paved areas, subsurface drainage from footing drains and sump pumps and cooling water are not domestic wastewater and must be excluded from soil absorption systems. Such water may be used to help maintain the operating water level in wastewater ponds.

Design flow is estimated by multiplying the number of household bedrooms by 150 gallons per day (gpd). This is based on 75 gallons per person per day for two people in each bedroom[1]. This accounts for the number of people that can occupy the home for extended periods rather than how many actually live there when the system is installed. Houses frequently experience a change in ownership or occupancy over the life of the wastewater system. When calculating wastewater flow, note that a water softener may increase water use by as much as 10 gallons per capita per day or possibly more where water is very hard.

Site and Soil Evaluation

Although the septic tank is important for removing solids from the wastewater, more of the wastewater treatment is provided by the soil. Microorganisms living in the soil profile feed on organic matter in the wastewater, treating and purifying the water as they grow. Four feet of aerated soil below the bottom of the absorption field is necessary to ensure adequate treatment of the wastewater before it reaches the water table or flows laterally due to a restrictive condition.

In sandy soil, it is recommended that as much vertical separation as possible be provided. An understanding of the soil is necessary to assess the ability of the site to provide good wastewater treatment. Soil must absorb the septic tank effluent, treat the wastewater, and transmit treated wastewater away from the soil absorption areas.

The site evaluation begins by reviewing available information such as a published soil survey and then evaluating the soil on site. County soil survey reports are usually available from the local Natural Resource Conservation Service (NRCS, formerly Soil Conservation Service). Contact your local NRCS office, county conservation district or Extension office for a copy of the report.

The soil survey provides general information and serves as a guide to the soil conditions. Sites characterized by slow permeability, restrictive subsoil layer, shallow soil over rock, high groundwater, poor drainage, or steep slopes, as identified in the soil survey, have moderate to

TABLE 1—Soil Limitation Ratings Used by NRCS For Wastewater Absorption Fields

	LIMITS			
Property	**Slight**	**Moderate**	**Severe**	**Restriction or Feature**
USDA Texture	–	–	Ice	Permafrost (not found in Kansas)
Flooding	None, Protected	Rare	Common	Flood water inundates site
Depth to Bedrock (in.)	>[2] 72	40-72	<[3] 40	Bedrock or weathered bedrock restricts water movement or reduces treatment capacity
Depth to Cemented Pan (in.)	> 72	40-72	< 40	Reduces water and air movement
Depth to High Water Table, (ft. below surface)	> 6	4-6	< 4	Saturated soil, poor aeration, anaerobic soil, restricted movement
Permeability, (in./hr.)				
24-60 in. layers	2.0-6.0	0.6-2.0	< 0.6	Slow perc rate, poor drainage
less than 24 in. layers	–	–	> 6.0	Poor filter
Slope, (percent)	0-8	8-15	> 15	Difficult to construct and hold in place
Large stones greater than 3 in., (percent by wt.)	< 25	25-50	> 50	Restricted water and air movement results in reduced treatment capacity

[1]The 150 gallons per bedroom, or 75 gallons of wastewater produced daily by each person, assumes at least some water using appliances such as clothes washer, dishwasher, water softener, etc.
[2]> means greater than
[3]< means less than

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MAY 17 2010
Kansas Department of Health and Environment

severe restrictions for conventional septic tank–soil absorption systems and other options may be preferred or required.

A site and soil evaluation should be completed in order to locate the area to be used for the absorption field, to verify the soil characteristics, and to size the system. Areas with slopes steeper than about 20 percent will cause considerable difficulty during construction and are not recommended for lateral field installations. Rock outcroppings warn of shallow soils and may suggest the probable direction of groundwater flow. The range of values for each of several properties that cause the soil to be placed in slight, moderate, and severe limitation rating for soil absorption systems is shown on Table 1.

The wastewater system area should be chosen prior to any construction on a site and should be an integral part of the homesite design and development. A soil profile analysis is highly recommended to ensure suitability of the area and to establish the loading rate so that adequate space is available for the absorption field and its replacement.

To perform a soil profile analysis, an excavator is usually used to open a pit, which exposes the soil profile. The soil evaluation, performed by a trained and qualified person[4], includes examining the soil profile, determining the soil texture, structure, color, consistence, measuring soil depth, and looking for evidence of a high or perched water table or other restrictions. The soil profile should be analyzed to a depth of at least 4 feet below the bottom of the absorption area or at least 6 feet below the surface.

Because OSHA regulations require shoring for trenches deeper than 5 feet for some soils, it is recommended that the pit be constructed so a person is not required to go deeper. Soil below 5 feet can be examined from cuttings, observation from a distance, and by shovel or auger without entering a deeper pit.

At least three pits should be dug surrounding the area to establish the range of soil characteristics that are present on the site, and to determine the best location for the absorption field. Sanitarians, usually through local health or environmental departments, or environmental health specialists, are available to assist in the site and soil

TABLE 2—Design Septic Tank Effluent Loading Rates for Various Soil Textures and Structures

Group	Soil Characteristics	Wastewater Loading (in/day)	(cm/day)	(gpd/ft²)
I.	Gravelly coarse sand and coarser.	Not Recommended for conventional soil absorption system[5]		
II.	Coarse sands (not cemented).	1.8	4.6	1.1
III.	Medium sand with single grain structure and loose to friable consistence (not cemented).	1.5	3.7	0.9
IV.	Other sands and loamy sands with single grain or weak structure (not extremely firm or cemented consistence). Sandy loams, loams and silt loams with moderate or strong structure (except platy and loose to friable consistence).	1	2.5	0.6
V.	Sandy loams, silt loams and loams with weak structure (not of extremely firm or cemented consistence). Sandy clay loams, clay loams and silty clay loams with moderate to strong structure (not of platy, of firm, or of cemented consistence).	0.7	1.7	0.4
VI.	Sandy clay loams, clay loams and silty clay loams with weak structure (not massive, not of firm, or of cemented consistence.) Some sandy clays, clays and silty clays with moderate and strong structure (not platy, not of firm, or of cemented consistence).	0.4	1	0.25
VII.	Other soils of high clay content with weak or massive structure, extremely firm or cemented consistence or platy, clay pan, fragipan, and caliche soils.	Not Recommended for conventional soil absorption system[6]		

NOTE: The above descriptions are estimates and assume that the soil does not have large amounts of swelling clays. Soils with platy structure, massive, compacted or high density should be used with extreme caution or avoided.

[4]A trained and qualified person would include a soil scientist, such as one working for NRCS, environmental health specialist, sanitarian, or other person who has received appropriate soil training and through experience is competent.
[5]Soil is too coarse for conventional soil absorption designs, use pressure distribution dosing or other alternative system to prevent too rapid infiltration.
[6]Soils with these conditions may be acceptable for wastewater stabilization ponds or possibly other alternative systems. (See Table 6).

APPROVED

MAY 17 2010

Kansas Department of

evaluations. A few consultants, either engineers or design/installation contractors, also provide this service.

Table 2 gives the recommended loading rates based on soil texture, structure, and consistence information. These loading rates are based on research that has shown that soil characteristics provide a strong basis for wastewater system design loading rate. Results show system design should be based on the most limiting soil texture found in the first 4 feet of soil below the bottom of the proposed absorption lateral.

Once the wastewater flow (number of bedrooms) and loading rate for the soil are known, the absorption field area needed for the lateral system can be calculated. It is highly recommended that the absorption field and an equal area reserved for future use be marked and fenced so they will not be disturbed during construction. Required setback distances to property lines, wells, surface water, and buildings must be checked and included in the site plan.

Where evaporation substantially exceeds precipitation, as in central and western Kansas, a reduction in soil absorption area may be used when the soil is well suited to wastewater absorption. A well suited soil has medium to coarse texture, perc rates less than 45 minutes per inch and wastewater loading rates of 0.5 gallons per square foot per day or more. For marginal, high clay, soil that has low loading rates, no reduction should be used regardless of location in Kansas. Recommended allowable soil absorption system reductions and percent of total absorption area for central and western Kansas is shown on Table 3.

Since about 1970 considerable research about onsite wastewater systems has occurred. New information, including design procedures, operating characteristics, and many new products, has been and continues to be developed to help improve onsite wastewater systems.

The soil profile evaluation provides a comprehensive assessment of soil characteristics and is the preferred

TABLE 3—Recommended Absorption Reductions

	Western Kansas	Central Kansas	Eastern Kansas
Actual absorption area (in percent)	65	80	100
Recommended reduction (in percent)	35	20	0

TABLE 4—Soil Absorption Field Loading Rate and Area Recommendation for Septic Tank Effluent Based on Perc

Perc Rate (minutes/inch)	Recommended Absorption Area (ft^2/bedroom)	Loading Rate (gpd/ft^2)
Less than 5 minutes	Not recommended for conventional soil absorption system[5]	
5-10 minutes	165	0.91
11-15 minutes	190	0.79
16-30 minutes	250	0.6
31-45 minutes	300	0.5
46-60 minutes	330	0.45
Greater than 60 minutes	Not recommended for conventional soil absorption system[6]	

TABLE 5—Minimum Required and Minimum Recommended Separation Distances for Onsite Wastewater Systems

Separation Distances	Minimum Distance (ft.) Required	Recommended[7]
Septic Tank to foundation of house or other buildings	10	10
Soil Absorption System to dwelling foundation	20	50
Any part of a wastewater system to:		
public potable water line	25[8]	25
private potable water line	10	25
property line	10	50
public water supply well or suction line	100[9]	200
private water supply well or suction line	50[9]	100
surface water course	50	100
Wastewater Lagoons to:		
property line	50[10]	200
dwelling foundation	50[10]	200

[5]Soil is too coarse for conventional soil absorption designs, use pressure distribution dosing or other alternative system to prevent too rapid infiltration.
[6]Soils with these conditions may be acceptable for wastewater stabilization ponds or possibly other alternative systems. (See Table 6).
[7]These recommended separation distances help assure a minimum of problems, but are no assurance that problems will not result.
[8]The minimum distance specified by KDHE guidelines for public water supplies
[9]The minimum distance required by KAR 28-30-8(a).
[10]When lot dimension, topography, or soil condition make maintaining the required 50 feet separation distance impossible, a written variance from the affected property owners shall be obtained and filed with deeds.

APPROVED
MAY 17 2010
Kansas Department of

method for determining the suitability of the soil to accept and treat wastewater and establish the design loading.

Some local sanitary codes require the perc test and other codes require both a perc test and a soil profile evaluation. "Perc" is short for percolation and has become the preferred term for this test to evaluate soil suitability to accept wastewater. Percolation means water movement through a soil. Since the driving force is gravity, most of the movement will be downward. The perc test really measures an infiltration rate for water into a wet but unsaturated soil at the depth of expected system placement. The procedure for doing a perc test is described in Appendix A (page 14). Once the perc rate is known, refer to Table 4 to determine the loading rate and absorption field area, or use another method specified by the local sanitary code.

Separation of the soil absorption field from buildings, structures, and boundaries is essential to maintain system performance, to permit repairs, to maintain required separation from wells, and to reduce undesirable effects of underground wastewater flow and dispersion. The structures and boundaries to consider include easements, buildings, property lines, utilities, wells, and components of the wastewater disposal system. Minimum required and recommended separation distances for private wastewater systems are given in Table 5.

Many soils, especially in eastern Kansas, have properties that restrict their suitability for soil absorption fields. When limiting properties occur in the soil profile, a variation of conventional laterals, wastewater ponds or alternative treatment systems may be used to compensate for the limiting condition. Variations and alternatives that may be considered are summarized in Table 6. When possible, sites with these restrictive conditions should be avoided due to higher cost, larger land area, and greater maintenance requirements for the alternative systems.

TABLE 6—General Alternative Option Guide for Moderate or Severe Limiting Soil Conditions

I.	Shallow Permanent, Perched or Seasonal Groundwater • Subsurface drainage system at least 50 feet from the soil absorption area to lower the water table–suitable for moderate or more permeable soil conditions. This alternative creates drainage that must be discharged away from the area • Variation of conventional lateral trench - Shallow in-ground trench–suitable for groundwater at 4¾ feet or deeper - At-grade lateral system–suitable for groundwater at 4 feet or deeper • Enhanced wastewater treatment[11] by rock-plant filter[12], sand filter[13], or aerated tank[14] or other equivalent system[15] followed by shallow soil absorption or wastewater pond • Wisconsin (engineered) mound–suitable for groundwater or other restriction at 1 foot or deeper • Rock-plant filter[12]–suitable for ground water at 1 foot or deeper followed by soil absorption
II.	Shallow Bedrock • Wastewater pond–suitable for sites with bedrock at any depth when overexcavated and at least 1½ feet of compacted clay lining is installed • Variation of conventional lateral trench - Shallow in-ground trench system– suitable for bedrock at 4¾ feet or deeper - At-grade lateral system–suitable for bedrock at 4 feet or deeper • Enhanced wastewater treatment[11] options (see I above) followed by shallow soil absorption • Wisconsin (engineered) mound–suitable for bedrock at 1 foot or deeper
III.	Rapid Perc Rate (< 5 mpi) or very permeable soil (> 20 in/hr) • Pressurized distribution dosing system to uniformly distribute wastewater throughout the absorption field • One foot lining using loam soil to bottom and sides of the trench to limit water absorption rate
IV.	Slow Perc Rate (60 to 120 mpi) or "slow" soil permeability (0.2-0.6 in/hr) • Dual shallow lateral systems in permeable surface soils (each with 60% to 80% of conventional lateral area) with a diversion valve and alternating use of systems • Wastewater pond provided sufficient site area is available to meet all setback requirements • Wisconsin (engineered) mound–suitable for nearly level sites with more permeable surface soil • Enhanced wastewater treatment[11] options (see I above) followed by shallow soil absorption into permeable surface soil
V.	Very Slow Perc Rate Soil (> 120 mpi), "very slow" soil permeability (< 0.2 in/hr) • Wastewater pond–suitable for sites with enough site area to meet all setback requirements • Wisconsin (engineered) mound–suitable for level sites with permeable surface soil • Enhanced wastewater treatment[11] options (see I above) followed by shallow soil absorption into permeable surface soil

[11]Enhanced treatment is higher quality than septic tank effluent and may be equivalent to secondary treatment in wastewater treatment terminology, or in some cases even higher quality, comparable to advanced wastewater treatment

[12]Rock-plant filter provides a higher level of treatment than septic tanks. Due to higher quality effluent, the soil absorption field size may be smaller than for a conventional absorption field system.

[13]Sand filters provide a very high level of treatment. Due to this high quality effluent, the soil absorption field may be smaller than that required for a conventional absorption field.

[14]Aerobic tanks have poor operating records so an operating/maintenance agreement with a reliable supplier is strongly recommended to ensure system performance.

[15]Promising technology is underdevelopment that may meet enhanced treatment requirements.

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MAY 17 2010
Kansas Department of
Health and Environment

Septic Tank

The septic tank separates the settleable and floatable solids, contains an anaerobic environment where bacteria partially decompose the solids, and provides storage for the accumulated sludge and scum. The septic tank is sized so that wastewater flow through the tank takes at least 24 hours even with sludge and scum accumulation. This detention time permits the settling of solids heavier than water and allows scum, grease and other materials lighter than water to float to the surface before the water is discharged to the absorption field.

Septic tanks are designed to handle all the daily flow a household will normally produce and must have sufficient capacity for the minimum recommended volume of at least two times the daily wastewater flow. Larger capacity tanks usually mean less carryover of solids, resulting in prolonged life of the soil absorption field. Larger tanks require less frequent cleaning and allow for future expansion of the home or times when guests visit. They also have a good cost-benefit return. Table 7 gives minimum and recommended capacities for sizing septic tanks.

Less solids exiting the septic tank helps extend the life of the soil absorption field because less clogging of the soil pores will occur. Septic tank effluent filters are effective in reducing solids and providing an added measure of protection for the soil absorption field so their use is highly recommended.

TABLE 7—Minimum and Recommended Septic Tank Capacities Based on the Number of Household Bedrooms.[16]

Number of Bedrooms	Septic Tank Capacity (gallons)[17]	
150 gpd/bedroom	Minimum	Recommended
1-3	1,000[18]	1,350
4	1,200	1,800
5	1,500	2,250

Two compartment tanks or two tanks in series also may help. If a multiple compartment tank is used, the first compartment shall be sized to contain from one-half to two-thirds of the total tank capacity. The total tank capacity is important and should be sized to retain at least two-to-three times the total daily wastewater flow as shown in Table 7. Figure 1 shows a design concept for a two compartment septic tank.

Tanks shall never be closer than 50 feet from any water supply and greater distances are preferred if possible. However, a 100-foot separation is required if the water source serves a public water supply. The septic tank shall not be located closer than 10 feet from any building, in swampy areas, or in areas located within the 100 year flood plain. Table 5 gives minimum required and recommended separation distances for onsite wastewater systems.

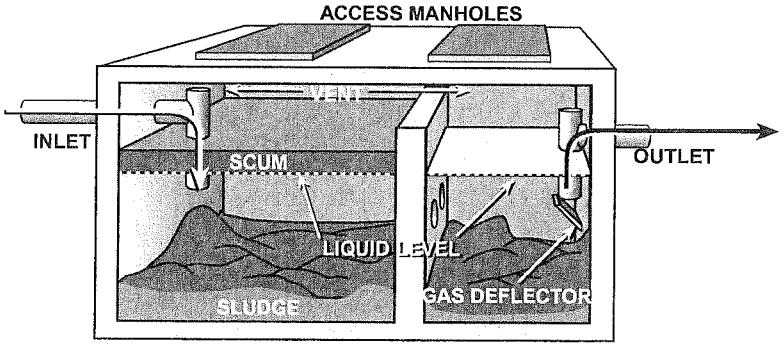
There shall be no permanent structure (patio, building, driveway, etc.) over the tank, lateral or other part of an onsite wastewater system. Consideration should also include easy access of trucks and equipment for pumping, maintenance, and repair. To avoid damage to the system, heavy equipment should not have to cross any portion of the wastewater system when servicing the septic tank.

A sketch of the wastewater disposal system as constructed, showing measurements should be made and delivered to the homeowner for future reference, and filed with the permit at the county health department. Figure 3 shows an example septic system reference sketch.

Septic tanks and soil absorption systems are an expensive and long-term investment. Material selection, design, and construction should be done with long life in mind. When located in suitable soil, well designed, properly constructed, and adequately maintained, they should last several decades.

All abandoned or unused septic tanks, cesspools, seepage pits or other holes that have received wastewater shall be emptied and plugged following procedures described in K-State Research and Extension bulletin MF-2246.

Figure 1—Compartmentalized Septic Tank



[16]For each additional bedroom, add 300 gallons to the minimum value and 450 gallons to the recommended value.
[17]Volume held by the tank below the liquid level (invert of the outlet pipe).
[18]Minimum tank size is 1,000 gallons.

APPROVED
MAY 17 2010
Kansas Department of Health and Environment

Septic Tank Design/Construction Specifications[19]

General Requirements

Figure 2 shows the dimensions included in this section for a typical precast concrete septic tank. The following factors are required of all septic tanks regardless of the construction material:

A. The septic tank including all extensions to the surface shall be watertight to prevent leakage into or out of the tank. It shall be structurally sound and made of materials resistant to corrosion from soil and acids produced from septic tank gasses. Because of corrosion, steel tanks are not acceptable.

B. The tank liquid depth (distance from outlet invert to bottom of tank) shall be at least 3 feet but shall not exceed 6½ feet. The effective inside length of tanks shall not be less than 1.5 nor greater than four times the effective inside width.

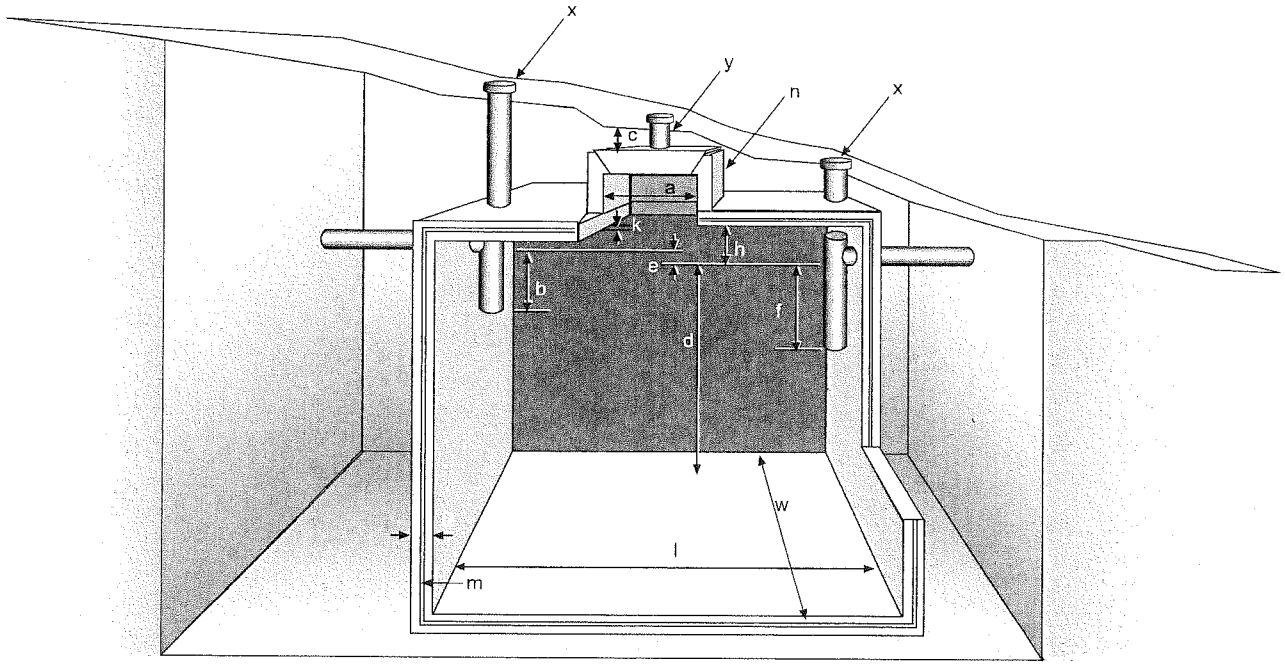
C. The minimum septic tank capacity is two times the daily wastewater flow using 150 gallons per bedroom or 1,000 gallons, whichever is larger. See Table 7 for minimum tank sizes. Tanks sized at three times daily flow are recommended and shall be required when garbage disposals are used.

D. The top of all tanks shall be designed and constructed to support a minimum uniform load of 400 pounds per square foot plus 2,500 pound axle load. When buried more than 2 feet deep, the tank, especially the top, shall support an additional 100 pounds per square foot for each foot of soil or portion thereof in excess of 2 feet.

E. If the tank is placed in an area subject to any vehicular traffic it shall be certified to meet H-20 highway loading by a Kansas licensed structural engineer.

F. Space above the liquid line is required for that portion of the scum that floats above the liquid. For vertical sidewall tanks, the distance between the top of the tank and the outlet invert should be at least 15 percent of the liquid depth with a minimum

Figure 2—Design Details for a Precast Concrete Septic Tank



Name	Measurement	Min.	Max.
a. access manhole	smallest dimension	20"	–
b. inlet baffle	penetration	8"	0.2 × d
c. cover[20]	surface to manhole	surface	12"
d. liquid depth	outlet to tank bottom	3'	6½'
e. difference	inlet to outlet inverts	3"	4"
f. outlet baffle	outlet to bottom	0.35 × d.	
g. thickness	wall	2½"	–

Name	Measurement	Min.	Max
h. open space	outlet invert to top	7"	0.15 × d
k. space	gap	1"	–
l. tank length	inside of walls	6'	4 × w
m. reinforcement	per engineering design		as needed
n. extension riser length[20]		to ≤ 1' from surface grade	
w. tankwidth	inside of walls	4'	
x. inspection riser	inside diameter	6"	
y. location riser	inside diameter	1½"	

[19]Where locally available products cannot presently meet these requirements, manufacturers will have until July 1, 2002 to comply.
[20]If tank is deeper than 12" add extension riser as shown so top of riser is no more than 12" from surface

APPROVED
MAY 17 2010
Kansas Department of

of 7 inches. In horizontal, cylindrical tanks, an area equal to approximately 12½ percent of the total volume should be provided above the liquid level. This condition is met if the space above the liquid level (distance from outlet invert to top of tank) is 15 percent of the tank diameter .

G. Sewage lines carrying solids from the source to the tank should have sufficient slope to maintain velocities that keep solids moving. For household size lines, a slope of between 1 percent (⅛ inch per foot) and 2 percent (¼ inch per foot) is usually best. The last 15 feet of sewer line preceding the tank shall not slope more than 2 percent (¼ inch per foot).

H. The inlet and outlet baffle or tee and compartment baffle should extend above the liquid level to one inch below the top of the tank. This space at the top of the tank is essential to allow gas to escape from the tank through the house stack vent.

I. The invert of the inlet pipe shall be located at least 3 inches above the invert of the outlet when the tank is level. This space allows for temporary rise in liquid level during discharges to the tank, and prevents liquid from standing in the sewer line between the house and the septic tank, which may cause stoppage or backup.

J. The septic tank or pumping tank inlet shall be a sanitary tee, elbow or long sweep elbow with low head inlet or baffle to direct incoming sewage downward and prevent flow from disturbing the floating scum layer. It should extend at least 8 inches below the liquid level, but should not penetrate deeper than 20 percent of the liquid depth.

K. The outlet tee or baffle prevents scum from being carried out with effluent, but limits the depth of sludge that can be accommodated. The outlet device should generally extend below the liquid surface a distance equal to 35 percent of the liquid depth. For horizontal, cylindrical tanks, this distance should be reduced to 30 percent of liquid depth.

Example: Horizontal cylindrical tank 60 inches in diameter, liquid depth = 52 inches, outlet tee penetrates 52 × .30 = 15.6 inches below liquid level.

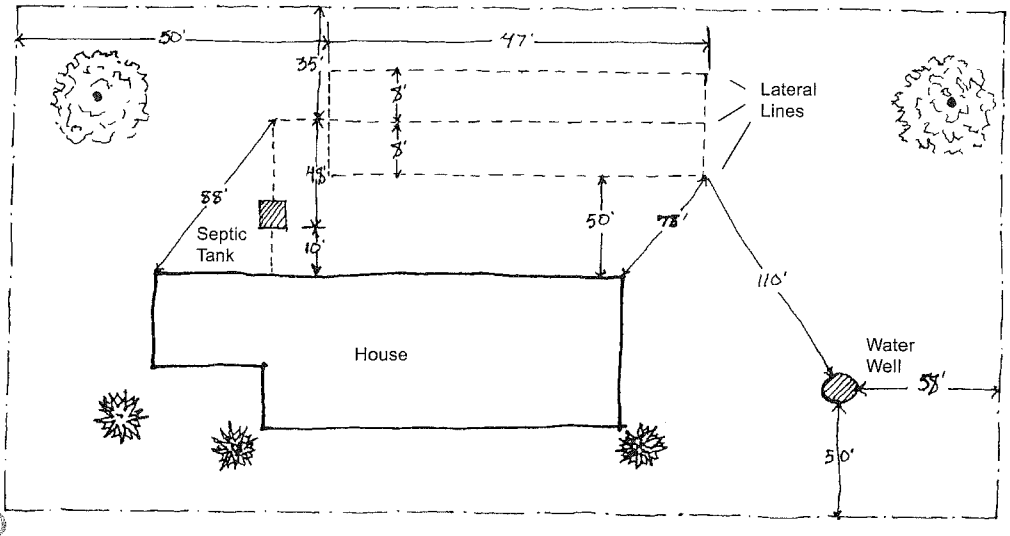
L. Inlet and outlet openings shall be designed and constructed to be water tight for at least a 20-year life of the system.

M. The dividing baffle in two compartment tanks shall extend from the bottom of the tank to at least 6 inches above the liquid line. The opening in the dividing baffle may be any shape and shall be at least 2 inches minimum dimension with a total area of at least 12 square inches. The baffle opening is to be centered 35 percent of liquid depth (30 percent for cylindrical tanks) below the liquid level.

N. Septic tanks shall have an access manhole with 20 inches minimum dimension for each compartment. If the manhole does not extend to surface grade, a small diameter (at least 1½ inch diameter) pipe shall extend to surface from the cover to mark the location of the manhole. This pipe shall not penetrate the lid of the tank. Inspection risers at least 6 inch diameter shall extend to surface grade centered over the inlet and outlet tees. All below grade attachments to the tank, connections, riser, extensions and lid shall be water tight. When any opening larger than 8 inches extends to the surface, that opening shall be child and tamper resistant. Ways to accomplish this include lids weighing at least 65 pounds, locks, or anchors that are not removable without special tools .

O. The sewer line from the house to the tank, all fittings and pipe in the tank, all extensions to the

Figure 3—Septic System Reference Sketch



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MAY 17 2010
Kansas Department of Health and Environment

surface from the top of the tank and the first 10 feet exiting the tank shall be schedule 40 pipe or heavier.

P. Septic tanks shall be designed for at least a 20-year life. They shall be designed and constructed to withstand extremes in loads resulting from adverse conditions without excessive deflection, deforming, creep, cracking or breaking. Change in shape shall be limited to 5 percent. Loads shall be based on 62.4 pounds per cubic foot for water and water saturated soil. Top loads for design shall be in uniform 400 pounds per square foot plus 2,500 pound axle point load. Design shall be based on a 2 foot placement depth to top of the tank. If the tank will be placed deeper than 2 feet or subject to vehicular traffic over the tank, a design by Kansas licensed structural engineer shall be done for the specific conditions.

Special Considerations for Concrete Tanks

The anaerobic environment of a septic tank produces gases that combine with moisture to produce acids. Concrete above the liquid level is subject to corrosion and deterioration from these acids. This corrosion is best resisted by high quality concrete mix. Concrete septic tanks shall meet the following requirements in addition to those above:

A. The concrete design mix shall be for a compressive strength of at least 4,000 pounds per square inch at 28 day cure. The water-cement ratio shall not exceed 0.45.

B. Baffles or other interior concrete units shall not be used for precast or poured in place concrete septic tanks unless they are cast or built into the tank wall at the time the tank is constructed.

C. Air entrainment additives shall be added to 5 percent volume. Other chemical admixtures are encouraged to reduce water content, improve cement placement in forms and wet handling of incompletely cured concrete.

D. Concrete tanks and lids shall receive proper care during the hydration (hardening) period by: 1) monitoring and controlling temperature of the concrete and gradients (i.e. maintain 50 to 90 degrees Fahrenheit for conventional cure and up to 140 degrees Fahrenheit under low pressure steam cure.) 2) monitoring and controlling humidity to prevent adverse moisture loss from fresh concrete (i.e. prevent or replenish loss of essential moisture during the early relatively rapid stage of hydration.)

E. Reinforcing steel shall be placed as designed by a Kansas licensed structural engineer to ensure floor, wall, and top do not crack from moisture, frost, soil load, water loads, axle loads, or other stresses. Loads as specified above shall be used for the design condition. Reinforcing steel shall be covered by a minimum of 1 inch of concrete and shall be placed within ± ¼ inch.

F. Pouring the floor and walls of the septic tank at the same time (monolithic pour) is the preferred construction procedure. Very large tanks are often cast in 2 pieces and assembled in the field. All tanks shall meet the same structural strength standard as specified earlier. Two piece tanks shall have permanently sealed structurally sound joints and shall be water tested after assembly. A Kansas Licensed structural engineer shall determine if the tank meets the strength specification.

G. In areas of high sulfate water (greater than 250 mg/L) more acid producing gases are likely and additional corrosion resistance is appropriate. Recommended measures include ASTM C150 Type II cement (moderate sulfate resisting), ASTM C150 Type V cement (highly sulfate resisting), or coating interior concrete surfaces above the water line. Coatings that provide additional protection of the concrete include asphalt, coal tar, or epoxy. The product used should be acid resistant and provide a moisture barrier coating for the concrete. The product must not bleed into the water and thus risk groundwater contamination.

H. Manufacturers are strongly urged to follow guidelines and meet standards of American Concrete Institute, National Precast Concrete Association, and American Society for Testing and Materials. Manufacturers should identify and advertise their products that meet applicable standards.

Special Considerations for Fiberglass, Fiberglass Reinforced Polyester, and Polyethylene Tanks

A. All tanks shall be sold and delivered by the manufacturer completely assembled.

B. Tanks shall be structurally sound and support external forces as specified above when empty and internal forces when full. Tanks shall not deform or creep resulting in deflection more than 5 percent in shape as a result of loads imposed.

C. Tanks and all below grade fittings and connections shall be water tight.

Septic Tank Placement Specifications

A. During the process of placing the septic tank, avoid causing compaction in the absorption field by not entering the absorption field area.

B. Where natural soil is not suitable tanks shall be placed on a bed of at least 4 inches of sand, pea gravel, or crushed granular noncorrosive material for proper leveling and bearing. Material shall be no larger than 2 inches in diameter and bed depth shall be at least four times the largest material diameter.

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MAY 17 2010

Kansas Department of
Health and Environment

C. Access manholes should be at surface grade, but shall not be more than 12 inches below surface grade. Where top of the tank must be more than 12 inches below surface grade, a water tight extension collar shall be added as required to raise the cover. Inspection openings placed over inlet and outlet tees or baffles shall be at least 6 inches in diameter and extend to the surface to permit easy tank inspection, cleaning of effluent filter, checking condition of tee or baffle and sludge accumulation.

D. Septic tanks should not be placed into the water table (including perched or seasonal water table) because of the tendency of the tank to float, especially when empty, as when pumped for maintenance. In any area subject to high water table or seasonally high water table, plastic and fiberglass tanks shall not be used unless precautions are taken to drain groundwater.

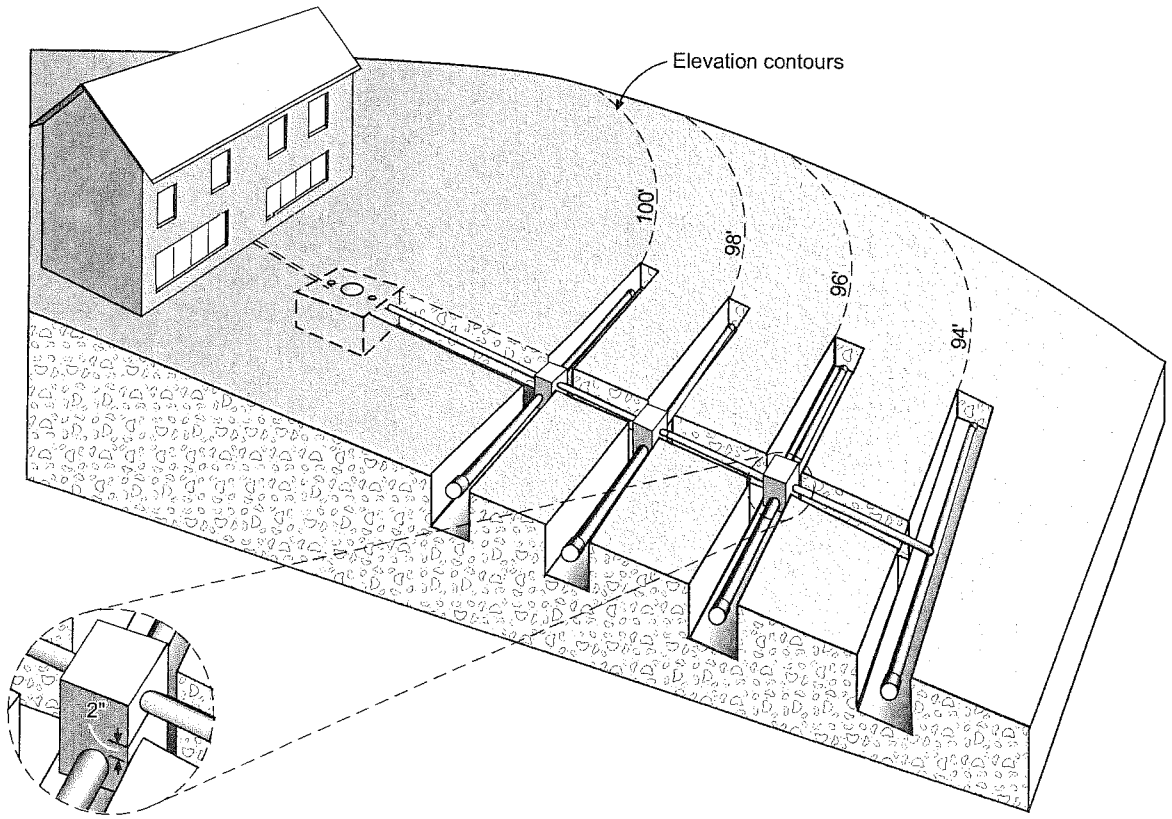
E. Septic tanks shall be water tight. An adequate test for water tightness is to fill the tank with water and let it stand for 8 hours to allow concrete to absorb water and plastic tanks to adjust. Then the tank is topped off and an initial measurement made with a hook gauge with vernier scale. After an hour, another measurement is made. Any loss is cause to reject the tank. Observations of the outside of the tank can also give clues about leakage losses. Any trickle, ooze, or exterior wet spot is reason to reject the tank. Precast one piece tanks are best tested at the plant before delivery. Two piece tanks that are assembled on-site must be tested following placement but before back filling.

F. The hole that the tank is placed into shall provide ample space around the tank for access to do compaction. Backfill shall be in uniform, compacted layers not exceeding 2 feet thick and surrounding the tank. Because of potential soil collapse, it is unsafe and may be illegal for a person to enter a trench deeper than 5 feet without adequate shoring. Compaction should be done from the surface without entering trenches deeper than 5 feet.

Absorption Field Size

Absorption field area is dependent on two factors: wastewater flow and soil loading rate. The wastewater design flow is based on the number of bedrooms allowing 150 gpd per bedroom (75 gpd per person) as discussed previously. The wastewater flow assumes the house is fully occupied with two persons per bedroom.

Figure 4. Typical Step Down or Serial Distribution System



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MAY 17 2010
Kansas Department of
Health and Environment

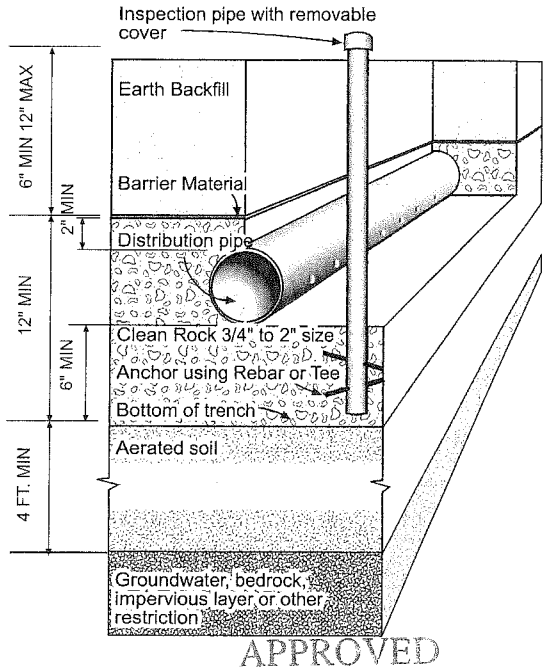
The site and soil evaluation previously discussed in that section is essential for good design. The loading rate is determined from the soil profile using Table 2 or from the perc rate using Table 4 or by using another method as specified in the local code. The soil absorption area is obtained by dividing the wastewater flow in gallons per day (gpd) by the loading rate (gpd per square foot (ft^2)).

The maximum gravity lateral run shall not exceed 100 feet and preferably should be less than 60 feet. If a lateral is supplied from the center, the total length shall not exceed 200 feet (100 feet to each side) and a maximum of 120 feet is preferred. Lateral systems on level sites with all laterals on the same elevation shall be connected at each end with a level manifold or connector pipes as shown in Figure 3 so there are no dead ends.

Table 8—Trench Separation Distances

Trench Width (inches)	Recommended Minimum Distance Between Trench Centerline (feet)
18-24	8.0
24-30	8.5
30-36	9.0

Figure 5—Standard Lateral Trench Design



Loading rate example

The following example illustrates how to choose and use the loading rate for design:

- four-bedroom home
- Harney soil. Light silty clay loam with medium subangular blocky structure at 17 to 40 inches
- greater than 6 feet to restrictions of rock or perched water table
- perc rate 40 minutes per inch
- trench width 3 feet
- undisturbed soil width between trenches is 6 feet

Wastewater flow

Size of house (number of bedrooms) × flow rate (gpd) per bedroom = total daily wastewater production

4 bedrooms × 150 gpd/bedroom = 600 gpd

Loading rate

From soil evaluation Table 2 = 0.4 gpd/ft^2 and from perc test using Table 4 = 0.5 gpd/ft^2

Use the smaller of these or 0.4 gpd/ft^2 for design.

Absorption Area

Wastewater flow ÷ loading rate = absorption area

$$\frac{600 \text{ gpd}}{0.4 \text{ gpd/ft}^2} = \frac{600 \text{ ft}^2}{0.4} = 1{,}500 \text{ ft}^2$$

Trench Length

Absorption area ÷ trench width = length of trench

$$\frac{1{,}500 \text{ ft}^2}{3 \text{ feet}} = 500 \text{ lineal feet of trench length}$$

Field Area

Only the bottom area of the trench is considered in determining absorption area. The absorption trench width should be 18 to 36 inches, preferably 24 inches. For 3 feet wide trenches as in this example, the total lateral length needed is 500 feet. If trenches are 2 feet wide, the total lateral trench length is 750 feet. Assuming that a 3 feet wide trench will be used and 100 feet is the length of each trench, 5 trenches, 100 feet long will be needed for 1,500 ft^2 total trench bottom. To calculate the total area necessary for the field, include the minimum 6 feet of undisturbed soil between trenches. For this example the total width is (5 × 3 ft) + (4 × 6 ft) = 15 ft + 24 ft = 39 feet The total field area is 39 × 100 or 3,900 ft^2. An area equal to this same size should be reserved for future expansion and/or replacement.

For sites that slope more than about 1 percent, a level lateral system installed without shaping the surface often requires more than a half foot difference in soil cover from one side of the area to the other. On slopes greater than 1½ percent there is enough slope to use a step down (or serial) distribution. This results in the top lateral

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being filled before effluent builds up and flows to the next lateral down slope. Step down or serial distribution as shown in Figure 4 is recommended for all sites that slope 1½ percent or more and/or result in more than 6 inches difference in cover for a level lateral system.

Adjacent absorption field trenches should be separated by at least 6 feet of undisturbed soil. Table 8 shows the minimum spacing for trench widths ranging from 18 to 36 inches. Individual trenches should be constructed on contour with the surface grade and with a level trench bottom to keep the trench cover a uniform thickness.

A minimum of 6 inches of rock or gravel shall be placed in the trench under the distribution pipe, followed by enough gravel to cover the pipe by 2 inches. The soil cover over the trench should not be less than 6 inches to provide adequate water holding capacity for grass nor more than 12 inches to maximize water and nutrient use by vegetation. Generally, the total trench depth should be as shallow as possible, but not less than 18 inches. Perforated distribution pipe shall be used and, where pressure dosing is not required, 4-inch diameter pipe is adequate. See standard lateral trench design and dimensions shown in Figure 5. Where pressure dosing is required, the pipe size should be just large enough to avoid excessive pressure loss (no more than 10 percent) in the distribution lines.

Variations from the standard lateral design described above allow the designer additional flexibility in some restrictive soil situations and are discussed in the site and soil evaluation section and included in Table 6. Many soils in eastern Kansas have a friable, moderately permeable surface soil layer of up to 15 to 18 inches in thickness. Many subsoils have high clay contents and a very restricted permeability. Laterals placed into the tight, very slowly permeable subsoil frequently do not perform satisfactorily.

Shallow in-ground laterals dug 6 to 12 inches into the surface soil layer and covered with imported topsoil may be a viable option to achieve a workable soil absorption system for some soil conditions. Shallow in-ground systems may overcome marginal conditions such as groundwater or rock over 4½ feet but less than 6 feet required for conventional laterals.

The shallow, rock-filled trench shall be covered with a synthetic geotextile barrier material (at least 3 ounce nylon or 5 ounce polypropylene nonwoven filter fabric) before the lateral and interval between laterals is covered with top soil brought to the site.

In soils with still more restrictive or shallow soil conditions (4 to 4½ feet to restrictions) an at-grade lateral system may be an option. The at-grade lateral involves preparing the soil surface on a level contour in strips much as the first step in constructing a Wisconsin mound. The rock, normally placed in a trench, is placed on the surface. Pressure dosing distribution is used to ensure even water distribution and help prevent horizontal flow at the natural soil surface resulting from temporary ponding in the lateral. The rock lateral shall be covered with barrier material before the lateral and interval space is covered with top soil brought to the site.

Loading rates and other design criteria are basically the same for shallow in-ground and at-grade systems as for conventional lateral trenches. The at-grade lateral requires tilling the soil strip under the lateral on a level contour. A pressure dosing system shall be included as a part of the at-grade design. Distribution lateral line pressure should not exceed 5 feet of head. Orifices in the pipe shall be sized and spaced to evenly distribute flow throughout the lateral system. If the area is too large to pressurize the entire system, a multizone design and sequencing valve shall be used to dose zones in sequence.

The use of an effluent filter on the septic tank outlet is strongly encouraged to prevent solids from plugging the absorption field. This will prolong the life of the absorption field and improve performance of the system. It also helps reduce the strength of wastewater effluent.

Absorption Field Material Specifications

Rigid PVC or corrugated polyethylene plastic pipe meeting American Society for Testing and Materials (ASTM) standard ASTM D2729-93 and ASTM F405-93 or latest edition respectively meet minimum standards for use as solid or perforated gravity distribution lines. All materials used in the plumbing, wastewater line, and lateral fields shall meet standards specified by ASTM. In gravity lateral pipes, perforations are circular, ½-inch diameter and are placed at 4 and 8 o'clock positions on the pipe circumference. In no circumstance is slotted pipe acceptable as the narrow slot openings plug easily.

Washed gravel or crushed stone is commonly used as the porous media for the trench. The media gradation shall be ¾ inches to 2 inches in diameter, with the smaller sizes preferred to reduce masking of the infiltration surface. Uniform size is preferred because more void space is created. Rock having a hardness of three or more on the Moh's Scale of Hardness is required. Rock that can scratch a penny without crumbling or flaking generally meets this criterion. Larger diameter and smaller diameter material, or soft aggregate such as calcite limestone are not acceptable and shall not be used.

Fines should be eliminated as much as possible. Fines shall not exceed 5 percent by volume, so unwashed material is generally unacceptable. A simple test is to wash a volume of material into a clear container of the same diameter and measure fines (5 inches of gravel should produce no more than ¼" of fines).

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MAY 17 2010

Kansas Department of
Health and Environment

When suitable rock or gravel is not locally available, is expensive, or access to the site is restricted, gravelless chambers are good choices for laterals. They have the advantage of more liquid storage capacity, reducing the effect of high flows or loadings on weekends or holidays. Chamber systems are lightweight making installation easier at sites with restricted heavy equipment access. Chambers also may be recovered for reuse in the future. Before using chambers, consult the local authority to identify requirements.

Chunks of recycled tires are a suitable substitute for rock. Ninety percent of the pieces should be 1/2 to 4 inches in size with no fines. Wire strands shall not extend more than 1/2 inch from the pieces.

The porous media shall be covered with a filter fabric (at least 3 ounce nylon or 5 ounce polypropylene) before backfilling to prevent soil from sifting through the media. Traditional untreated building paper or 3-inch layer of straw are inferior second choices or are not recommended. Filter fabric is required when tire pieces are used as the porous media. Materials relatively impervious to air and moisture are not permitted.

Field Construction Specifications

Protection of the absorption field area begins before any activity on the site. The site and soil evaluation identifies the best lateral field area and reserve area. Heavy equipment, such as loaded trucks, should be kept away from the absorption field by marking the site. The weight of such equipment can permanently alter soil characteristics due to compaction. Excessive equipment or foot traffic can compact even relatively dry soils.

Construction of septic tank-lateral field systems when the soil is too wet causes compaction and smearing of the soil structure, greatly reducing the water absorption and treatment efficiency of the system. A good test for this is to work the soil into a ball and roll between the hands. If it can be rolled out into a soil wire 1/4 inch in diameter or smaller without falling apart, it is too wet and construction should not proceed.

Before beginning construction, contours should be determined and level lateral locations should be marked by flags or stakes on the contour. Trenches shall not be excavated deeper than the design depth or wider than the design width. Following excavation, the trench sides and bottom shall be raked to remove any smearing and graded to assure a bottom with no more than 1 inch difference in elevation along the entire lateral length or the complete field for a level system. The lateral pipe and rock cover shall not vary more than 1 inch in elevation along the lateral length using a surveyor level or laser.

The trench bottom should then be immediately covered with at least 6 inches of rock or the chamber. Distribution pipes are carefully placed on the rock, and leveled with perforations at 4 o'clock and 8 o'clock positions. Rock is placed around and over the pipe to a cover depth of at least 2 inches.

After rock and pipe have been placed in the trench the filter fabric or other barrier shall be placed to protect from soil movement into the rock. Finally, earth backfill shall be carefully placed to fill the trench cavity. The backfill shall be mounded above the trench about 20 percent of the soil fill height to allow for settling. If a variation in the trench depth is used, topsoil also must be placed between laterals as well as over the lateral to level the site.

Maintaining Onsite Wastewater Systems

The homeowner's responsibility for onsite wastewater treatment and disposal does not end when the backfill is placed over the trench lines and wastewater introduced. Maintenance of the system is a critical factor to ensure long life and continued effectiveness of the system. Minimum annual maintenance criteria include:

- check the sludge and scum in the tank to determine pumping requirements; tanks need to be pumped regularly depending on wastewater flow and tank size, (often 3 to 5 years),
- check the baffles or tees to ensure they are intact, secure, and in good condition,
- check the septic tank and soil absorption area monthly for indications of leaks or failure,
- check observation ports in each lateral to ensure effluent is reaching all parts of the system,
- check effluent filter and clean as needed.

Refer to K-State Research and Extension bulletins listed at the end of this document for additional information. A file containing records of repairs, pumping, site plan of the system, annual checklist, and other pertinent information should be maintained for easy reference and for information when ownership changes.

Wastewater Stabilization Ponds

Wastewater ponds, sometimes called lagoons, are a viable sewage treatment method and should be considered for individual household wastewater where soil conditions have severe limitations for conventional lateral absorption field systems. Single family wastewater ponds should not be considered if septic tank-lateral field systems are feasible as determined by local requirements or recommendations contained in this bulletin. Wastewater ponds are especially applicable on sites with very restrictive permeability, high clay subsoil, (i.e. slow perc rates) or shallow bedrock where adequate area is available.

A wastewater pond is a small pond with a maximum 5-foot operational water depth, which receives domestic wastewater. Size, as in a soil absorption field, is deter-

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MAY 17 2010

Kansas Department of
Health and Environment

mined by the number of occupants and thus the wastewater flow, the soil, and evaporation.

Wastewater enters the pond by a pipe outlet near the bottom close to the center of the lagoon. All private wastewater ponds must be nondischarging and must be fenced. Wastewater ponds require a sizable area, including water surface, embankment, and separation distances. Maintenance is required to remove vegetation at the water's edge, to mow vegetation on embankments, and to remove trees that will shade the pond. Odors from a properly designed, installed, and maintained pond are infrequent and minimal.

Individuals considering wastewater ponds for sewage treatment should first check with county or other local authorities to determine requirements. Proceed with any private sewerage facility only when public sewers are not available and all applicable local requirements are met. Refer to K-State Research and Extension bulletins on wastewater ponds for more information and guidance.

Alternative Systems Guidelines

Kansas Administrative Regulations (K.A.R. 28-5-9) authorize county health departments, or other authorized local agency, in counties that have local codes, to grant a variance for alternative onsite wastewater treatment and disposal systems. Most county codes contain a variance clause that authorizes the local administrative agency to grant requests for variances provided that certain conditions are met. The request for variance is filed with the county administrative agency. The local agency can consult with KDHE for technical assistance in evaluating the system, but has the authority to issue the variance locally if there is a local code.

No private onsite wastewater system shall have a surface discharge.

When there is no local code KDHE is authorized by regulation to grant a variance. Onsite wastewater treatment options that might be considered for variance include enhanced wastewater treatment options such as aerated tank, sand or media filter, rock-plant filter, or other equivalent system. Design, construction, operation, and maintenance criteria or guidelines are planned but are not yet available for use in Kansas.

Some county codes require that design and specifications for alternative systems be completed by a licensed professional engineer. Engineers should be adequately trained or have experience under adequate supervision, before designing alternative systems. Results show that design by an inexperienced engineer can not produce a more reliable or long life alternative than conventional systems. Some alternative systems involve complex design and specific construction criteria that can result in dramatic failure when violated.

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

Appendix A

Conducting a Perc Test

Water movement through soil in response to gravity is called percolation. For wastewater soil absorption field evaluation, the absorption of water from a post-type hole is a method for the evaluation for soil suitability and loading rate design. The absorption of water from this hole involves water movement in 3 dimensions and forces other than gravity. The term "perc" test is applied to this evaluation. The purposes of this test include:

- Obtaining the rate at which wet, unsaturated soil will absorb water,
- Helping assess suitability of soil on a specific site to absorb septic tank effluent,
- Helping select from among alternative onsite sewage systems and establish a design loading rate.

To ensure the best evaluation, all available soil information should be utilized. This would include assessment of restrictive conditions such as high water table, perched water table, shallow depth of soil, and restrictive layers such as clay pan; soil profile evaluation from the site, including history of high water tables; and description of soil profiles from county soil surveys.

Brief Description

A minimum of four to six holes are placed throughout the proposed site of the absorption field and at the depth of the proposed laterals and soaked with water until the clay is swelled, usually for at least 24 hours. The perc rate is measured in each hole and reported as the number of minutes it takes for an inch of water to be absorbed in the hole. The optimum time to conduct a perc test is in the spring when the soil is normally wet. An accurate perc test during a dry period when the soil is cracked may not be possible.

Materials Needed to Conduct the Perc Test

1. Site plan including proposed absorption field and location of tests. Dimensions help ensure the test holes are properly located in and around the field.
2. One batter board–1 inch by 2 inch board of 18 inches long for each perc test hole.
   A. Number each board so that each test hole will be distinguishable.
   B. Mark a center line on the side of each batter board. This will provide a consistent reference point for the measuring device.
3. Durable measuring device (1 to 2 feet long) and a way to reproducibly locate the water surface, such as a pointed hook or float on a stiff wire or rod.
4. An adequate supply of water to soak the hole and conduct the test. Water usually has to be transported to the site. Two hundred to 300 gallons is usually adequate.

Procedure

1. **Identify Proposed Site of Absorption Field**—The site preferably should be located downslope from the septic tank. If effluent will not flow by gravity, an effluent pump may be used to move effluent to a suitable absorption field. For new homesites, the proposed area reserved for future use should also be checked for suitability.
2. **Number and Location of Tests**—Locate a minimum of four to six holes uniformly over the proposed absorption field site. If the site is sloping, it is especially important to have test holes at all elevations to be used so that any differences in soil will be evaluated.
3. **Type of Test Hole**—Dig or bore each hole to the depth of the proposed trench (usually 18 to 24 inches) and with a consistent diameter (8 inches is recommended). All test holes shall be the same size to help ensure consistency in results.
4. **Prepare the Test Hole**—Scratch the sides and bottom of the hole to eliminate any smeared or compacted soil surfaces and remove loose material from the hole. Place 2 inches of washed gravel in the bottom of the hole. The gravel can be contained in a mesh bag for easy removal and reuse at other sites. This gravel protects the bottom of the hole from erosion, scouring, and sediment as water is introduced.
5. **Wet Hole to Allow for Soil Swelling**—Saturation means that the voids between the soil particles are filled with water. This happens fairly quickly for soil immediately surrounding the portion submerged in water. Swelling is caused by intrusion of water into the clay particles and can take many hours and possibly days when the soil is quite dry.
   A. Carefully add 12 to 14 inches of water. Using a hose will prevent soil washing down from the sides of the hole.
   B. Maintain the water level for at least 24 hours to allow for swelling to occur. In most cases it will be necessary to add water periodically from a reservoir. A float supplied by a hose from a reservoir simplifies the procedure.
   C. If the soil appears to be sandy or initially very dry, plan to check the condition of the hole wetting after 12 hours or overnight. If there is no water left in the hole and the reservoir is dry, refill the reservoir and holes. After the full 24 hours have passed since soaking was initiated, begin measuring as described in #6.
6. **Perc Measurement**
   A. Remove the apparatus used to add water to the hole.
   B. Place the batter board across the top of each hole and secure with weights, spikes or attach to stakes. Be sure that the centerline mark is centered over the hole and each board is numbered.
   C. Align the measuring rule with mark on the board and use the hook gauge or the float and rod to read the level when it just touches the water surface. Record the measurement and time. Fill the hole to about 6 inches over the rock and make the initial measurement.
   D. Measure at 30-minute intervals (does not have to be exact) recording both level and time. If the water level in the hole drops too rapidly, it will be necessary to reduce the time interval for measurement. The time interval should be short enough that the water level should not drop more than 25 percent of the wetted hole depth.

   Note: If the water drops more than 1 to 2 inches in 30 minutes, it will be necessary to add water to the hole after each reading until it is the same depth as recorded initially. Be sure to record the measurement of the refilled perc hole.
7. **Calculate Perc Rate**. Divide time interval by drop in water level to find the perc rate in minutes per inch (mpi).

Examples:

If the drop is ⅝ inches in 25 minutes:

$$\frac{25}{\frac{5}{8}} = 25 \times \frac{8}{5} = 40 \text{ mpi}$$

If the drop is 1½ inches in 12 minutes:

$$\frac{12}{1\frac{1}{2}} = \frac{12}{\frac{3}{2}} = \frac{12 \times 2}{3} = 8 \text{ mpi}$$

   A. Continue measurements until each of three consecutive calculated rates varies by no more than 10 percent from the average of the three rates. Use the average of three rates as the value for that hole

   Example:

   Rates of 26.0, 28.0, and 30.5 mpi average 28.2 mpi

   B. Measure and calculate the rate for each hole in the application field. Average the rates for all holes as the value to use for loading rate and bottom area sizing.
8. **Compare with Permeability in the NRCS Soil Survey**. The field measured perc (mpi) should be no smaller than about one third the inverse of the permeability rate shown in the table of physical and chemical properties of soils in the soil survey report. If it is, suspect a problem with the perc test, soil mapping or other cause. A well aggregated, undisturbed soil may have a good perc rate.

APPROVED

MAY 17 2010

Kansas Department of
Health and Environment

Appendix B

Sources of Additional Information

Kansas State University, Agricultural Experiment Station and Cooperative Extension Service Bulletins[21] (except as noted)

Wastewater Systems and Related Information

Design of Submerged Flow Wetlands, Special Report 457, Missouri Small Flows Education and Research Center, Agricultural Experiment Station, University of Missouri, Columbia, MO 65211

Environmental Health Handbook, First Edition, Aug 1992, Kansas Association of Sanitarians, KDHE, and K-State Research and Extension cooperating, available from K-State, Extension Biological and Agricultural Engineering, Cost: $20.00[22]

Get to Know Your Septic System, MF-2179

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[22] *Available through Extension Biological and Agricultural Engineering, Kansas State University, 237 Seaton Hall, Manhattan, KS 66506-2917, Phone: (785) 532-5813*
[23] *American Concrete Institute, P.O. Box 9094 Farmington Hills, Michigan 48333, Phone: (810) 848-3808*
[24] *American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 Phone (610) 832-9500*
[25] *National Precast Concrete Association, 10333 North Meridian Street, Suite 272, Indianapolis, Indiana 46290 Phone (317) 571-9500*

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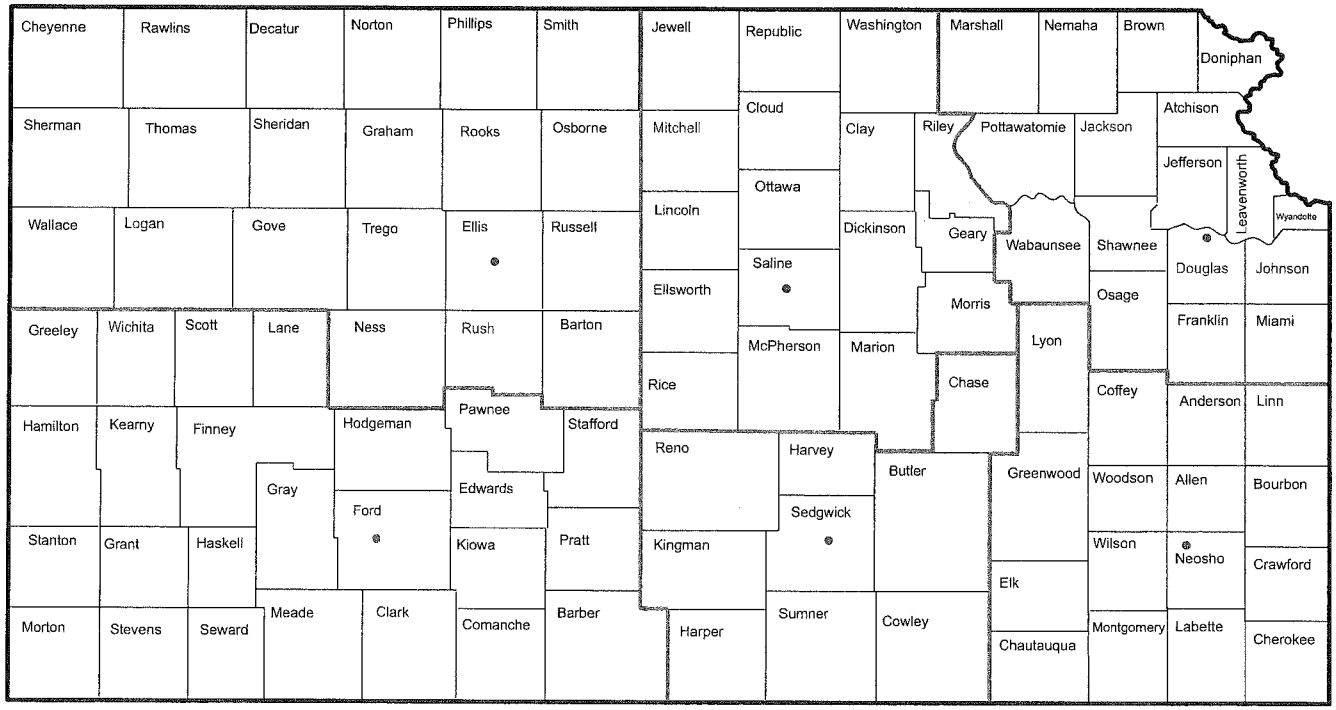

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