WORK SESSION

Ron Sellers	Ron Hirst	Daniel P. Friesen	**Courthouse**
District 1	District 2	District 3	206 W. 1st Avenue
Vice-Chair	Member	Chair	Hutchinson, KS 67501

A G E N D A

Reno County Annex
125 W. 1st Avenue
Tuesday, May 31, 2022
Directly Following the Regular Session

1. Call to Order

2. Discussion Items

2.A Environmental Health and Septic Permits

3. Adjournment

Topics to be reviewed:

1. Overview of program
2. County Water prevalence and geology as it pertains to wastewater
3. Contaminants in wastewater and influence to groundwater/surface waters
4. Current code
5. Wastewater permit process
6. Soil profiles
7. Staff challenges
8. Misconceptions
9. Case management
10. Website transparency
11. Code revocation and detriments

Department - Environmental Health

Supervisor- Darcy Basye

Staff
Jared Simon-Environmental Health Specialist
John Vetter- Environmental Health Specialist
OPEN- Childcare Licensing Surveyor
Jeanette Ladd- Childcare Licensing Surveyor
Mikayla Lare- Administrative Assistant

Department Initiatives

Environmental Health

- Dedicated to the residents of Reno County to have a safe and healthy environment.
- Tasked with protection of groundwater for all citizens via enforcing the Reno County Sanitation Code.
- Active partner with Planning and Zoning for Building development in the zoned areas of Reno Co.
- Active partner with Reno County Floodplain manager for sites that are served by onsite wastewater systems and floodplain is present on the parcel.
- Routinely follow and track animal bite cases in the county per Resolution 2004-49.
- Perform annual school inspections per state statute 65-202.
- Routinely follow up on nuisance complaints in the county to ensure no public health hazard is present.
- Perform mortgage inspections as requested for the sale of homes in the unincorporated areas of the county that are served by private water and private sewer.
- Partner with Epidemiology staff to monitor environmental disease trends.
- Serve as a clearinghouse for calls from the public and direct them to the appropriate agencies as needed.
- Investigate Environmental health Hazards in county or a directed.

Licensing Childcare

- Conduct/perform childcare licensing in Reno County and Harvey County in accordance with Kansas's regulations. Investigation of childcare complaints. Education of childcare providers.
- Conduct monthly orientation class for childcare providers.
- Promote the childcare program at community events and partner with local stake holders for educated childcare providers
- Satisfy KDHE Grant requirements

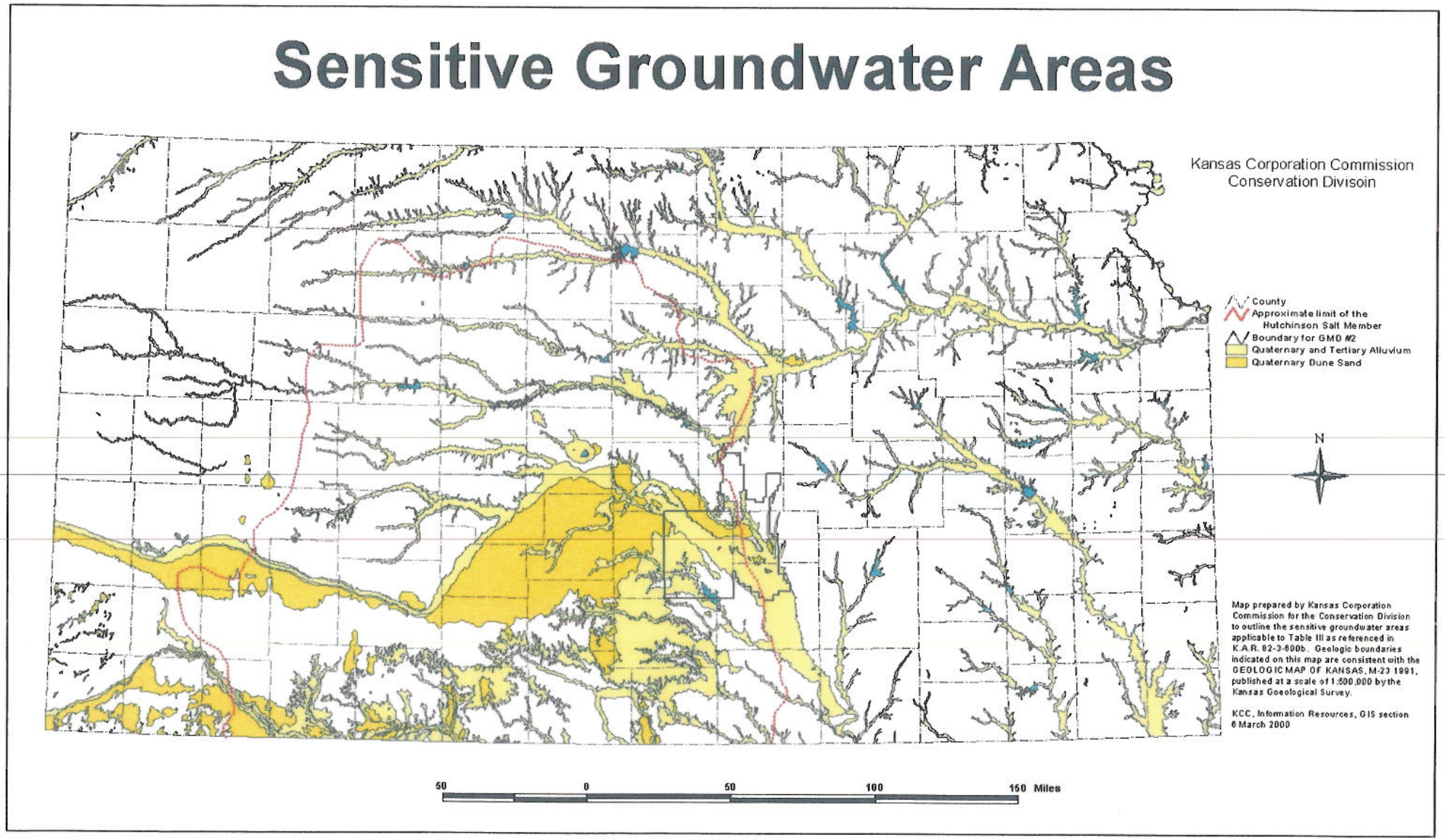
Environmental section was started in the late 1980's and the first code was adopted in 1988, then amended in 1991, and again in 1994. Current code was adopted in Oct. 2003. Each revision and adoption has to be approved by KDHE. KDHE has come out with a model code that is much more stringent then the county's current code.

Why is Reno County so unique for wastewater treatment?? The county has high ground water, perched water tables, clay lenses, sandy soils, fractured shale, and clay.

County is located over the Equus Beds/GMD#2. Refer to maps included for sensitive groundwater areas designated by the KCC, Kansas Corporation Commission and noted on in the Equus Beds/GMD#2 maps the county contains high pollution potential in most of the county.

Ground water is consumed by all citizens in Reno Co. Private wells and City wells are located in the county. The sanitation code has a section dedicated to public water wells.

Sensitive Groundwater Areas



EQUUS BEDS GROUNDWATER MANAGEMENT DISTRICT NO. 2
GROUNDWATER POLLUTION POTENTIAL ATLAS 09-02

DRASTIC METHODOLOGY

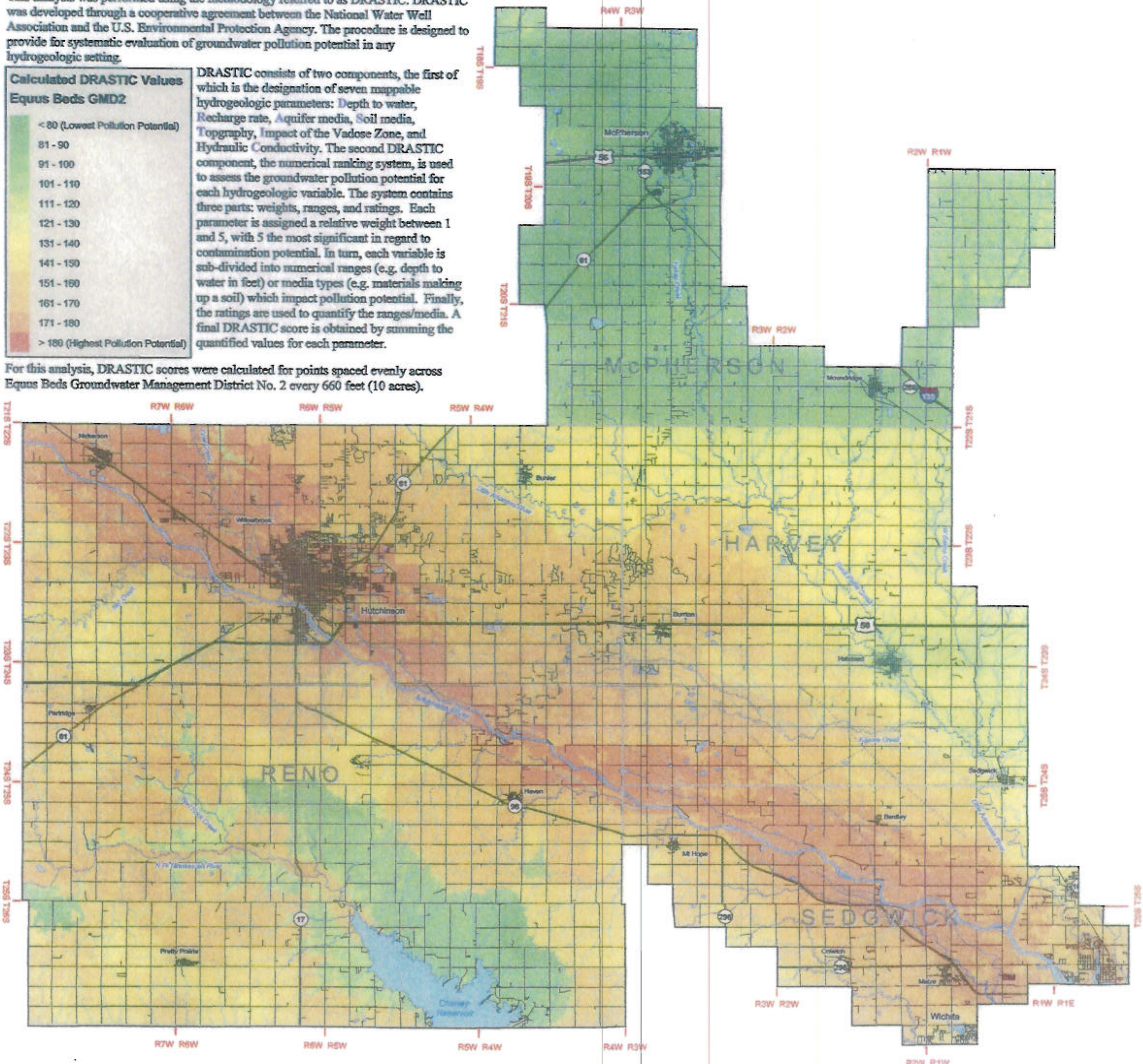
This analysis was performed using the methodology referred to as DRASTIC. DRASTIC was developed through a cooperative agreement between the National Water Well Association and the U.S. Environmental Protection Agency. The procedure is designed to provide for systematic evaluation of groundwater pollution potential in any hydrogeologic setting.

Calculated DRASTIC Values
Equus Beds GMD2

- < 80 (Lowest Pollution Potential)
- 81 - 90
- 91 - 100
- 101 - 110
- 111 - 120
- 121 - 130
- 131 - 140
- 141 - 150
- 151 - 160
- 161 - 170
- 171 - 180
- > 180 (Highest Pollution Potential)

DRASTIC consists of two components, the first of which is the designation of seven mappable hydrogeologic parameters: Depth to water, Recharge rate, Aquifer media, Soil media, Topgraphy, Impact of the Vadose Zone, and Hydraulic Conductivity. The second DRASTIC component, the numerical ranking system, is used to assess the groundwater pollution potential for each hydrogeologic variable. The system contains three parts: weights, ranges, and ratings. Each parameter is assigned a relative weight between 1 and 5, with 5 the most significant in regard to contamination potential. In turn, each variable is sub-divided into numerical ranges (e.g. depth to water in feet) or media types (e.g. materials making up a soil) which impact pollution potential. Finally, the ratings are used to quantify the ranges/media. A final DRASTIC score is obtained by summing the quantified values for each parameter.

For this analysis, DRASTIC scores were calculated for points spaced evenly across Equus Beds Groundwater Management District No. 2 every 660 feet (10 acres).



Equus Beds Groundwater Management District No. 2
313 Spruce Street
Halstead, Kansas 67056-1925
Phone: (316) 835-2224
Fax: (316) 830-2210
E-Mail: equusbed@ink.org

1:250,000

0 2 4 6 8 10 Miles

0 3 6 9 12 15 Kilometers

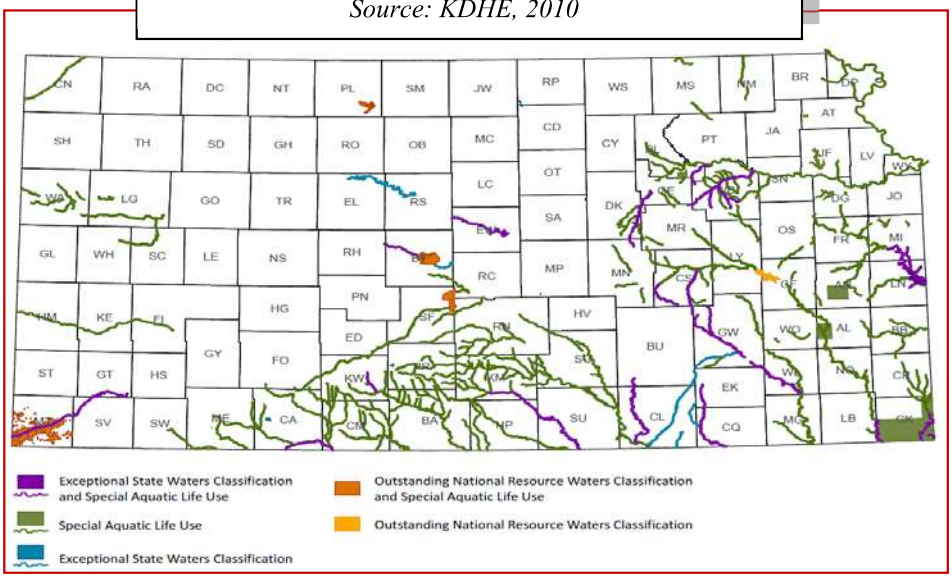
09/11/02

High Value and Threatened Waters and Watershed Resources

The Kansas Surface Water Quality Standards designate specific water bodies for high value uses including Special Aquatic Life Use, Exceptional State Waters and Outstanding National Resource Waters. Figure 1.11 shows a map of these water bodies.

In addition to these designated water bodies, properly functioning, minimally disturbed headwater watersheds represent an important resource for maintaining or improving water quality conditions in the future. The recent KDHE Reference Stream Assessment described earlier in this Document identifies potential areas where protection strategies may be considered.

Figure 1.11 - Kansas High Value Waters
Source: KDHE, 2010



Definitions

K.A.R. 28-16-28(aaa) "**Outstanding national resource water**" means any of the surface waters or surface water segments of extraordinary recreational or ecological significance identified in the surface water register, as defined this regulation, and afforded the highest level of water quality protection under the antidegradation provisions and the mixing zone provisions of K.A.R. 28-16-28c.

K.A.R. 28-16-28(dd) "**Exceptional state waters**" means any of the surface waters or surface water segments that are of remarkable quality or of significant recreational or ecological value, are listed in the surface water register as defined in this regulation, and are afforded the level of water quality protection under the antidegradation provisions of K.A.R. 28-16-28c and the mixing zone provisions of K.A.R. 28-16-28c.

K.A.R. 28-16-28d(b)(2)(A) "**Special aquatic life use waters**" means either classified surface waters other than classified stream segments that contain combinations of habitat types and indigenous biota not found commonly in the state or classified surface waters other than classified stream segments that contain representative populations of threatened or endangered species.

Changing Climate and Water Quality

Changing climate conditions are expected to impact the frequency, durations, and intensity of rainfall events in Kansas. Increased precipitation leads to flooding, increased pollutant runoff, undersized sewer and storm water pipes issues, and design complications on traditional best management practices. Decreased precipitation in some areas triggering drought can cause increased concentrations of pollutants, decreased in water resources (public water supplies, irrigation, etc.), and decreases in wildlife habitat. The variability of the climate could potentially increase harmful algal blooms. Water quality partners will work together in Kansas to mitigate the effect of changing climate conditions on water quality in surfaced and ground water.

CHAPTER TWO
NONPOINT SOURCE INSTITUTIONAL AND PARTNERSHIP FRAMEWORK

Sources of nonpoint pollution in Kansas are primarily unregulated and management of NPS pollution is a shared responsibility among numerous local, state and federal agencies, organizations and individuals. Sources of pollution include both urban and rural activities requiring a comprehensive approach to management of these sources. The following table provides a summary of common NPS pollutants and sources in Kansas. A comprehensive list of potential pollutant source categories is included in Appendix 4.

Table 2.1 Sources of Pollutants

Pollutant	1	2	3	4	5	6	7	8	9
Atrazine & Pesticides	+			+		+	+	+	+
Bacteria		+	+	+			+	+	
BOD		+	+	+	+		+	+	
Nitrogen	+	+	+	+		+	+	+	+
Phosphorus	+	+	+	+	+	+	+	+	+
Suspended Solids	+	+		+	+	+	+	+	+

1-Cropland
2-Livestock
3-On-site wastewater
4-Pasture/Rangeland
5-Riparian Areas
6-Transportation
7-Urban
8-Farms & Homes
9-Hydrologic Modification

Source: Adapted from Kansas Nonpoint Source Pollution Management Plan, 2010 Update

Multiple government programs provide information, technical assistance or financial assistance to landowners and citizens to implement BMPs on a voluntary basis. The term BMP (Best Management Practice) is used throughout this Document to refer to a wide variety of urban and rural structural and nonstructural practices that can be implemented by organizations and individuals to reduce or prevent nonpoint source pollution. The Kansas WRAPS Work Group established a set of characteristics for various land use/land cover components that would be reflective of a properly functioning watershed. Application of appropriate BMPs can be utilized to achieve these functions within watersheds in need of restoration. These characteristics are included in Appendix 4.

Institutional Partners

The following table provides an overview of some of the primary local, state and federal agencies and organizations with their associated NPS related program responsibilities.

TABLE 4-4

POLLUTANT CONTRIBUTIONS OF MAJOR RESIDENTIAL WASTEWATER FRACTIONS[a] (gm/cap/day)

Parameter	Garbage Disposal	Toilet	Basins, Sinks, Appliances	Approximate Total
BOD_5	18.0 10.9-30.9	16.7 6.9-23.6	28.5 24.5-38.8	63.2
Suspended Solids	26.5 15.8-43.6	27.0 12.5-36.5	17.2 10.8-22.6	70.7
Nitrogen	0.6 0.2-0.9	8.7 4.1-16.8	1.9 1.1-2.0	11.2
Phosphorus	0.1 0.1-0.1	1.2 0.6-1.6	2.8 2.2-3.4	4.0

a Means and ranges of results reported in (5) (6) (7) (10) (14)

TABLE 4-5

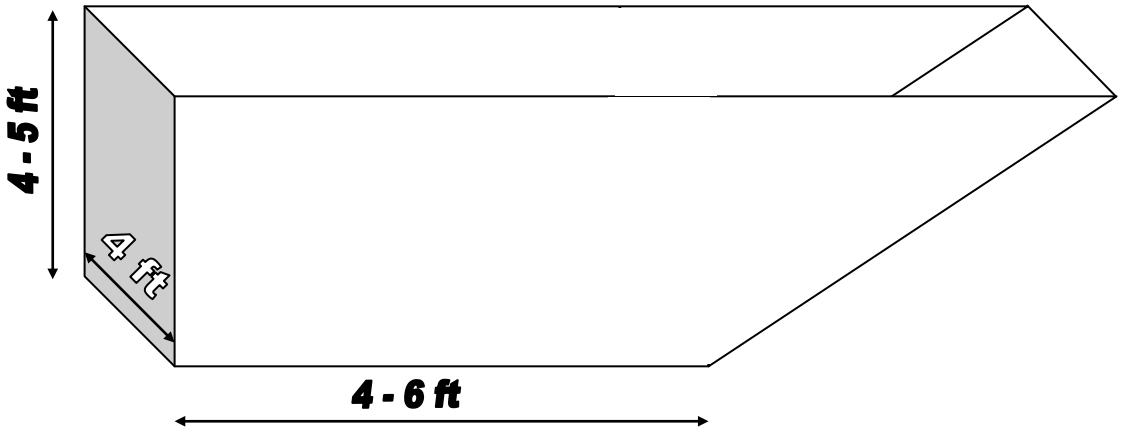
POLLUTANT CONCENTRATIONS OF MAJOR RESIDENTIAL WASTEWATER FRACTIONS[a] (mg/l)

Parameter	Garbage Disposal	Toilet	Basins, Sinks, Appliances	Combined Wastewater
BOD_5	2380	280	260	360
Suspended Solids	3500	450	160	400
Nitrogen	79	140	17	63
Phosphorus	13	20	26	23

a Based on the average results presented in Table 4-4 and the following wastewater flows: Garbage disposal - 2 gpcd (8 lpcd); toilet - 16 gpcd (61 lpcd); basins, sinks and appliances - 29 gpcd (110 lpcd); total - 47 gpcd (178 lpcd).

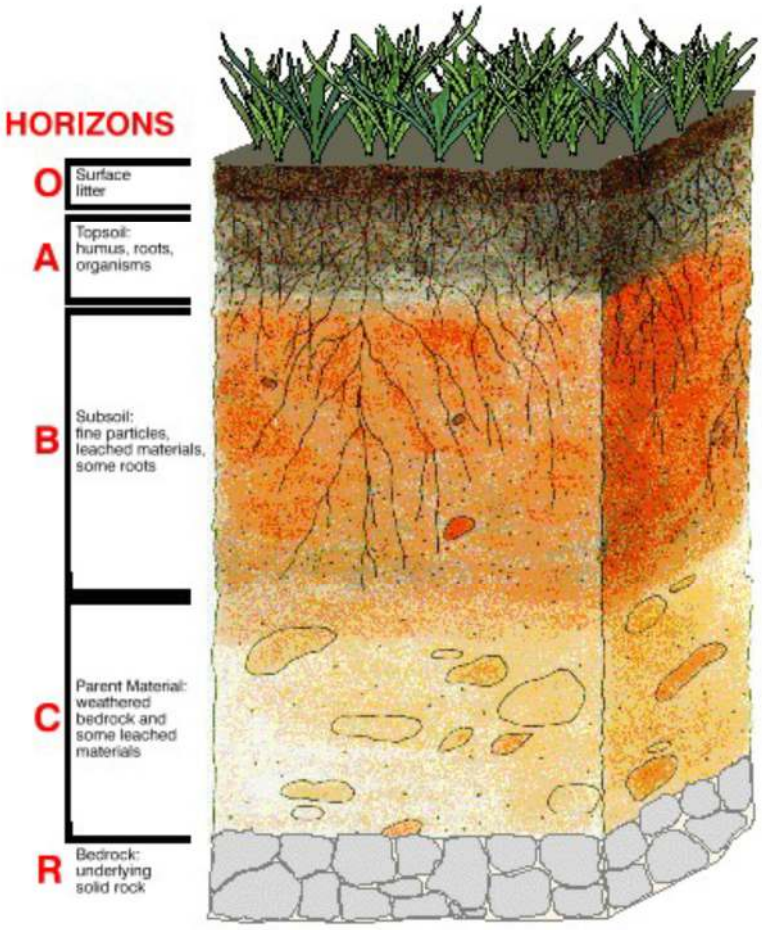
RENO COUNTY HEALTH DEPARTMENT
209 West Second Avenue Hutchinson, Kansas 67501-5232
Phone 620-694-2900 Fax 620-694-2901 www.renogov.org/health

Soil Profile Pit Dimensions



Number	Usually only one pit is needed. However if your site has highly variable soils more pits may need to be dug.
Location	They should be located in the area to be used for the installation of the on-site wastewater system.
Reminder	At least 48 hours before you dig your pit, call Kansas One Call, 1-800-344-7233 or 1-800-DIG-SAFE
Construction	Slope one end of the pit so that the inspector can have safe access. For reasons of safety you should coordinate the digging of your pit with the Health Department site evaluation in order to minimize the amount of time the pit remains open.
Depth	Do not dig any deeper than 5 feet.
Photograph	

Primary Layers of a Soil Profile



Step 2 of 4

Reno County Health Department
209 West 2nd Hutchinson KS 67501 Phone: 620-694-2900 Fax: 620-694-2901

LOT 6 Soil Profile Worksheet

THIS IS NOT A PERMIT

Soil Type: 6346

Property Owner:			Property Address:
Property Owner Phone:		Floodplain on Property ☐Y ☐N	Mailing Address:
Land Use: yard	Lot Size: 6.0	Enh Tr: ☐Y ☐N # of Bedrooms:	Location of Profile Pit: See aerial
Garbage Disposal: ☐Y ☐N	Fixed irrigation over system ☐Y ☐N	Water conditioner/treatment ☐Y ☐N	Vegetation: pasture / Fees Paid ☑Y ☐N

Horizon	Depth	Dominant Color	Mottles	Texture	Structure	Consistence	Roots	Remarks
A1	0 - 15"	5yr3/3	none	silty clay loam	2msbk	mfr	3f	
B1	15 - 40"	5yr4/4	none	silty clay	3msbk	mfr	1f	
B2	40 - 46"	7.5yr4/2	none	silty clay	2mabk	mvfi	none	gr 5-10%
B3	46"+	7.5yr4/3	none	silty clay	3msbk	mfr	none	

Loading Rate (GPD / Ft^2): .25

Restrictive Layer(s): ☑Y ☐N

Type:	Depth:
silty clay loam	0"
	Fees paid for site assessment

Minimum Design Standards

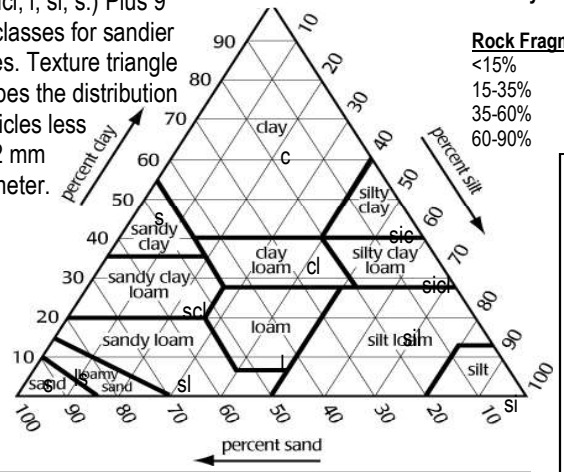
- Refer to the Reno County Sanitation Code, effective October 1st, 2003
- Refer to the KDHE Bulletin 4-2 Minimum Standards, effective 1997, for design and construction of onsite wastewater systems.
- Refer to the KAS, KSU, KDHE Environmental Health Handbook, effective 2002, for more design standards.
- Inspection ports at the ends of each lateral
- Septic tank manhole riser

Soil Profile Completed by: _____ Date: 11/17/2021
Environmental Health Specialist

For Official Use Only:
Reviewed by: _____ Date: 11-18-2021
Environmental Health Coordinator

Texture

12 main USDA divisions (e.g. sicl, l, sl, s.) Plus 9 other classes for sandier textures. Texture triangle describes the distribution of particles less than 2 mm in diameter.



Sandier Classes *(based on sand size)*
Sand: cos,s,fs,vfs
Loamy Sand: lcos,ls,lfs,lvfs
Sandy Loam: cosl,sl,fsl,vfsl

Rock Fragments (% Volume)

<15%	*none used*
15-35%	gravelly (G), cobbly (CB)
35-60%	very gravelly, etc.:(VG,VCB)
60-90%	extr gravelly etc. (EG, ECB)

Boundary (e.g. cw)

Describe the transition between horizons.

Distinctness			Topography		
Abrupt	A	< 2 cm	Smooth	S	Nearly a plane
Clear	C	2-5 cm	Wavy	W	Waves wider than deep
Gradual	G	5-15 cm	Irregular	I	Depth greater than width
Diffuse	D	> 15 cm	Broken	B	Discontinuous

Consistence

Describes particle cohesion and adhesion. Strength describes the resistance to crushing a 25 mm cube or medium sized ped with 5 seconds of force.

Moist Soil	Crushing Force	
Loose	ml	falls apart
Very friable mvfr	very slight	
Friable	mfr	slight
Firm	mfi	moderate
Very firm	mvfi	strong
Extremely firm	mefi	squeeze between hands
Dry Soil		
Loose	dl	falls apart
Soft	ds	very slight
Slightly hard	dsh	slight to moderate
Hard	dh	strong
Very hard	dvh	squeeze between hands
Extremely hard	deh	under foot

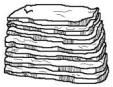
Mottling

Describe spots of different color –
Color / Quantity / Size / Contrast / Shape

Quantity		
Few	f	< 2%
Common	c	2-20%
Many	m	> 20%
Size		
Fine	1	< 5 mm
Medium	2	5-15 mm
Coarse	3	> 15 mm
Contrast		
Faint	f	Difficult to see
Distinct	d	Readily seen
Prominent	p	Conspicuous

Shape
Note in remarks – streaks, bands, spots, etc.

Dominant Color: identifies the color that occupies the greatest volume of the horizon. Use Munsell Color Chart - Hue/Value/ Chroma, (e.g 10YR 5/1).



Platy: Thin, flat plates of soil that lie horizontally. Usually found in E-hz or compacted soils.

Prismatic: Vertical columns of soil that might be a number of cm long. Usually found in subsoil (B) horizons.

Columnar: Vertical columns of soil that have a round "cap" at the top. Found in sodium (Na) affected soils.

Blocky: Irregular blocks that are usually 1.5 - 5.0 cm in diameter.

Granular: Resembles cookie crumbs usually less than 0.5 cm in diameter. Commonly found in surface horizons with prairie grass root systems.

Single Grained: Soil is broken into individual particles that do not stick together. Always accompanies a loose consistence. Commonly found in sandy soils

Massive: Soil has no visible structure, is hard to break apart and appears in very large clods.

Structure (e.g. 2msbk)

Describe units (peds) that separate at surfaces of weakness - Grade / Size / Shape

Grade		
Structureless	0	No aggregation
Weak	1	Barely observable aggregation
Moderate	2	Distinct peds
Strong	3	Durable peds

Size		Granular Platy*	Angular, Subangular, Blocky	Prismatic, Columnar
Very fine	vf	< 1 mm	< 5 mm	< 10 mm
Fine (Thin)	f	1-2 mm	5-10 mm	10-20 mm
Medium	m	2-5 mm	10-20 mm	20-50 mm
Coarse (Thick)	c	5-10 mm	20-50 mm	50-100 mm
Very coarse	vc	> 10 mm	> 50 mm	> 100 mm

*For platy structure use thin in place of fine and thick rather than coarse.

Shape		
Platy	pl	Flat, plate like
Prismatic	pr	Taller than wide
- Columnar	cpr	rounded tops
Blocky	bk	cubical
- Angular	abk	sharp edges
- Subangular	sbk	rounded edges
Granular	gr	spherical, crumb-like
No structure		
- Single grain	sg	sandy texture
- Massive	ma	

Horizon (e.g. B 2)

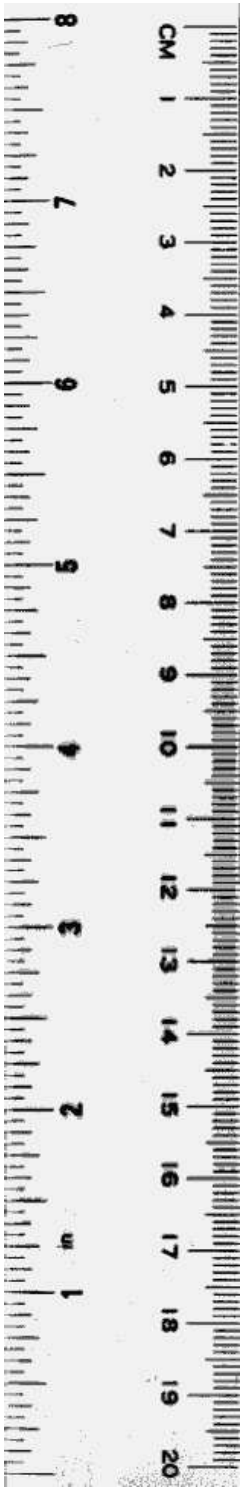
Horizon	Use A, E, B, C
Sub-Horizon	Use 1, 2, 3…

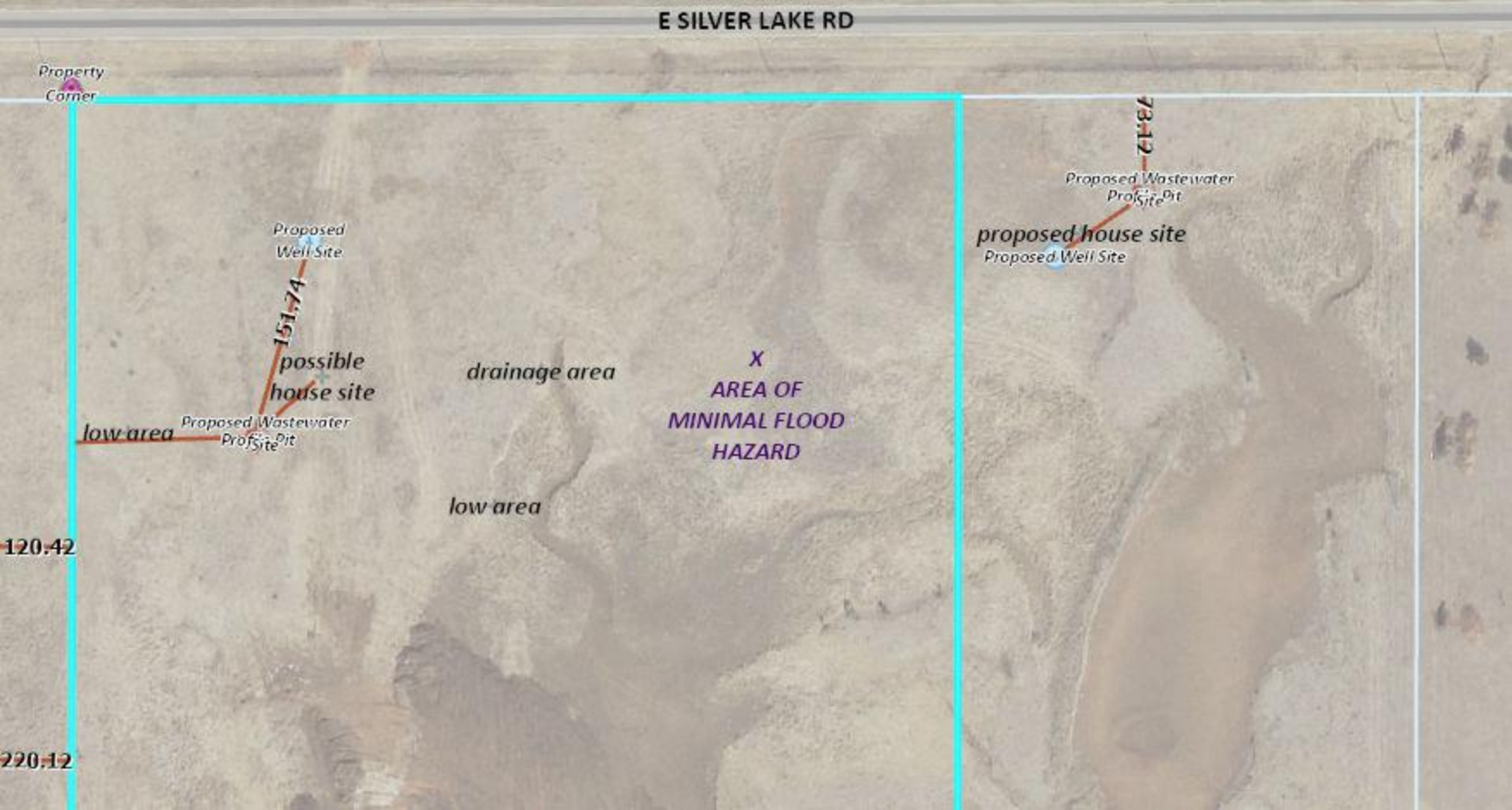
Depth Interval (e.g. 8")

Measured from top of horizon to bottom of horizon.
Use inches, decimal feet or centimeters *(show units).*

Roots (e.g. 2 vf)

Quantity			
Few	1	< 1 / unit area	
Common	2	1-5 / unit area	
Many	3	> 5 / unit area	
Size			**Unit**
Area			
Very fine	vf	< 1 mm	1 cm^2
Fine	f	1-2 mm	1 cm^2
Medium	m	2-5 mm	1 dm^2
Coarse	co	> 5 mm	1 dm^2




E SILVER LAKE RD
Property Corner
Proposed Well Site
151.74
possible house site
drainage area
X
AREA OF MINIMAL FLOOD HAZARD
low area
Proposed Wastewater Prof. Site Pit
low area
120.42
220.12
73.17
Proposed Wastewater Prof. Site Pit
proposed house site
Proposed Well Site

Darlow and similar soils: 5 percent
• This component was formerly mapped as Farnum soils and Slickspots. The Darlow soils are very deep, somewhat poorly drained, and slowly permeable. They formed in saline-sodic, loamy alluvium. In places the surface layer is fine sandy loam. In some areas the surface layer is very slightly or slightly saline.

Management

Major uses:
• This map unit is poorly suited to the commonly grown crops because of the sodic conditions, wetness, and the flooding hazard. Most areas are used for pasture or range. In areas of the Abbyville and Saxman soils that are cropped, the severe hazard of wind erosion is a concern. Maintaining soil tilth and preventing surface crusting also are concerns. Adding organic material to the soils helps to overcome these problems. The potential for ephemeral gully erosion is high in areas of the Abbyville and Kisiwa soils. The high sodium content, the pH, the content of soluble salts, the water table, and the flooding limit engineering uses.

General and detailed information about soil properties and interpretations needed for managing this map unit is included in subsequent sections of this publication.

1004—Albion sandy loam, 0 to 1 percent slopes

Map Unit Setting

General location: This map unit is in the southern third of the county on level or nearly level paleoterraces.
Elevation: 1,201 to 2,001 feet

Component Description

Albion and similar soils

Setting
Percentage of the map unit: 90 percent
Geomorphic description: Paleoterraces in river valleys
Parent material: Loamy alluvium

Component properties and qualities
Slope: 0 to 1 percent
Rate of surface runoff: Very low
Content of organic matter in the surface layer: 1.0 to 2.0 percent
Reaction in the surface layer: pH 5.6 to 6.5
Slowest permeability class: Moderately rapid
Depth to restrictive feature: No restrictive feature noted
Drainage class: Well drained
Native plant cover type: Rangeland
Flooding: None
Depth to water table: More than 80 inches
Ponding: None
Salt-affected condition: Not affected
Sodium-affected condition: Not affected
Available water capacity: About 7.3 inches

Interpretive groups
Land capability classification (nonirrigated): 3e
Land capability classification (irrigated): Not typically irrigated
Range site: Sandy (pe21-28)

A typical soil series description with range in characteristics is included, in alphabetical order, under the heading "Soil Series and Their Morphology."

Additional component information: In some small areas the surface layer is gravelly sandy loam, coarse sandy loam, loamy sand, or loamy coarse sand. In places the soil contains several discontinuous clay lenses between depths of 20 and 80 inches. The clay lenses range in thickness from 1 to 12 inches and in texture from silty clay to sandy clay loam.

Additional Minor Components

Shellabarger and similar soils: 10 percent
• These soils are in landscape positions similar to those of the Albion soil. They have a surface layer of sandy loam or coarse sandy loam and contain more clay in the subsoil than the Albion soil. Also included are small areas of Nalim soils. In some places several laterally discontinuous clay lenses occur within the soil profile between depths of 30 and 80 inches. The lenses range in thickness from 1 to 12 inches and in texture from silty clay to sandy clay loam.

Management

Major uses:
• Most areas are used as cropland, but some areas are used for pasture or range. This map unit is moderately well suited to all of the commonly grown crops. Wheat, grain sorghum, soybeans, and irrigated corn are the main crops. The hazard of wind erosion is severe, and the hazard of water erosion is slight. Wind erosion can be controlled by using a system of conservation tillage that maintains a cover of plant residue on the surface. The moderate water-holding capacity can limit production. Increasing the content of organic matter, leaving plant residue on the surface, and applying a system of conservation tillage can minimize this problem. In some places the results of soil tests may show soil reaction (pH) in the strongly

Wastewater Contractor Resources

Resources

- Sanitation Code (PDF)
- Bulletin 4-2 (PDF)
- Environmental Health Handbook (PDF).
- EPA Design Manual - Wastewater Treatment and Disposal System (PDF).
- EPA Onsite Wastewater Treatment Manual (PDF).
- Approved Septic Tanks
- Lagoon Construction Diagram (PDF).
- Click HERE to start your construction plan

KSU Handouts

- KSU Aquatic Plants and Their Control (PDF).
- KSU Get to Know Your Septic System (PDF).

Reno County Forms

- Specific Request Review form (PDF).
- Wastewater Application (PDF).
- Soil Profile Worksheet (PDF).
- Wastewater Waiver Request form (PDF).
- Wastewater or Well Water Construction Plan Worksheet (PDF).

Reno County Handouts

- Handout #2 - Lagoons (PDF).
- Handout #3 - Enhanced Treatment Wastewater Systems (PDF).
- Handout #4 - Mounds (PDF).
- Handout # 5 -Wastewater Systems in General (PDF).
- Handout #7 - Enhanced Treatment Wastewater Systems AETU (PDF).
- Handout #9 - Septic Systems in a Flood Plain (PDF).
- Handout #10 - How to Become a Licensed Wastewater Contractor

- KSU Onsite Wastewater Treatment Additives (PDF).
- KSU Plugging Cisterns, Cesspools, Septic Tanks, and Other Holes (PDF).
- KSU Selecting an Onsite Wastewater or Septic System (PDF).
- KSU Septic Tank Maintenance a Key to Longer Septic System Life (PDF).
- KSU Septic Tank Soil Absorption System (PDF).
- KSU Wastewater Pond Operation, Maintenance and Repair (PDF).
- KSU Wastewater Pond Design and Construction (PDF).
- KSU Wastewater Pond Operation, Maintenance, and Repair (PDF).
- KSU Why Do Onsite Wastewater Systems Fail (PDF).
- KSU Rock Plant Filter Design and Construction for Home Wastewater Systems (PDF).
- KSU Rock Plant Filter Operation, Maintenance, and Repair (PDF).

(PDF).

- Handout # 11 - How to Complete An Installation Design Diagram (PDF).
- Handout #12 - Semi-Public Wastewater Systems (PDF).
- Handout #14 - Wastewater Supply Requirements (PDF).
- Handout #15 - Lagoons in a Flood Plain (PDF).
- Handout #18 - Wastewater Permit Process (PDF).
- Handout #20 - Soil Profile Information (PDF).
- Handout #21 - Trip Charges (PDF).
- Handout #22 - Lagoon Maintenance (PDF).
- Handout #23-Lateral Field Types Approved in Reno Co. (PDF).
- Handout #24-Septic Tank Effluent Filters (PDF).

Continuing Education Resources (CEU's)

- NOWRA Decentralized Wastewater Education
- NAWT- quarterly webcast in conjunction with EPA
- NSF
- NEHA
- Kansas Small Flows
- Inspectapedia
- EPA-Webcasts
- Infiltrator Water Technologies

- Norweco
- Biomicrobics
- Des Moines Area Community College
- Orenco Systems
- Also check with your local distributors for educational opportunities

State of Kansas
Department of Health
and Environment

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MINIMUM STANDARDS FOR DESIGN AND CONSTRUCTION OF ONSITE WASTEWATER SYSTEMS

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In Cooperation with
K-State Research and Extension

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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!

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

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).

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.

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.

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.

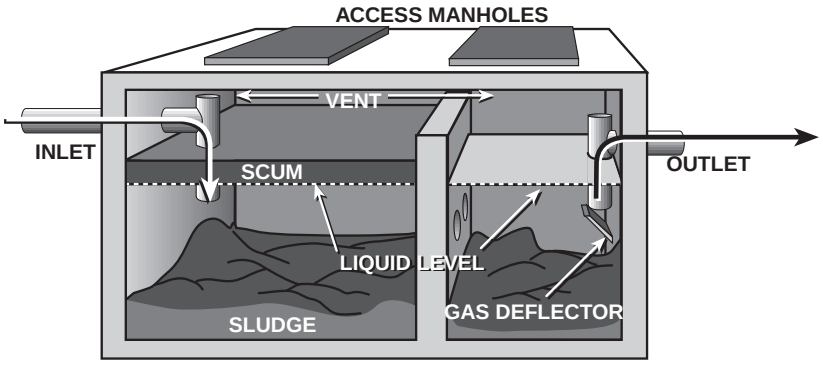
There shall be no permanent structure (patio, building, driveway, etc.) over the tank, lateral or other part of an onsite wastewater system. Consideration should also include easy access of trucks and equipment for pumping, maintenance, and repair. To avoid damage to the system, heavy equipment should 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.

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.

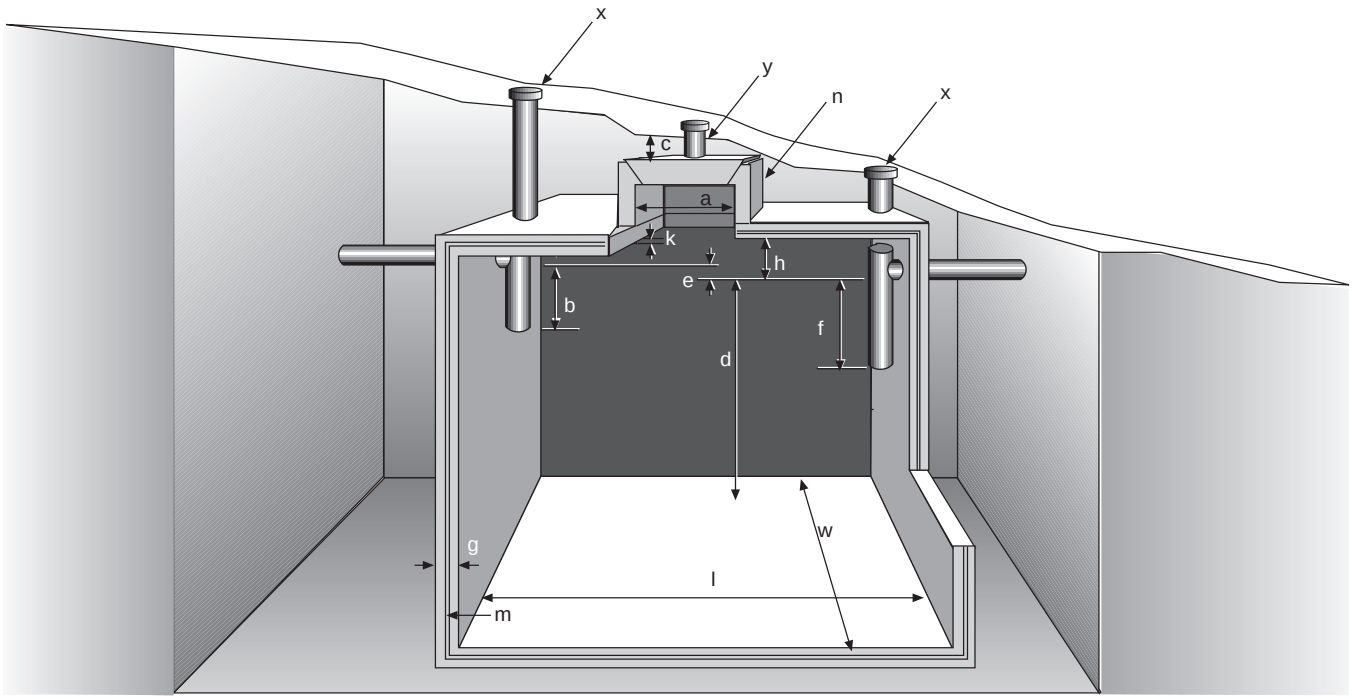
C. The minimum septic tank capacity is two times the daily wastewater flow using 150 gallons per bedroom or 1,000 gallons, whichever is larger. See Table 7 for minimum tank sizes. Tanks sized at three times daily flow are recommended and shall be required when garbage disposals are used.

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

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.

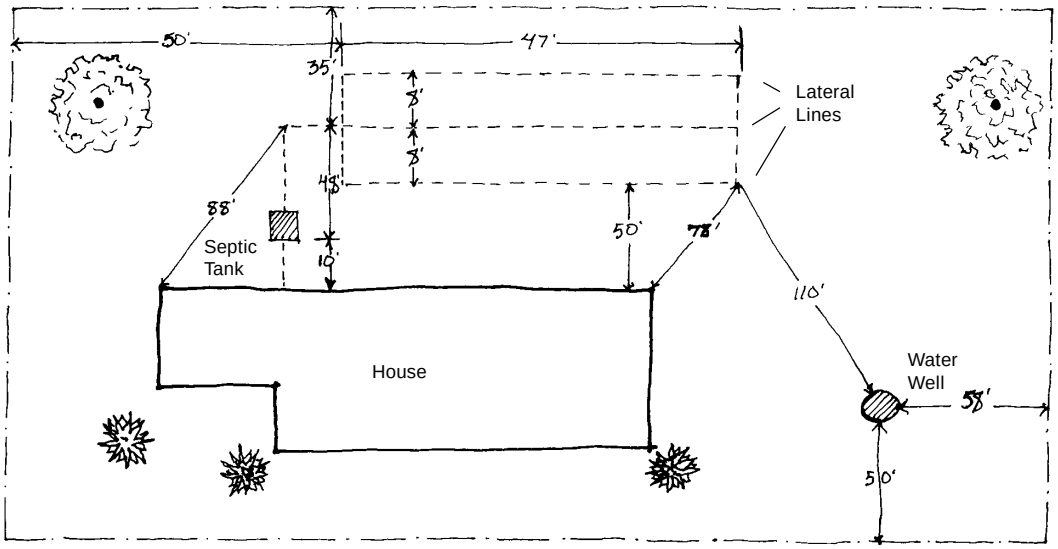
L. Inlet and outlet openings shall be designed and constructed to be water tight for at least a 20-year life of the system.

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



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.

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.

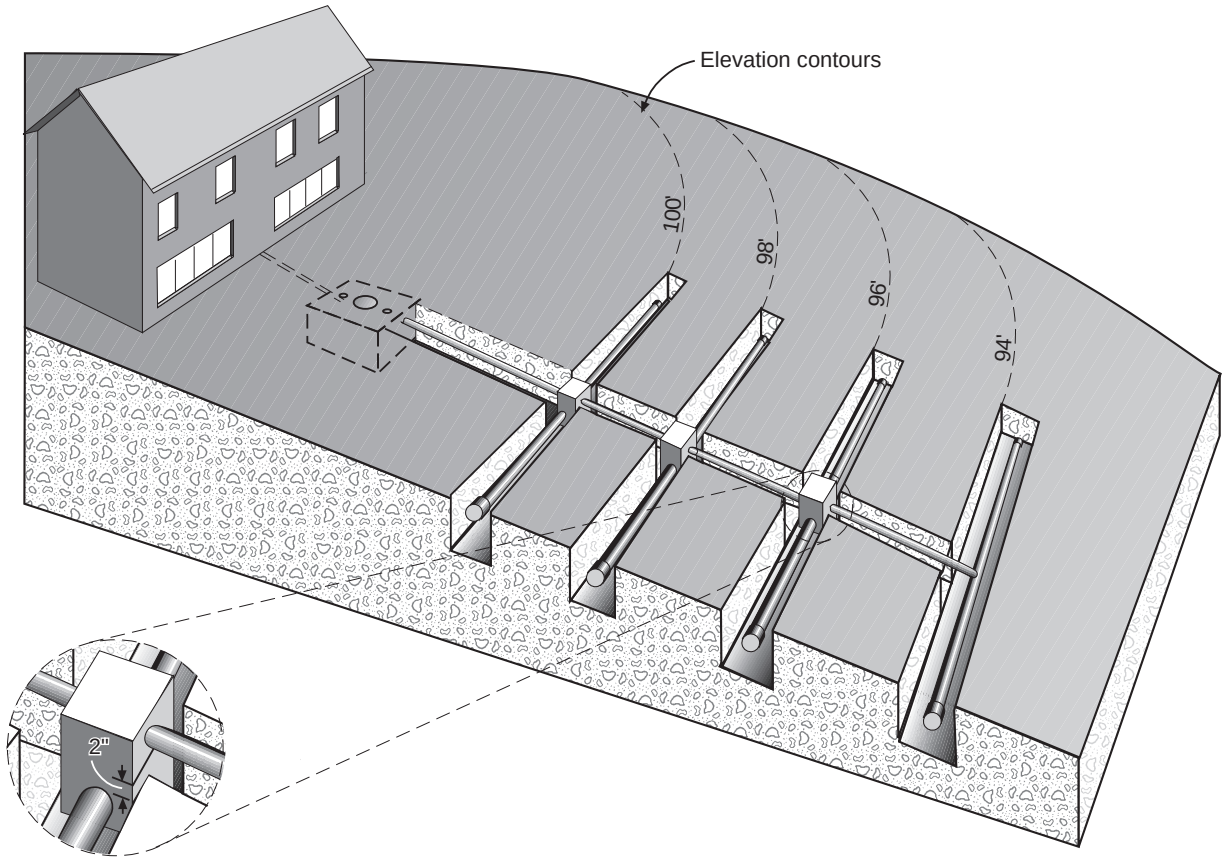
E. Septic tanks shall be water tight. An adequate test for water tightness is to fill the tank with water and let it stand for 8 hours to allow concrete to absorb water and plastic tanks to adjust. Then the tank is topped off and an initial measurement made with a hook gauge with vernier scale. After 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



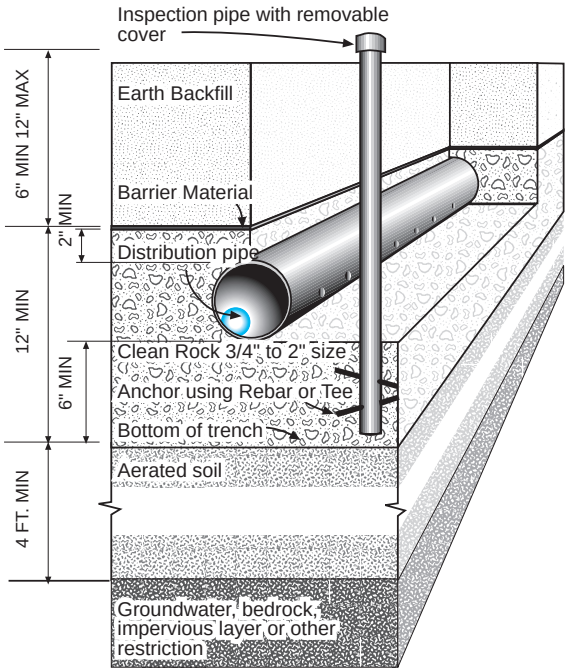
The site and soil evaluation previously discussed in that section is essential for good design. The loading rate is determined from the soil profile using Table 2 or from the perc rate using Table 4 or by using another method as specified in the local code. The soil absorption area is obtained by dividing 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

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).

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-

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.

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 $\frac{5}{8}$ inches in 25 minutes:

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

If the drop is $1\frac{1}{2}$ 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.

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

How to Run a Percolation Test, FO-0583-C, (Revised 1993), Minnesota Extension Service, University of Minnesota, St. Paul, MN 55108

Onsite Domestic Sewage Disposal Handbook, MWPS-24, Midwest Plan Service, Iowa State University, available from K-State, Extension Biological and Agricultural Engineering, Cost: $6.00[22]

Plugging Cisterns, Cesspools, Septic Tanks, and Other Holes, MF-2246

Rock–Plant Filter Design and Installation, expected 1997

Rock–Plant Filter Operation, Maintenance and Repair, expected 1997

Septic Tank Maintenance, MF-947

Septic Tank–Soil Absorption System, MF-944

Soil Evaluation for Home Septic Systems, MF-945

Wastewater Pond Design and Construction, MF-1044

Wastewater Pond Operation, Maintenance, and Repair, MF-2290

Why Do Septic Systems Fail? MF-946

Your Wastewater System Owner/Operator Manual, S-90 For sale bulletin, cost 35¢

Other Helpful Bulletins

Kinds and Types of Levels, LR-17[22]

Land Judging and Homesite Evaluation, S-34

Operating, Checking and Caring for Levels, LR-101[22]

Safe Domestic Wells, MF-970

Soil Water Measurements: An Aid to Irrigation Water Management, L-795

Using a Level, AF-19[22]

Standards Related to Onsite Wastewater System Materials and Procedures

ACI[23]212.3R Chemical Admixtures for Concrete

ACI 350R Environmental Engineering Concrete Structures

ASTM[24]C150-95 Standard Specification for Portland Cement. Vol. 04.01

ASTM C267-82 Standard Test Method for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacings. Vol 04.05

ASTM C452-95 Standard Test Method for Potential Expansion of Portland Cement–Cement Mortars Exposed to Sulfate. Vol. 04.01

ASTM C890-91 Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures. Vol. 04.05

ASTM C1227-94 Standard Specification for Precast Concrete Septic Tanks. Vol. 04.05

ASTM D1600-94 Standard Terminology for Abbreviated Terms Relating to Plastics. Vol. 08.04

ASTM D2321-89 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications. Vol. 08.04

ASTM D2729-93 Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings. Vol. 08.04

ASTM F481-94 Standard Practice for Installation of Thermoplastic Pipe and Corrugated Tubing in Septic Tank Leach Fields. Vol. 08.04

ASTM F405-93 Standard Specification for Corrugated Polyethylene (PE) Tubing and Fittings. Vol. 08.04

ASTM F412-94a Standard Terminology Relating to Plastic Piping Systems. Vol. 08.04

ASTM F449-93 Standard Practice for Subsurface Installation of Corrugated Thermoplastic Tubing for Agricultural Drainage or Water Table Control. Vol. 08.04

ASTM D3385-94 Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer. Vol. 04.08

ASTM F789-89 Standard Specification for Type PS-46 Poly(Vinyl Chloride) (PVC) Plastic Gravity Flow Sewer Pipe and fittings. Vol. 08.04

ASTM F810-93 Standard Specification for Smoothwall Polyethylene (PE) Pipe for Use in Drainage and Waste Disposal Absorption Fields. Vol. 08.04

ASTM ASTM F949-93a Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings. Vol. 08.04

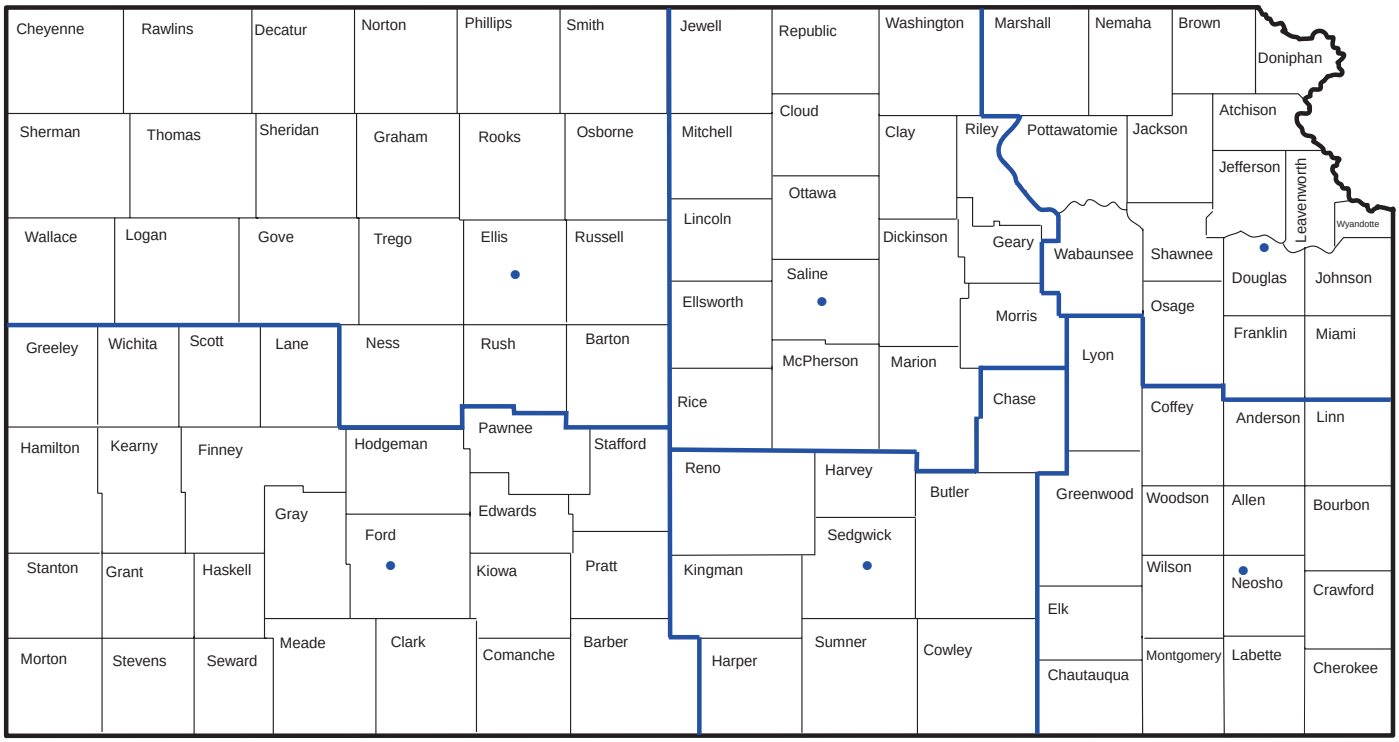
NPCA[25] Durable, Watertight Precast Concrete, TECH notes, April 1996

NPCA Septic Tank Manufacturing: A Best Practices Manual. Anticipated by Summer 1998

NPCA Underground Watertight Systems (video)

[21]Production Services/Distribution, Kansas State University, 28 Umberger Hall, Manhattan, KS 66506–3402, Phone: (785) 532-5830
[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

KDHE District Boundries and District Offices



KDHE, Division of Enviroment, Nonpoint Source Section
Forbes Field, Bldg. 283
Topeka, Kansas 66620
(785) 296-4195

KDHE District Offices

Kansas Dept Health & Environment
Northwest District Office
2301 E. 13th Street
Hays, KS 67601–2 651
(785) 625-5663

Kansas Dept Health & Environment
North Central District Office
2501 Market Place, Suite D
Salina, KS 67401
(785) 827-9639

Kansas Dept Health & Environment
Northeast District Office
800 W. 24th Street
Lawrence, KS 66046–44 17
(785) 842-4600

Kansas Dept Health & Environment
Southwest District Office
302 W. McArtor Road
Dodge City, KS 67801–6098
(316) 225-0596

Kansas Dept Health & Environment
South Central District Office
130 S. Market, 6th Floor
Wichita, KS 67202–3802
(316) 337-6020

Kansas Dept Health & Environment
Southeast District Office
1500 W. 7th Street
Chanute, KS 66720–9701
(316) 431-2390

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Reno County Sanitation Code

Adopted by the Board of County Commissioners July 2,2003
Effective October 1, 2003

Administered by the Reno County Health Department

209 West 2nd Street
Hutchinson, Kansas 67501
620-694-2900

www.renogov.com/health.htm

Reno County Sanitation Code

Adopted January 1, 1988, Amended May 15, 1991, Amended August 1, 1994, Amended July 2, 2003

Acknowledgments

Original Task Force: This Task Force was formed in June of 1986 with the goal of developing a sanitation code for Reno County. The following members were appointed by the Reno County Commission:

George Holcomb	Private Engineer	Ezra Miller	Well Driller
Herb Stange	Plumber	Jim Fortner	Area Soil Scientist
Doug Uehling	Soil Conservation	Harold Gottsch	Extension Service
Paul Greeley	City Planning Department	Dave Rodriguez	City Sanitarian
Roger Eggenburg	City Wastewater Treatment Plant	Hal Munger	City Engineer
Gene Haas	County Planning Department	Bob Kurfiss	Rural Resident
Bruce Shultz	Health Dept. Adv. Board	Loren Jones	Rural Resident
Norman Yutzy	Rural Resident	Daniel Duncan	Rural Resident
Judy Seltzer	Health Department	Carolyn Thompson	Health Department
Kansas Department of Health & Environment			
Patrick McCool	Engineer, Topeka	Gerald Grant	Engineer, Wichita

1992 Code Amendment Task Force: Amendments included revisions to septage transportation and disposal incorporating new federal EPA regulations. Also amended was the minimum lot size requirement from 40,000 square feet to 3 acres. The following members were appointed by the Reno County Commission:

George Sugars	County Public Works Director	Mike Tonn	Rural Resident
Gene Haas	Dir. of County Planning	Ken Jorns	Rural Resident
Reg Jones	Dir. of Utilities, Hutchinson	Eli Bontrager	Rural Resident
Cindy Kidd	County Public Works	Gary Vincent	Sanitation Hauler
Paul Dehm	Sanitation Hauler		
Kansas Department of Health & Environment			
John Paul Getz	District Engineer, Wichita	Don Chisam	Local Env. Protection Spec.
Ex-official Members:			
David F. Holmes	Reno County Commissioner	Joe O'Sullivan	Reno County Legal Counsel
James Perry	Reno County Commissioner	Joe Stucky	Reno County Commissioner

2001 Code Amendment Task Force: Amendments included revisions incorporating advances in private wastewater system design, maintenance of said systems, conditions wherein lot size requirements may be reduced, requiring the permitting of lawn irrigation wells and adding a chapter on public water supply protection. The following members were appointed by the Reno County Commission:

Larry Cottrell	Realtor	Ezra Miller	Well Driller
Barbara Lilyhorn	KSU-Reno Co. Res. & Extension	Ron Vincent	Well & Wastewater Contractor
Scott Crane	Plumber	Dr. Robert Shears	Health Dept. Advisory Board
Reg Jones	Dir. of Utilities, Hutchinson	Dan Garber	Garber Surveying
David McComb	Dir. Of County Planning	Max Murray	Rural Resident
Howard Miller	Cheney Lake Watershed Inc.	Robert Murphy	N.R.C.S. Soil Scientist
Cindy Kidd	Rural Resident	Austin Miller	Rural Resident
Robert Wimer	Reno Co. Conservation District	Larry Thode	Rural Resident
Bill Morand	Rural Resident	Nancy Scott	Dir. of Planning, Hutchinson
Kansas Department of Health & Environment:			
Don Chisam	Local Env. Protection Specialist	Debra Baker	Local Env. Protection Director

Table of Contents

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Chapter One

Administrative Procedures

Article 1: General Provisions

Section I. Title

This Code shall be known and referred to as the Reno County Sanitation Code.

Section II. 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.

Section III. Findings and Declaration of Policy

The County Commissioners find that provisions for adequate and reasonable control over the environmental conditions in unincorporated areas of the county are necessary and desirable; and that it is necessary to adopt a sanitation code to:

A. Eliminate and prevent the development of environmental conditions that are hazardous to health and safety; and

B. Promote the economical and orderly development of land and water resources of the county.

For those reasons and objectives it will be the policy of the Board of County Commissioners to amend this code from time to time with respect to any matter affecting environmental sanitation and safety.

Section IV. Purpose

The purpose and intent of this code is:

A. To prescribe the administrative procedures to be followed in administering this sanitation code or any amendments thereto;

B. To prescribe rules and regulations for controlling practices to minimize health and safety hazards;

C. To establish administrative procedures to facilitate fair and equitable regulation while recognizing the rights of affected persons to receive reasonably prompt processing and to appeal administrative decisions.

Section V. Jurisdiction and Application

This Code and all authorized rules, regulations, restrictions and requirements shall apply from and after the effective date and adoption to and throughout the unincorporated area of Reno County, Kansas, and to all persons, property, establishments and business activities located or conducted, regardless of ownership and acreage, within Reno County, Kansas and outside municipal boundaries of any city.

This Code and any or all rules, regulations, restrictions and requirements shall also apply to and throughout all areas of Reno County, Kansas including those areas located within the municipal boundaries of any city, whenever authorized or required under application of the Laws of the State of Kansas or of the United States, whether by statute, contract, rule or regulation, or pursuant to the jurisdiction of the Reno County Board of Health.

Section VI. Applicability within City Boundaries

This Code and any or all authorized rules regulations, restrictions and requirements shall apply within and throughout any city in Reno County, Kansas and to all persons, property, establishments and business activities located or conducted within the municipal boundaries of any city from and after the effective date of adoption of the Code, by appropriate ordinance, by the governing body of the City.

Section VII. Severability

If any clause, sentence, paragraph, section or subsection of this Code shall be adjudged invalid for any reason whatsoever, such judgment shall not affect, repeal or invalidate the remainder thereof, but shall be confined to the clause, sentence, paragraph, section or subsection thereof found to be invalid.

Section VIII. Disclaimer of Liability

This Code shall not be construed or interpreted as imposing upon the County, or its officials or employees: (1) any liability or responsibility for damages to any property; or (2) any warranty that any installation, system or portion thereof that is constructed, repaired or modified under permits or inspections required by this Code will function properly. In addition, any employee charged with the enforcement of this Code, who acts in good faith and without malice in the

discharge of his duties, shall not thereby be personally liable for damage which may occur to any person or property as a result of the discharge of his duties.

Section IX. Amendments and Additions

This Code may be supplemented or its provisions may be amended by Resolution adopted by the Board of County Commissioners, after notice and hearing, as required by law, and any such amendments or additions shall be incorporated within and codified as a part of this Code. Any changes, modifications or additional provisions adopted and imposed by State or Federal law, rule or regulation which are applicable to and administered through the jurisdiction of Reno County, Kansas shall be incorporated within and made part of this Code, with or without notice and hearing, as authorized or required by State or Federal law.

Section X. Repeal and Supersede Effect

This Code shall supersede any and all previously adopted Resolutions or regulations, which are, in whole or in part, in conflict with any provision of this Code, where applicable, any rule regulation or resolution which is or was in effect upon the effective date of this Code shall be repealed to the extent necessary to give this Code full force and effect, and in the case of any conflict of provisions, whether real or apparent, then the provision of this Code shall govern wherever applicable.

Section XI. Effective Date

This Code shall become effective from and after the date of adoption by the Board of County Commissioners, or other appropriate jurisdiction, and publication of notice as required by law.

Article 2: Administration

Section I. Administering Authority

The Health Officer and his designee(s) shall have the authority and responsibility for the administration of this Code. Under the authority of any particular Chapter or Article of this Code, the Health Officer may implement such administrative procedures, consistent with this Code, as he deems necessary for the effective administration of any regulations or which may be required or imposed under application of the Laws of the State of Kansas or the United States.

Section II. Administrative Actions and Decisions

It is the intent of this Code to establish regulation and standards for the protection of the public health and safety. To the extent possible, all administrative actions and decisions required or authorized for the administration of this Code shall be made solely in accordance with the standards enumerated in the Code. Whenever in the course of administrative decision or taking action for which standards are not provided then the decision or action shall be made according to the purpose and intents of this Code so that the result will best serve the public health and safety.

Section III. Interpretation of Terms or Words

All terms and words used in this Code shall be interpreted and given meaning according to their common understanding and to provide reasonable application of the purposes and intent of the Code. Whenever applied to this Code, the terms and phrases used shall be interpreted in the following manner:

A. Words appearing in the singular number shall include the plural, and those appearing in the plural shall include the singular.

B. Words used in the present tense shall include the past tense and future tense, and words used in the future tense shall include the present tense and past tense.

C. Words appearing in the masculine gender shall include the feminine and neuter genders.

D. The word “shall” is mandatory; the word “may” is permissive

E. The phrase “this Code” shall refer to the Code and all authorized rules, regulations, restrictions and requirements, and the phrase “the regulations”

shall include rules, regulations, restrictions and requirements authorized by the Code.

Section IV. Definitions

The following words, terms and phrase appear in more than one Section of this Code and, thus, have general application and usage. Words, terms and phrases appropriate or applicable to specific Chapters within this Code are defined, where necessary, within those Chapters. Unless the Code requires or specifies otherwise the following words terms or phrases, as used in this Code, shall be given the meaning defined in this Section.

A. Access: Entry into or upon any real estate, structure or vehicle including any part thereof.

B. Administrative Agency: The Reno County Health Department; also referred to herein as "Agency".

C. Administrative Rules: Those rules and regulations contained in Chapter One of this Code which prescribe general procedures to be followed in the administration of the Code adopted by the County.

D. Applicant: Any person who submits an application or requests permission to do some act regulated by this Code.

E. Application: The application forms provided by the Agency including the filing fee and any other supporting documents required by the Agency.

F. Authorized Representative: Any employee of the Reno County Health Department, who is designated by the Health Officer to administer this code.

G. Board of County Commissioners: Means the Board of County Commissioners of Reno County, Kansas.

H. Board of Health: The Board of County Commissioners acting as the Reno County Board of Health.

I. Health Officer: The legally appointed Health Officer of Reno County, appointed in accordance with K.S.A. 65-201 or his duly authorized representative.

J. KDH&E: Kansas Department of Health and Environment

K. Law: Includes federal, state and local statutes, ordinances, regulations and resolutions.

L. Permit: Document or license provided by the Agency on standard forms to perform tasks required by this Code.

M. Person: Any municipality, political subdivision, institution, corporation, partnership, association, or individual.

N. Premises: Any one or more lots or tracts of land, including all buildings, structures, or facilities located thereon.

O. Sanitation Code: Procedures, standards and regulations adopted by the County designed to minimize or control those environments and environmental conditions that may adversely affect the health and well being of the public. Such environments and environmental conditions may include, but are not restricted to: domestic wastewater and domestic wastewater disposal; water supply; food and food handling. Whenever the term "Code is used herein, such reference shall be to the Sanitation Code of Reno County, Kansas.

P. Schedule of Compliance: A schedule of remedial measures and times including an enforceable sequence of actions or operations leading to compliance with any regulation or limitation.

Q. Subdivision: Any tract of land that is or has been subdivided into two or more lots for the purpose of sale or building development, whether immediate or future, including the streets, alleys or other portions thereof intended to be dedicated for public use; and any re-subdivision of land or lots.

Section V. Technical and Scientific Terms

Unless otherwise defined, any technical or scientific term used within this Code or within any rule, regulation, restriction or requirement shall be given the meaning most commonly known and applied within the appropriate literature or manuals applicable for that science, industry or technological skill.

Section VI. Vested Interests

Nothing contained in this Code or any regulations shall be deemed or construed to grant any vested interest or protected right to any person beyond the express limited terms of any permit or ruling issued under this Code, and the Code and

regulations are expressly declared to be subject to amendment, change or modification.

Section VII. Compatibility with Other Laws

Nothing contained in this Code or any regulations shall be deemed to alter or modify the application of any other laws, codes or regulations which are or may be applicable to the property, use, business activity or other object or matter regulated under this Code, and any permit, approval or other condition given or acknowledged under this Code shall be limited in effect to the requirements of this Code and shall not, under any circumstances, relieve the holder from compliance with all other applicable laws, codes, regulations or requirements.

Section VIII. Waiver of Requirements

In unusual cases where compliance with the requirements of this Code is not feasible, the Health Officer shall have the authority, in his sole discretion, to waive the requirements, provided he is furnished with reliable information to show that such waiver does not and will not impair the potability of the groundwater or otherwise endanger the health and safety of the individuals involved and/or the general public.

Requests 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.

Appeals from the decision of the Agency shall be made to the District Court, who after due consideration may affirm, reverse or modify the decision.

Article 3: Permits and Licenses

Section I. Permits and Licenses Required

No person shall conduct, carry-on or perform any business or activity identified in this Section without first having obtained a valid permit in conformance with the requirements of this Code.

*A. Permit for Private or Semi-Public Wastewater Disposal System

Every person who installs, removes, alters, repairs or replaces or causes to be installed, removed, altered, repaired or replaced any private wastewater disposal system or part thereof shall, prior to commencement of any work, apply for and obtain a permit to perform such work, and no private wastewater disposal system shall be installed, removed, altered, repaired or replaced except pursuant to a permit issued under this Article.

*B. License for Wastewater Contractor / Installer

Every person who conducts the activity of an installer as defined in Chapter 2 of this Code, shall apply for, obtain and maintain a valid operator's license to perform that activity.

C. License for Sanitary Service Contractor

Every person who engages in or conducts the activity of a Sanitary Service Contractor, as defined in Chapter 2 of this Code, shall apply for, obtain and maintain a valid operator's license to perform that activity.

*D. Permit for Private Water Supplies

Every person who installs, drills, develops, constructs or reconstructs any private water supply on any premises subject to the Code shall, prior to commencement of any work, apply for and obtain a permit to perform such work

* Includes Homeowners.

Section II. Application Forms and Procedures

A. Content

Application for a permit or license shall be made on forms provided for that purpose. The application shall give a description of the character of the

work proposed to be done, or activity to be engaged in, and, if appropriate, the locations, ownership, occupancy, and use of the premises in connection therewith. The Agency may require plans, specifications or drawings and such other information as deemed necessary.

B. Filing

An application for any permit or license required under this Code shall be filed with the Agency.

C. Verification

An application for a permit must be signed by the owner of the property to be improved and for which the permit is being requested or by his authorized representative. The Agency may require proof of such authorization.

D. Compliance

The applicant shall be responsible for compliance with the permit requirements as further set out in this Code. Only a person who complies with the requirements of this Code shall be entitled to receive or retain a permit or license.

Section III. Permit/License Issuance; Investigations

If the Agency determines that the application complies with the requirements of this Code, a permit for construction or license for operation shall be issued. In making this determination the Agency may perform an inspection to determine compliance with this Code.

Within ten (10) working days after receipt of an application for a permit or license, the Agency shall begin such investigations and inspections as it shall deem necessary to determine whether the permit or license shall be issued or denied, and shall issue or deny the permit or license within thirty (30) working days of receipt of the application. If the application is denied, the Agency shall give the applicant written reason for denial.

It shall be the duty of the person performing the work authorized by a permit to notify the Agency when work is ready for any required inspection. Such notification shall be given not less than one regular working day before the work is to be inspected.

Section IV. Permit Conditions

Every permit and license issued under this Code shall be subject to the terms and conditions specified in this Section.

A. Right of Access

Application for, and acceptance of, any permit issued under this Code shall grant to any inspector, code or law enforcement officer, and any representative of the Agency the right to enter upon any property subject to the permit, at any reasonable time during standard business hours, with or without notice, for the purpose of inspection to determine and ensure qualifications for and compliance with the permit, and shall allow for reasonable access to and review of records, property or other materials necessary to perform the inspection.

B. Authorized Activity

Each permit or license issued under the authority of this Code shall be limited to and expressly provide for the type and manner of activity permitted for the holder and shall not be used nor applied for any other purpose, type or manner of activity. The permit or license issued shall specifically refer to the activity description contained within the permit or license application, and any change in the type, manner, scope or location of any activity shall require application for and modification of the permit or license.

C. Permit or License Non-transferable

No permit or license required by this Code shall be transferable to another person or premises and the holder of the permit or license shall notify the Agency prior to any change in ownership or location of any permitted licensed activity.

D. Term Expiration

Each permit for construction or license issued under the authority of this Code shall clearly state the date of issuance, the term of the permit or license, and the expiration date. The term of each permit or license issued under this Code shall be for a period not to exceed one (1) year unless the Agency determines, for cause shown, that the permit or license should be issued for a period of time other than one (1) year; in which case, the Agency may designate a lesser time when the activity can or will be fully completed within the shorter period, or may designate a greater time, but in no event

more than three (3) years, subject to annual review and payment of any required fee, where the activity is reasonably known or contemplated for continuation beyond one year.

E. Renewal

Any permit or license issued under the authority of this Code may be renewed for one or more additional terms upon application for renewal filed with the Agency on a form authorized for that purpose. No permit or license which has been expired for more than thirty (30) working days or which is subject to revocation, for any reason, may be renewed, and such permits or licenses may be reissued only upon the filing of a complete application for a new permit or license.

F. Error and Omissions

The issuance of a permit or license shall not prevent the Agency from thereafter requiring the correction of errors in plans and specifications or from preventing construction activity being carried on thereunder when such activity would be in violation of this code or of any other code or resolution or from revoking any permit or license when issued in error.

The Agency may, in writing, suspend or revoke a permit issued under provisions of this Code whenever the permit is issued in error or on the basis of incorrect information provided by the applicant.

Section V. Standard Fees

For the purpose of defraying all or part of the cost of administration of this Code, the Board of County Commissioners shall establish a schedule of fees for all permits and licenses required by the Code. The fees imposed under this Code shall be paid by the applicant prior to the issuance of any permit or license authorized by the Code, and all annual fees shall be paid prior to the anniversary or expiration date of a permit or license, where applicable.

A. Failure to Pay

Failure to pay any fee imposed by this Code may be cause for denial, suspension or revocation of any permit or license.

B. Double Fee for Unauthorized Practices

Any person who shall commence any activity for which a permit is required

by this Code without first having obtained the permit shall, if subsequently permitted to obtain a permit, pay double the permit fee fixed by this section for such activity, provided, however that this provision shall not apply to emergency work when such work was urgently necessary to protect public health and safety and it was not practical to obtain a permit before commencement of such emergency work. In all such cases, a permit must be obtained as soon as possible after the performance of such work, and if there is a delay or more than three (3) working days in obtaining such permit, a double fee as herein provided shall be charged.

Section VI. Supplemental to State Regulations

The permits or licenses, and all fees, conditions and regulations imposed under this Section or any other Section of this Code shall be supplemental to and in addition to any permits, licenses, fees or regulations imposed or required by any other law, including those administered by the Kansas Dept. of Health & Environment.

A. Conflict in Regulations or Requirements

All rules, regulations, restrictions, and requirements of this Code shall remain in effect and shall apply to any activity or condition covered by this Code except when in direct conflict with a provision of the State rules or regulations, in which case the State-imposed rule or regulations shall apply. Terms and conditions, rules, requirements, regulations or limitations which are supplemental to those imposed by the State and which are not specifically or expressly excluded or prohibited shall not be considered conflicting and shall be imposed and in effect.

B. Additional Regulations

Rules, regulations, and requirements applicable to any conduct, activity, condition or standard, which are not expressly regulated by operation of State law but which are regulated by this Code, shall be and remain in full force and effect as specifically applied under this Code for and within Reno County, Kansas.

Article 4: Inspections and Investigations

Section I. Inspections Required

Physical site inspections shall be authorized and performed for all permitted or licensed activities under this code.

A. Construction Activity

Whenever plans and specifications are required by this Code to be submitted as part of a permit application, the Agency shall inspect the premises prior to the start of operations to determine compliance with the approved specifications and with any other requirements of this Code.

B. Private and Semi-Public Wastewater Systems

Private and semi-public wastewater systems shall be inspected by the Agency prior to being placed in operation to ensure compliance with this code. Such systems shall be inspected thereafter as often as necessary to ensure compliance with this Code. No portion of the system shall be covered or made inaccessible to inspection prior to approval.

Section II. Inspection Reports

A written inspection report shall be made for all inspections conducted under the authority of this Code, stating the name of the inspector, the date and time of the inspection, the type of inspection and the property inspected. The report shall enumerate all findings made during the inspection.

Whenever a private or semi-public wastewater system is inspected after a permit is issued, the findings of the inspector shall describe any determined violations, the Code section violated, and the correction to be made. A copy of the completed report shall be issued to the owner of the premises and, if different than the owner, to the holder of the permit. The report is a public document.

Section III. Inspection Scheduling and Re-inspections

Whenever inspections are required under this Code to be scheduled for any installation, construction, initial activity, or for the correction of any violation or other non-conforming condition, it shall be the duty of the holder of the permit or license or the establishment to notify the Agency and schedule the time and date for the inspection.

Section IV. Access and Right of Entry

The Agency shall have the right to make inspections of establishments, premises, places and localities for the purpose of determining compliance with this Code. Inspections shall be done at a reasonable time. The Agency may examine the water usage records of any establishment that uses a private sewage disposal system for information pertaining to the amount of water used by the establishment.

If the building, premises or establishment to be inspected is occupied, the Agency representative shall first present proper identification and request entry; if such building or premises be unoccupied, he shall first make a reasonable effort to locate the owner, or other persons having charge or control of the building or premises, to request entry. If entry is refused, the Agency shall have recourse to all remedies provided by law to secure entry.

The Agency shall have reasonable access to the business records of any person licensed to perform any activity under this Code where the records, daily logs, or other documents are reasonably necessary to determine compliance with the requirements of this Code.

Chapter Two

Domestic Wastewater Treatment

Article 1: General Provisions

Section I. Purpose

Wastewater is a potential source of disease and a potential hazard to the health, safety and welfare of the public. It also poses a direct threat to the environment as a potential pollutant of the air, water and soil, and presents a hazard to all forms of plant and animal life. It is the purpose of this Chapter to provide minimum standards for the sanitary treatment of all sewage generated or transported within Reno County unless otherwise regulated by competent authority.

Section II. Scope

All wastewater must be disposed of by the use of a sanitary sewer system as defined in this Section. A sanitary sewer system may be classified as either a: public wastewater system, semi-public wastewater system or a private wastewater system.

Section III. Definitions

Unless the context requires or specifies otherwise, the following words, terms or phrases, as used in this Code, shall be given the meaning defined in this section.

A. Absorption System: A private wastewater system for the treatment of sewage by means of absorption trenches and the biological decomposition of wastewater effluent in the adjacent soil.

B. Absorption Trenches: One or more trenches of varying length and depth and of fixed horizontal separation in which effluent is percolated into the soil.

C. Alternative Wastewater System: A domestic wastewater system other than a anaerobic septic tank-soil absorption system, lagoon or privy that is used or designed to be used, to collect, treat, hold or discharge domestic waste from residential, industrial or commercial property. This includes, but is not limited to, such systems as; mounds, shallow and at-grade absorptions fields.

D. Bedrock: A soil horizon which contains greater than 50% consolidated material, by volume.

E. Cesspool: A drywell that receives untreated sanitary wastes containing human excreta.

F. Class V Injection Well: A septic system receiving only domestic wastewater and having the potential to serve 20 or more persons a day or, any septic system receiving non-domestic wastewater.

G. Distribution Box: A watertight chamber below the outlet level of a septic tank or treatment unit and from which effluent enters the absorption system.

H. Domestic Septage: The liquid and solid material removed from a septic tank, lagoon, privy (portable or stationary), alternative wastewater system, portable toilet or similar device that receives only domestic wastewater. Domestic septage does not include commercial or industrial wastewater or grease removed from a grease trap.

I. Domestic Wastewater: All water-borne 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. Stormwater shall not be mixed with domestic wastewater.

J. Drywell: A well or excavation completed above the water table so that its bottom and sides are typically dry except when receiving fluids.

K. Enhanced Treatment System: Any private or semi-public wastewater system which has been designed to improve the quality of wastewater effluent by reducing total nitrogen and one or more of the following: biological oxygen demand, dissolved solids, suspended solids, phosphorus or bacteria prior to disposal to the soil. Examples of such systems are: aerobic septic tanks, sand, textile or peat filters and constructed wetlands.

L. GPD: Gallons Per Day.

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

N. Non-Domestic Wastes: Any liquid or water-borne wastes, other than domestic wastewater, produced in connection with any industrial or commercial process or operation.

O. Installer: Any person duly licensed to construct, install and/or repair private sewage treatment systems.

P. Private Wastewater System: Any septic system, lagoon, alternative wastewater system, privy, holding tank or other means of wastewater treatment that does not discharge to a public or semi-public wastewater system.

Q. Privy: A facility designed and/or used for the biological composting and disposal of human excreta.

R. Public Wastewater System: A wastewater system that is used or designed to be used for the collection, treatment and discharge of domestic wastewater or industrial or commercial wastes and has a valid permit from KDH&E.

S. Reconstruction: The replacement, alteration or repair of existing components of a private or semi-public wastewater system that improves or enhances the performance of the system, or changes the classification of the wastewater system.

T. Sand Trap Waste: The sand, gravel and other solid material along with its associated liquid which settles from the effluent flow produced in connection with the commercial or industrial process of washing vehicles.

U. Sanitary Service: The pumping out and/or removal of wastes, sludge or human excreta from privies, septic systems, lagoons, alternative wastewater systems, enhanced treatment systems and other private or semi-public wastewater systems, and the transportation of such material to a point of final ~~disposal~~ treatment.

V. Sanitary Service Contractor: Any person duly licensed to perform sanitary disposal services.

W. Semi-Public Wastewater System: A wastewater system used for ~~the~~ on-site collection and treatment of domestic wastewater only~~,~~ that accepts, or is designed to accept, greater than 1,000 GPD but no more than 2,500 GPD and does not discharge to the surface waters of the State.

X. Septic System: An anaerobic septic tank-soil absorption system used for the collection and treatment of domestic wastewater.

Y. Septic Tank: An approved, watertight, accessible, covered receptacle designed and constructed to receive sewage in which three processes take place: settling of the solids, the digestion of some of the accumulated solids by anaerobic action, and separation of the floatable scum.

Z. Single Family Waste Stabilization Pond: An artificial or man-made structure which is not a public wastewater system and into which 1,000 GPD or less of

domestic wastewater is discharged and confined for treatment. It is otherwise referred to as "lagoon" herein.

AA. Soil Mottles: Spots or streaks of contrasting soil colors that indicate the presence of a seasonal water table zone.

BB. Wastewater Contractor: Any individual or company that constructs, reconstructs or modifies private or semi-public wastewater systems.

CC. Wastewater (Sewer) District: A special district authorized and empowered by state statutes to plan, construct and operate a public wastewater system.

Section IV. Rules of Application

The requirements established by Chapter 2 of the Reno County Sanitation Code shall apply and be applicable to any and all private and semi-public wastewater systems now or hereafter installed, used or operated upon any property located within Reno County, Kansas subject to the provisions of this Code.

A. General Rule

Unless otherwise provided or excepted in accordance with this Section, from and after the effective date of the Code, no person shall construct, reconstruct or modify, nor cause or allow the construction, reconstruction or modification of any private wastewater system except as permitted under and which complies with the established requirements of this Code. No commercial or industrial wastes shall be directed to a private or semi-public wastewater system.

B. Existing Systems Treating Domestic Waste

Any private sewage treatment system lawfully installed prior to the effective date of this Code and used exclusively for domestic sewage, and not industrial nor commercial wastes, may remain in use if, and as long as, it continues to operate in accordance with the original design and location, does not experience any system failure, and does not present any hazard to the public health, safety or welfare; however, any replacement, alteration, enlargement, repair, removal, conversion, improvement or demolition shall comply with the requirements of this Code or any later amendments, revisions or versions.

Section V. Approval of Plans and Specifications

A. Semi-Public Wastewater Systems

Plans and specifications for all semi-public wastewater systems shall be submitted to and approved by the Agency prior to starting any construction of such systems.

B. Private Wastewater Systems

Plans and specifications for all private wastewater systems shall be submitted to and approved by the Agency prior to starting any construction of such systems. The standards of design, construction and location for such systems shall be extracted from independent standards current to the time of plan review. Examples of such standards applicable at the time of this codes adoption are KDH&E Bulletin 4-2, Minimum Standards for Design and Construction of Onsite Wastewater Systems and the KAS/KSU/KDH&E Environmental Health Handbook. Under unique circumstances the Agency may require the system to be designed by a professional engineer or ask for review of the proposal by KDH&E.

Section VI. Criteria for Plan Approval

A. Prior to issuing a permit for construction the Agency shall conduct a soil profile test of the proposed building site in order to identify site limitations or restrictions. No permit shall be issued unless the proposed wastewater system meets accepted design standards for the conditions determined by the soil profile test. In addition to specific requirements determined from the soil profile analysis, the following minimum requirements shall be met before a permit is issued:

*1. For lots or parcels containing less than 1.5 acres, a public water system and an enhanced treatment system.

*2. For lots or parcels containing at least 1.5 acres, but less than 3.0 acres, an enhanced treatment system.

*3 For lots or parcels containing at least 3.0 acres or more, an enhanced treatment system may be required.

* In all circumstances, regardless of lot size, at least 10,000 square feet of suitable area for immediate and eventual use as a private wastewater system, exclusive of buildings, trees, roads, streets, driveways, parking areas, patios or other public right of way easements.

B. In addition to other criteria specified in this Code, no plan approval and permit for private or semi-public wastewater systems shall be issued if:

1. The proposed building site is one acre or less, for lots of record established after the effective date of this Code; or

2. The natural slope of the lot is greater than ten (10) percent; or

3. Any portion of the wastewater system, except a solid wastewater line of watertight construction is within:

   a. 100 feet of any water well or a pump suction line from a water well. No wastewater line regardless of construction shall be located less than 10 feet from a private or semi-public water well or a suction line from a private or semi-public water well.

   b. 50 feet from any property line of the building site or premises it serves.

   c. 25 feet from a public water supply line.

   d. 4 feet from any impervious layer, rock formation, permanent water table or seasonal water table.

C. No private or semi-public wastewater system shall be constructed if the applicant's property line is within 400 feet of an existing public sewer, unless the Agency finds that connection to such a sewer is not feasible and that a domestic wastewater system, meeting the requirements of this Code, can be constructed on the property.

D. For Single family wastewater stabilization ponds (lagoons) only:

1. Lagoons shall be located no closer than 100 feet, as measured from the edge of the 5-foot water line, to the nearest property line or residence.

2. Lagoon fencing shall be constructed in accordance to accepted standards of construction and shall be completed within 15 days from the date of initial operation.

E. Owner/operators of private and semi-public wastewater systems meeting the KDH&E definition of a class V injection well shall contact the KDH&E and comply with or satisfy all requirements and regulation adopted by the KDH&E, pursuant to Kansas Administrative Regulations, Article 46.

Article 2: Prohibited Practices

Section I. Private or Semi-Public Wastewater Systems

No person shall sell, use, or lease for use any real estate upon which is located a private or semi-public wastewater system which:

A. Improperly discharges effluent as prohibited by Chapter Five, Article 1, Section I, Paragraph G of this code; or

B. Discharges or receives industrial or commercial waste.

Section II. Public, Private or Semi-Public Wastewater Systems

No person shall sell, use or lease for use any public, private or semi-public wastewater system which:

A. Discharges onto the surface of the ground, into watercourses, lakes, ponds or any impoundment; or

B. Causes fly breeding, produces offensive odors or any other condition that is prejudicial to health and comfort.

Article 3: Semi-Public Wastewater Systems

Section I. Annual Permit

The owner of every semi-public wastewater system shall obtain a permit for the initial operation of the system and annually thereafter from the Agency. A permit for operation shall be issued by the Agency following an inspection of the system and said Agency's determination that the system has been constructed according to approved plans and presents no significant health risk. No semi-public wastewater system shall be constructed or operated until the owner has obtained the required permit.

Section II. Proper Maintenance and Operation

All semi-public wastewater systems shall be maintained in good working condition and shall not discharge onto the surface of the ground or drain into any stream or roadside ditch, or produce offensive odors or become a breeding place for flies, mosquitoes or rats. Whenever the Agency shall find any semi-public wastewater system malfunctioning and causing any of the above prohibited conditions he shall order the owner and/or user to correct the condition within thirty (30) working days.

Article 4: Private Wastewater System Operation and Maintenance

Section I. Inspection of Construction

Following the issuance of a permit for construction, and prior to covering any portion of the wastewater system, the permit holder shall contact the Agency and arrange for an inspection of construction for the purpose of assuring compliance with the conditions of this Code.

Section II. Proper Maintenance and Operation

A. All private wastewater systems

All private wastewater systems shall be maintained in good working condition as prescribed in accepted standards for maintenance such as the latest edition of the KDH&E Bulletin 4-2 Minimum Standards for Design and Construction of Onsite Wastewater Systems or the KAS/KSU/KDH&E Environmental Health Handbook and shall not discharge onto the surface of the ground or drain into any stream or roadside ditch, or produce offensive odors or become a breeding place for flies, mosquitoes or rats. Whenever the Agency shall find any private wastewater system malfunctioning and causing any of the above prohibited conditions, the Health Officer shall order the owner and/or user to correct the condition within thirty (30) working days.

B. Enhanced Treatment Wastewater Systems

Owners and/or operators of enhanced treatment wastewater systems shall maintain a contract for, at minimum, the annual inspection of the system and pertinent components and prescribed maintenance with a licensed wastewater contractor or representative of the manufacturer of the treatment system. A copy of the inspection report along with a report of any corrective actions taken as prescribed by the inspection report shall be filed with the Agency within sixty (60) calendar days of the date of inspection.

Article 5: Regulations for Sanitary Service Contractors

Section I. License Required

No person shall remove, haul, transport, or dispose of any domestic septage without a valid license from the Agency. A valid sanitary service contractor's license issued to a sole proprietor, a partnership or a corporation shall be valid as to all its agents and employees.

Section II. License Term and Renewal

Any license issued under this Section shall expire on December 31 of each year and must be renewed annually. All required license fees shall be paid at the time of application for the license or renewal, and no fee required under this Code shall be prorated or refunded for any partial term of part-year application.

Section III. Standard of Performance

Every person licensed as a sanitary service contractor under this Section shall comply with the performance requirements specified in this Code.

A. Equipment

A license holder shall maintain his equipment so as to ensure that no spillage of sewage will occur during transportation, and that employees of the licensee are not subjected to undue health hazards. All sewage shall be transported in an enclosed watertight tank

B. Vehicles

Sewage shall be transported only in vehicles approved for that purpose by the Agency. Each such vehicle must be inspected prior to issuance or renewal of a license to a sanitary services contractor. The vehicle must be kept in good working condition and the name of the licensee shall be clearly displayed on both sides of the vehicle in bold letters not less than 5 inches high.

C. Disposal

All licensees' shall comply with the requirements of Title 40, Part 503 of the Code of Federal Regulations: Sewage Sludge Use and Disposal. In addition all licensees:

1. Who dispose of domestic septage at a KDH&E permitted public wastewater treatment facility shall comply with all requirements established by that facility for the discharge of domestic septage into the facility.

2. Who dispose of domestic septage by land application shall comply with the following criteria:

   a. Application shall not exceed 30,000 gallons per acre per year.

   b. No application within one-half mile of a public water supply well.

   c. No application within a 100-year flood plain.

   d. No application on to any surface, such as frozen or saturated soil, if run-off to the waters of the State is likely to occur.

   e. No application within 50 feet of any property line.

   f. No application within a wellhead protection zone that has been placed on file with the Agency.

   g. No application into a private or public wastewater lagoon or sanitary landfill.

D. Reporting

Licensee's shall maintain disposal logs on every load and submit a copy of the same to the Agency at the time of annual renewal. Disposal logs shall contain the following information:

1. Dates of disposal, the identity of the generator of the domestic septage, the volume disposed and the identity of the disposal site by location and owner.

2. In addition, the licensee shall maintain records that comply with all record keeping requirements established under Title 40, Part 503 of the Code of Federal Regulations.

Section IV. License Revocation

A license may be revoked for failure to comply with this Code. The revocation procedure shall comply with the provisions of Chapter 1 of this Code.

Article 6: Regulations for Wastewater Contractors

Section I. License Required

No person shall install, engage in the installation of, repair or modify a private or semi-public wastewater system unless that person holds a valid wastewater contractor license issued by the Agency. Employees of a validly licensed installer are not required to be separately licensed.

Section II. License Term and Renewal

Any license issued under this Section shall expire on December 31 of each year and must be renewed annually. All required license fees shall be paid at the time of application for the license or renewal, and no fee required under this Code shall be prorated or refunded for any partial term of part-year application.

Section III. Standard of Performance

Prior to the issuance or renewal of a license under this Article, the applicant shall be required to demonstrate adequate knowledge of State and Local regulations pertaining to private and semi-public wastewater systems and general engineering principles pertaining to such systems. The Agency may consider actual experience, education, or professional licensing of the applicant in the granting or denial of an application for an initial license or renewal, including prior revocations or disciplinary action.

Attendance by any applicant to an appropriate training workshop, conducted or sponsored by the Agency or other recognized governmental, education or professional institution, and satisfactory completion of a written examination administered by the Agency covering subjects related to public health concerns, wastewater treatment techniques, standards for design or construction or installation of wastewater systems, wastewater treatment theory, and/or soil science, shall satisfy the requirements of this Section. Any applicant who fails to satisfactorily complete the written examination may retake the examination after thirty (30) calendar days.

Section IV. Continuing Education

Every person licensed as a wastewater contractor, under the authority of this Article, must obtain a minimum of three (3) hours of annual continuing education approved by the Agency each calendar year, and no license issued under this Article will be renewed without submission of a certification of the training to the Agency.

The training, to be approved, must be directly related to the knowledge requirements necessary for issuance of the license.

Section V. Code Compliance

The installation, relocation, or repair of any private sewage treatment system shall be in compliance with the provisions of this Code.

Section VI. License Revocation

A license may be revoked for failure to comply with this Code. The revocation procedure shall comply with the provisions of Chapter 1 of this Code.

Chapter Three

Water Supplies

Article 1: General Provisions

Section I. Purpose and Intent.

The provisions of this code are for the purpose of regulating and controlling the development, maintenance, and use of private or semi-public water supplies in the unincorporated area of Reno County, Kansas, in order that public health will be protected and the contamination and pollution of the water resources of the county will be prevented.

Section II. Compliance Required

After the effective date of this code, no person shall construct or reconstruct on any property subject to this code, any semi-public or private water supply that does not comply with the requirements of this code.

Section III. Definitions

In addition to the definitions provided in Chapters 1, 2 and 4 of this Code the words, terms and phrases listed below, for purposes of this chapter, are defined as follows:

A. Abandoned Well: A well which: has been permanently discontinued from use; or, the pumping equipment has been permanently discontinued from use; or it has the potential for transmitting surface contaminants into the aquifer; or, possesses potential health and safety hazards; or, is in such a condition it cannot be placed in active or inactive status.

B. Active Well: A water well which is an operating well used to withdraw water, monitor or observe groundwater conditions.

C. Annular Space: The space between the well casing and the well bore or the space between two or more strings of well casings

D. Aquifer: An underground formation that contains and is capable of transmitting groundwater.

E. Confined Aquifer: An aquifer overlain and underlain by impermeable layers. Groundwater in a confined aquifer is under pressure greater than atmospheric pressure and will rise in a well above the point at which it is first encountered.

F. Construction: All acts necessary to create a water well as defined at paragraph BB herein.

G. Domestic Purpose: 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.

H. Groundwater: That part of the subsurface water which is in the zone of saturation.

I. Grout: Material such as cement, neat cement, bentonite clay or other such material approved by KDH&E used to create a permanent impervious watertight bond between the casing and the undisturbed formation surrounding the casing or between two or more strings of casing.

J. Grout Tremie Pipe or Grout Pipe: A steel or galvanized steel pipe or similar pipe having equivalent structural soundness that is used to conduct pumped grout to a point of selected emplacement during the grouting of a well casing or plugging of an abandoned well or test hole.

K. Heat Pump Hole: A hole drilled in installed piping for an earth coupled water source heat pump system, also known as a vertical closed loop system.

L. Household Purpose: Water used for drinking, culinary and ablutionary purposes.

M. Inactive Status: A water well that is not presently operating but is maintained in such a way that it can be put back in operation with a minimum of effort.

N. Pitless Well Adaptor or Unit: An assembly of parts installed below frost line which will permit pumped groundwater to pass through the wall of the casing or extension thereof and prevent entrance of contaminants.

O. Potable Water: Water free from impurities in amounts sufficient to cause disease or harmful physiological effects in humans and conforming to the most recent KDH&E primary drinking water standards.

P. Private Water Supply: A water well supply used for domestic purposes, excluding public water supplies, semi-public water supplies and water supplies used for the watering of livestock on lands exceeding ten acres.

Q. Public Water Supply: A water supply 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.

R. Pump Pit: A water tight structure constructed at least two (2) feet away from the water well and below ground level to prevent freezing or pumped groundwater and which houses the pump or pressure tank, distribution lines, electrical controls, or other appurtenances.

S. Reconstruct: The repair, replacement or alteration of an existing water well. Minor repairs, replacements and alterations of above ground components are excluded from the term "Reconstruct".

T. Sanitary Well Seal: A manufactured seal installed at the top of the well casing which, when installed, creates and air and watertight seal to prevent contaminated or polluted water from gaining access to the groundwater supply.

U. Semi-Public Water Supply: A water supply used for domestic purposes serving three (3) to nine (9) residential units (rental or under separate ownership) on a piped system.

V. Static Water Level: The highest point below or above ground level which the groundwater in the well reaches naturally.

W. Test Hole: Any excavation constructed for the purposes of determining the geologic, hydrologic and water quality characteristics of underground formations.

X. Treatment: The stimulation of production of groundwater from a water well, through the use of Hydrochloric Acid, Muriatic Acid, Sulfamic Acid, Calcium or Sodium Hypochlorite, polyphosphates or other chemicals and mechanical means, for the purpose of reducing or removing Iron and Manganese Hydroxide and oxide deposits, Calcium and magnesium carbonate deposits and slime deposits associated with iron or manganese bacterial growths which inhibit the movement of groundwater into the well.

Y. Uncased Test Hole: Any test hole in which casing has been removed or in which casing has not been installed.

Z. Unconfined Aquifer: An aquifer containing groundwater at atmospheric pressure. The upper surface of the groundwater in an unconfined aquifer is the water table.

AA. Water District: Any special district authorized and empowered by state statutes to plan, construct and/or operate a public water supply system.

BB. Water Well: Any excavation that is drilled, cored, bored, washed, driven, dug jetted, or otherwise constructed, when the intended use of such excavation is for the location, diversion, artificial recharge, or acquisition of groundwater.

CC. Water Well Contractor or Contractor: Any individual, firm, partnership, association or corporation who constructs or treats a water well. The term shall not include: A) an individual constructing, reconstructing or treating a water well located on land owned by the individual, when the well is used by the individual for farming, ranching, or agricultural purposes or for domestic purposes at he individual's place of abode; or B) an individual who performs labor or services for a licensed water well contractor at the contractor's direction and under the contractor's supervision.

Article 2: Semi-Public Water Supplies

Section I. Requirements for Semi-Public Water Supplies

No person shall operate or maintain a semi-public water supply system that has been:

A. Constructed or reconstructed after January 1, 1988 until it has been inspected and a permit issued by the Agency.

B. Temporarily or permanently enjoined as a public health nuisance by a court of competent jurisdiction.

C. Found by the Agency not to comply with the provisions of this code and written notice thereof has been given to the owner or his agent.

Section II. Conditions of Use

In addition to the requirements of Article 3 of this Chapter, which pertain to private water wells, the following shall be done and reviewed by the Agency prior to the issuance of a permit, to assure water quality for the public:

A. An initial test for all contaminants for which primary drinking water standards have been established by the KDH&E.

B. An initial and at least annual bacterial and nitrate analysis.

C. A partial chemical analysis is to be done initially and every three (3) years thereafter. And should include at a minimum analysis for chloride, hardness, iron, manganese, sodium, sulfate and total hardness.

D. Other tests such as a screen for pesticides, volatile organic chemicals, and heavy metals may be required, at the direction of the Agency, to protect the public's health.

The water samples shall be collected by the Agency and sent to the KDH&E lab or other state certified lab for analysis. The fee for the analysis is the responsibility of the owner of the water supply or his representative.

Article 3: Private Water Supplies

Section I. Permit

No person shall construct or reconstruct any private water supply on any premises subject to the regulations of this code until he has obtained a permit therefore from the Agency.

Section II. Approved Plans

No permit to construct or reconstruct a private water supply on premises subject to the regulations of this code shall be issued until the plan showing the location of the supply has been approved by the Agency.

Section III. Use Limitations

A. No permit for drilling a water well for private water supply purposes shall be issued to any person when in the discretion of the Agency the property can be served at a reasonable cost by a public water supply, or when the water supply to be accessed constitutes a significant, quantified health risk.

B. No use of surface water (lakes, ponds, or streams) as a source of water for a private water supply shall be permitted:

C. No person shall sell, lease or rent any real estate upon which is located a private or semi-public water supply which fails to comply with the provisions of this Code after written notice of the defective condition has been given to the owner or responsible person by the Agency.

Section IV. Construction

All persons constructing or reconstructing a water well shall comply with the minimum requirements for construction as established in the most current edition of the KDH&E Articles 12 and 30.

Section V. Backflow Prevention

Private water supplies used for irrigation or livestock watering shall be fitted with an approved functional backflow prevention device as described in the latest version of the U.S. Environment Protection Agency Cross-Connection Control Manual.

Section VI. Plugging of Abandoned Wells, Cased and Uncased Test Holes

All abandoned water wells shall be plugged pursuant to K.A.R. 28-30-1-10. Water wells not being used shall be put on inactive status or plugged depending on the future potential use of the well as noted in K.A.R. 28-30-7 (f) (1) – (7).

Section VII. Inactive Status

Landowners may obtain the KDH&E's written approval to maintain wells in an inactive status rather than being plugged if the landowner can present evidence to KDH&E as to the condition of the well and as to the landowner's intent to use the well in the future. As evidence of intentions, the owner shall be responsible for properly maintaining the well in such a way that:

A. The well and the annular space between the hole and the casing shall have no defects that will permit the entrance of surface water or vertical movement of subsurface water into the well;

B. The well is clearly marked and is not a safety hazard;

C. The top of the well is securely capped in a watertight manner and is adequately maintained in such a manner as to prevent easy entry by other than the landowner;

D. The area surrounding the well shall be protected from any potential sources of contamination within a one hundred (100) foot radius;

E. If the pump, motor or both, has or have been removed for repair, replacement, etc., the well shall be maintained to prevent injury to people and to prevent the entrance of any contaminant or other foreign material;

F. The well shall not be used for disposal or injection of trash, garbage, sewage, domestic wastewater or storm runoff; and

G. The well shall be easily accessible to routine maintenance and periodic inspections.

Section VIII. Separation from Pollution Sources

Well locations shall be approved by the Agency with respect to distances from pollution sources and compliance with local regulations. The following minimum standard shall be observed.

A. The horizontal distances between the well and the potential source of pollution or contamination such as sewer lines, pressure sewer lines, septic tanks, lateral fields, pit privy, seepage pits, fuel or fertilizer storage, pesticide storage, feed lots or barnyards shall be one hundred (100) feet or more.

B. Proper drainage in the vicinity of the well shall be provided so as to prevent the accumulation and ponding of surface water within fifty (50) feet of the well. The well shall not be located in a ravine or any other drainage area where surface water may flow into the well.

C. When sewer lines are constructed of cast iron, plastic or other equally tight materials, the separation distance shall be ten (10) feet or more.

D. All wells shall be twenty-five (25) or more from the nearest property line, allowing public right-of-ways to be counted; however, a well used only for irrigation or cooling purposes may be located closer than twenty-five (25) feet to an adjoining property where:

1. Such adjoining property is served by a sanitary sewer and does not contain a septic tank system, disposal well or other source of contamination or pollution; and

2. The property to be provided with the proposed well is served by both a sanitary sewer and a public water supply.

Section IX. Water Well Disinfection

All persons constructing, reconstructing, or treating, a water well and removing the pump or pump column, replacing a pump, or otherwise performing an activity which has potential for contaminating or polluting the ground water supply shall be responsible for adequate disinfection of the well, well system and appurtenances thereto.

Chapter 4

Public Water Supply Protection

Article 1: General Provisions

Section I. Purpose and Intent

The provisions of this chapter are adopted for the purpose of protecting the sources of water for public water supplies through the regulation and control of practices contributing to non-point source pollution within wellhead protection zones that have been approved by the governing body of the public water supply and the Reno County Board of County Commissioners.

Section II. Definitions

In addition to the definitions provided in Chapters 1,2 and 3 of this code, the words, terms and phrases listed below, for purposes of this Chapter are defined as follows:

A. Animal Unit: Means a unit of measurement calculated by using the most current formula described by K.S.A. 65-171d and any future amendments thereof.

B. Confined Animal Feeding Operation: Means any lot, pen, pool, or pond, which is:

1. Used for the confined feeding of animals or fowl for food, fur or pleasure purposes;

2. Not normally used for raising crops; and

3. Not used for growing vegetation for animal food.

C. Publicly Owned Treatment Works: Means any wastewater treatment facility licensed by the Kansas Department of Health and Environment which is operated, owned or licensed to a benefit district, township, city, county or state unit of government

D. Wellhead Protection Zone: Means a groundwater sensitive area identified by the public water supplier as being within the zone of capture, withdrawal or other accepted method of delineating a public water supply well. Also referred to as source water protection zone or groundwater protection zone.

Article 2: Prohibited Practices

Section I. Confined Animal Feeding Operation

No person shall operate a confined animal feeding operation within a wellhead protection zone that has been constructed after the effective date of this Code that:

A. Contains more than 1,000 animal units or;

B. Contains any number of animal units within 300 feet of a public water supply well.

Section II. Unlined Pit Privies

No person shall sell, use, lease or rent any unlined pit privy within a wellhead protection zone.

Section III. Commercial Storage Tanks

Owners of commercial storage tanks located within a wellhead protection zone shall report to the public water supplier for their respective wellhead protection zone any release or unaccounted loss of inventory within 24 hours.

Section IV. Publicly Owned Treatment Works Sludge

Within a wellhead protection zone, publicly owned treatment works sludge shall not be applied on or below the ground.

Chapter Five

Code Enforcement

Article 1: Unlawful Conduct

Section I. General Provisions

For the purpose of enforcing the regulations, conditions, requirements and prohibitions established by this Code the following acts shall be unlawful:

A. Obstruction of the Agency

No person shall willfully impede or obstruct a representative of the Agency in the discharge of his official duties under the provision of this Code.

B. Operation without a Permit or License

No person shall do any act or engage in any activity for which a permit or license is required by this Code unless first obtaining such permit or license. The existence of emergency conditions may be a defense to this provision.

C. Failure to Comply with Emergency Order

No person shall fail or refuse to comply with an emergency order of the Agency issued under Section A of this chapter.

D. Failure to Comply with Permit or License

No person shall fail to comply with the specified terms or conditions of any permit or license issued under this Code nor do any act or engage in any activity of conduct regulated by this Code without a valid permit or license, nor continue activities or conduct subject to any permit or license which has expired, been suspended or been revoked under this Code.

E. Failure to Comply with Regulations

No person shall do any act or engage in any activity which is regulated by any Section or Chapter of this Code except as authorized and permitted under the Code, and no person shall knowingly operate any activity regulated by this Code in any manner which does not comply with the requirements of the conditions and regulation specified in this Code.

F. Falsification and Misrepresentation

No person shall falsify nor misrepresent any fact, information, produce or data provided, required or submitted for any application, permit, license, inspection, examination, investigation, report, record, test or other determination required under this code.

G. Improper Discharges

No person shall cause nor permit any wastewater or sewage to be discharged to or upon the ground surface, the ground water, or other natural water course which creates or causes a health hazard or unlawful pollution, and no person shall cause nor permit any effluent from any private sewage disposal system to be so discharged, or to leak, seep or otherwise escape from the system such as to create or cause a health hazard or unlawful pollution. No cesspools or seepage pits are allowed under this Code.

H. Failure to Repair or Correct

No person shall fail or refuse to repair or to correct any defect, deficiency or other condition, whether natural or otherwise, in any private or semi-public wastewater system which has caused, or which the Agency determines is likely to cause, within reasonable certainty, any improper discharge or other health hazard, unsanitary condition, or unlawful pollution.

I. Prohibited Practices

No person shall permit, or allow to permit, any prohibited practice as established by this Code.

Article 2: Enforcement Proceedings

Section I. Emergency Orders

The Health Officer of Reno County, or other authorized code enforcement office or representative of the Agency, may issue such orders or directives as he deems necessary upon a determination that such action is required to prevent, contain or eliminate an obvious violation of this Code or an imminent threat to the health or safety of the public.

A. Health Risk

Whenever the Health Officer finds that an emergency exists which requires immediate action to protect the public health he may without notice or hearing, issue an order reciting the existence of such an emergency and require that such action be taken as he may deem necessary to meet the emergency, including the suspension of the permit or license. Notwithstanding any other provisions of this Code, such order shall be effective immediately and shall by enforceable in Reno County District Court.

B. Work Stoppage

Whenever any work is being performed on a private sewage disposal system contrary to the provisions of this Code, the Agency representative may order the work stopped immediately by issuing an emergency order and serving it on any persons engaged in the doing or causing such work to be done, and any such person shall forthwith stop such work until authorized by the Agency to proceed with the work.

C. Compliance

Any person, to whom an emergency order is directed, shall comply therewith immediately, but upon written request filed within five (5) days of issuance, shall be afforded a hearing before a Hearing Officer as soon as possible. Such a hearing shall be held within ten (10) days of the issuance of such emergency order.

Section II. Suspension of Permit or License

The Agency may suspend any permit or license that it issues if the holder thereof does not comply with the requirements of this Code. The suspension shall become effective ten (10) days after the holder of the license or permit, or the premises subject to the permit, receives written notice of such suspension. The holder or

other aggrieved party may request a hearing in accordance with Article 4, Section I of this Chapter. After a hearing, the hearing officer may uphold the suspension as originally ordered or modify it as he sees fit, but in no event shall he enter an order of suspension for a period longer than that set out in the original order. Both the original order and any order entered after an appeal may condition the length of suspension upon correction of the conditions upon which the suspension is based.

Section III. Revocation of License

The Agency may revoke a license for serious or repeated violations of any of the requirements of this Code or for interference with the Agency in the performance of its duties.

Prior to revocation, the Agency shall notify, in writing, the holder of the license, of the specific reason (s) for which the license is to be revoked and that the license shall be revoked at the end of the ten days following service of such notice unless a written request for hearing is filed with the regulatory authority by the holder of the license within the 10-day period. If no request for hearing is filed within the 10-day period, the revocation of the license becomes final.

Whenever a revocation of a license has become final, the holder of the revoked license may make written application for a new license and pay the fee required.

Article 3: Penalties and Prosecution

Section I. Penalties

Any violation of any provision or requirement of this Code or the commission of any unlawful act or conduct specified in this Chapter shall be deemed to be a Class C misdemeanor punishable upon conviction by a fine of not less than $100.00 and not more than $500.00. Each day's violation shall constitute a separate offense.

Section II. Prosecution

The Agency is hereby authorized to apply to the District Court for enforcement of this Code, unless a municipality adopting this Code provides otherwise for the prosecution of violations arising within its municipal jurisdiction. In that event, the City Attorney of the municipality adopting this Code may prosecute violations of this Code in the name of the city in the municipal court of that city.

Article 4: Appeals

Section I. Appeal for Hearing

Except as otherwise provided in Section V or this Chapter, any person aggrieved by any notice, final order, or denial of a permit or license by the Agency files with the Agency within ten (10) days after the date of issuance of the notice, order, or denial a written request for a hearing setting forth the grounds on which the request is made. The filing of the request for hearing shall operate as a stay of any notice or order except an emergency order.

Section II. Hearing Officer

The Agency shall designate, in writing, one or more officials to act as hearing officer to hear appeals under this Code. The officer may be an employee of the Agency but shall not be the person who, in the name of the Agency, made the determination or issued the order upon which the appeal is based.

Section III. Conduct of Hearing

Upon receipt of the appeal request, the Hearing Officer shall set a time and place for a hearing, and shall give the petitioner written notice thereof. The hearing shall be commenced not later than ten (10) days after the date on which the request for hearing was filed; provided, that upon request of the aggrieved party, the hearing may be postponed for a reasonable time beyond such ten-day period.

A record shall be made at the hearing, and the aggrieved party may be represented by counsel or other authorized person. The Agency shall have the burden to sustain any notice, final order, or other decision subject to the appeal

Section IV. Decision

Within ten (10) days after the conclusion of the appeal hearing, the hearing officer shall issue a written decision to the petitioning party. That decision may sustain, modify or deny the decision of the Agency.

Section V. Proceedings of Hearings

A summary of all proceedings of hearing, including the findings and the decision of the Hearing Officer, together with a copy of every notice and order related thereto, shall be filed with the Agency.

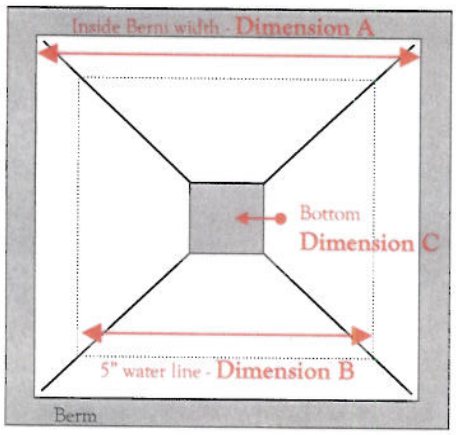
Section VI. Application of State Law Procedures

The appeal of any final decision action of the Agency which is taken under the authority of a state administrative agency in application of the Laws of the State of Kansas shall be subject to and conducted in accordance with the Kansas Administrative Procedures Act, K.S.A. 77-501, et Seq., and the provisions of that Act shall supersede any and all time limitations and procedures otherwise specified in this Code.

The Kansas Administrative Procedures Act shall not apply to any proceeding arising out of an appeal from any decision or action taken solely under the authority of the Board of County Commissioners or the governing body of any city.

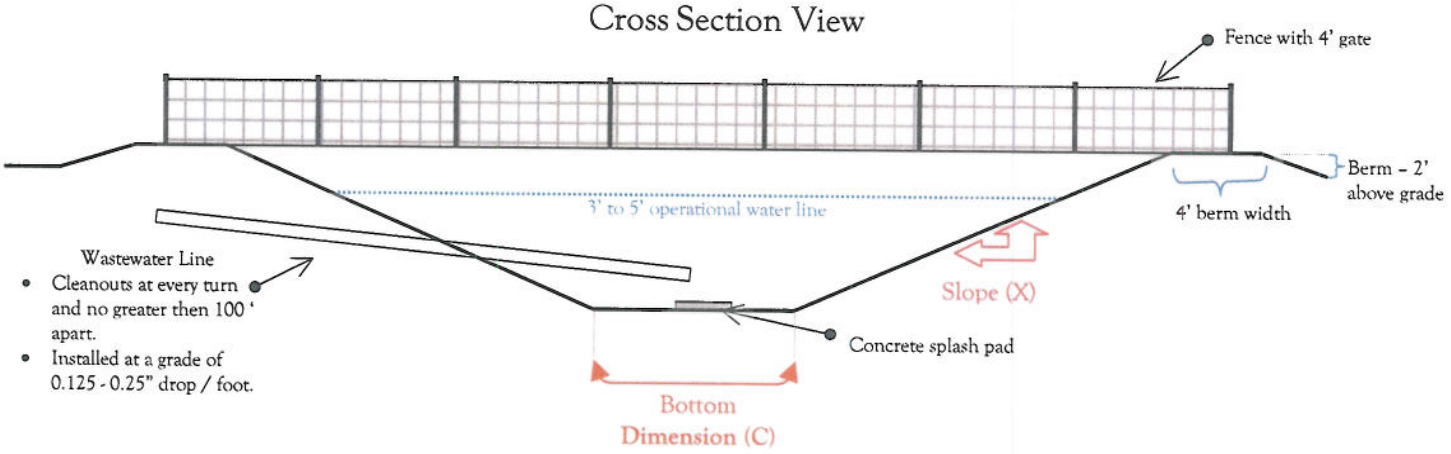
Appendix 2: Lagoon Construction Diagram

Top View



Dimensions				
Lagoon Size	A	B	C	X (Slope)
M-40	52' x 52'	40' x 40'	10' x 10'	3 : 1
M-45	59' x 59'	45' x 45'	10' x 10'	3.5 : 1
M-50	64' x 64'	50' x 50'	15 x 15"	3.5 : 1

Cross Section View

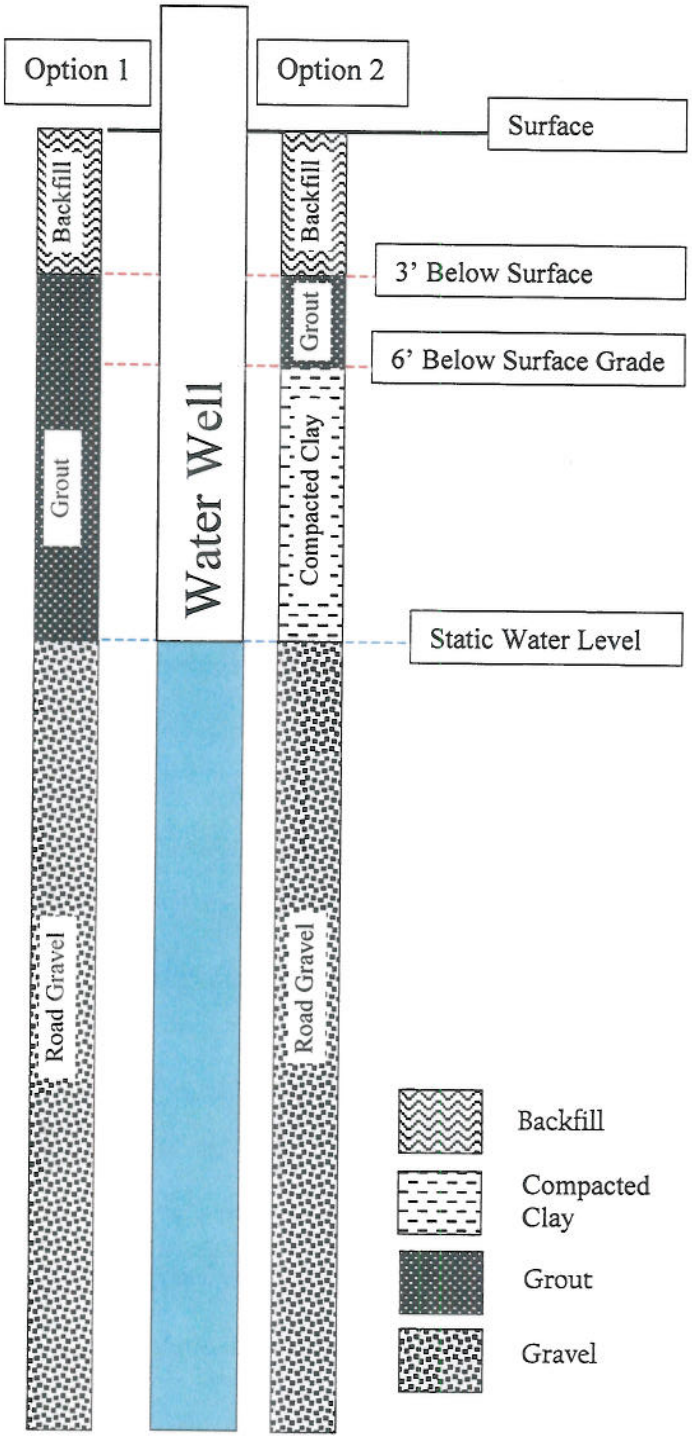


Fencing Requirements

- Mesh size opening no larger than 2" by 4".
- Minimum fence height of 4 feet.
- Minimum gate width of 4 feet.
- Fence on outside of berm if livestock are present.
- Fence may be on top of berm if no livestock are present.
- Constructed within 15 days from date of initial operation.

Reference: Environmental Health Handbook,
KDH&E, Kansas State University, Kansas Association of Sanitarians

Appendix 3: Well Plugging Diagram



*Reference:*Article 30, KDH&E

Plugging an Abandoned Well

Remove any well pumps or water line from well and, if needed, as much debris as possible.

Measure:
- Depth of Well
- Depth to Static Water Level
- Diameter of Well Casing

Using these measurements, determine the amounts of each fill material required.

Materials Needed:
- Approved Grout (typical materials used are bentonite clay and cement)
- Clean fill dirt of clayey consistency (optional)
- Clean road gravel
- Bleach

Excavate around casing to a depth of 3' below surface grade.

Cut off well casing at level of at least 3' below surface grade.

Add bleach to the well (One gallon is usually sufficient).

Add clean road gravel up to the static water level.

Remove the displaced water from the water well.

Fill remaining well casing using one of the following options.

Option 1
Add grout from static water level to top of remaining well casing forming a "mushroom plug" around the top of the casing.

Option2
Add clean clay in increments of 2-3', tamping down each time to remove any voids, to a depth of 6 feet below surface grade.
Add grout material to top of remaining well casing and form a "mushroom plug" around top of casing

A minimum of 3 feet of grout is required.

Backfill hole to original surface grade with excavated dirt.

For additional information contact the Reno County Health Department.

Appendix 4: Animal Units Definition

Animal	Animal Unit Value
Horses	2.0
Mature dairy cattle	1.4
Beef cattle *Weighing more than 700 pounds*	1.0
Cattle *Weighing less than 700 pounds*	0.5
Swine *Weighing more than 55 pounds*	0.4
Ducks	0.2
Swine *Weighing 55 pounds or less*	0.1
Sheep or Lambs	0.1
Laying Hens or Broilers *If the facility has a liquid manure system*	0.033
Turkeys	0.018
Laying Hens or Broilers *If the facility has continuous overflow watering*	0.01

Total Animal Units = (# Animals) x (Corresponding Animal Unit Value)

Reference: K.A.R. 28-16-56C (O) 1-10

Reno County Health Department

"Healthy living in a healthy community."

RENO COUNTY HEALTH DEPARTMENT
209 West Second Avenue
Hutchinson, Kansas 67501-5232
(620) 694-2900
Fax (620) 694-2901
www.renogov.org/health

Wastewater Permit Process

Dear Homeowner:
The table below outlines the sequence of events needed to comply with the Reno County Sanitation Code permitting process.

Step	Applicant (Homeowner or Contractor)	Health Department
1	Completes permit application form	
2	Pays permit fee of $275; $50 trip charge applied on 3rd visit & each visit thereafter	
3	Excavates soil profile pit	
4		Conducts site evaluation including soil profile
5		Fills out soil profile worksheet & inspection worksheet
6		Mails worksheets to applicant
7	Completes construction plan	
8		Obtains construction plan
9		Reviews all worksheets and waiver request
10		Informs applicant & contractor of any needed changes
11		Issues Permit
12		Permit mailed to applicant and contractor informed
13	Receives approved permit	
14	Begins construction process with contractor	
15		Checks on progress either by phone or site visit with owner
16	Contacts the Health Department to schedule final inspection on construction	
17		Conducts final inspection
18		Completes final inspection form and mails copy to owner along with educational materials

Please contact the Reno County Environmental Health Staff @ 620-694-2900 as needed.

Email Environmental Health Staff at eh@renogov.org

Reno County Health Department

209 West 2nd Ave Hutchinson KS 67501 Phone 620-694-2900 Fax 620-665-8883

Issued According To Construction Plan

Permit

20 - RP

Permit Type:
- ☐ Private ☐ Semi-Public ☐ Waiver (See Attached)
- ☐ New Construction ☐ Replacement ☐ Repair
- ☐ Wastewater ☐ Well
- ☐ Floodplain (Permit and/or waiver will be filed with Reno County Register of Deeds. See attached specialized permit)

Wastewater Type:
- ☐ New Tank
- ☐ Septic System
- ☐ Enhanced Treatment (requires yearly maintenance)
- ☐ Lagoon (must be fenced 15 days within use)
- ☐ Existing Tank (if existing tank is found to be in poor condition during installation of remaining system it must be replaced with a KDHE certified septic tank with appropriate capacity.)
- ☐ Privy
- ☐ Lateral
- ☐ Gravel Bed
- ☐ Holding Tank
- ☐ Mound
- ☐ Experimental: _____ _____
- ☐ Maintenance: _____
- ☐ See attached letter

☐ *Semi Public Permit Holders: Please submit Annual Inspection Reports to Reno County Health Department EH Staff by expiration date to avoid any lapse of Annual Permit.*

Permit Holder _____

Permit Address SAMPLE PERMIT

City State Zip

System Location _____

Issued By Construction is not to begin without a permit issued

Issue Date _____ Expiration Date _____

Owner Acknowledgement: _____ Date: _____

Contact the Reno County Health Department
Environmental Health Staff to schedule an inspection

Do not cover any Wastewater Systems without an inspection
All Water Wells require an inspection upon completion

This permit authorizes the construction or re-construction of either an on-site Water Well or on-site Wastewater System conforming to the requirements of the Reno County Sanitation Code and the construction plan approved for the site referenced above.

It is the homeowner's responsibility to assure future compliance with the Reno County Sanitation Code

2022 Reno County Licensed Wastewater Contractors

FirstName	LastName	Company	Address	City	State	Zip	Phone	Performs Enhanced Treatment Maintenance
Anson	Railsback	Advantage Plumbing Heating & Air, Inc	1618 W Nickerson Blvd	Hutchinson	KS	67501	620-662-1865	YES
Steve	Worthington	All Clear Sewer	1727 E 4th	Hutchinson	KS	67501	620-664-0374	YES
Sheldon	Yoder	All Pro Plumbing, Heating & Air, Inc.	1810 S Kent Rd	Hutchinson	KS	67501	620-662-8285	NO
Josh	Barkley	Barkley Plumbing Corporation	938 Corey Rd.	Hutchinson	KS	67501	620-663-9655	YES
Deron	Bartlett	Bartlett Plumbing Heating & Air	5104 S Valley Pride	Hutchinson	KS	67501	620-665-3673	YES
Wally	Becker	Becker Building Company	114 Harvey	Halstead	KS	67056	316-772-3202	NO
Duaine	Seck	Butch Seck Backhoe Service	2315 N Mayfield	Hutchinson	KS	67502	620-921-1131	NO
Ron	Vincent	Carl Vincent Service	420 S. Main	Hutchinson	KS	67501	620-662-0009	YES
Travis	Eck	Eck Services	810 E D Ave	Kingman	KS	67068	620-491-0065	NO
Jeff	Gilbert	Gibby's Sewer and Drain	319 W 5th Ave	Hutchinson	KS	67501	620-899-6620	NO
Jim	Hiebert	HII Mobile Home, LLC	100 S Airport Rd	Hutchinson	KS	67502	620-662-4552	NO
Keith	Seck	Keith Seck Bone Springs Excavation	4816 N Bone Springs Rd	Sterling	KS	67579	316-619-6567	NO
Tim	Lubbers	Lubbers Excavating	25220 W 69th North	Mt. Hope	KS	67108	316-444-2333	YES
Jeff	Meyer	Meyer Electrical	609 S Buffalo	Stafford	KS	67578	620-234-5336	NO
Robert Cody	Borrowman	Plumbing Solutions and Service	6200 N Plum	Hutchinson	KS	67502	620-200-0609	YES
Barry	Eckhoff	Preferred Plumbing, Inc	2213 E Longview Rd	Hutchinson	KS	67502	620-960-1448	NO
Scott	Kempton	Scooter Plumbing LLC	2533 Ave N	Little River	KS	67457	620-899-4880	NO
Joseph	Seiwert	Seiwert Services INC	31500 W 21st N	Garden Plain	KS	67050	316-531-2930	
Scott	Walton	Walton Plumbing & Heating, Inc.	112 N Broadway	Sterling	KS	67579	620-278-3462	YES

2022 Reno County Licensed Sanitary Service Contractors

FirstName	LastName	Company	Address	City	State	Zip	Phone
Corey	Flickinger	B & E Sewer Service	17911 NW 12th	Burrton	KS	67020	620-463-2800
Ron	Vincent	Carl Vincent Service	420 South Main	Hutchinson	KS	67501	620-662-0009
Travis	Eck	Eck Services	810 E Ave D	Kingman	KS	67068	620-491-0065
Marvin	Nisly	Nisly Brothers, Inc	5212 S Herren Road	Hutchinson	KS	67501	620-662-6561
Scott	Walton	Walton Plumbing	112 N Broadway	Sterling	KS	67579	620-278-3462

MODEL COUNTY SANITARY CODE

Kansas Department of Health and Environment

Local Environmental Protection Program

12/2/2021

TABLE OF CONTENTS

CHAPTER I

POLICY, ADMINISTRATION AND ENFORCEMENT

ARTICLE I

GENERAL PROVISIONS

Section 1. **Title**

This Code shall be known and referred to as the _____ County Environmental Sanitary Code.

Section 2. **Legal Authority**

This Code is adopted under the authority granted to the Board of County Commissioners under application of Federal Law and the Laws of the State of Kansas, including K.S.A. 19-3701 et seq., as amended, and pursuant to the powers and authorities of the Board of County Commissioners under K.S.A. 19-101a; and Sec. 5 of Article 12 of the Kansas Constitution and by K.S.A. 12-3301 et seq., if adopted by any city.

Section 3. **Findings and Declaration of Policy**

A fundamental duty of every government is the protection of the health and safety of its citizens and to thereby promote the public welfare. Consequently, the Board of County Commissioners hereby finds, determines and declares that it is necessary to adopt a uniform system of rules, regulations and standards to eliminate and prevent environmental conditions that are or may be hazardous to the public health, safety and welfare and to thereby promote the safe, economical and orderly development and conservation of the land and resources of the County.

Section 4. **Purpose**

The purpose of this Code is:

A. To promote the public health, safety, comfort and well-being of the public; and
B. To prescribe the procedures to be followed in administering this Code; and
C. To prescribe rules, regulations, standards and enforcement procedures to minimize, control, or eliminate potential or actual sources or causes of disease, infection, contamination or pollution, whether in food, solid waste, sewage, air, water or other media; and
D. To protect the integrity of water, air, soil, and natural resources, including aquatic biota, flora, fauna, and wildlife through the prevention of pollution and degradation of the environment by regulation of activities which may affect environmental conditions.

Section 5. **Jurisdiction and Application**

This Code and all authorized rules, regulations, restrictions and requirements shall apply from and after the effective date of adoption, to and throughout the unincorporated areas of _____ County, Kansas, and to all persons, property, establishments and business activities located or conducted, regardless of ownership and acreage, within _____ County, Kansas and outside the municipal boundaries of any City.

Section 6. **Public Health Jurisdiction and Application**

This Code and any or all rules, regulations, restrictions and requirements shall apply to and throughout all areas of _____ County, Kansas, including those areas located within the municipal boundaries of any City, whenever authorized or required under application of the Laws of the State of Kansas or of the United States, whether by statute, contract, rule or regulation, or pursuant to the jurisdiction of the _____ County Board of County Commissioners.

Section 7. **Severability**

If any clause, sentence, paragraph, section or subsection of this Code shall be adjudged invalid for any reason whatsoever, such judgement shall not affect, repeal or invalidate the remainder thereof, but shall be confined to the clause, sentence, paragraph, section or subsection thereof found to be invalid.

Section 8. **Disclaimer of Liability**

This Code shall not be construed or interpreted as imposing upon the County, or its officials or employees: (1) any liability or responsibility for damages to any property; or (2) any warranty that any installation, system, or portion thereof that is constructed or repaired under permits or inspections required by this Code will function properly. In addition, any employee charged with enforcement of this Code, who acts in good faith and without malice in the discharge of his or her duties, shall not thereby be personally liable and is hereby relieved from personal liability for damage which may occur to any person or property as a result of the discharge of his or her duties.

Section 9. **Amendments and Additions**

This Code may be supplemented or its provisions may be amended by Resolution adopted by the Board of County Commissioners, as provided by K.S.A. 19-3705, and any such amendments or additions shall be incorporated within and codified as a part of this Code. Any changes, modifications or additional provisions adopted and imposed by State or Federal Law, rule or regulation which are applicable to and administered through the jurisdiction of _____ County, Kansas, shall be incorporated within and made a part of this Code, as authorized by State or Federal law.

Section 10. **Repeal and Supersede Effect**

This Code shall supersede any and all previously adopted Resolutions or regulations, which are, in whole or in part, in conflict with any provision of this code, where applicable, and any rule, regulation or resolution which is or was in effect upon the effective date of this Code shall be repealed to the extent necessary to give this Code full force and effect, and in the case of any conflict of provisions, whether real or apparent, then the provisions of this Code shall govern wherever applicable.

Section 11. **Effective Date**

This Code shall become effective from and after the date of adoption by the Board of County Commissioners, or other appropriate jurisdiction, and publication of notice as required by law.

ARTICLE II

ADMINISTRATION

Section 1. **Administrating Authority [Administrative Agency]**

Unless otherwise specifically designated within a separate and particular Chapter or Article of this Code, the [Administrative Authority], and/or designees, shall have the primary authority and responsibility for the administration of this Code.

Under the authority of any particular Chapter or Article of this Code, the [Administrative Authority] may implement such administrative procedures, consistent with this Code, as deemed necessary for the effective administration of any regulations or which may be required or imposed under application of the laws of the State of Kansas or the United States.

The Board of County Commissioners may designate code enforcement officers who shall be responsible for the enforcement of all provisions of this Code in coordination with the [Administrative Authority] or his or her designees.

Section 2. **Administrative Actions and Decisions**

It is the intent of this Code to establish regulations and standards for the protection of the public health and safety. To the extent possible, all administrative actions and decisions required or authorized for the administration of this Code shall be made solely in accordance with the standards enumerated in the Code. Whenever, in the course of administration, it is necessary to make an administrative decision or take action for which standards are not provided, then the decision or action shall be made according to the purpose and intent of this Code so that the result will best serve the public health and safety.

Section 3. **Interpretation of Terms or Words**

All terms and words used in this Code shall be interpreted and given meaning according to their common understanding and to provide reasonable application of the purpose and intent of the Code. Whenever the context requires, in the application of this Code, the terms and phrases used shall be interpreted in the following manner:

A. Words appearing in the singular number shall include the plural, and those appearing in the plural shall include the singular.

B. Words used in the present tense shall include the past tense and future tense, and words used in the future tense shall include the present and past tense.

C. The word "shall" is mandatory; and the word "may" is permissive.

D. The phrase "this Code" shall refer to the Code and all the authorized rules, regulations, restrictions and requirements and the phrase "the regulations" shall include rules, regulations, restrictions and requirements authorized by the Code.

Section 4. **Technical and Scientific Terms**

Unless otherwise defined, any technical or scientific term used within this Code or within any rule, regulation, restriction or requirement shall be given the meaning most commonly known and applied within the appropriate literature of manuals applicable for that science, industry or technological skill.

Section 5. **Vested Interests**

Nothing contained in this Code or any regulations shall be deemed or construed to grant any vested interest or protected right to any person beyond the express limited terms of any permit or ruling issued under this Code, and the Code and regulations are expressly declared to be subject to amendment, change or modification.

Section 6. **Compatibility with Other Laws**

Nothing contained in this Code or any regulations shall be deemed to alter or modify the application of any other laws, codes or regulations which are or may be applicable to the property, use, business activity or other object or matter regulated under this Code, and any permit, approval or other condition given or acknowledged under this Code shall be limited in effect to the requirements of this Code and shall not, under any circumstance, relieve the holder from compliance with all other applicable laws, codes, regulations or requirements.

ARTICLE III

PERMITS AND LICENSES

Section 1. **Permits and Licenses**

No person shall conduct, carry-on or perform any business or activity identified in this section without first having obtained a valid permit or license in conformance with the requirements of this code.

A. **Onsite Wastewater Disposal System – Permit Required**. Every person who installs, removes, alters, repairs or replaces, or causes to be installed, removed, altered, repaired or replaced any onsite wastewater disposal system or part thereof shall, prior to commencement of any work, apply for and obtain a permit to perform such work and no onsite wastewater disposal system shall be installed, removed, altered, repaired or replaced except pursuant to a permit issued under this article.

B. **Onsite Wastewater System Installer – License Required**. Every person who conducts the activity of an Onsite Wastewater System Installer, as defined in Chapter I of this code, shall apply for, obtain and maintain a valid license to perform that activity.

C. **Sanitary Disposal Service Operator – License Required**. Every person who engages in or conducts the activity of a Sanitary Disposal Service Operator, as defined in Chapter I of this code, shall apply for, obtain and maintain a valid license to perform that activity.

D. **Wastewater System Inspector and/or Water Well Inspector – License Required**. Every person who engages in or conducts the activity of a Wastewater Inspector and/or Water Well Inspector, as authorized in Chapter II of this code, shall apply for, obtain and maintain a valid license to perform that activity.

E. **Disposal.** Waste materials removed from onsite wastewater systems or privies must be disposed of in a manner approved through a written plan submitted to the Administrative Agency for

a. Transporting by a licensed wastewater hauler to a permitted wastewater treatment facility; or
b. Discharge or Injection on cropland/grassland (see Land Application)

F. **Land Application- Permit Required.** A licensed Sanitary Disposal Service Operator must obtain a Land Application Permit from the [Administrative Authority] to legally land apply domestic septage to a parcel(s) of land. Among other requirements, the domestic septage must be chemically treated with lime for thirty (30) minutes or incorporated into the soil within six (6) hours of the application as per federal regulation, 40 CFR Part 503 (EPA 503 Program, Land Application of Septage). No discharge of such wastewater shall be permitted:

i. Within one-hundred (100) feet of any water well, or
ii. Within _____ (__) feet of other properties, or
iii. Within thirty-three (33) feet of any surface water body, or
iv. Onto saturated or frozen ground, without prior approval of the Administrative Agency.

G. **Applications for Permits and Licenses**. All persons required by this code to obtain a permit or license shall make application for such permit or license to the_____ County _____ Department on standard forms provided for that purpose.

H. **Issuance of Permit or License**. After receipt of an application for a permit or license required by this code, the [Administrative Authority] shall begin such investigations 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 _____ (___) business days depending upon information and data requested. If the permit or license is denied, the [Administrative Authority] shall send the applicant a written notice with reasons for denial stated thereon.

It shall be the duty of the person performing the work authorized by a permit to notify the [Administrative Authority] when work is ready for any required inspection. Such notification shall be given not less than ____ (__) hours during normal office hours before the work is to be inspected.

I. **Right of Access**. Application for, and acceptance of, any permit issued under this code shall grant to any representative of the [Administrative Authority] the right to enter upon any property subject to the permit, at any reasonable time during standard business hours, with or without notice, for the purpose of inspection to determine and ensure qualifications for and compliance with the permit, and shall allow for reasonable access to and review of records, property or other materials necessary to perform the inspection.

J. **Authorized Activity**. Each permit or license issued under the authority of this code shall be limited to and expressly provide for the type and manner of activity permitted for the holder and shall not be used nor applied for any other purpose, type or manner of activity. The permit or license shall specifically refer to the activity description contained within the permit or license application, and any change in the type, manner, scope or location of any activity shall require application for and modification of the permit or license.

K. **Permit/License Non-transferable**. No permit or license required by this code shall be transferable, nor shall any fees required and paid be refunded.

L. **Term Expiration**. Each permit or license issued under the authority of this code shall clearly state the date of issuance, the term of the permit or license, and the expiration date. The term of each permit or license issued under this code shall be for a period not to exceed _____, unless otherwise specified.

M. **Renewal.** Any permit or license issued under the authority of this code may be renewed for one or more additional terms upon application for renewal filed with [Administrative Authority]. No permit or license which has been expired for more than _____ days or which is subject to revocation, for any reason, may be renewed, and such permits or licenses may be reissued only upon filing of a complete application for a new permit or license.

N. **Errors and Omissions**.

1. The issuance of a permit shall not prevent the [Administrative Authority], and/or designees from thereafter requiring the correction of errors in plans and specifications or from preventing construction activity being carried on thereunder when such activity would be in violation of this code or of any other code or resolution or from revoking any permit or license when issued in error.

2. [Administrative Authority], and/or designees may, in writing, suspend or revoke a permit or license issued under provisions of this code whenever the permit is issued in error or on the basis of incorrect information provided by the applicant.

O. **Standard Fees**. The _____ County Board of County Commissioners shall establish a schedule of fees for all permits and licenses required by this code, payable upon submission of the application for such permit or license.

Section 2. **Supplemental to State Regulations**

The permit(s) or license(s), and all fees, conditions and regulations imposed under this code shall be supplemental to and in addition to any permits, licenses, fees or regulations imposed or required by any other law, including those administered by the Kansas Department of Health and Environment.

Section 3. **Administration of State Requirements**

In the event that any rule, regulation or requirement arising under the laws of the State of Kansas is assumed or administered through the jurisdiction of the _____ County Board of County Commissioners, and/or the [Administrative Authority], and/or designees, acting under any lawful executive or administrative order or pursuant to a contract agreement, whereby the jurisdiction of any state authority is delegated to or administered by _____ County, then any permit or license issued or issuable by the state authority shall apply and shall satisfy the permit or license requirements imposed by this article subject to the following conditions and exceptions:

A. **Permit or License Fees**: The permit or license fees required by this article, Section 1, shall apply and be required for payment if greater than or equal to any state-imposed fees. The state-imposed fees shall apply whenever it is greater, but only one fee shall be imposed and required for payment.

B. **Conflict in Regulations or Requirements**: All rules, regulations, restrictions and requirements of this code shall remain in effect and shall apply to any activity or condition covered by this code except when in direct conflict with a provision of the state rules or regulations, in which case the state-imposed rules or regulations shall apply. Terms and conditions, rules, requirements, regulations or limitations which are supplemental to those imposed by the state and which are not specifically or expressly excluded or prohibited, shall not be considered conflicting and shall be imposed and in effect.

C. **Additional Regulations**: Rules, regulations and requirements applicable to any conduct, activity, condition or standard which is not expressly regulated by the state, but which is regulated by this code, shall be and remain in full force and effect as specifically applied under this code for and within _____ County Kansas.

ARTICLE IV

INSPECTIONS AND INVESTIGATIONS

Section 1. **Inspections Required**

Physical site inspections shall be authorized and performed for all permitted or licensed activities under this code.

Section 2. **Inspection Reports**

A written inspection by the [Administrative Authority], and/or designees shall be made for all inspections conducted under the authority of this code, stating the name of the inspector, the date and time of the inspection, the type of inspection, and the property inspected. The report shall enumerate all findings made during the inspection. The report is a public document.

Section 3. Inspection Scheduling

Whenever inspections are required under this code to be scheduled for any installation, construction, initial activity or for correction of any violation or other non-conforming condition, it shall be the duty of the holder of the permit or license or the operator of the establishment to promptly notify the [Administrative Authority], and/or designees and schedule the time and date for the inspection.

Section 4. Property Transfer Inspections

Whenever any building or use requiring sanitation is connected to or is served by a private wastewater system, and/or private water supply, and is offered for sale, including contract for deed, transfer, leasing or renting, the seller shall have such system inspected by a licensed inspector approved by the [Administrative Authority], and/or designees. When this process is completed and approved, the Administrative Agency will issue the proper permit. Upon discovery by the Administrative Agency that the seller or seller's agent has failed to request a system inspection under this code, the Administrative Agency shall require the seller or seller's agent to arrange an inspection within 14 days of notice of violation. The seller shall be responsible for bringing any violation discovered during the inspection up to code, at his or her expense. Inspection shall not relieve any person of compliance with the requirements of this Code.

The protocol for inspection of private wastewater systems shall include, but not be limited to:

A. **Septic Tank with Absorption Field Systems:** Septic tanks must be pumped dry and inspected to determine volume, tank composition, baffles or tees at the inlet and outlet and the septic tank's general structural integrity, location, measurement and mapping of the absorption field lines (if records of the location are available).

B. **Pump Tanks with Absorption Field Systems**: Pumping dry and inspection of the pump tank to determine volume, tank composition, baffles or tees at the inlet and outlet and the pump tank's general structural integrity, location, measurement and mapping of the absorption field lines (if records of the location are available). Pump operation and high-water alarms.

C. **Aerated Tanks**: Aerator operation, manufacturer and maintenance contract. Pumping and inspection of the septic tank to determine volume, tank composition, baffles or tees at the inlet and outlet and the septic tank's general structural integrity. Location, measurement and mapping of the absorption field lines (if records of the location are available). Pump operation and high-water alarms.

D. **Composting Toilets**: Operation and design standards of the specific system.

E. **Drip Irrigation System**: Operation and design standards of the specific system.

F. **Holding Tanks**: Structural integrity, alarm system, pumping records and verification of use.

G. **Mound System**: Design Standards and operation of the individual system.

H. **Wastewater Stabilization Pond (Lagoon)**: Dimensions; type and integrity of fencing; vegetation (growth such as cattails, trees and duckweed); evidence of erosion; evidence of seepage; any structures over 10 ft. tall within 50 ft. of the operating level; color of the water; and cleanouts every 100 ft. or less.

I. **Private Water Supply**: Identify type of water supply (drilled well, hand dug well, other). If private water supply is a well, determine whether it is properly sealed.
If there is a public water supply and private supply on same property, determine if there are any cross connections.

ARTICLE V.

ENFORCEMENT PROCEEDINGS

Section 1. **Emergency Orders**

The [Administrative Authority], and/or designees, may issue such orders or directives as deemed necessary upon a determination that such action is required to prevent, contain or eliminate an obvious violation of this code or an imminent threat to the health or safety of the public.

A. **Health Risk**: Whenever [Administrative Authority], and/or designees determines that a condition exists which requires immediate action to protect public health, may without prior notice or hearing, issue an emergency order stating the nature of the threat to public health and directing that action be taken deemed necessary to eliminate or minimize such condition. Notwithstanding any other provisions of this code, such order shall be effective immediately upon issuance and shall be put in writing as soon as practicable.

B. **Work Stoppage**: Whenever any work is being performed on an onsite wastewater disposal system, or onsite water (private wells) supply system, contrary to the provisions of this code, the [Administrative Authority], and/or designees may order the work stopped immediately by issuing an emergency order and serving it on any persons engaged in the doing or causing such work to be done, and any such person shall forthwith stop work until authorized by the [Administrative Authority], and/or designees to proceed with the work.

C. **Compliance**: Any person, to whom an emergency order is directed, shall comply therewith immediately, but upon written request filed within ____ (__) days of issuance, shall be afforded a review of the order by [Administrative Authority], and/or designees. Such review shall be held within ____ (__) days of the issuance of such emergency order.

Section 2. **Suspension of Permit or License**

The [Administrative Authority] may suspend any permit or license issued if the holder thereof does not comply with the requirements of this code. The suspension shall become effective ____ (__) days after the holder of the license or permit, or the person in charge of such establishment or premises subject to the permit or license, receives written notice of such suspension. The holder or other aggrieved party may request an appeal hearing in accordance with Article VI of this code. After a hearing, [Administrative Authority] may uphold the suspension as originally ordered or modify it, but in no event shall the [Administrative Authority] enter an order of suspension for a period longer than that set out in the original order. The original order, or any order entered after an appeal, may condition the length of time of the suspension upon correction of the conditions upon which the suspension is based.

Section 3. **Revocation of Permit or License**

The [Administrative Authority] may revoke a permit or license for violations of any of the requirements of this Code or for interference with the _____ County _____ Department in the performance of its duties.

Prior to revocation, the [Administrative Authority] shall notify, in writing, the holder of the permit or license, or the person in charge of the establishment or premises subject to the permit or license, of the specific reason(s) for which the permit or license is to be revoked and that the permit or license becomes final. Any holder of the license or permit, or the person in charge of the establishment or premises which is subject to the notice of violation, may request an appeal hearing as provided in Article VI of this Code. If no request for an appeal hearing is filed within ____ (___) days of the notice of violation, the revocation of the permit or license becomes final.

Whenever a revocation of a permit has become final, the holder of the revoked permit may make a written application for a new permit and pay the fee required.

Whenever a revocation of a license has become final, the holder of the revoked license shall not be eligible for a new license unless or until the [Administrative Authority] is assured that such licensee is qualified to perform all duties in compliance with the requirements of this code.

Section 4. **Abatement of Nuisances**

In accordance with K.S.A. 65-159; the [Administrative Authority] may maintain a civil action in injunction, in the name of the Board of County Commissioners of _____ County, or any municipality in which this code is applicable, to abate and enjoin a nuisance, which have, or threaten to have a detrimental effect on the environment or the health of the public.

ARTICLE VI

APPEALS

Section 1. **Appeal for Hearing**

Except as provided in Article V of this Chapter, any person aggrieved by a notice, final order or denial of a permit or license may request an appeal hearing on the matter before the [Administrative Authority] provided such person files the request within _____ (__) days after the date of the notice, final order or denial. Said request for a hearing shall be in writing setting forth the grounds in which the appeal request is made. The filing of the request for a hearing shall operate as a stay of any notice, final order or denial except an emergency order.

Section 2. **Hearing Officer**

The [Administrative Authority] shall designate, in writing, one or more officials to act as the department's Hearing Officer to hear appeals under this code. The officer may be an employee of the department but shall not be the person who, in the name of the department, made the determination or issued the order upon which the appeal is based.

Section 3. **Conduct of Hearing**

Upon receipt of the appeal request, the [Administrative Authority] shall assign a date and time for an appeal hearing, and designate a Hearing Officer. A copy of the appeal hearing date, time and place shall be mailed to each part of the appeal request and to the applicant, interested person, governmental agency or other appropriate party.

At the conclusion of the appeal hearing, the Hearing Officer shall issue a written decision to the petitioning party. The decision may sustain, modify or deny the decision of the [Administrative Authority].

A summary of all proceedings of the appeal hearing, including the findings and the decision of the Hearing Officer, together with a copy of the appeal request, every notice and order related thereto, shall be filed with the _____ County _____ Department.

Section 4. **Application of State Law Procedures**

The appeal of any final decision or action of the [Administrative Authority] which is taken under authority of a State Administrative Agency in application of the laws of the State of Kansas shall be subject to and conducted in accordance with the Kansas Administrative Procedures Act, K.S.A. 77-501, et seq. and the provisions of that Act shall supersede any, and all, time limitations and procedures otherwise specified in this code.

The Kansas Administrative Procedures Act shall not apply to any proceedings arising out of an appeal from any decision or action taken solely under the authority of the Board of County Commissioners.

ARTICLE VII:

VIOLATIONS AND PENALTIES

Section 1. Prohibited Practices and Unlawful Conduct

The following acts shall be unlawful:

A. **Obstruction of Administrative Agency**. No person shall willfully impede or obstruct a representative of the _____ County _____ Department in the discharge of his or her official duties under the provisions of this code.

B. **Operation without a Permit or License**. No person shall do any act or engage in any activity for which a permit or license is required by this code unless first obtaining such permit or license.

C. **Use of Non-Approved Systems**. No person shall use, or cause to be used, any private onsite wastewater system constructed after the adoption of this code until it has been inspected and approved by the Administrative Agency.

D. **Failure to Comply with Emergency Order**. No person shall fail or refuse to comply with an emergency order of the Administering Agency issued under Article V of this Chapter.

E. **Failure to comply with Permit or License**. No person shall fail to comply with the specified terms or conditions of any permit or license issued under this code nor do any act or engage in any activity or conduct regulated by this code without a valid permit or license, nor continue activities or conduct subject to any permit or license which has expired, been suspended or been revoked under this code.

F. **Failure to Comply with Regulations**. No person shall do any act or engage in any activity which is regulated by any Article, Section or Chapter of this code except as authorized and permitted under the code, and no person shall knowingly operate any activity regulated by this code in any manner which does not comply with the requirements of the conditions and regulations specified in this code.

G. **Falsification and Misrepresentation**. No person shall falsify nor misrepresent any fact, information, product or data provided, required or submitted for any application, permit, license, inspection, examination, investigation, report, record, test or other determination required under this code.

H. **Improper Discharges**. No person shall cause nor permit any wastewater to be discharged to or upon the ground surface, into the groundwater or natural surface water course which creates or causes a health hazard or unlawful pollution, and no person shall cause nor permit any effluent from any onsite wastewater disposal system to be so discharged, or to leak, seep or otherwise escape from the system such as to create or cause a health hazard or unlawful pollution.

I. **Failure to Repair or Correct**. No person shall fail or refuse to repair or correct any defect, deficiency or other condition, whether natural or otherwise, in any onsite wastewater disposal system, or onsite water (private wells) system, which has caused, or

which the [Administrative Authority], and/or designees has determined is likely to cause, within reasonable certainty, any improper discharge or other health hazard, unsanitary condition, or unlawful pollution. If the violation is not corrected within the time frame set forth by the [Administrative Authority], the Director may issue an order for the property to be vacated until corrections have been made and any fines have been paid.

Section 2. Penalties

Any violation of any provision or requirement of this code or the commission of any unlawful act or conduct specified in this Article shall be deemed to be a Class "C" misdemeanor pursuant to K.S.A. 19-3707 and punishable upon conviction by a fine not to exceed two-hundred dollars ($200) for each offense. Each day's violation shall be a separate violation.

Section 3. Prosecution

The County Attorney/Counsel, as provided by K.S.A. 19-3707, shall prosecute violations of this code and is hereby authorized and directed to file appropriate actions for such prosecution upon request of the [Administrative Authority]. Actions of injunction, mandamus, and *quo warranto* may be utilized for enforcement of these codes and shall be governed by the provisions of the Kansas Code of Civil Procedure. The County Attorney shall act within _____ (__) days of receipt of documentation of this violation.

ARTICLE VIII:

CODE VARIANCE

Section 1. Variances

The owner or representative of any land, or the user of any onsite wastewater treatment system or private water supply regulated by this code may file a request for a Variance to the [Administrative Authority] for any standard, specification, rule or regulation prescribed by this code which is not otherwise discretionary under the authority of the [Administrative Authority] prior to construction. After receipt of the request, the [Administrative Authority], and/or designees shall prepare a report and recommendation regarding the request for a Variance. A copy of the report shall be sent to the requesting party and to any appropriate Planning or Governing body or interested person or party requesting such report. The report shall include specific reasons or purpose for a recommendation of approval or denial.

In making any decision varying or granting an exception of the rules or modifying any provision of this code, the [Administrative Authority], and/or designees may impose such restriction terms, time limits and other appropriate safeguards as deemed necessary to protect the public interest and assure compliance with the purpose and intent of this code, including performance bonds, or other surety acceptable to the County, guaranteeing the completion of any required

improvement. Such surety shall be in favor of the County and properly executed prior to the granting of any permit. The amount of the surety shall be based on a general estimate of the cost of said improvement as determined by the Board of County Commissioners.

ARTICLE IX:

DEFINITIONS

Section 1. **Definitions**

The following words, terms and phrases appear in more than one Chapter of this Code and, thus, have general application and usage. Words, terms, and phrases appropriate or applicable to specific Chapters within this Code are defined, where necessary, within those Chapters. Unless the context requires or specifies otherwise, the following words, terms or phrases, as used in this Code, shall be given the meaning defined in this section.

A. Abandoned Onsite Wastewater System: System which is determined by the Administrative Agency to have been permanently abandoned, or is in such a state of disrepair as to make it unusable
B. Absorption System: An onsite wastewater disposal system for the treatment of wastewater by means of a leaching field and adjacent soil or by other means of absorption into the ground.
C. Absorption Bed: Below-grade soil treatment area consisting of a wide and shallow excavation containing distribution media and multiple laterals.
D. Absorption Field (Lateral Field): A configuration of onsite wastewater absorption trenches or bed installed to absorb wastewater effluent from a septic tank or other solids-removal device.
E. Absorption Trench (Lateral Trench): Below-grade soil treatment area, having fixed horizontal separation, consisting of a shallow excavation with a width of 3 feet or less, containing distribution media and one lateral.
F. Access: Entry into or upon any real estate, structure or vehicle including any part thereof.
G. Administrative Agency: The agency or official designated in any of the Chapters contained in this code to administer the provisions of that Chapter or any Section therein.
H. Administrative Authority: The Board of County Commissioners or their appointed representative.
I. Administrative Rules: Any regulation adopted by an administering agency, which the agency determines to be necessary and appropriate to enable it to fulfill its duties and responsibilities under this Code.
J. Advanced/Enhanced Onsite Wastewater Treatment System: A private wastewater disposal system, approved by the [Administrative Authority], and/or designees, which effectively provides secondary treatment of septic tank effluent to reduce levels of pollutants before discharge to an approved underground soil distribution system.

K. Aerated/Aerobic Wastewater Treatment System: An onsite wastewater disposal system employing biological action, which is enhanced by the addition of air or oxygen, and has been tested and meets NSF Standard 40.

L. Agricultural Purpose: A land use related to the production of livestock or crops, including growing crops or pasture and functions immediately and necessarily related thereto, and the feeding of livestock by the resident on the land, but does not include any structure used as a dwelling or the sewage treatment system servicing such dwelling.

M. Alternative Onsite Wastewater System: Any onsite wastewater system which has been approved by the [Administrative Authority], and has proven reliability and performance in field use, but which differs in design or operation from septic tank and absorption-field system and/or wastewater stabilization pond (lagoon).

N. Applicant: Any person who submits an application or requests permission to do some act regulated by this Code.

O. Application: The application form provided by an Administering Agency, including the filing fee and any other supporting documents required by the agency.

P. Aquifer: A subsurface water-bearing bed or stratum of sand, gravel or bedrock which stores or transmits water in recoverable quantities or is capable of yielding water to, or transmitting water contaminants or pollutants to, wells or springs.

Q. Authorized Representative: A person who is designated by the [Administrative Authority] to administer the provisions of this Code or any Section therein.

R. Bedrock: Consolidated rock that underlies the soil and other unconsolidated material.

S. Blackwater: Wastewater generated from toilets and kitchen sinks. Blackwater has the potential to be pathogenic.

T. Board of County Commissioners: The Board of County Commissioners of _____ County, Kansas.

U. Board of Health: The Board of County Commissioners acting as the Board of Health for _____ County, Kansas.

V. Cesspool: A drywell that receives untreated wastewater and which may have an open bottom and /or perforated sides. Prohibited by this Code.

W. Class V Well: Those wells defined in the Federal Underground Injection Control (UIC) program as Class V [40 C.F.R. 146.5]. A septic system receiving only domestic wastewater and having the potential to serve 20 or more persons a day or any septic system receiving non-domestic wastewater is a Class V Well. Class V UIC wells prohibited by Kansas law include large capacity cesspools, motor vehicle disposal wells and industrial waste disposal. (K.A.R. 28-46)

X. Commercial Wastewater: Any wastewater produced as a by-product of any commercial process or operation, other than domestic sewage.

Y. Composting Toilet: A self-contained toilet system using little or no water, designed to decompose human wastes through microbial action (composting), and store the resulting material for further treatment and disposal.

Z. County: _____ County, Kansas.

AA. Distribution Box: A watertight chamber below the outlet level of a septic tank or treatment unit from which wastewater enters the absorption system.

BB. Domestic Wastewater/Sewage: Wastewater/Sewage which is normally characterized as residential wastewater/sewage, not from commercial or industrial activity, and which originates primarily from kitchen, bathroom and laundry sources, including waste from food preparation, dishwashing, garbage grinding, toilets, baths, showers and sinks.

CC. Effluent: Sewage water, or other liquid, partially or completely treated or in its natural state, discharging from a septic tank, subsurface wastewater infiltration system, aerobic treatment unit, or other treatment system or system component.

DD. Engineer: A licensed professional civil engineer registered with the State of Kansas.

EE. Engineered: Plans, drawings, designs and calculations prepared and stamped by a professional engineer licensed by the State of Kansas.

FF. Environmental Health Handbook (EHH): A technical resource for professionals, service providers and technicians who work with private wastewater and private water systems. First published in 1992 by the Kansas Department of Health and Environment, and revised in 2002 and 2020.

GG. Establishment: Any structure or self-contained unit therein, including single- and multiple-family dwellings, commercial and industrial buildings, schools, churches, and public institutions.

HH. Experimental/Innovative System: A type of onsite wastewater treatment and disposal system that by construction, design, or function does not conform to requirements set forth in this Code and/or Bulletin 4-2 design. This category is designed to allow innovative systems that have been demonstrated to work in practice or theory to be considered for use in the County. Each Experimental/Innovative System must undergo a thorough [Administrative Authority] review prior to system installation and be granted a variance under the provisions of this Code.

II. 100-Year Floodplain: Land which is subject to inundation as a result of flooding having a one percent (1%) chance of occurrence annually; and more recently referred to as a Special Flood Hazard Zone- AE, as defined by the Federal Emergency Management Agency (FEMA).

JJ. Graywater: Wastewater from sources within single-family residences, including showers, bathtubs, clothes-washing machines, hand-washing lavatories and sinks (excluding water from soiled diapers, kitchen sinks and dishwashers) that are not used for disposal of hazardous or toxic ingredients.

KK. Grease Traps: A plumbing device designed to intercept or trap most greases and solids before they enter a wastewater disposal system. These reduce the amount of fats, oils and greases (FOGs) that enter the septic tank and absorption field.

LL. Hearing Officer: Any person designated in this Code, or by an administering agency, to hear appeals from decisions made by an agency representative relating to the enforcement and administration of this Code.

MM. Holding Tank: An approved watertight receptacle for the retention of wastewater before, during or after treatment.

NN. Industrial and Commercial Wastewater Systems: Any wastewater system for wastewater produced as a by-product of any industrial and commercial process or operation, other than domestic wastewater. Uses involving industrial or commercial wastewater must comply with regulations involving industrial and commercial wastes as approved and permitted by the Kansas Department of Health and Environment. Industrial or commercial wastewater (from shops, car washes, funeral homes, etc.) shall not be permitted to discharge to any onsite domestic wastewater system.

OO. Industrial Wastewater: Any wastewater produced as a by-product of any industrial process or operation, other than domestic sewage.

PP. Installer: See Onsite Wastewater System Installer.

QQ. Lagoon: A constructed basin surrounded with berms and lined with either low-permeability soils or a synthetic liner, which uses wind or mechanical aeration, sunlight, and natural bacteria to treat domestic wastewater through physical, chemical, and biological processes.

RR. Lateral: Pipe, tubing or other conveyance, used to carry and distribute effluent.

SS. Lateral Field: See Absorption Field.

TT. Lateral Trench: See Absorption Trench.

UU. Law: Includes Federal, State and Local statutes, ordinances, regulations and resolutions.

VV. Major Repair: See Structurally Significant Alteration.

WW. Minor Repair: Means the replacement or repair of onsite wastewater system subcomponents, such as pipes, switches, pumps, valves, baffles, or such similar type of work as designated by the [Administrative Authority], and/or his/her designees.

XX. Mound System: An above-ground timed pressure dosed onsite wastewater system used to absorb wastewater from septic tanks in cases where seasonably high water table zones, high bedrock considerations, slowly permeable soils, or limited land areas prevent conventional subsurface absorption systems.

YY. Onsite: A water supply and/or a sanitation system located entirely within the boundaries of the legal description of the property which they serve.

ZZ. Onsite Wastewater System Installer: Any person duly licensed to construct, install and/or repair any onsite wastewater disposal systems authorized by this Code.

AAA. Onsite Wastewater System, or Onsite System: A Private Onsite Wastewater Treatment and Disposal System, along with attendant pipes and appurtenances, which is not required to have a Kansas Water Pollution Control Permit issued pursuant to K.S.A. 65-165.

BBB. Permit: The written permission to perform some act regulated by this Code, including, for example, permission to construct or permission to operate.

CCC. Person: An individual, corporation, partnership, association, state or political subdivision thereof, federal agency, state agency, municipality, commission or interstate body or other legal entity.

DDD. Plat: A map or plan of an area of land showing actual or proposed features.

EEE. Pollution: Any induced alteration of the physical, chemical, biological, and radiological integrity of water, air, soil (both surface and subsurface) or contamination of food or foodstuffs.

FFF. Premises: Any lot or tract of land and all buildings, structures or facilities located thereon.

GGG. Privy (Sanitary Privy): A facility with a water-tight receptacle made of concrete or other acceptable material designed to receive, store and provide for periodic removal of non-water carried wastes from the human body. Material removed from the vault is transported and disposed at a licensed public waste treatment facility or by other means as approved by the [Administrative Authority], and/or his/her designees.

HHH. Public Wastewater Disposal System: A sanitary wastewater system which holds a state water pollution control permit and collects untreated or partially treated wastewater from individual establishments, premises, or recreational areas and transports it by means of pipes or conduits to a plant or other location for treatment.

III. Pump Tank: Tank used in addition to a septic tank, which contains a sewage effluent pump, control floats, control panels, and a high-water alarm.

JJJ. Pumper/Hauler: See Sanitary Disposal Service Operator.

KKK. Rathole: A well completed above the water table so that its bottom and sides are typically dry except when receiving fluids. Prohibited by this code.

LLL. Sanitarian: An agent determined by the County to be trained in the sanitary sciences (i.e. biology, chemistry, geology, physics and mathematics) who acts as an inspector or health official.

MMM. Sanitary Disposal Service: The pumping out and/or removal of wastewater [sewage, sludge or human excreta] from onsite wastewater disposal systems [any source, including but not limited to sanitary privies, vaults, septic tanks, lagoons, waterless sewage systems, private wastewater treatment systems, or holding tanks] and/or the transportation of such material to a point of temporary storage or final treatment or disposal.

NNN. Sanitary Disposal Service Operator: Any person duly licensed to perform sanitary disposal services.

OOO. Sanitary Sewage/Wastewater System: Any system of pipes, tanks, conduits, structures or other devices for the collection, transportation, storage, treatment and disposal of sewage.

PPP. Seepage Pit: A subsurface excavation three (3) feet or deeper, which may be filled or lined with rock or gravel and receives untreated wastewater. Prohibited by this Code.

QQQ. Septage: Either liquid or solid material removed from a septic tank, portable toilet, type III marine sanitation device, or similar system that receives only household, non-commercial, non-industrial sewage. Domestic septage does NOT include grease from grease traps.

RRR. Septic Tank: A watertight, accessible, covered receptacle that is designed and constructed to receive wastewater either before, during or after treatment. All septic tanks shall be designed, constructed and approved according to specifications set forth by the Kansas Department of Health and Environment Bulletin 4-2.

SSS. Sewer District: Any County-operated municipal sewer system duly formed, authorized and empowered to plan, construct and operate a public sewer system in accordance with K.S.A. 19-27a01.

TTT. Sludge: Refers to the layer of solids that accumulates at the bottom of a septic tank or other wastewater system component, as a result of the wastewater treatment or detention processes. Often consists of decomposed or partially decomposed solids, active or inactive microbial bulk, and any other materials that are heavier than the liquid wastewater.

UUU. Structurally Significant Alteration: When used in reference to private onsite wastewater treatment and disposal systems, the term "structurally significant alteration" means any of the following—a) Replacement, repair or extension of any portion of the lateral field of the system, and/or b) Replacement, repair or reconstruction of any one or more of the critical parts of the system, as designated by the Administrative Agency; and/or c) Any replacement, repair or reconstruction which, upon review of the Administrative Agency, is determined to be an essential repair in order to correct or prevent an improper discharge or imminent health hazard or unlawful pollution.

VVV. Subdivision: Any land, vacant or improved, which is divided or proposed to be divided into two (2) or more lots, parcels, sites, units, plots, or interests for the purpose of sale, lease or financing of development, either on the installment plan or upon any and all plans, terms and conditions, including re-subdivision. "Subdivision" includes the division or development of residential and nonresidential-zoned land, whether by deed, meets and bounds description, map, plat or other recorded instrument.

WWW. System Failure: A condition of an onsite wastewater system that threatens the public health by inadequately treating sewage or creating a potential for direct or indirect contact between sewage and the public, as determined by the [Administrative Authority]. System failure includes, but is not limited to: surface discharge of sewage; seeping of incompletely

treated sewage; unfenced or fenced lagoons that do not restrict access by children, pets and/or livestock; any other condition determined by the [Administrative Agency] to be a health hazard to humans, pets or livestock.

XXX. Trunk Line: The solid pipe from which the laterals extend in a septic tank system.

YYY. Variance/Waiver/Exception: A rule, exception or exemption granted by the [Administrative Authority], and/or his/her designees from the specific terms of this Code which will not be contrary to the public interest and where owing to special conditions a literal enforcement of this Code will, in an individual case, result in an unnecessary hardship.

ZZZ. Wastewater Stabilization Pond: See Lagoon.

AAAA. Waterless Toilet: A self-contained toilet system using little to no water, designed to store human waste for further treatment and disposal.

CHAPTER II. WASTEWATER DISPOSAL

ARTICLE I.

GENERAL PROVISIONS

Section 1. **Purpose**

Wastewater is a potential source of disease and a potential hazard to the health, safety and welfare of the public. It also poses a direct threat to the environment as a potential pollutant of the air, water and soil, and presents a hazard to all forms of plant and animal life. It is the purpose of this chapter to provide minimum standards for the sanitary disposal of all wastewater generated or transported within _____ County unless otherwise regulated by a competent authority.

Section 2. **Scope**

All wastewater must be disposed of by the use of an approved wastewater system as defined in this Article. A sanitary wastewater system may be classified as either a public wastewater disposal system or a private onsite wastewater treatment system (POWTS), unless alternative disposal/treatment options have been approved by the [Administrative Authority].

Section 3. **Requirements for Subdivision Development**

After the adoption of this code, no person shall develop any subdivision until the plans and specifications for the wastewater system(s) have been approved by the [Administrative Authority], and/or designees and, when required, by the Kansas Department of Health and Environment. A subdivision is defined as any plat creating two (2) or more lots pursuant to the provisions and requirements set forth in the _____ County Subdivision Regulations.

No township or county planning commission, or zoning board authorized to review plats of subdivisions, shall recommend for approval any plat containing one or more lots or building sites having less than _____ square feet of land available for an onsite wastewater system,

unless a public wastewater system is provided to serve all properties within the subdivision; or a surety bond, in an amount stipulated by the _____ County Board of County Commissioners, is filed with the _____ County Treasurer to guarantee the installation of such public systems.

Section 4. **Rules of Application**

The provisions of Bulletin 4-2 "Minimum Standards for Design and Construction of Onsite Wastewater Systems" published by KDHE and Kansas State University Agricultural Experiment Station and Cooperative Extension Service, March 1997, and as may be amended, is hereby adopted and incorporated into this Code and is set forth herein to assure protection of the public health and environment from all designed, constructed and installed onsite wastewater systems. Requirements established by the KDHE, Bulletin 4-2 and the _____ County Sanitary Code shall apply and be applicable to any and all privately owned onsite wastewater treatment systems now or hereafter installed, used or operated for any facility located within the unincorporated area of _____ County Kansas.

Sections of the _____ County Environmental Sanitary Code may be more stringent than the requirements of KDHE Bulletin 4-2 and have been adopted based on available research and technology.

A. **General Rule**: Unless otherwise provided or excepted in accordance with this Section, as of the effective date of the code, no person shall design, install, replace, alter, repair, use or operate, nor cause or allow the installation, replacement, alteration, repair, use or operation of any onsite wastewater disposal system except as permitted under and as which complies with the established requirements of this code.

B. **Existing Systems Treating Domestic Wastewater**: Any onsite domestic wastewater disposal system lawfully installed prior to the effective date of this code, and used exclusively for domestic sewage, may remain in use if, and as long as:

1. It continues to operate in accordance with the original design and location and does not experience any system failure; and
2. Does not present any hazard to the public health, safety or welfare; and
3. Does not discharge onto the surface of the ground, or waters of the state, as defined in K.S.A. 65-161(a); and
4. Any replacement, structurally significant alteration, enlargement, repair, removal, conversion, improvement or demolition shall comply with the requirements of this code or any later amendments, revisions or versions.
5. The system is found to be adequate and not failing or in need of repairs at the time of property transfer.

Temporary hardship manufactured homes, set up subsequent to natural disaster or accidental destruction of a permanent dwelling or family hardship situations, as permitted by _____ County Regulations, may be connected to existing onsite sanitation systems. Such connections shall be subject to an inspection and compliance with the requirements of this code.

C. **Existing Systems Treating Industrial and Commercial Wastewater**:

1. Discharge of industrial or commercial waste to a soil absorption system is prohibited. Any soil absorption system in commercial or industrial use at the time of passage of this code shall be referred to the Kansas Department of Health and Environment to assure compliance with state and federal requirements.
2. Those systems, which are used exclusively for domestic wastewater, may remain in use, as long as the system is used only for domestic wastewater treatment and satisfies the requirements of this code.

D. **Existing Tracts and Lots of Record**: The owner or representative of any land, which is a tract or lot of record on or before the effective date of this code, may apply for and receive a permit under the applicable provisions of this chapter if:

1. The tract or lot size is at least ____ (__) acre(s); and
2. The installation and use of the system shall be exclusively for onsite wastewater disposal and will comply with all other requirements of this code; and
3. The lot is located in a parcel of land which has received final approval on or before the effective date of this code or the lot or tract is not platted but was duly recorded as a lot or tract of record prior to the effective date of this code; and
4. The lot or tract is not located within the boundaries of any sewer district operated by _____ County.

ARTICLE II.

PUBLIC WASTEWATER DISPOSAL SYSTEMS

Section 1. **Regulation of Municipal or Public Systems**

Any public wastewater system which is maintained and operated by a municipality, by a lawfully created public sanitary sewer district, or by a lawfully organized public improvement district authorized under application of the Laws of the State of Kansas and located in whole or part within _____ County, Kansas, shall be built and operated only as permitted by the rules and regulations of the Kansas Department of Health and Environment.

Section 2. **Policy Regarding Public Wastewater Systems**

Due to unsuitable soil conditions, high ground water table, bedrock being close to the surface of the ground, the density of development permitted by _____ County Zoning and Subdivision Regulations, and the relationship of development to community growth areas, the _____ County Board of County Commissioners may require public wastewater districts to be established in accordance with K.S.A. 19-27a01. The cost of installation, maintenance and operation of the public wastewater district facilities shall be borne by those properties and persons being served by the system.

ARTICLE III.

PRIVATE ONSITE WASTEWATER TREATMENT AND DISPOSAL SYSTEMS

Section 1. **Types**

Private Onsite Wastewater Treatment Systems are classified as being one the following types:

1. Septic Tank & Soil Absorption System
2. Wastewater Stabilization Pond (Lagoon)
3. Other:
    a. Mound System
    b. Holding Tank
    c. Composting Toilet
    d. Alternative Treatment System
    e. Subsurface Drip Disposal System with aerobic treatment
    f. Other system as defined by the County and in compliance with the sanitary code

Section 2. **Proper Maintenance and Operation**

All onsite wastewater disposal systems shall be maintained in good working condition and shall not discharge onto the surface grade or into the groundwater or drain into any stream or roadside ditch or produce any offensive odors or become a breeding place for flies, mosquitoes or rats and other disease vectors. Surfacing of effluent in pools or streams or groundwater contamination will indicate system failure. Whenever the [Administrative Authority], and/or designees shall find any onsite wastewater disposal system malfunctioning and causing any prohibited condition, it shall order the owner and/or user to correct the condition within _____ days.

Some alternative wastewater systems may require additional maintenance in order to function properly. The [Administrative Authority], and/or designees may require a maintenance agreement with a qualified service provider for the life of the system. All records of maintenance performed under a required maintenance agreement shall be provided to the [Administrative Authority], and/or designees within _____ days of completion.

Section 3. **Location of an Onsite Wastewater System**

All Onsite Wastewater Systems must meet the minimum separation distances outlined in the **Table 1** below, unless a variance or rule exception is granted pursuant to Chapter I, Article VIII, Section 1 of this code.

Table 1: Minimum Separation Distances for Onsite Wastewater Systems:

Onsite Wastewater System	Minimum distance (feet)
Septic tank to building foundation	10

Soil absorption field to building foundation	20
Any part of a wastewater system to:	
Public potable water line	25
Private potable water line	10
Property line	10
Public water supply, well or suction line	100
Private water supply well or suction line	50
Surface water course	50
Public Utility Lines (not water)	___
Wastewater Stabilization Pond (Lagoon):	
Property Line	50
Dwelling foundation	50
Private or public water line	___

Section 4. **Location of Onsite Wastewater Systems Below Flood/Full Pool**

A. No portion of an onsite wastewater system shall be located below the flood pool elevation of any reservoir or full pool elevation of any pond, lake or water supply reservoir with the potential to inundate the wastewater system.

B. No pond or swimming pool shall be constructed or maintained so as to discharge or have the potential to discharge water or graywater into an onsite wastewater disposal system which could result in the failure of that system, unless a structure or suitable arrangement approved by the [Administrative Authority], and/or designees, is constructed to protect the on-site wastewater disposal system from such discharge or potential discharge of water.

Section 5. **Location of Onsite Wastewater Disposal Systems Within a 100-Year Floodplain**

Except for wastewater stabilization ponds (lagoons), no portion of an onsite wastewater system shall be constructed within the Special Flood Hazard Zone AE as defined by the Federal Emergency Management Agency (aka: 100-year floodplain) for _____ County. This does not preclude repairs of existing systems, provided other requirements of this code are met. Berms of a wastewater stabilization pond (lagoon) shall be constructed a minimum of one (1) foot above the base flood elevation. Where base flood elevations have not been established, the base flood for the levee shall be determined and certified by a registered professional engineer or licensed surveyor.

Section 6. **Connections to Public Wastewater Disposal Systems**

To the extent feasible, public sewer systems shall be used for the disposal of all wastewater within _____ County. No onsite wastewater system shall be permitted under this chapter whenever a public sewer system is within _____ feet (____') of the property line unless the [Administrative Authority], and/or designees finds that connection to such a sewer is not

feasible or is cost-prohibitive and an onsite wastewater system meeting the requirements of this code can be constructed on the property.

Section 7. Repairs and Corrections

Any onsite wastewater disposal system that cannot connect to a public wastewater system and does not function properly as designed and permitted shall be replaced or repaired. Plans and specifications for the replacement or repairs shall be submitted to and reviewed by the [Administrative Authority], and/or designees, and no repairs or replacements, other than ordinary maintenance, shall be performed without a permit and inspection as required under this code.

Section 8. General System Requirements

The system shall be designed based on wastewater flow, including water used to flush a reverse osmosis or softener system. It should consist of a building connection, a treatment unit such as a septic tank and absorption field. An "absorption field" means a configuration of onsite trenches installed to absorb wastewater effluent from a septic tank or other solids removal device. The system shall be sized to receive all domestic wastewater including laundry waste, whether or not an approved graywater system has been installed. The design of the system shall ensure that the waste discharged to the onsite wastewater disposal system:

A. Does not contaminate any drinking water.

B. Is not accessible to insects, rodents or other possible carriers of disease, which may come in contact with food or drinking water.

C. Does not contaminate surface water or groundwater aquifers.

D. Does not surface above ground level.

E. Does not pose a danger and/or is not accessible to children or animals.

F. Does not give rise to a nuisance due to odor or unsightly appearance.

Section 9. Alternative Sewage Treatment Systems (ASTS)

When site conditions are not conducive to the use of traditional septic systems, an Alternative Sewage Treatment System (ASTS) may be considered by the [Administrative Authority]. ASTS engineered designs must be submitted to the [Administrative Authority] for review and approval during the planning stages of the project. Some alternative systems are well-suited to individual homes, although the cost, complexity, and maintenance of these systems need to be carefully considered. Most use electric pumps or siphons as well as filters, all of which need more monitoring and maintenance than a traditional system.

Alternative sewage treatment systems are defined as any sewage treatment and dispersal system other than a conventional sewage disposal system. ASTSs are used to overcome one or more adverse site or soil condition such as high groundwater, slowly permeable soils, or other limiting condition or where increased wastewater treatment is needed. Unlike conventional sewage

disposal systems, ASTSs vary in design and concept depending on the site and soil conditions. The design goals of all sewage treatment and dispersal systems, including ASTSs, are the prevention of disease, treatment and dispersal of sewage effluent below the surface of the ground, and the prevention of contamination of groundwater and other beneficial waters by discharges from sewage disposal systems. Deed Restrictions may be required depending on the maintenance protocol for each system.

Section 10. Application Procedure

The person applying for the wastewater disposal system permit shall first file an application in writing on a form furnished for that purpose by the [Administrative Authority], and/or designees. The permit application shall:

A. Identify and describe the activity for which permission is requested (e.g. construction, repair, etc.). Identify the location of the activity for which permission is requested by legal description and street address.

B. Indicate the type of establishment which the sanitary wastewater system will serve.

C. Provide a completed soil profile analysis and site assessment for each site location as specified in Section 11 of this Article.

D. Include a system design that is in agreeance with the recommendations of the site assessment. System design should include a legal description of the site, required laterals, septic tank size or lagoon size, number of bathrooms in the dwelling and be prepared by a licensed installer or registered professional engineer.

Section 11. Field Data Requirements

A. **Site and Soil Evaluation**. Four feet (4') of soil beneath the bottom of the soil absorption field is required to assure adequate treatment before wastewater reaches the water table or flows laterally due to the presence of a restrictive layer. An evaluation of the soil including a soil profile are required to assess the ability of a site to provide proper wastewater treatment. In some cases a variance may be allowed when an alternative design is proposed.

B. **Soil Profile**. A soil profile shall be conducted by the [Administrative Authority], and/or designees and shall consist of an onsite visual examination of the soil in location of the proposed absorption field. The applicant shall be responsible for digging a minimum of two (2) three-foot by five-foot by five-foot (3'W x 5'L x 5'D) inspection pits prior to completing the analysis of the soil capabilities evaluation. This evaluation will be used to determine the soil loading rate.

C. **Water Table Borings**. Borings to determine underground water elevation in low areas may be required by the [Administrative Authority], and/or designees. Borings shall be made to a minimum of seven feet (7'). Water table elevations shall not be recorded until sufficient time has elapsed for the stabilization of groundwater (such stabilization in clay soils may require several hours or overnight). Evidence of the presence of water above four feet (4') in the borings shall negate the use of a below-grade absorption field in that area. Location, identification number and depth to water table shall be recorded on the

site plan. Other records of the water table elevation, including seasonal peaks, may be submitted or required.

D. **Rock Borings**. Where surface outcroppings of subsurface rock exist, or are suspected, a sufficient number of borings to a depth greater than four feet (4') may be required by the [Administrative Authority], and/or designees to determine if such condition may interfere with installation, performance or repair of the proposed wastewater treatment system. Evidence of rock in the borings may negate the use of a conventional wastewater treatment system in that area. Boring locations and data shall be recorded by number on the site plan.

Section 12. Plans and Specifications

Plans and specifications shall be drawn to scale, no greater than one inch to fifty feet (1" – 50'), and shall include, but not be limited to the following information:

A. Location of the soil profile samples in relation to the area of the proposed onsite wastewater disposal system.

B. Size of lot, dimensions and relative location of structures.

C. Proposed location of the onsite wastewater disposal system, including all system parts.

D. Retention of Plans: One set of approved plans shall be retained by the Administering Agency and one set of approved plans shall be returned to the applicant.

Section 13. Inspection Required for System Approval

No onsite wastewater disposal system shall be placed into service and no occupancy permit may be issued to any person for use of any establishment to be connected to such system until the system has been inspected and approved by the [Administrative Authority].

A. No inspection nor system approval will be initiated until and unless the applicant or owner has fully complied with the permit and application requirements of this Code. Any required permit must be posted and displayed at the property job site.

B. The applicant, property owner or installer shall provide a minimum of one (1) working day notice to the Administrative Agency to perform any required inspection. An inspection will be conducted only when proper notice is given and only where the site address can be properly located on a map or is posted and visible from the road.

C. There will be at least one (1) inspection required for each wastewater system. A second inspection may be required when determined necessary by the inspector.

Section 14. Applicable Building Codes

In addition to the standards and requirements established under this Chapter, the installation, alteration, construction, reconstruction, repair, replacement or other work for or upon any onsite wastewater system regulated under this Code shall comply with and satisfy the specifications and requirements, whenever applicable, of the International Building Code and the International

Plumbing Code, or similar codifications, as adopted by and in effect in _____ County, Kansas. The Administering Agency shall have available copies of any such code specifications and shall delineate those parts and requirements, which are applicable to private wastewater systems.

Section 15. Abandoned System Requirements

An abandoned wastewater system shall be disconnected from building or facilities, pipes plugged, and receptacles dismantled or removed; and any void space in which such receptacles are contained shall be plugged following procedures described in K-State Research and Extension bulletin MF-2246, Plugging Cisterns, Cesspools, Septic Tanks and Other Holes. Before filling, receptacle contents shall be pumped out and disposed of in accordance with Chapter II, Article XI, Section 3 of this Code (Regulations for Sanitary Disposal Service Operators). The guidance applies to systems that receive only domestic sewage. If the system has received non-domestic sewage, then closure must be coordinated with KDHE, which may require additional sampling and closure activities.

ARTICLE IV.

REQUIREMENTS FOR ONSITE WASTEWATER ABSORPTION SYSTEMS

Section 1. Permits Required

It shall be unlawful for any person, firm, or corporation to erect, construct or perform any structurally significant alteration, remove, convert or demolish any wastewater system regulated by this Code, without first obtaining a wastewater system permit from the [Administrating Authority/Administrative Agency]. Permits issued under this Article shall be subject to the following qualifications:

A. Minimum Lot Size. A minimum lot or tract size of _____ (_) acres shall be required for any permit issued under this Article except as provided in Chapter II, Article I, Section 4.D. This minimum lot size applies to single family homes. Multi-family housing or commercial systems may require greater acreage.

B. Terms and Renewals. A permit issued under this Article shall be valid for a period of _____ (__) months following the date of issuance and may be renewed annually by order of the Administrative Agency.

C. Transfer. A permit issued under this Article shall not be transferable.

D. Standards. No permit shall be issued to any person, property or establishment which does not comply with and satisfy the specified requirements of all applicable Sections of this Code.

Section 2. General System Requirements

The system shall be designed to consist of a building connection and treatment unit, such as a septic tank and absorption field.

Section 3. Application Requirements

The system design shall include the required laterals, and septic tank size as set forth in Section 4 of this Article.

Section 4. Construction Specifications

Septic tanks shall meet the design and construction specifications as set forth in the State of Kansas Department of Health and Environment Bulletin 4-2 and amendments thereto. All tanks associated with the treatment, collection and/or disposal of onsite domestic wastewater (including but not limited to septic tanks, holding tanks, pump tanks, treatment unit tanks) shall be constructed of sound, durable materials, not subject to excessive corrosion or decay and shall be watertight, such as concrete, fiberglass or thermoplastics. Each such tank shall be structurally designed to withstand all anticipated earth or other loads and shall be installed level and on a solid bed. Steel septic tanks shall not be permitted.

A. Tank Requirements. Residential septic tanks shall be a minimum of one thousand (1,000) gallon capacity tanks. Tanks shall be sized according to **Table 2** below.

Table 2: Minimum and Recommended Septic Tank Capacities Based on the Number of Household Bedrooms.[1]

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

[1]*For each additional bedroom, add 300 gallons to the minimum value and 450 gallons to the recommended value.*
[2]*Volume held by the tank below the liquid level (invert of the outlet pipe).*
[3]*Minimum tank size is 1000 gallons.*

B. Pump Tanks.

1. Septic Tank Effluent Pump (STEP) This method involves a two-compartment septic tank with the pump assembly in the second compartment. An approved pump assembly shall be used.

2. Pump Tank. Single or multiple compartment pump tanks shall be precast concrete, fiberglass or polyethylene. The pump tank shall have a minimum capacity of 300 gallons.

All pump tanks shall be equipped with an approved manhole and lid-to-finished grade and shall also be equipped with an approved high water alarm. Any risers shall be brought two inches above grade to prevent infiltration from surface water.

C. Depth. The access manhole cover must be at least 20" diameter and extended to the finished grade and shall consist of a cast iron ring and lid, or other material, which meets the Administrative Authority's approval.

D. Location. The location of the septic system shall be such as to maintain not less than the stated distances as shown in Chapter II, Article III, Section 3.

E. Site Preparation. The area proposed to be occupied by the private wastewater disposal system shall not be disturbed or compacted prior to system installations. Fencing or other appropriate barriers shall be used to designate this area. During and after installation, care shall be taken to avoid compaction or destruction of the soil profile.

Excavation for septic tank and lateral systems shall not be done in such a manner, or in which site and soil conditions are likely to result in over-compaction of the area.

F. Lateral Size The linear footage required for lateral system shall be determined based on soil loading rates and the number of bedrooms' water usage as outlined in Bulletin 4-2.

G. Lateral Trench The acceptable absorption trench length shall not exceed one hundred feet (100') and shall be determined based on trench width as provided in **Table 3** of this Article, with a maximum trench depth not to exceed ____ (__) inches.

Table 3: Trench Separation Distances

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

H. Lateral Field. Standard perforated distribution pipe, with a minimum four inch (4") internal diameter (10' length of rigid PVC) shall be used. There shall be a minimum pipe slope of _____ inch (___") from outlet end of tank to first lateral trench. Individual distribution pipe shall have a maximum slope of _____ inches (__") per one hundred feet (100'). Individual distribution pipe should not exceed one hundred feet (100') from end of lateral trench to trunk line. Distribution lines shall be installed on top of minimum of six inches (6") of washed gravel sized from three quarter inch (3/4") to two inches (2"). Distribution pipe will be covered with a minimum of two inches (2") of washed gravel sized from three quarter inch (3/4") to two inches (2"). The [Administrative Authority] shall approve the fabric material that will be placed over the gravel before backfilling. Serial or "step-down" distribution may be required for excessively sloping yards. Valves or drop boxes may be required on all serial or step-down distribution systems. Depth of the trenches should be a minimum of eighteen inches (18") and shall not exceed _____inches (__").

No part of the lateral field shall be covered by more than twelve inches (12") of backfill. No septic tank lateral field or any portion thereof shall be placed in fill material unless approved by the [Administrative Authority]. All lateral fields shall meet design and construction specifications set forth in the State of Kansas Department of Health and Environment Bulletin 4-2 and amendments thereto.

The lateral field shall be constructed and installed according to requirements approved by the [Administrative Authority] and shall be designed and installed with some method of detection, acceptable to the Department, which allows for and assists in locating the lateral lines in the future.

I. Connections: Inlet and outlet pipe connected to the septic tank shall be four inch (4") solid pipe with a minimum rating of Schedule 40. Solid lines from the outlet pipe of the septic tank shall be four inch (4") solid pipe with a minimum rating of SDR 35. Materials used in the plumbing, wastewater line, and lateral fields shall meet standards specified by the American Society for Testing and Materials (ASTM).

J. Prohibited Connections. No roof, driveway, or floor drain shall be connected to a septic tank system.

K. Additional Requirement for Absorption Field Utilizing Gravelless Lateral Field Technology: The following requirements are in addition to all other requirements noted within this Code:

1. Inspection ports may be required by the [Administrative Authority] for monitoring purposes.

2. The end plates of each chamber trench shall be constructed of plastic, made by the manufacturer of the chambers.

3. The overhead distribution pipe shall be fed into the top of the chamber (unless otherwise specifically approved by the [Administrative Authority]) with a standard PVC tee fitting. The PVC tee shall extend downward midway into the depth of the chamber.

L. Alternative Septic Treatment Systems (ASTS): Enhanced treatment of domestic onsite wastewater systems may be considered after thorough assessment by the [Administrative Agency] in areas of marginal suitability for conventional systems. The [Administrative Agency] may require the alternative, experimental and/or innovative domestic onsite wastewater system to be designed by a professional engineer, or follow criteria developed by a professional engineer. Additional monitoring and reporting requirements of alternative, experimental and/or innovative systems may be required by the [Administrative Agency].

M. Other Requirements. Any additional construction specification guidelines necessary shall be approved by the [Administrative Authority].

Section 5. Inspection Requirements

An inspection shall be made when the system is installed. The tank and pipe shall be in the ground but must be uncovered for the inspector to check the following:

A. Tank size and inside structure, including inlet and outlet baffles or tees and any risers.
B. Connections to the house, influent and effluent side of the tank.
C. The width and depth of trenches for lateral lines.
D. All solid, un-perforated trunk lines on undisturbed soil and with no rock material in the trunk line ditch.
E. Depth of gravel in laterals.
F. Level of pipes and the end of each lateral line capped or interconnected.
G. Filter material over laterals.
H. Anticipated depth of fill over laterals.

I. Quality of all construction materials to assure compliance with minimum standards set forth by the [Administrative Authority].

A second inspection may be made after final grading has occurred, but before occupancy, when determined necessary by the inspector. The inspector will check the following:

A. Depth of soil over septic tank.
B. Depth of soil cover over lateral lines.
C. Contour of soil to assure allowance for water diversion around the lateral field.
D. Operation of aeration unit (when installed).

ARTICLE V.

REQUIREMENTS FOR MOUND SYSTEMS

Section 1. **Permits Required**

It shall be unlawful for any person to erect, construct or perform any structurally significant alteration, remove, convert or demolish any mound system without first obtaining the proper construction permit from the [Administrative Authority].

Section 2. **Permit Qualification**

A permit authorized under this Article shall be issued, and any mound system operated under the provisions of this Code, shall be approved subject to the qualifications specified in this Section.

A. Minimum Lot Size. A minimum lot or tract size of _____ acres shall be required for use, operation or permittance of any mound system under this Article except as provided in Chapter I, Article VIII of this Code.

B. Standards. Any mound system permitted or operated under the authority of this Article shall comply with the standards prescribed in this Article and all applicable terms, conditions and requirements of this Code.

Section 3. **General Requirements and Standards**

Mound systems shall be permitted only after a thorough site evaluation has been made, and landscaping, dwelling, placement, effect on surface drainage and general topography have been considered. Mound systems shall not be utilized on soils where high groundwater level or bedrock occurs within _____ inches (__") of the surface.

Section 4. **Design**

All mound systems shall be designed by a registered professional engineer, registered sanitarian or professional soils scientist, and approved by the [Administrative Authority]. Required distances from the system, as provided in Article III, **Table 1**, shall apply to the design of mound

systems. Construction specifications of septic tanks and laterals, etc. used in a mound system shall comply with the construction standards as provided in Article IV, Section 4.

ARTICLE VI.

REQUIREMENTS FOR COMPOSTING/WATERLESS TOILETS

Section 1. **Permits Required**

It shall be unlawful for any person, firm or corporation to construct, install or perform any modifications to composting or waterless toilets without first obtaining a permit from the [Administrative Authority].

Section 2. **Permit Qualifications**

A permit authorized under this Article, and any composting or waterless toilet operated under the provisions of this Code, shall be approved subject to the qualifications specified in this Section:

A. Land Use: A composting or waterless toilet system may be permitted or operated only for such uses as seasonal cabins or camping facilities and similar temporary activities where no water supply is available and is approved by a Special Use Permit as provided in the _____ County Zoning Regulations.

B. Minimum Lot Size: The minimum lot size for the use of composting or waterless toilets shall be determined by the _____ County Planning and Zoning Commission when considering the approval of the Special Use Permit.

C. Standards: Anaerobic Unit composting toilets shall have the National Sanitary Foundation Seal of Approval and Testing and comply with the requirements of the KDHE's Environmental Health Handbook. The unit may be electric or non-electric but must be installed with fans for required ventilation.

D. Maintenance: Composting toilets shall be maintained and cleaned per manufacturer's standards and recommendations. Maintenance records shall be submitted annually to the _____ [Administrative Authority].

Section 3. **Privies and Waterless Toilets**

The use of privies for onsite sanitation is prohibited. However, the temporary use of chemical and dry toilets may be allowed in special cases including, but not limited to, public and private events, and construction/repair sites. All waste must be disposed in an approved disposal site. The installation and removal of such facilities shall be subject to the regulations for Sanitary Disposal Service Operators set forth in Article XI of this Chapter.

ARTICLE VII.

REQUIREMENTS FOR HOLDING TANKS

Section 1. **Permits Required**

It shall be unlawful for any person, firm or corporation to install, perform any modification or structural alteration, convert or use any holding tank without first obtaining a permit from the [Administrative Authority].

Section 2. **Permit Qualifications**

A permit authorized under this Article, and any holding tank used for sanitation purposes operated under the provisions of this Code, shall only be approved subject to the following qualifications:

A. Land Use: Holding tanks may only be used for private onsite retentions of wastewater before the contents are removed by a Sanitary Disposal Operator.
    1. Holding tanks may be permitted or operated for such uses as seasonal cabins, camping facilities, auctions, public or private schools, golf courses and other recreational activities when such uses are approved by a Special Use Permit as provided in the _____ County [Zoning Authority].

    2. Holding tanks may be permitted or operated for commercial and industrial tracts or parcels that were in existence prior to the effective date of this Code and subject to the approval of a Variance or Rule Exception as provided in Chapter I, Article VIII, of this Code.

B. Minimum Lot Size: The minimum lot size required for use, operation or permittance of any holding tank under this Code shall be _____ (__) acres or subject to the approval as provided in Chapter I, Articles VI & VIII of this Code.

C. Standards: Holding tank systems shall only be permitted after a thorough site consideration and evaluation has been made by the [Administrative Authority].

Section 3. **General Requirements and Design**

Prior to the approval for any holding tank system, an analysis of the site shall be prepared by a licensed engineer, professional soils scientist or registered sanitarian to include the soil capability, water table, depth to bedrock, is subject to 100 Year Flooding, lot/parcel size and lot/parcel configuration. Any holding tank system authorized under this Article shall be designed, constructed and operated to comply with the following standards and specifications:

A. Capacity Requirements: The minimum liquid capacity of a holding tank collecting domestic wastewater shall be _____ gallons or a minimum _____ (__) day holding capacity, whichever is greater. Holding capacity shall be determined on average daily water use.

B. Site Location: Holding tanks shall be located at least ten (10) feet from any part of a building or structure and a minimum of ten (10) feet from any property boundary. Holding tanks shall be located so as to provide access to an all-weather road or driveway wherein the pumper may drive equipment to within ____ (__) feet of the servicing manhole.

C. Warning Devices: A high water warning device shall be installed so that it activates when water levels reach _____ (__) foot below the inlet pipe. Such device shall be an audible and illuminated alarm.

D. Access Opening: Each tank shall have an access manhole which is extended to finished surrounding grade and shall consist of a circular cast iron ring and lid or other material subject to the approval of the [Administrative Authority]; such manhole lids or covers shall be secured.

Section 4. **Change in Use**

The permit holder shall notify the Administering Agency in writing within ____ (__) working days of any change in the use of the premises served by the holding tank, including change of ownership or occupancy.

ARTICLE VIII.

REQUIREMENTS FOR WASTEWATER STABILIZATION PONDS

Section 1. **Permits Required**

It shall be unlawful for any person, firm or corporation to erect, construct or perform any structurally significant alteration, remove, convert or demolish any wastewater stabilization pond (lagoon) regulated by this Code, without first obtaining a permit from Administering Agency. Permits issued under this Article shall be subject to the following qualifications:

A. Land Use. Permits may be issued under this Article only for an establishment which is not required to hold a Kansas Department of Health and Environment Water Pollution Control Permit. Any wastewater stabilization pond (wastewater lagoon) for industrial uses must be approved by the Kansas Department of Health and Environment.

B. Minimum Lot Size. Unless a waiver or variance is granted pursuant to Chapter I, Article VIII of this Code, a minimum lot or tract size of _____ acres shall be required for any permit issued under this Article.

C. Standards. No permit shall be issued to any person, property or establishment, which does not comply with and satisfy the specified requirements of all applicable Sections of this Code.

Section 2. Wastewater Lagoon Design Requirements

Plans for all wastewater lagoons shall be submitted to the [Administrative Authority] for approval. All wastewater lagoons shall meet design and construction specifications as set forth in the Kansas Environmental Health Handbook.

A. All wastewater lagoons must be designed and maintained so as not to overflow or discharge.

B. The completed construction of the wastewater lagoon shall conform to the plans and specifications approved by the [Administrative Authority].

C. The wastewater lagoon shall be operated in such a manner that a public health nuisance or water pollution problem will not arise.

D. The normal ground water elevation shall be four (4) feet below the bottom of the lagoon.

E. A separation distance of fifty (50) feet between the proposed water's edge of the lagoon at the normal pond water depth and the property line of another owner shall be provided.

F. When the lagoon excavation penetrates or terminates in either a rock strata or a porous (sand or gravel) strata, the excavation shall be extended a distance of one (1) foot on both the bottom and side slopes. The area of supplemental excavation shall be filled with a non-permeable earthen material to limit seepage from the pond. This normally may be accomplished by using a clay soil, which is free of rocks. If a clay soil is not available, the fill soil shall be mixed with bentonite clay at the manufacturer's recommended rate and compacted.

G. A septic tank of a size no less than one-thousand (1,000) gallons may be installed. Effluent from the septic then shall drain by sewer pipe to the lagoon.

H. If a septic tank is used, the sewer line shall be a four (4) inch solid pipe with a minimum rating of SDR thirty-five (35) with a minimum slope of one-eighth (1/8) inch per foot. A cleanout pipe must be installed before entering the septic tank.

I. After construction of the lagoon, the builder shall smooth the berm so that no clods, rocks or ruts will interfere with mowing.

J. A stand of grass shall be established on the berm. This grass should be short-rooted, perennial, such as blue, fescue or brome, and shall be mowed regularly.

K. The entire lagoon area shall be fenced with a minimum four (4) feet high woven or welded wire fencing with two-inch by four-inch (2" x 4") maximum openings. This fence is to discourage entry by unauthorized persons (especially children), pets and livestock.

L. A gate of sufficient size and location to accommodate the entrance of a mower must be provided.

M. Roof drains may not be discharged to the lagoon unless an approved control arrangement is provided to readily facilitate a diversion from the system in the event of heavy precipitation.

N. Construction of the lagoon must be approved by the [Administrative Authority] before a final occupancy permit will be issued.

O. Lagoons, where more than twenty-five hundred (2,500) gallons per day of domestic wastewater is processed, may be considered a Public Wastewater Disposal System.

P. Maintenance is required to remove vegetation at the water's edge, to mow vegetation on embankments and remove trees which shade the pond.

a. Not maintaining an adequate water level in the lagoon will allow for increased vegetation growth and make it harder to prevent unwanted plants (i.e. smartweed, cattails, cottonwood/willow trees).

b. The lagoon may have an over-abundance of unfavorable or harmful bacteria or algae due to the lack of incoming water, which could lead to odor issues and mosquito breeding.

c. The lagoon may have structural issues due to low water levels and insufficient soil saturation (e.g. cracks).

Section 3. **Wastewater Lagoon Separation Distances**

All private onsite systems must meet minimum separation distances outlined in **Table 4**, unless a variance was approved by the [Administrative Authority].

Table 4: Minimum Separation Distances for Wastewater Stabilization Pond Systems

Private Onsite Wastewater Disposal System	**Minimum distance (feet)**
Septic tank to foundation of house or other buildings	10
Any part of a wastewater system to:	
Public potable water line	25
Private potable water line	10
Property line	10
Public water supply, well or suction line	100
Private water supply well or suction line	50
Surface water course	50
Public Utility Lines (not water)	___

Wastewater Stabilization Pond (Lagoon):	
Property line	10' operational water level
Dwelling foundation	__' operational water level
Private or public water line	100' operational water level
Surface water course	50' operational water level

ARTICLE IX.

REQUIREMENTS FOR OTHER SYSTEMS

Section 1. **Permits Required**

A permit shall be required for any system authorized or approved under this Article.

Section 2. **Permit Qualifications**

Any permit approved or authorized under this Article shall be issued subject to the qualifications specified in this Section.

A. Standards. No permit shall be issued to any person, property or establishment which does not comply with and satisfy standards prescribed for the alternative sewage treatment system by the [Administrative Authority] consistent with standards imposed for the systems designated in this Chapter, and all applicable terms, conditions and requirements of this Code.

B. Minimum Lot Size. Unless a Variance is granted, pursuant to Chapter I, Article VIII, a minimum lot or tract size of ____(__) acres shall be required for any permit issued under this Article.

ARTICLE X.

REQUIREMENTS FOR ONSITE WASTEWATER SYSTEM INSTALLERS

Section 1. **License Required**

No person shall engage in the installation or repair of an onsite wastewater system unless that person holds a valid lincense issued by the [Administrative Authority]. Employees of a validly licensed installer are not required to be separately licensed. To receive a license:

A. Contractors wishing to install or repair onsite wastewater systems in _____ County must pass an examination. Multiple employees of a contractor may be licensed. Only the primary owner or manager of the business is required to pass the test. However, if the primary owner or manager of the business is the only individual who

obtains a license, then he or she must be physically present at the job site during the installation of the wastewater system.

B. The examination will test the contractor's knowledge of the KDHE Bulletin 4-2 and the _____ County Sanitary Code requirements.

C. The test requires a minimum passing score of _____percent (__%). All contractors passing the test will be placed on a list that is sorted alphabetically.

D. In the event the contractor receives less than an _____ percent (__%), the contractor will be provided the opportunity to re-test at the [Administrative Authority] Office, after thirty (30) days.

Section 2. License Term and Renewal

Any license issued under this Article shall expire on December 31 of each year and must be renewed annually, on or before January 15 of the following year. Applications for licenses and renewals shall be filed on forms supplied by the [Administrative Authority]. All required license fees shall be paid at the time of the application for the license or renewal, and no fee required under this Code shall be prorated or refunded for any partial term or part year application.

Section 3. Standards of Performance

Prior to the issuance or renewal of a license under this Article, the applicant shall be required to demonstrate adequate knowledge of the regulations pertaining to onsite wastewater systems and general engineering and geologic principles pertaining to such systems. The administering agency may consider actual experience, education or professional licensing of the applicant in the granting or denial of an application for an initial license or renewal, including prior revocations or disciplinary action.

Attendance by any applicant at an appropriate training workshop, conducted or sponsored by the Administrative Authority or other recognized governmental, educational or professional institution, and satisfactory completion of a written examination administered by or on behalf of the Administrative Authority covering subjects related to public health concerns, wastewater disposal techniques, standards for design or construction or installation of wastewater disposal systems, wastewater treatment theory, and/or hydraulics shall satisfy the requirements of this Section.

Section 4. Certificate of Insurance

A licensed Installer shall have and maintain insurance for liability and workmanship in amounts and forms as designated by the Administering Agency, and a copy of the certificate of insurance shall be filed with the Agency.

Section 5. Code Compliance

The installation, relocation or repair of any onsite wastewater disposal system shall be in compliance with the provisions of this Code.

Section 6. License Revocation

A license may be revoked for failure to comply with this Code. The revocation procedure shall comply with the provisions of Chapter I, Article V, Section 3 of this Code.

Section 7. **Continuing Education**

A requirement for continuing education is set for extended renewal of a wastewater system installer license. The Licensee must complete continuing education approved by the Administrative Agency. The continuing education must be pertinent and related to wastewater treatment. Continuing Education Units (CEU's) must be submitted to the Administrative Agency.

ARTICLE XI.

REQUIREMENTS FOR SANITARY DISPOSAL SERVICE OPERATORS

Section 1. **License/Permit Required**

No person may engage in the removal, transport, or disposal of wastewater from any onsite wastewater system or component (holding tank, septic tank, pump tank, portable toilet or grease trap) unless that person holds a valid Sanitary Disposal Service Operator's License. Sanitary disposal service operators employed under a validly licensed Sanitary Disposal Service are required to be individually licensed by the [Administrative Authority]. Licensed sanitary disposal service operators must have a permit to dispose of wastewater by land application.

Section 2. **License/Permit Term and Renewal**

Any license/permit issued under this Article shall expire on December 31 of each year and must be renewed annually, on or before January 15 of the following year. Applications for licenses/permits and renewals shall be filed on forms supplied by the Administrative Agency. All required license/permit fees shall be paid at the time of application for the license/permit or renewal, and no fee required under this Code shall be prorated, nor refunded for any partial term or part year application.

Section 3. **Standards of Performance**

Every person licensed as a Sanitary Disposal Service Operator under this Article shall comply with the performance requirements specified in this Section.

A. Cleaning. When cleaning a septic tank, the licensed Sanitary Disposal Service Operator shall remove the liquid, sludge and scum, leaving no more than three (3) inches depth of wastewater.

B. Sanitary Disposal Service Equipment

1. Maintenance. All equipment used for removing, transporting and/or disposing of septage shall be of watertight construction, and be maintained in good condition to ensure that all materials removed from onsite wastewater systems will be transported, without spillage, to an approved point of disposal.

2. Inspection and Registration. All sanitary disposal equipment and vehicles shall be inspected annually by the Administrative Agency for compliance with this Code. Registration of inspected equipment and vehicles will be maintained by the

[Administrative Authority], and shall expire one year from date of inspection. Each vehicle shall bear permanent identification clearly identifying the name of the company, the owner and the address of the business.

C. Disposal. A license/permit holder shall dispose of the collected septage in a manner approved by the Administrative Agency. Septage shall be acquired, transported, treated and disposed of according to the U.S. Environmental Protection Agency rule 503, and in such a fashion that no surface runoff leaves the property. Discharge of such septage is prohibited:

1. Within one-hundred (100) feet of any water well, or
2. Within _____ (__) feet of other properties, or
3. Within thirty-three (33) feet of any surface water body, or
4. Within the 100-year floodplain, or
5. Onto saturated or frozen ground

D. Records. A license/permit holder shall maintain records of sanitary disposal activity, as outlined in this section. Records shall be immediately submitted to the [Administrative Authority], upon request. The records shall include:

1. Acquisition of Septage
    1. Date, location [source], volume (in gallons) of each acquisition [load or partial load] of septage or waste transported
    2. Method of treatment, if any treatment occurred

2. Disposal of Septage
    a. Date, location, method of disposal
    b. Date, description and proof of equipment maintenance performed

The report form must contain the signature of the person submitting the report and must bear the signature or signatures of the responsible person operating the disposal site for each load or partial load received at the site from the contractor.

E. Experience. Prior to the issuance or renewal of a license, the applicant shall be required to demonstrate adequate knowledge of the regulations pertaining to Sanitary Disposal Service Operators. The [Administrative Authority] may consider prior conduct of the applicant in localities not subject to this Code in the granting or renewal of a license, as well as any prior violations of this Code.

F. Compliance.The license/permit holder shall comply with all applicable federal, state and local regulations or laws including, but not limited to, those set forth now or hereafter adopted in EPA 40 CFR Part 503 (Standards for the Use or Disposal of Wastewater Sludge, Volume 58, Number 32, Page 9388, of the Federal Register, February 19, 1993), as amended.

G. Liability for Remediating Spills. Any person who disposes of septage on public property without the written consent of the administrative agency shall be liable for the removal of the septage, restoration of the area, and the proper disposal of that septage, as well as the costs incurred by such remediation.

H. Certificate of Insurance. A licensed sanitary disposal service operator shall have and maintain insurance for liability and workmanship in amounts and forms as designated by the [Administrative Authority], and a copy of the Certificate of Insurance shall be filed with the Administering Agency.

Section 4. License Revocation

A license/permit may be revoked for failure to comply with this Code. The revocation procedure shall comply with the provisions of Chapter I, Article V, Section 3 of this Code.

ARTICLE XII.

REQUIREMENTS FOR ONSITE WASTEWATER SYSTEM AND WATER WELL INSPECTORS

Section 1. License Required

No person shall engage in the inspection of an onsite wastewater system or water well unless that person holds a valid Wastewater and/or Water Well Inspector License issued by the Administering Agency.

Section 2. License Term and Renewal

Any license issued under this Article shall expire on December 31 of each year and must be renewed annually, on or before January 15th of the following year. Applications for licenses and renewals shall be filed on forms supplied by the [Administrative Authority]. All required license fees shall be paid at the time of the application for the license or renewal, and no fee required under this Code shall be prorated or refunded for any partial term or part year application.

Section 3. Standards of Performance

Prior to the issuance or renewal of a license under this Article, the applicant shall be required to demonstrate ample knowledge of the various kinds of onsite wastewater systems and/or water wells used within _____ County and how they relate to the _____County Sanitary Code. The Inspector must be knowledgeable in the general and specific engineering principals of these systems. The [Administrative Authority] may consider actual experience, education or professional licensing of the applicant in granting or the denial of an application for a license or renewal, including prior revocations or disciplinary action.

A. Applicants must pass an examination. The examination will test the contractors knowledge of the KDHE Bulletin 4-2, K.A.R. 28-30, and the _____ County Sanitary Code requirements.

B. The test requires a minimum passing score of _____ percent (__%). All inspectors passing the test will be placed on a list that is sorted alphabetically.

C. In the event the inspector receives less than an _____ percent (__%), the inspector will be provided the opportunity to re-test at the [Administrative Authority] Office, after thirty (30) days.

Section 4. **Inspector's Bonds**

The [Administrative Authority] may establish a requirement for bonding of any Inspector licensed under this Article and may prescribe reasonable terms and conditions for those bonds.

Section 5. **Certificate of Insurance**

A licensed Inspector shall have and maintain insurance for liability in amounts and forms as designated by the [Administrative Authority] and a copy of the Certificate of Insurance shall be filed with the Agency.

Section 6. **License Revocation**

A license may be revoked for failure to comply with this Code. The revocation procedure shall comply with the provisions of Chapter 1, Article 5, Section 3 of this Code.

CHAPTER III GRAYWATER

ARTICLE I.

GRAYWATER SYSTEMS

Section 1. **General System Specifications**

Graywater should only originate from a single-family residence that has an approved public or private onsite wastewater system. Wastewater from sources other than from a single-family residence is prohibited in a graywater system.

Wastewater from sinks used for food preparation or disposal, sinks from workshops or garages, dishwashers, bidets, urinals, floor drains, reverse osmosis reject water and other water that has come in contact with toilet waste is defined as blackwater and is prohibited for a graywater reuse system.

The total flow of graywater should not exceed the subsurface drip irrigation system flow, as designed.

An existing or proposed onsite wastewater treatment system should not be reduced in size with the addition of a graywater system.

Graywater System operation:

A. Graywater should not be applied to food-producing plants.
B. Graywater should only be used during the growing season.
C. Graywater should not be applied when the soil is saturated.

Section 2. **Plumbing Specifications**

All graywater system components should be designed and manufactured for the intended use of wastewater and/or graywater reuse systems.

The graywater system plumbing should include a diversion valve and an overflow pipe, so graywater is redirected to an approved public or private onsite wastewater system when warranted. Such warranted cases include, but are not limited to: saturated or frozen soils, surface ponding and/or runoff, unusual odors, system back up, clogging of the filter, or when the graywater system has met flow capacity per the approved design calculations.

All installers of the plumbing should meet all licensing, certification, training or registration requirements as required by state and county code, as well as any applicable municipal code.

All piping outside of the house should be schedule-40 pipe or heavier with the exception of the subsurface drip irrigation lines.

All plumbing materials should be clearly labeled to designate their use for graywater.

Section 3. **Subsurface Drip Irrigation Specifications**

Irrigation lines should be designed and manufactured for the use of wastewater and/or graywater systems. Irrigation lines designed and manufactured for the use of potable water for use in traditional irrigation systems are prohibited.

The graywater system should utilize a filter designed and manufactured for use with wastewater /graywater and/or subsurface drip irrigation systems.

The filter should be accessible and maintained and cleaned per manufacturer instructions.

All subsurface drip irrigation systems should be designed by a licensed landscape architect or engineer licensed to practice in the State of Kansas.

All graywater system designs should consider the graywater flow, land use and the vegetation being irrigated, the evapotranspiration rate, the type of soil, the grade of the site, and the total lot size to be irrigated when selecting appropriate tubing, valves, flush points and pipe size.

All installers of subsurface irrigation systems should meet all licensing, certification, training or registration requirements, as required by the administrative authority.

The subsurface drip irrigation system should meet the following setback requirements:

A. 1 foot from all building foundations;
B. 2 feet from all property lines and/or easements;
C. 25 feet from a public water main;
D. 10 feet from an in-ground swimming pool;
E. 50 feet from a spring, or from the bank of a surface water course, or from the overflow level (full pool elevation) of a pond, lake, or reservoir;
F. 50 feet from a private domestic water well or suction line;
G. 3 feet from the lateral field and tank of an approved private onsite wastewater system; and
H. 100 feet from a public water supply well.

The subsurface drip irrigation system lines and components should be installed with minimum of 4 inches of soil cover and a maximum of 10 inches of soil cover.

The subsurface drip irrigation system lines and components should be a minimum of 12 inches apart.

If the subsurface drip irrigation system fails or failure is suspected, the owner should divert the graywater to the approved public or private onsite wastewater system until corrected.

Section 4. **Tank and Pump Specifications**

All tanks, pumps and related components should be designed and manufactured for the use of wastewater and/or graywater reuse systems.

All tanks and pumps should be installed according to manufacturer specifications.

Design of the graywater system should not allow graywater to be stored in the tank for more than twenty-four (24) hours.

Tanks should meet the separation requirements in Bulletin 4-2 Table 5.

All tank and tank components should be exterior of the home and all structures.

The tank including all extensions to the surface should be watertight to prevent leakage into or out of the tank. It should be structurally sound, meet H-10 loading rate standards, and made of materials resistant to corrosion from soil and acids produced from tank gases. Because of corrosion, steel tanks are prohibited.

Tanks should have an access opening with twenty (20) inches minimum dimension to grade. Any opening extending to the surface should be child and tamper resistant. Ways to accomplish this include lids weighing at least sixty-five (65) pounds, locks, or anchors that are not removable without special tools.

Section 5. **Variance Requests**

Persons seeking a variance shall submit the variance request to the administrative authority pursuant to Chapter I, Article VIII, Section 1 of this code.

During construction of an approved graywater system, no changes to the design should be made. A new variance shall be required if changes to the graywater system design are made.

If modifications are made to an existing graywater system at any time, a new variance shall be required.

Abandoned or unused graywater systems that have received graywater shall be emptied and plugged in compliance with state law, as outlined in KDHE Bulletin 4-2 (page 6) and K-State Research and Extension Bulletin MF-2246.

Inspections of graywater systems shall be required to the extent private wastewater system inspections are otherwise required.

Graywater system resale inspections shall be required to the extent private onsite wastewater system resale inspections are required by the administrative authority. Upon change of ownership or occupancy, the new owner or tenant should be notified that the residence contains a graywater system.

Section 6. Best Practice Recommendations

It is recommended that graywater system owners maintain records that show the system design and location, identify the fixtures that are the source of the graywater, describe maintenance requirements of this Specification and show how the minimum irrigation area was calculated.

It is recommended that during the growing season the soil is kept at a constant moisture level without over-saturating the soil.

Pathogens, excreta, FOG (Fat, Oil, and Greases) and other impurities exist in a graywater system. Care should be taken to not introduce an excess amount of these items to the graywater system.

The following should be washed in a system that is connected to an approved public or private onsite wastewater system:

A. Soiled diapers, under garments and bedding.
B. Bedding, rags, and clothing, etc. from persons infected with the flu, communicable diseases, or other illnesses.
C. Washing hands that have been in contact with the above items.

Subsurface drip irrigation lines will be shallow. Care should be taken when excavating, coring, or verticutting in a subsurface drip irrigation area.

Use plant friendly products, which are biodegradable, non-toxic and free of salt (sodium), boron (borax), and chlorine bleach. These products can be damaging to plants. Never wash anything containing harsh cleaners or oil.

Beauty products can affect pH levels in graywater and can be harmful to plants.

Avoid contact with graywater and soil irrigated by graywater at all times.

At the beginning of the irrigation season and periodically thereafter check for even distribution of graywater.

Special considerations for homes with lagoons and their function without graywater:

A. Graywater systems will reduce the amount of flow to a lagoon. This may result in lower water levels and may require the periodic addition of water to a lagoon. Downspouts may be connected to the lagoon as necessary to add water. In drought time, potable water may need to be added to the lagoon. Increased concentration of organic load from toilets and kitchens could lead to odor issues and mosquito breeding in the lagoon.

In designing a graywater system, a backflow valve and drip line relief valve should be considered.

To ensure the graywater system is in working-order and functions as designed, homeowners should be willing to perform yearly/routine maintenance.

Building inspectors should be involved in the permitting process of an approved graywater system if the homeowner resides in a county or municipality with a building code.

Section 7. **Definitions of Specification for Chapter III:**

A. Blackwater: Wastewater from sinks used for food preparation or disposal, sinks from workshops or garages, dishwashers, bidets, urinals, floor drains, reverse osmosis reject water and other water that has come in contact with toilet waste.

B. Easement: An interest in real property consisting of the right to use or control the land, or an area above or below it, for a specific limited purpose benefitting a separate parcel of real property.

C. Grade: The inclination of a physical feature, landform or constructed line to the horizontal.

D. Graywater: Wastewater from sources within single-family residences, including showers, bathtubs, clothes-washing machines, hand-washing lavatories and sinks that are not used for disposal of hazardous or toxic ingredients.

E. Graywater System: A system used to recycle or reuse graywater for a purpose, instead of disposing the graywater to an onsite wastewater system or a public sewer system that contains plumbing from applicable sources, a diversion and overflow valve, a filter, a pump, a tank and subsurface drip irrigation lines.

F. Growing Season: A period of time in a year when plant growth occurs, on average in Kansas, this time period ranges from 180 to 190 days between March 1st and October 31st annually.

G. H-10 Loading Rate Standard: A structural load rate of 16,000 lb/axle and following manufacturer's recommendation for amount of properly compacted fill.

H. Public Water Supply: A system for the provision to the public of piped water for human consumption, if such system has at least ten (10) service connections or regularly serves an average of at least twenty-five (25) individuals daily at least sixty (60) days out of the year.

I. Resale Inspection: A procedure performed by the local authority to determine the functional status of a private onsite wastewater system prior to the conveyance of property.

J. Schedule-40 Pipe: Pipe that has a wall thickness of 6.02 millimeters (mm), and the bored hole for stream movement is 102.26 mm in diameter.

K. Setback Requirements: A distance from one location to another location, between which installation is prohibited.

L. Single-family Residence: A house that is not used for multi-residential, commercial, or other nonresidential purpose.

M. Subsurface Drip Irrigation System: A network of pipes or tubes for controlled delivery of graywater directly to plants.

N. Suction Line: A pipe or tubing feeding into the inlet of a fluid impelling device (for example, pump, compressor or blower), consequently under suction.

O. Variance: An official authorization from KDHE or a local authority to depart from wastewater management regulations.

P. Wastewater: Any water that contains waste products; for example, water used for washing, flushing or in a manufacturing process.

CHAPTER IV. Water Supplies

ARTICLE I.

PURPOSE AND INTENT

The provisions of this chapter are for the purpose of regulating and controlling the development, maintenance, and use of all water supplies which are or may be intended for domestic use, other than public water supplies, in _____ County, Kansas, in order that public health will be protected and the contamination and pollution of the water resources of the county will be prevented.

Section 1. **Compliance Required.**

After the effective date of this Code, no person shall construct or reconstruct on any property subject to this Code, any public, semi-public or private water supply that does not comply with the requirements of this Code.

ARTICLE II.

DEFINITIONS

In addition to the definitions provided in other chapters of this code, the words, terms and phrases listed below, for purposes of this Chapter IV, are as follows:

A. Abandoned Water Well: a water well determined by the Administrative Agency to meet at least one of the following conditions:

1. Use of the water well has been permanently discontinued.
2. Pumping equipment has been permanently removed from the water well.
3. The water well either is in such disrepair that it cannot be used to supply water or has the potential for transmitting surface contaminants into the aquifer, or both.
4. The water well poses potential health and safety hazards.
5. The water well is in such a condition that it is not an active well or cannot be placed in inactive status.

B. Active Well: a water well which is an operating well used to withdraw water, or monitor or observe groundwater conditions.

C. Aquifer: an underground formation that contains and is capable of transmitting groundwater.

D. Backflow: the undesirable reversal of flow of water or mixtures of water and other liquids, gases or other substances into the distribution pipes of the potable supply of water from any source or sources.

E. Confined Aquifer: an aquifer overlain and underlain by impermeable layers. Groundwater in a confined aquifer is under pressure greater than atmospheric pressure and will rise in a well above the point at which it is first encountered.

F. Construction of Water Wells: all acts necessary to obtain groundwater for private, public or commercial use, by any method.

G. Domestic Uses: the use of water by any person or family unit or household for household purposes, or for the watering of poultry, farm and domestic animals used in operating a farm, or for the watering of less than one thousand (1,000) head of livestock, or for the irrigating of lands not exceeding a total of two acres in area for the growing of gardens, orchards and lawns.

H. Groundwater: the part of the subsurface water which is in the zone of saturation.

I. Grout: cement grout, neat cement grout, bentonite clay grout or other material approved by the Kansas Department of Health and Environment (KDHE) used to create a permanent impervious watertight bond between the casing and the undisturbed formation surrounding the casing or between two or more strings of casing.

J. Inactive Status: a water well which is not presently operating but is maintained in such a way it can be put back in operation with a minimum of effort.

K. Potable Water: water free from impurities and carcinogens in amounts sufficient to cause disease or harmful psychological effects in humans and conforming with the latest KDHE regulations.

L. Private Water Supply: private water supply for domestic use, containing no more than two (2) service connections and serving no more than twenty-four (24) people per year.

M. Public Water Supply System: a system for delivery to the public of piped water for human consumption that has at least ten (10) service connections or regularly serves at least twenty-five (25) individuals daily at least sixty (60) days out of the year. This term includes any source, treatment, storage or distribution facilities used in connection with the water supply system.

N. Pump Pit: a watertight structure constructed at least two feet away from the water well and below ground level to prevent freezing of pumped groundwater and which houses the pump or pressure tank, distribution lines, electrical controls or other appurtenances.

O. Reconstructed Water Well: an existing well that has been deepened or has had the casing replaced, repaired, added to or modified in any way for the purpose of obtaining groundwater.

P. Sanitary Well Seal: a manufactured seal, approved by the Kansas Department of Health and Environment and the Administrative Agency, installed at the top of the well casing which, when installed, creates an air and watertight seal to prevent contaminated or polluted water from gaining access to the groundwater supply.

Q. Semi-Public Water Supply: a private water supply for domestic use, containing three (3) to nine (9) service connections and serving no more than twenty-four (24) individuals at least 60 days out of the year.

R. Spring: the point at which groundwater is naturally discharged at the earth's surface.

S. Static Water Level: the highest point below or above ground level which the groundwater in the well reaches naturally.

T. Test Hole or Hole: any excavation constructed for the purpose of determining the geologic, hydrologic and water quality characteristics of underground formations.

U. Treatment: the stimulation of the production of groundwater from a water well through the use of hydrochloric acid, muriatic acid, sulfamic acid, calcium or sodium hypochlorite, polyphosphates or other chemicals, and mechanical means, to reduce or remove iron and manganese hydroxide and oxide deposits, calcium and magnesium carbonate deposits, and slime deposits associated with iron or

manganese bacterial growths that inhibit the movement of groundwater into the water well. These treatments may only be used under the supervision of a KDHE licensed water well contractor.

V. Unconfined Aquifer: an aquifer containing groundwater at atmospheric pressure. The upper surface of the groundwater in an unconfined aquifer is the water table.

W. Water District: Any special district authorized and empowered by state statutes to plan, construct and/or operate a public water supply system.

X. Water Well: Any excavation that is drilled, cored, bored, washed, driven, dug, jetted or otherwise constructed, when the intended use of such excavation is for the location, diversion, artificial recharge or acquisition of groundwater.

Y. Water Well Contractor License: a document issued by the Kansas Department of Health and Environment to qualified persons making application therefore, authorizing such persons to engage in the business of constructing, reconstructing, or treating water wells.

Z. WWC-5 Form: Also known as a 'water well record.' While the WWC-5 Form or 'water well record' may be used to report a well that has been constructed, reconstructed, or plugged, the WWC-5P Form or 'water well plugging record' was developed subsequently to report a plugged water well. Any licensed water well contractor, as well as any landowner, "…who constructs, reconstructs, or plugs a water well shall keep a careful and accurate log of the construction, reconstruction or plugging of such well and shall furnish a record of said well log to the secretary within thirty (30) days after completion of such well in such form as the secretary might require." (K.S.A. 82a-1212)

ARTICLE III.
STANDARDS & REQUIREMENTS

Section 1. Purpose and Intent of Article

The provisions of this article have been adopted for the purpose of regulating and controlling the construction, maintenance and use of public and private water supplies of the county to the end that public health will be protected and the contamination and pollution of the water resources of the county will be prevented.

Section 2. Compliance Required

A. No person shall construct or reconstruct on any property subject to the provisions of this chapter, anypublic, semi-public, or private water supply that does not comply with the requirements of this chapter.

B. No dwelling shall be occupied that does not have water supplied under pressure to that dwelling.

C. No sale or conveyance of any real property shall be complete until all abandoned wells on such real property are plugged. Hand dug wells on real property shall be plugged or reconstructed in accordance with K.A.R. 28-30-2 through 28-30-10, as amended.

Section 3. Requirements - Public Water Supplies

A. **Permit to operate.** No person shall operate a public water supply without obtaining a public water supply permit from KDHE.

B. **Approval of plans.** No person shall construct or reconstruct any public water supply on any property subject to the provisions of this chapter until the plans and specifications have been submitted to and approved in writing by KDHE.

Section 4. Requirements - Semi-public Water Supplies

A. **Permit to construct.** No person shall drill, develop, construct or reconstruct any semi-public water supply on any premises for domestic use subject to regulations of this chapter until they have obtained a permit from the Administrative Agency.

B. **Minimum water testing standards.** Semi-public water supplies shall be tested annually for coliform bacteria and annually for nitrate. Results of the testing shall be submitted to the Administrative Agency. Testing shall be done by a lab approved by the Administrative Agency. The Administrative Agency shall reserve the right to require additional testing if, in their opinion, a potential exists for other contaminants. If either coliform bacteria are present or nitrate exceeds the Maximum Contaminant Level (MCL), the end users of the semi-public water supply shall be notified in writing by the Administrative Agency, to their residence within 10 days of receipt of results. The semi-public water supply shall be treated in accordance with requirements set by the Administrative Agency.

C. **Approval of plans.** No person shall construct or reconstruct, after adoption of this chapter, any semi-public water supply on any property subject to the provisions of this chapter until the plans and specifications have been submitted to and approved, following minimum standards found in K.A.R. 28-30-2 through 28-30-10, as amended, in writing by the Administrative Agency.

Section 5. Requirements - Private Water Supplies

A. **Permit to construct**. No person shall drill, develop, construct or reconstruct any private water supply on any premises for domestic use subject to regulations of this chapter until they have obtained a permit therefore from the Administrative Agency.

B. **Approval of plans**. No permit to construct, reconstruct or develop a private water supply on any premises subject to the regulations of this chapter shall be issued until the plans showing the locations and construction of the supply have been approved by the Administrative Agency.

C. **Inspections for transfer of property.** Whenever any property connected to, or served by, a private water supply is offered for or subject to a contract of sale, the Administrative Agency shall evaluate the condition of the well, the area surrounding the well, and the well water, at a fee to be paid to the Administrative Agency. A water sample shall be taken and screened for bacteria, nitrate, and chloride and reported as Environmental Protection Agency's (EPAs) primary and secondary Maximum Contaminate Levels (MCL's). Any inspection provided under this section shall not constitute nor be deemed a warranty and neither the Administrative Agency nor any official of the Board of Health shall be liable for any future failures of the system or for other claims arising out of the inspection. Inspection shall not relieve any person of compliance with the requirements of this Code.

D. **Water testing for daycare facilities.** Where a private water supply serves a daycare, a water sample shall be screened annually for coliform bacteria, nitrate, and lead. Results

of the testing shall be submitted to the Administrative Agency. Testing shall be done by a lab approved by the Administrative Agency. The Administrative Agency shall reserve the right to require additional testing if, in their opinion, a potential exists for other contaminants. If either coliform bacteria are present or nitrate or lead exceed the Maximum Contaminant Level (MCL), the owners of the daycare shall be notified in writing within 10 days of receipt of results. The daycare water supply shall be treated in accordance with requirements set by the Administrative Agency.

E. **Use limitation**. Use of surface water (lakes, ponds or streams) as a source of water for a private water supply shall not be permitted:

1. Where a public water supply line is available; or
2. Where a satisfactory groundwater source is available; or
3. Unless adequate treatment is provided, in no case shall surface water be used without filtration and chlorination; or
4. Where the pond or lake receives any drainage or discharges from septic tanks or sewage treatment plants.

Section 6. **Minimum Standards for Groundwater Supplies.**

A. **Location**. All wells used as sources of water for semi-public and private water supplies shall be separated from the specified sources of pollution by distances equal to or greater than those shown in the following table (**Table 5**). The Administrative Agency shall determine the minimum distances that shall be provided between a well and other potential sources of contamination. Such distances shall be sufficient to provide reasonable assurance that the well will not become contaminated.

Table 5: Minimum Standards for Groundwater Supplies

Groundwater Supplies	Minimum Separation (feet)
Subsurface absorption field for septic tank effluent	50
Watertight vaulted pit privy	50
Septic tank	50
Streams, lakes, and ponds	50
Barnyard, stables, manure piles, animal pens, etc.	50
Sewer lines not constructed of cast iron or other equally tight construction	50
Sewer lines constructed of cast iron or other equally tight construction	10
Property lines	25
Petroleum and fertilizer storage	50
House/outbuilding	50
Lagoon	50

B. **Construction.** The enforcement of this section shall be regulated in accordance with K.A.R. 28-30-2 through 28-30-10, as amended. Recommended standards for design, construction and location; and practices consistent with current approved technology shall be followed.

Section 7. **Requirements for Subdivision Development.**

No person shall develop any subdivision until the plans and specifications for water supply provision and/or protection have been approved by the Administrative Agency.

Section 8. **Water Well Pump Installer and Maintenance Licensure.**

No person shall repair or install a water well pump unless they hold a valid Water Well Pump Installer and Maintenance License from the Administrative Agency. Property owners are exempt from the license, but not exempt from provisions of the code. An annual fee shall be paid to the Administrative Agency by January 1 of each year, following the initial issuance of the Water Well Pump Installer and Maintenance License. A license issued under the provisions of this Chapter may be revoked for violation of any of the terms of this Code. No person responsible for operating a private well or semi-public well shall contract, or offer to contract, with any person for services unless that person holds a valid permit or license to provide such service from the Administrative Agency.

KANSAS NONPOINT SOURCE POLLUTION MANAGEMENT PLAN 2019 UPDATE






2019

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Division of Environment
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KANSAS NONPOINT SOURCE POLLUTION MANAGEMENT PLAN 2019 UPDATE

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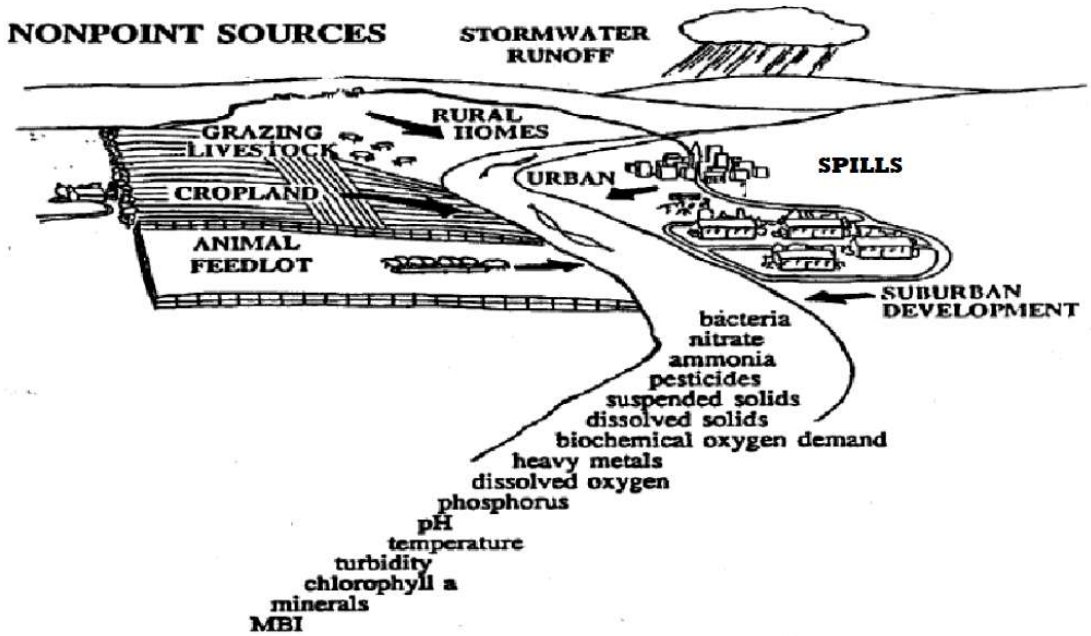
INTRODUCTION AND HISTORY

Nonpoint source pollution refers to the transport of natural and man-made pollutants by rainfall or snowmelt moving over and through the land surface and entering lakes, rivers, streams, wetlands or ground water. Atmospheric deposition and hydrologic modification are also sources of nonpoint pollution (EPA, 2003). The Kansas Surface Water Quality Standards state:

> "**Nonpoint Source"** *means any activity that is not required to have a national pollutant discharge elimination system permit and that results in the release of pollutants to waters of the state. This release may result from precipitation runoff, aerial drift and deposition from the air, or the release of subsurface brine or other contaminated groundwaters to surface waters of the state." -KAR 28-16-28b(yy)*

The following figure shows a conceptual diagram of common sources of nonpoint pollution and potential contaminants that can be transported to surface and ground waters.



Source: Adapted from the Kansas Nonpoint Source Pollution Management Plan, 2000 Update

Milestones in the History of Kansas Nonpoint Source Pollution Management

A Kansas Water Quality Management Plan was developed by the Kansas Department of Health and Environment (KDHE) in the late 1970's, outlining a 20 year strategy for protecting the quality of surface and ground waters in Kansas, including control of nonpoint source (NPS) pollution. The plan was endorsed by then Governor John Carlin and approved by concurrent resolution of the Kansas Legislature (KDHE, 1979).

In 1986, a policy subsection of the *Kansas Water Plan* was adopted directing the KDHE to develop a statewide strategy to implement NPS pollution control programs consistent with federal guidelines and reflective of different river basin conditions and issues (*Kansas Water Plan*, 1986). Interagency coordination was recognized as a key component for successful development and implementation of the strategy, particularly agencies with funding for implementation of best

management practices (BMPs) including the State Conservation Commission (SCC) and the United States Department of Agriculture (USDA) Soil Conservation Service (now the Natural Resources Conservation Service). The SCC NPS Pollution Control Program was authorized in 1989 in collaboration with KDHE to support local NPS planning and provide additional funding for NPS BMP implementation through local conservation district programs (*Kansas Water Plan*, 1986).

Another policy subsection of the *Kansas Water Plan,* adopted in 1987, recommended an Environmental Protection Strategy to establish a partnership between the State and county governments to address environmental protection issues, including NPS related issues not addressed through other programs. The Local Environmental Protection Program (LEPP), administered by KDHE, was established in 1992 and provided annual grants to implement county environmental protection plans including adoption and implementation of county sanitary/environmental codes.

In 1987, Congress enacted Section 319 of the Clean Water Act (CWA), establishing a national program to control nonpoint sources of water pollution. The CWA Section 319(h) established a program to provide grants to States and Tribes to implement state NPS management programs. The KDHE administers CWA Section 319 funding in Kansas. The KDHE was designated by the Governor as the lead state agency for NPS pollution in 1988 and the *Kansas NPS Pollution Management Plan* was approved by the Environmental Protection Agency (EPA) in 1989. This Document outlined a state strategy for addressing NPS pollution in Kansas and was last updated in 2000.

In 1995, a multi-agency water quality initiative was established by then Governor Bill Graves to protect and restore the quality of Kansas surface waters with initial focus on the Kansas-Lower Republican River basin. Sediment, atrazine and bacteria were the primary pollutants of concern.

In 1998, the Clinton Administration initiated a Clean Water Action Plan to promote the restoration of impaired waters throughout the nation. A Unified Watershed Assessment was completed by each state to determine watershed conditions and provide information for prioritizing resources to address water quality issues. This initiative employed a watershed approach to water quality restoration and protection, and in 2003, additional CWA 319 funding was provided to states to develop and implement watershed based plans for restoration of impaired waters. Although a small number of watershed oriented projects had been initiated in the early 1990s to address NPS issues affecting Kansas lakes (Cheney Lake watershed and Hillsdale Lake watershed are example projects), this federally driven watershed based initiative provided the impetus for the Kansas Watershed Restoration and Protection Strategy (WRAPS) program, which was adopted as part of the Kansas Water Planning Process in 2004.

The current Kansas Total Maximum Daily Load (TMDL) Program was initiated in 1998 following settlement of a complaint filed in 1995 by the Kansas Natural Resource Council and the Sierra Club against the EPA, compelling it to enforce Section 303(d) of the Clean Water Act by establishing TMDLs. Kansas intervened in the litigation and a settlement was reached in 1998, laying out a schedule for the state to submit TMDLs for water quality limited stream segments and

lakes in each of the 12 major river basins in Kansas. This process established a significant state water quality priority, which has been a primary focus of NPS efforts since that time.

2010 Update

The 2010 Update to the *Kansas NPS Pollution Management Plan* was intended to outline a strategic plan for NPS management in Kansas that addresses the nine key program elements required by EPA and provide a framework for coordination and collaboration among agencies and organizations involved in NPS related management activities. The nine key elements are outlined in Appendix 1.

By 2010, much had been accomplished toward achievement of the goals and strategies outlined in the 2000 update of the plan. The goals, objectives and strategies outlined in the 2010 update built on those contained in the previous plan and provided the basis for NPS program activities in the future. Program accomplishments up to 2010 are as follows.

2010 Kansas NPS Pollution Management Program Highlights

- Development of watershed-based Total Maximum Daily Loads (TMDLs) for impaired water bodies through the Kansas TMDL program
- Establishment of a targeted component of the SCC Cost-Share programs to address high priority TMDL watersheds and development of the Kansas Water Quality Buffer Initiative
- Development of the Kansas Surface Water Nutrient Reduction Plan
- Completion of a statewide Source Water Assessment for public water supplies
- Development and Implementation of the Kansas Watershed Restoration and Protection Strategy (KS-WRAPS) Program
    - Organization of a KS-WRAPS Interagency Work Group and Watershed Partnership
    - Establishment of a $2 million KS-WRAPS fund utilizing EPA Section 319 and Kansas Water Plan funds to support development and implementation of WRAPS in priority watersheds on an annual basis
    - Establishment of 38 WRAPS Stakeholder Leadership Teams addressing about 50% of Kansas' surface area actively conducting watershed assessment, planning and implementation projects
    - Achievement of two 319 Program Watershed Success Stories – i.e. restoration of impaired water bodies in Clarks Creek (bacteria impairment) and Banner Creek watersheds (nutrient related eutrophication impairment)
    - Establishment of Kansas guidance for development of 9-Element compliant watershed plans and initiation of plan development and revisions for individual WRAPS projects
    - Completion and approval of four EPA compliant 9-Element watershed plans
    - Initiation of a targeted WRAPS monitoring program through collaboration with the KDHE Bureau of Water Watershed Management and Watershed Planning Sections, and the Bureau of Environmental Field Services Technical Services Section.,
    - Organization of a WRAPS conference held every 12-18 months
- 105 counties implementing state approved Local Nonpoint Source Pollution Management Plans through conservation district programs
- 104 counties implementing state approved county sanitary/environmental codes and Local Environmental Protection Plans through participation in the LEPP

- Development and implementation of a NPS pollution control project component of the Kansas Water Pollution Control Revolving Fund
- Establishment of a Buffer Coordinator and Technical Assistance Partnership with federal and state agencies and conservation organizations to facilitate implementation of NPS BMPs throughout the state
- Incorporation of state TMDL, Source Water Protection (SWP) and WRAPS water quality priorities into ranking criteria for applicable USDA Farm Bill programs
- Coordination and implementation of a Missouri-Kansas bi-state Targeted Watershed Grant for the Marais Des Cygnes river basin
- Interstate coordination efforts with Oklahoma to address water quality issues affecting Grand Lake and Oologah water supply reservoirs
- Completion of over 100 Source Water Protection Plans in addition to WRAPS plans
- Approximately 5,300 CWA Section 401 water quality certifications issued in conjunction with the US Army Corps of Engineers CWA Section 404 nationwide permits and 400 water quality certifications issued for individual 404 permits
- Implementation of several State Wetland Development grants to enhance wetland and riparian area management
- Completion of a Kansas Reference Stream study and initiation of an EPA Healthy Watersheds Initiative grant
- The estimated annual estimated pollutant load reductions resulting from the implementation of NPS best management practices during Federal Fiscal Year 2010 (October 1, 2009 – September 30, 2010) as reported to KDHE were as follows:
    - 357,798 pounds of nitrogen
    - 160,134 pounds of phosphorus
    - 70,242 tons of sediment

2019 Update

The 2019 Update to the *Kansas NPS Pollution Management Plan* continues work that began with the 2010 update. KDHE continues the EPA required nine elements in achieving watershed goals. This update allowed KDHE to evaluate and modify existing strategies as well as develop new strategies to accomplish water quality milestones. The *Kansas NPS Pollution Management Plan* continues to build upon past updates and plan for future NPS program activities.

- Development of watershed-based Total Maximum Daily Loads (TMDLs) for impaired water bodies through the Kansas TMDL program
- Continued collaboration of a targeted component of the KDA-DOC Cost-Share programs to address high priority TMDL watersheds
- Completion of a statewide Source Water Assessment for public water supplies
- Continued Development and Implementation of the Kansas Watershed Restoration and Protection Strategy (KS-WRAPS) Program
    - Continued utilization of a $2 million KS-WRAPS fund utilizing EPA Section 319 and Kansas Water Plan funds to support development and implementation of WRAPS in priority watersheds on an annual basis
    - Achievement of ten 319 Program Watershed Success Stories – i.e. restoration of impaired water bodies in Kansas
        - **Walnut and West Creeks**, Dissolved Oxygen, 2010
        - **Fall River**, Dissolved Oxygen, 2010

        - **Eagle Creek**, (~72 miles), Dissolved Oxygen, 2012
        - **Dragoon Creek**, Dissolved Oxygen, 2012
        - **Neosho River**, (near Parkerville), Bacteria, 2012
        - **Big Creek**, (~63 miles), Bacteria, 2012
        - **Mill Creek**, (5 segments), Fecal Coliform Bacteria, 2012
        - **Cottonwood River**, (~123 miles), Bacteria, 2012
        - **Allen Creek**, (including Dows and Stillman Creeks), Bacteria, 2012

    - Establishment of Kansas guidance for review and revisions of 9-Element compliant watershed plans for individual WRAPS projects
    - Completion and approval of 36 EPA compliant 9-Element watershed plans
    - Organization of a WRAPS annual meeting held every 12 months
- 105 counties implementing state approved Local Nonpoint Source Pollution Management Plans through conservation district programs
- 103 counties implementing state approved county sanitary/environmental codes and Local Environmental Protection Plans through participation in the LEPP
- Continued implementation of a NPS pollution control project component of the Kansas Water Pollution Control Revolving Fund
- Incorporation of state TMDL, Source Water Protection (SWP) and WRAPS water quality priorities into ranking criteria for applicable USDA Farm Bill programs
- Interstate coordination efforts with Oklahoma to address water quality issues affecting Grand Lake and Oologah water supply reservoirs
- Approximately 5,500 CWA Section 401 water quality certifications issued in conjunction with the US Army Corps of Engineers CWA Section 404 nationwide permits
- Results from the implementation of NPS best management practices during Federal Fiscal Year 2017 (October 1, 2016 – September 30, 2017) as reported to KDHE were as follows:
    - 408,080 pounds of nitrogen
    - 214,393 pounds of phosphorus
    - 150,689 tons of sediment
- Initiation and Implementation of the National Water Quality Initiative between EPA and NRCS. Original HUC 12 watersheds included Munjor Creek, Grasshopper, and Emma Creek. In 2017, Grasshopper and Emma were replaced with Mud Creek and Soldier Creek.
- Water Vision/RAC Formation:
    - In 2015, Governor Sam Brownback initiated the 50 Year Water Vision.
    - Regional Advisory Committees (RAC) were formed for stakeholders to develop regional goals.
    - Eight RACs identified BMP implementation as focused goal utilizing goals from 9-Element watershed plans.
    - Development of Harmful Algal Blooms (HAB) Action Plans for some RACs
- Development of an Offsite BMP Implementation Program between the Little Arkansas WRAPS Project and the City of Wichita.
- Development of an Interagency Streambank Stabilization Team consisting of the Kansas Water Office, the Kansas Department of Health and Environment and the Kansas Department of Agriculture, Division of Conservation. Priority watersheds were chosen for funding and implementation of streambank restoration projects.

- Establishment of two interagency research coordination teams, for sediment and harmful algae blooms
- Development of a statewide load reduction mapping tool by KDA-DOC to capture and illustrate all sources of load reductions in Kansas Priority areas
- Formation of agency partnerships to implement Regional Conservation Partnership Program awards within Kansas:
    - Water Quality Through the Implementation of Forestry Practices
    - Middle and Lower Neosho River Water Quality
    - Milford Lake Watershed Project
- Development of an aerial assessment protocol to be utilized by KDHE to provide additional assessment data to WRAPS Projects
- Establishment of a WRAPS Subwatershed Water Quality Monitoring Program to track water quality changes in WRAPS priority watershed with BMP implementation
- Development and implementation of a Local Conservation Lending Program through collaboration with the Kansas Water Pollution Control Revolving Fund
- Development of a Drinking Water Protection Program through collaboration with the Kansas Safe Drinking Water Revolving Fund
- Continued implementation of a NPS pollution control project component of the Kansas Water Pollution Control Revolving Fund totaling $3,803,375
- Establishment of long-term sediment monitoring through USGS and NAQWA

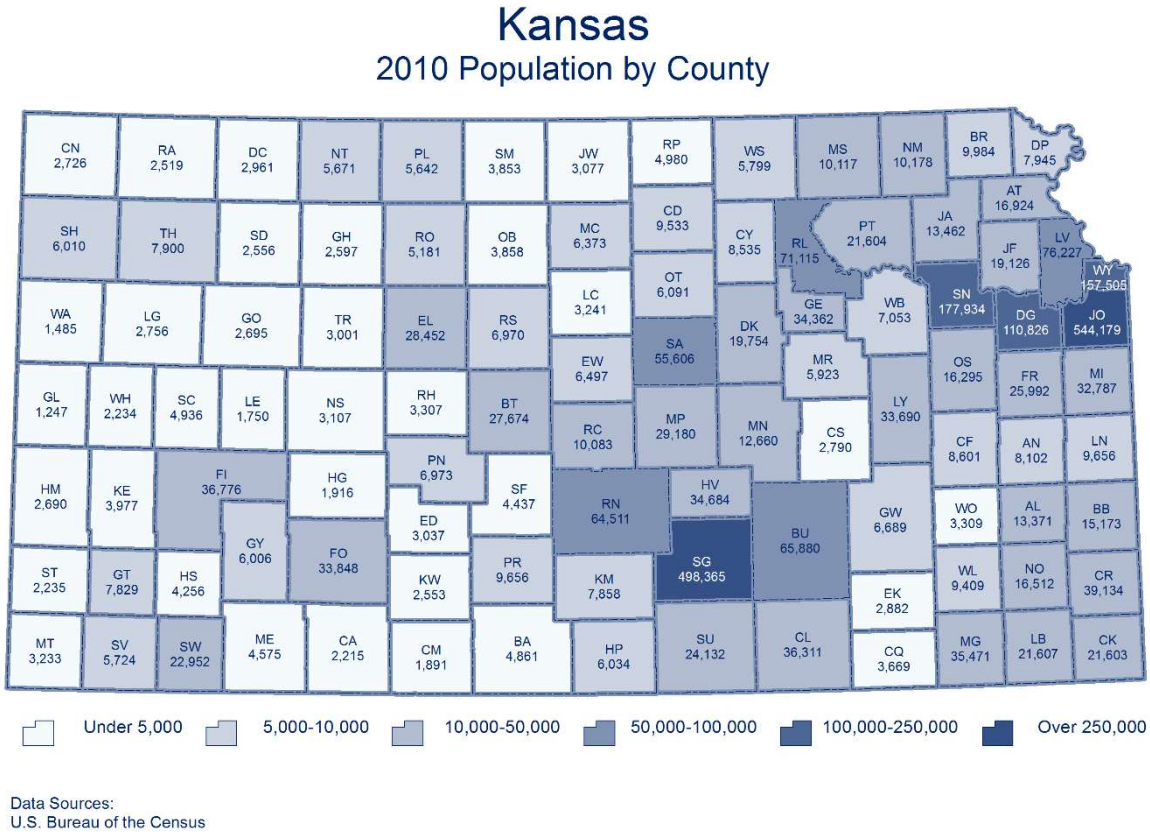
CHAPTER ONE
KANSAS WATER QUALITY CONDITIONS AND NONPOINT SOURCE ISSUES

Social and Physical Setting

Population

Kansas is comprised of 105 counties with a 2010 population estimated at 2,853,118 (U.S. Census Bureau). Figure 1.1 shows a map of county population based on 2010 estimates with the lightest colored counties having the least amount of people and the darkest colored counties having the greatest population. Major population centers are located in the northeast and south central portions of the state with Sedgwick and Johnson counties being the most populated.

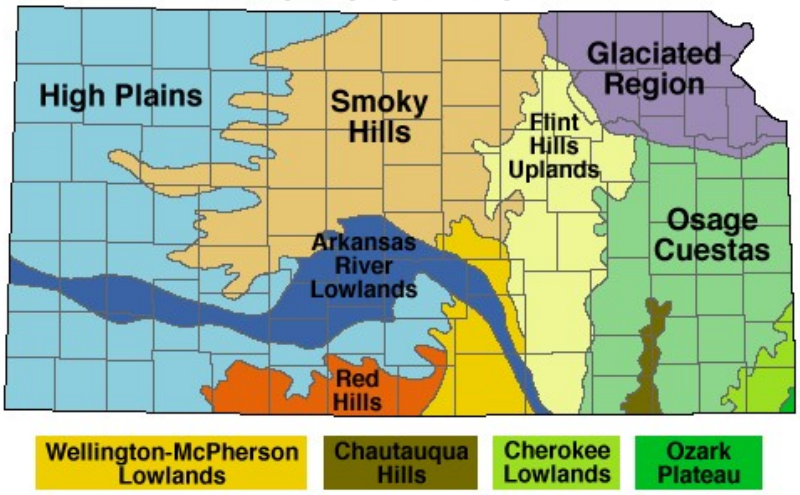
Figure 1.1 Kansas 2010 Population Estimates by County
Source: Kansas Water Plan 2014 DRAFT



Physiography

The physical characteristics of the state can be grouped into eleven distinct physiographic regions. Figure 1.2 shows the general boundaries of these regions (Source: Kansas Geological Survey). Each region represents a unique set of topographic, hydrologic and cultural characteristics. Elevation varies across the state from less than 700 feet above sea level in the southern part of the Osage Cuestas in southeast Kansas to over 4,000 feet in the High Plains of western Kansas.

Figure 1.2
Generalized Physiographic Map of Kansas



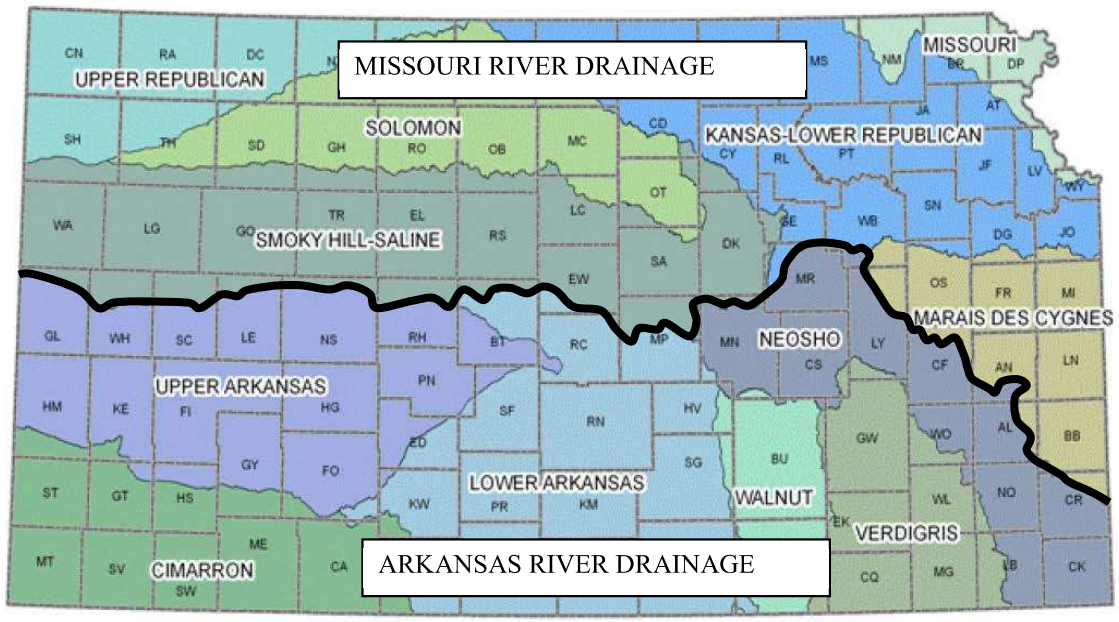
Source: Kansas Geological Survey

Hydrology

Kansas is part of the Mississippi River Basin and is split by the Missouri River system and the Arkansas River system (Figure 1.3).

Annual precipitation varies dramatically across the state, ranging from less than 16 inches in the far west to more than 44 inches in the southeast corner of the state (Figure 1.4). Runoff also varies significantly as shown in Figure 1.5.

Figure 1.3 Kansas River Basins
Source: Kansas Water Plan 2009



In Kansas, about two-thirds to three-quarters of total water diverted for authorized uses comes from groundwater supplies (aquifers), and the balance is from surface water supplies including streams, reservoirs, and ponds. On average, irrigation makes up 85 percent of the consumptive use of water in Kansas. This can vary significantly depending on weather Conditions. Municipal use (public water supply) accounts for about 10 percent of total consumptive use of water in the state. The remaining 5 percent of consumptive water use is for industrial, recreation, stock watering, hydraulic dredging and other uses (Kansas Dept. of Agriculture, 2010 – www.agriculture.ks.gov).

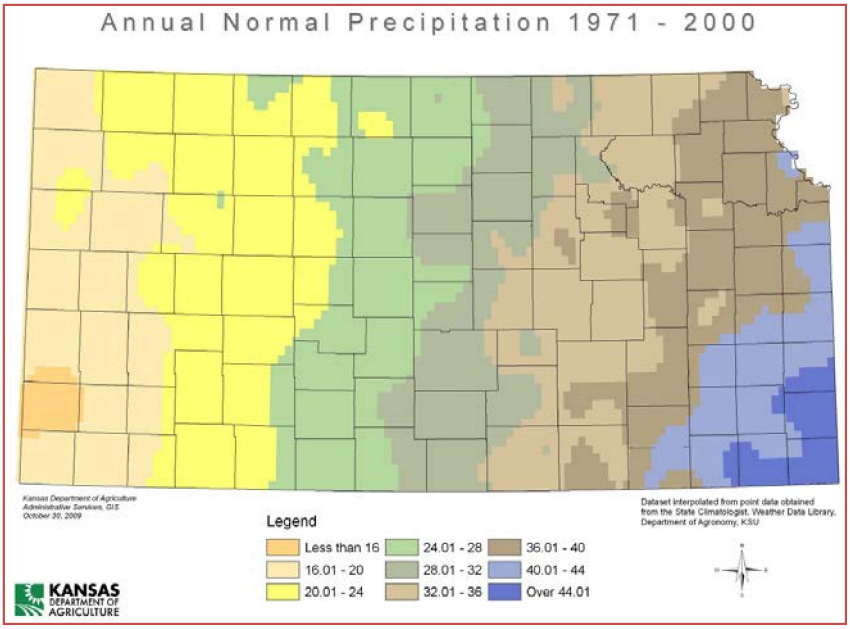
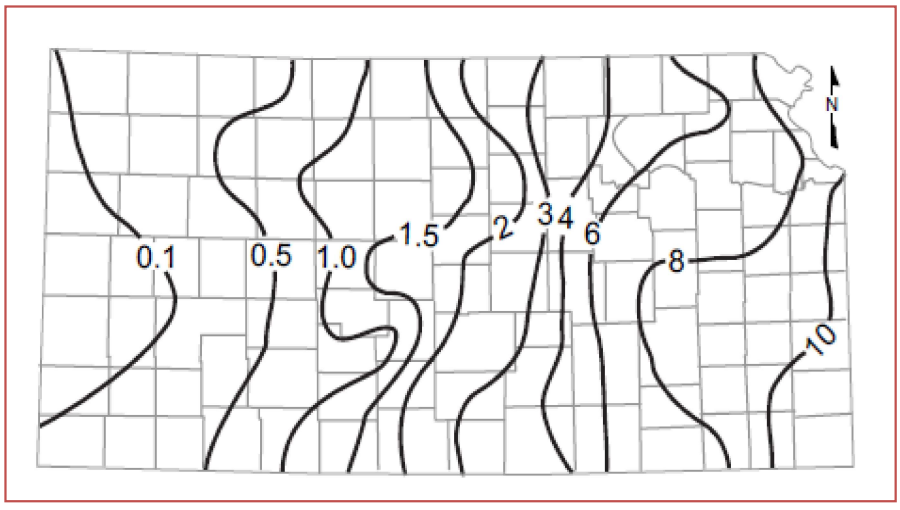


Figure 1.4 Annual Normal Precipitation in Inches 1971-2000
Source: Kansas Department of Agriculture 2010

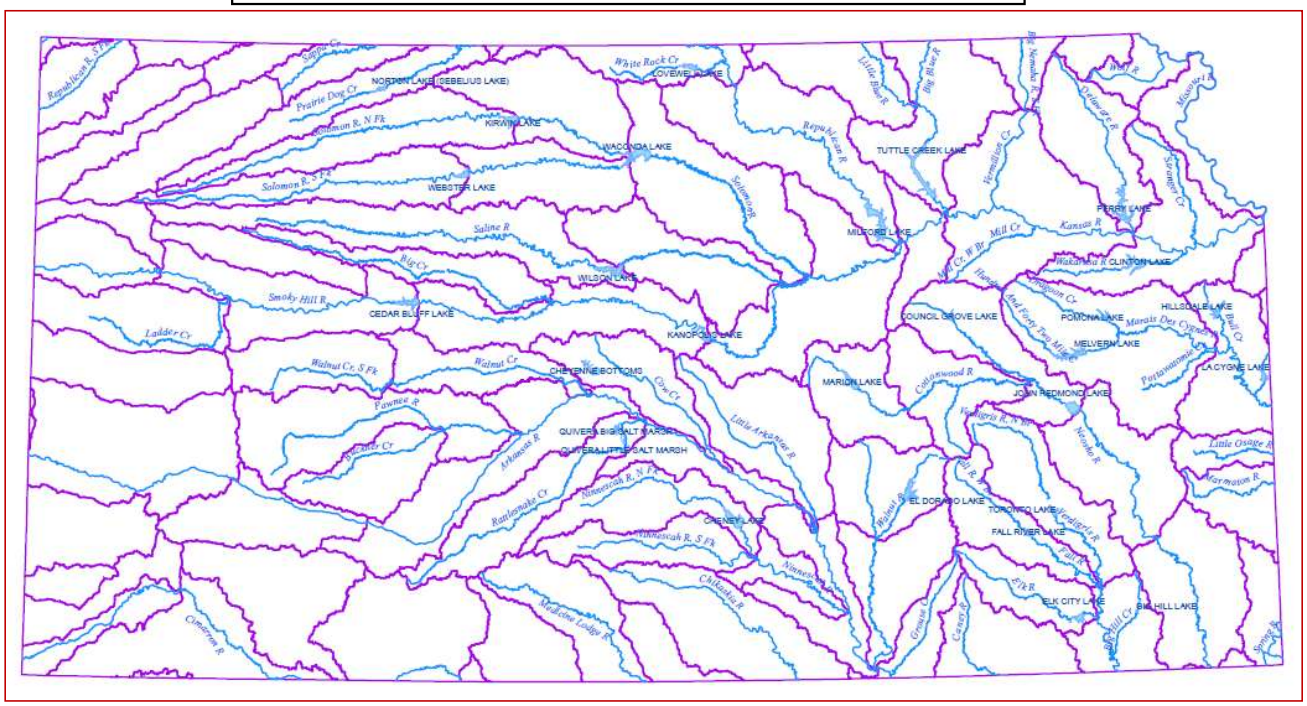
Figure 1.5 Mean Annual Runoff in Inches
(adapted from Wetter, 1987)
Source: Sophocleous, Kansas Geological Survey



Ground water is the predominant source of water supply in the western part of the state, while surface water sources are most prevalent in eastern Kansas, particularly for public water supplies. The state has 24 federal reservoirs, which provide multiple benefits including flood control, public water supply, recreation, aquatic habitat, water quality releases and irrigation water supply in some western reservoirs.

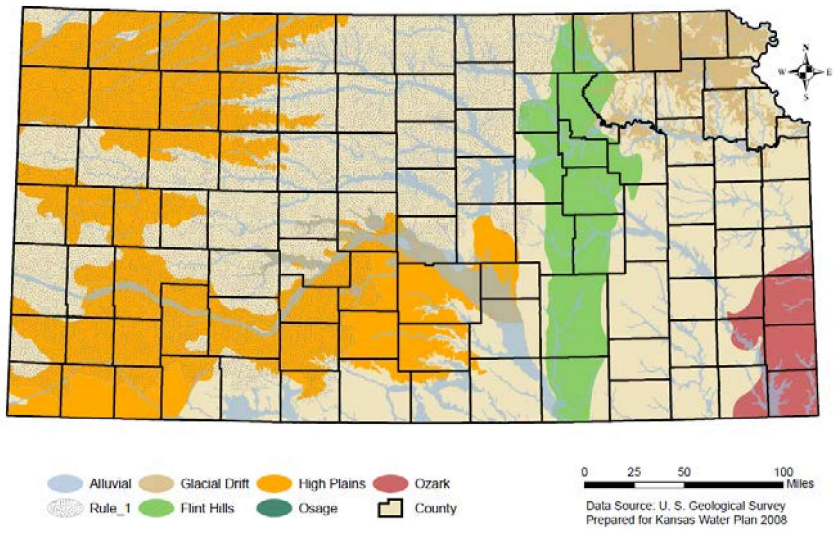
For water planning purposes the state has been divided into twelve major river basins as shown in Figure 1.3. These river basins can be divided into smaller watersheds, referred to as Hydrologic Unit Codes (HUCs) for water resource management purposes. Figure 1.6 shows the major rivers, stream and reservoirs in Kansas along with the 8 digit HUC watersheds. Figure 1.7 shows the State's major aquifer systems.

Figure 1.6 Kansas 8 digit Hydrologic Unit Code Watersheds
Source: KDHE, 2011



The High Plains Aquifer is the largest aquifer in Kansas, extending into bordering states including Nebraska, Colorado, Oklahoma and Texas, and is used extensively for irrigated agriculture. Water levels have been declining in parts of this aquifer for many years causing concern about future water availability. The easternmost portion of the High Plains aquifer includes the Big Bend Prairie and the Equus Beds Aquifers in south central Kansas. The Equus Beds Aquifer provides a significant source of municipal water supply as well as irrigation.

Figure 1.7 Major Kansas Aquifers
Source: Kansas Water Plan 2009



Land Use

Kansas encompasses nearly 52.7 million acres with about 89% of these acres related to some type of agricultural use (Kansas NRI, 2007 - www.ks.nrcs.usda.gov/technical/ks_nri.html). Table 1.1 shows land use changes between 2007 and 2012 based on the 2012 National Resources Inventory (NRI) conducted by the Natural Resources Conservation Service.

A map of land cover in Kansas is shown in Figure 1.8. Cropland is the predominant land use with large tracts of irrigated land in western Kansas and a combination of irrigated and dryland farming in the eastern half of the state as rainfall increases. Grassland, consisting of native rangeland and pasture, represents the next largest land use type with large contiguous tracts of grassland located in the Smoky Hills, Red Hills and Flint Hills physiographic regions.

Table 1.1 Estimated Land Use Changes in Kansas – NRCS 2012 National Resource Inventory

Land Use	*2007 estimated acres*	*2012 estimated acres*	*change*
Cropland - cultivated	23,756,700	24,353,100	596,400
Cropland - noncultivated	1,878,900	1,481,000	-397,900
Conservation Reserve Program	3,164,900	2,352,800	-812,100
Pastureland	2,497,600	2,967,000	469,400
Rangeland	15,787,500	15,808,100	20,600
Forestland	1,685,500	1,790,100	104,600
Other Rural Land	735,600	760,600	25,000

Source: USDA Natural Resources Conservation Service, Kansas NRI Information 2012

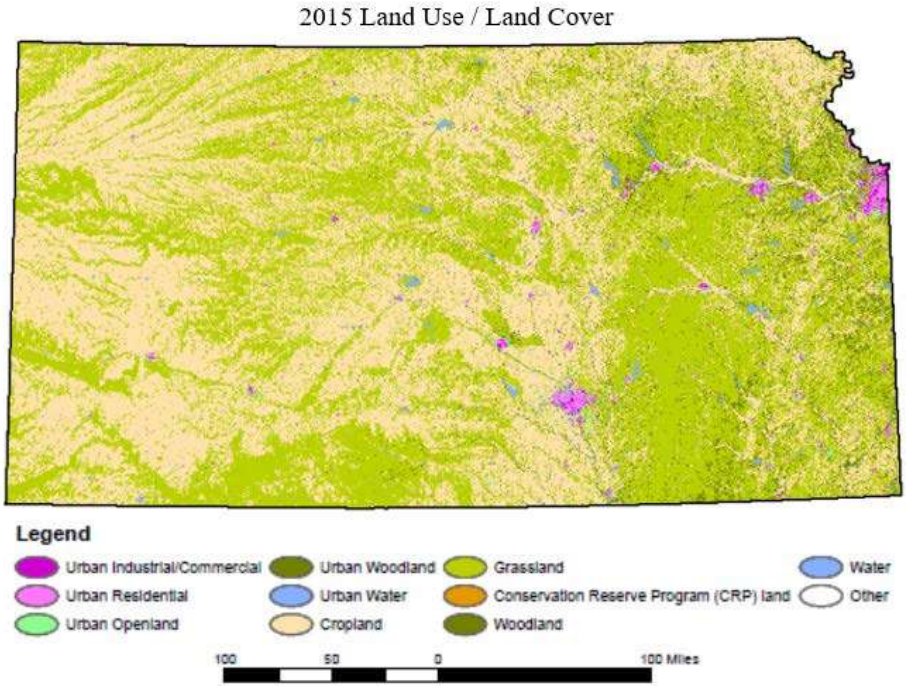


Figure 1.8 Land Use 2015

Integrated Water Quality Assessment Report

Kansas has over 121,000 miles of streams shown in the U.S. Geological Survey (USGS) National Hydrography Dataset (NHD). Of this amount, 27,774 miles of perennial and intermittent waterways are designated as classified rivers and streams for surface water quality standards based on the Kansas Surface Water Register, December 12, 2013 (www.kdheks.gov/befs/download/Current_Kansas_Surface_Register.pdf). These water bodies are routinely monitored for water quality conditions through the State's water quality monitoring network maintained by the KDHE. The KDHE has also designated 316 lakes, reservoirs and ponds (191,103 surface acres) as classified waters as well as 36 wetlands (55,969 acres), which are also monitored on a routine basis.

The Integrated Water Quality Assessment Report is prepared by the KDHE biannually in fulfillment of CWA requirements. The most current assessment report was completed in March 2018. Data used for this assessment were collected from 30-50 probabilistically selected monitoring sites that are part of KDHE's stream monitoring program during 2011-2015. Following is a summary of key findings from this report related to NPS pollution (KDHE, 2018):

Streams:

- Monitoring data indicated that 16% of the state's designated stream mileage fully supported all designated uses, whereas 84% was impaired for one or more uses.
- Major causes of non-support for streams, in order of prevalence, were nutrient enrichment, sedimentation, weather-related impacts and elevated levels of fecal bacteria.
- Sources primarily responsible for pollutant loadings and/or use impairments included agriculture (irrigated and non-irrigated crop production, livestock grazing and feeding operations, unrestricted cattle access), natural phenomena (weather-related impacts), and physical habitat degradation.

Lakes and Wetlands:

- Approximately 3.5% of the assessed lake acreage fully supported all designated uses, whereas over 96% was impaired for one or more designated uses.
- Major causes of impairments in lakes and wetlands included nutrient enrichment, siltation, elevated turbidity levels, taste and odor problems, and zebra mussel infestations.
- Agriculture, municipal point sources, natural phenomena (e.g. weather-related impacts), and non-native species introductions were the primary sources of impairments.
- Approximately 63% of the assessed lake acreage exhibited no recent change in trophic condition, 40% experienced a measurable increase in trophic state, and less than 1% exhibited some improvement in trophic condition.

Section 303(d) of the CWA calls for the development of a list of waterbodies currently failing to meet established water quality standards. The Kansas 2018 list of impaired waters (i.e. 303(d) list) is included in the 2018 Integrated Water Quality Assessment Report and can be found on the web in its entirety at: http://www.kdheks.gov/befs/data_mgmt.htm and : http://www.kdheks.gov/tmdl/index.htm. The Kansas 2018 303(d) list identifies 498 station/pollutant combinations of water quality impairment on lakes, wetlands and stream systems (watersheds), encompassing 2,437 stream segments, and in need of TMDLs to address the offending pollutants. The 2018 list identifies 480 station/pollutant

combinations of waters that were previously listed as impaired but are now meeting water quality standards, with 19 of these being new in 2018.

KDHE Interim Assessment of Water Quality Trends

Water Quality Assessments- Background

Biennially water quality monitoring data is formally analyzed by the Watershed Planning, Monitoring, and Assessment Section (WPMAS) to determine the state's overall water quality condition. The section has primary responsibility for surface water chemical and biological monitoring and assessment, the 303(d) and TMDL programs, as well as the water quality standards program. Section 303(d) of the Clean Water Act requires states to identify all water bodies where state water quality standards are not being met. Every two years, WPMAS prepares and submits the list of impaired waters to the Environmental Protection Agency (EPA) for approval, utilizing water quality data associated with the KDHE targeted stream, biological and lake monitoring networks. The waters listed in the Section 303(d) list require a Total Maximum Daily Load (TMDL). The list is frequently submitted as part of an Integrated Report that also describes the general status and trends in water quality of Kansas water quality, extrapolated from random probabilistic stream survey sites, consistent with national protocols under Section 305b. The 303(d) list is found at http://www.kdheks.gov/tmdl/2018/Approved_2018_303_d)_List_of_All_Impaired_Waters.pdf.

Based upon the findings of the 303(d) report and/or additional evaluation, the WPMAS section additionally determines which water bodies are delisted, sets priorities for TMDL development and identifies if an existing TMDL needs to be revised. Regarding TMDL Implementation, WPMAS and Watershed Management Sections are working collaboratively to assist watershed groups with building TMDL implementation into every 9-element watershed plan. Assistance is being provided to watershed groups including water quality assessments for TMDLs to identify possible delisting opportunities and water quality improvement, deriving existing pollutant loads and necessary load reductions interpreted from TMDLs, identifying interim milestones to achieve water quality improvement and establishing a monitoring plan for each watershed plan

KDHE Subwatershed Monitoring

Monitoring of selected critical HUC 12s, associated with high priority implementation of Best Management Practices by WRAPS groups was completed at 15 sites in eastern Kansas from 2011-2015. A summary report of the five year analysis from those WRAPS sites will be used to direct the next round of subwatershed monitoring assessing BMP effectiveness in improving water quality. Additionally, lake monitoring on a routine network was resumed to start anew the ongoing assessment of lake quality and trophic state.

2017 marked the second year of sampling nine new targeted subwatersheds, where implementation to abate nonpoint source pollution has occurred under WRAPs. Annual subwatershed reports are completed to detail the activities and water quality data observed each year within each targeted watershed. Sampling at the targeted subwatersheds will occur for an additional three years to complete the five year period to establish an accurate water quality baseline. The targeted subwatersheds additionally represent TMDL priorities, reflective of Kansas' TMDL Vision and nutrient reduction framework. Routine lake monitoring continued in 2017. Likewise, the continuation of supplemental chemistry and biology sampling occurred in select streams below

wastewater treatment plants to provide the basis for impact analysis of subsequent wastewater operations as new TMDLs impose expectations on those plants to reduce nutrients.

KDHE Interim Assessment of Water Quality Trends

In 2017, water quality baselines and trend assessments were conducted on 15 HUC8s that were identified as HUC8s that both contain high priority TMDLs and WRAPs projects. The priority HUCs were initially identified in the Kansas 303(d) prioritization process which included the following factors:

HISTORIC CONDITION

The first set of factors described the historic ambient condition and relative generation of phosphorus loads within each of the 68 HUC 8s in Kansas. Those factors include:

1. Estimated average incremental P load generated within the HUC 8 in T/yr
2. The estimated total P load exiting the HUC 8 (including P loads imported from upstream HUCs) in T/yr
3. The median TP concentration of all streams within the HUC 8 in mg/l

The loads provided some hydrologic context to the ambient concentrations found in each HUC 8. For example, a HUC 8 with a very high median TP concentration was the Lower Sappa Subbasin in Northwest Kansas. However, the lack of surface flows in that subbasin precluded high loads being generated within the HUC and, hence, low P loads exiting the HUC. Therefore, the inclusion of hydrology tended to push the rankings of loads toward the eastern and central portions of Kansas.

The HUC 8s were ranked from high to low for each of these indicators and scores were assigned to percentile groupings, i.e., Ranks 1 – 7 got 5 points (top 10%); Ranks 8 – 17 got 4 points (11 – 25%); Ranks 18 – 34 got 3 points (26 – 50%); Ranks 35 – 51 got 2 points (51 – 75%); Ranks 52 – 61 got 1 point (76 – 90%) and the lowest seven ranked HUC 8s, #'s 62 – 68 (bottom 10%) got no points.

STRESSORS

The next set of factors described the current and probable future stresses that would exacerbate the impacts of phosphorus loading within each HUC 8. These factors included:

1. The crop acres in the HUC 8
2. The percentage of land area within the HUC 8 that was cropland
3. The urban acres in the HUC 8
4. The percentage of land area within the HUC 8 that was urban
5. The number of stream TP impairments and the number of lake eutrophication impairments present in the HUC 8
6. The total design volume of wastewater potentially discharged by the major facilities in the HUC 8
7. The percent population change between 2000 and 2010 for each county within the HUC 8

8. The number of cattle inventoried in each county in 2007 within the HUC 8. These factors were similarly ranked and scored as the historic condition factors.

RELATIVE VALUE OF WATER

Several factors were identified that conveyed a sense of value for the surface waters found in each HUC 8. These factors describe:

1. The number of Outstanding National Resource Waters (i.e., Tier 3) present in the HUC 8.
2. The number of Exceptional State Waters (i.e., Tier 2.5) present in the HUC 8.
3. The Priority Riparian Area scores for each HUC 8.
4. The presence of a public water supply lake in the HUC 8.
5. If public water supplies have a direct point of diversion into any of the streams in the HUC 8 (i.e., public water supplies served by surface waters).
6. The influence of the pour point of the HUC 8 on the quality of water seen at the interstate border (At the border, close to the border, distant from the border, or no impact at the border).

Rankings and scores were tabulated for the 68 HUC 8s as with the other factors.

IMPLEMENTATION POTENTIAL

The final set of factors dealt with the probability that effective implementation could occur if nutrient TMDLs were established for waters in any given HUC 8. For point source discharges, previous stressor factors involving major NPDES discharges, population growth, and urban land distribution in a HUC 8 also serve as indicators of our ability to control those regulated discharges through wastewater and stormwater NPDES permits. Given the pervasive rural constitution of Kansas watersheds, the key for implementation then lies with the ability of the non-point source control programs at the disposal of the state (i.e., 319, State Water Plan, Farm Bill). Because non-point source control implementation depends heavily on local leadership and management, the factors used for this consideration were tied to the presence and ability of Watershed Restoration and Protection Strategy groups (WRAPS) in certain HUC 8s. Four factors were evaluated for WRAPS in each HUC 8, including:

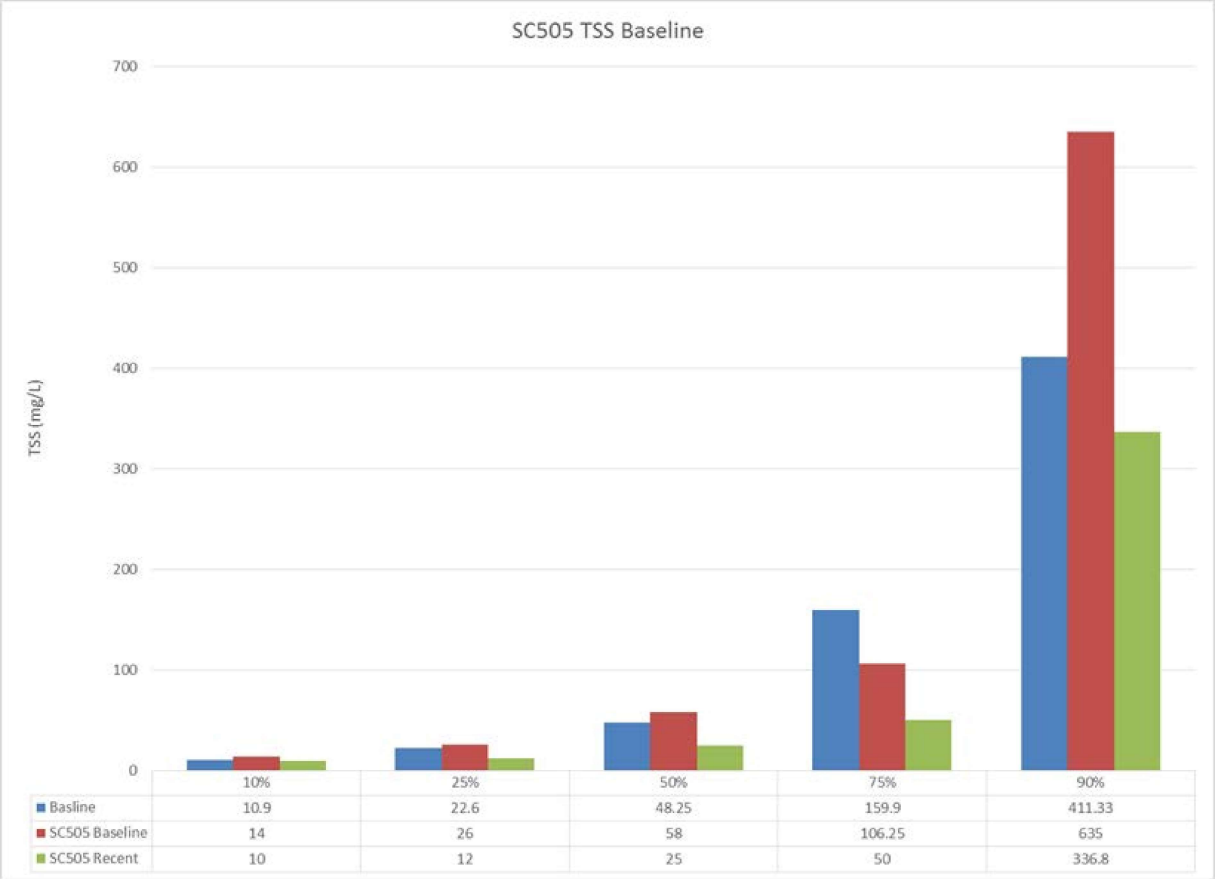
1. Is there an active WRAPS group present in the HUC 8?
2. Does the WRAPS group have a history of performing effective implementation on the ground since it formed?
3. Has the WRAPS group identified critical HUC 12's?
4. Does the WRAPS group have effectiveness monitoring in place to evaluate its efforts?

BASELINE DEVELOPMENT

Though 16 HUC8s were identified as high priority, there are only 15 of them that contained active WRAPS projects. The baseline and trend data was evaluated for the following parameters: Total Nitrogen (TN), Total Phosphorus (TP), Total Suspended Solids (TSS), and Bacteria. The 15 HUC8s evaluated are detailed in the following table:

HUC8 Name	HUC8s with High Priority TMDLs
Lower Republican	10250017
Big Creek	10260007
Lower Smoky Hill	10260008
Middle Kansas	10270102
Delaware	10270103
Lower Kansas	10270104
Lower Big Blue	10270205
Upper Marais Des Cygnes	10290101
Little Arkansas	11030012
Upper Walnut River	11030017
Lower Walnut River	11030018
Neosho Headwaters	11070201
Upper Neosho	11070204
Middle Neosho	11070205
Spring	11070207

The baseline evaluations for each HUC8 included calculating the 10th, 25th, 50th, 75th, and 90th percentiles for total phosphorus (TP), total nitrogen (TN), total suspended solids (TSS), and bacteria for the individual KDHE stream chemistry monitoring stations within the HUC8 for the period of record 1990-2010. The baseline for the entire HUC8 is established by calculating the 10th, 25th, 50th, 75th, and 90th percentiles from the compiled calculated percentiles for the all stream chemistry monitoring stations within the HUC8. This same procedure was followed for the more recent period of record for 2011-2017 to calculate a recent condition, which is then compared to the 1990-2010 baseline for each parameter to establish a general trend assessment. The resulting information was charted for each HUC8, establishing four total baseline charts for each HUC8 (one for each parameter). Further assessments with the data could be made with each individual station, comparing the data for the general trends between each station or in comparison to the larger HUC8 assessment. An example of the charted baseline follows with the TSS baseline for the HUC8 where stream chemistry station SC505 resides showing as blue bars; the TSS baseline for SC505 is displayed as red bars, and the recent condition at SC505 displayed as green bars.



	10%	25%	50%	75%	90%
Basline	10.9	22.6	48.25	159.9	411.33
SC505 Baseline	14	26	58	106.25	635
SC505 Recent	10	12	25	50	336.8

Each HUC8 analysis was saved in a separate excel spreadsheet and remain available for staff to utilize and update as these are further evaluated and incorporated into the associated WRAPS project's water quality milestones when the plans are up for review and revisions. Conclusions drawn from the analysis will be thoroughly evaluated on an on-going basis dependent upon the timeline for projects within each HUC8, additionally the datasets for the recent period may be updated as needed to further assess recent trends as more data is collected.

Kansas Reference Stream Assessment
(http://www.kdheks.gov/befs/download/bibliography/Kansas_reference_stream_report.pdf)

A report was completed in 2010 by KDHE entitled *Kansas Reference Streams: Selection of Suitable Candidates, Impending Threats to Reference Stature, and Recommendations for Long-Term Conservation*. The study involved assembling numerous existing geographical databases and developing a human disturbance index to evaluate and rank the state's nearly 100,000 watersheds and corresponding stream reaches. The National Hydrography Dataset (NHD) was utilized for these delineations. Watersheds were ranked based on disturbance analysis by ecoregions established for the study. The primary intent of the study was to identify potential watersheds with minimal amounts of disturbance within the various ecoregions to provide a basis for future field analysis and consideration of measures that could be employed to protect high value watersheds that demonstrate properly functioning conditions that provide good quality water. This will provide useful information for watershed projects in developing water quality restoration and protection plans.

2015 Update Kansas Forest Action Plan

This recent assessment identifies both benefits and threats regarding Kansas forest resources and identifies priority areas for enhanced management and protection. Restoration and protection of water quality is recognized as a key component of the strategy. The assessment indicates about 5.2 million acres of forests, woodlands and trees in Kansas (includes windbreaks, riparian buffers and other areas that do not meet the USDA definition of forestland). The assessment suggests future declines in forest resources due to conversion to cropland, urban development and other uses. The full report can be viewed at: https://stateforesters.org/sites/default/files/publication-Documents/Kansas%20National%20Priorities.pdf.

Current State NPS Priority Issues

The ***Kansas Water Plan*** (www.kwo.ks.gov) outlines state policies and programs for the comprehensive management of water resources. It addresses both water quality and water quantity issues and establishes state priorities for targeting applicable state and federal programs. The Kansas Water Authority (KWA) and the Kansas Water Office (KWO) are responsible for coordinating the development and implementation of the *Kansas Water Plan* in collaboration with multiple local, state and federal agencies, regional advisory committees, organizations and the general public through the Kansas Water Planning Process. The plan is updated periodically to address current issues and reflect progress in plan implementation. The KWA membership is comprised of state water-related agency heads and representatives of state water interests appointed by the Governor and legislative leadership to advise the Governor and Legislature on water policy and program funding to address state water resources issues and concerns. Basin advisory committees consist of representatives of local water interests within the State's twelve major river basins that advise the KWO and KWA on issues within their respective basins.

In 1989, a State Water Plan Fund was established to facilitate implementation of the *Kansas Water Plan*. Funding is provided annually to multiple agencies to administer programs and projects that implement recommendations of the plan. The fund generates approximately $20 million annually. The KWA makes funding recommendations each year to the Governor and Legislature on expenditure of the State Water Plan fund. Funding is subsequently appropriated to the respective agencies through the State budgetary process.

The *Kansas Water Plan* consists of both policy and basin sections. The *Plan* identifies the following primary NPS related water quality priorities:

- Total Maximum Daily Loads
- Source Water Protection
- Surface Water Nutrient Reduction
- Reservoir Sustainability
- Wetland and Riparian Area Management
- A Long-Term Vision for the future of Water Supply in Kansas
- Harmful Algal Blooms

Total Maximum Daily Loads (www.kdheks.gov/tmdl/)
Section 303(d) of the CWA requires states to develop TMDLs for water bodies on the State's List of Impaired Waters. TMDLs are quantitative objectives and strategies needed to achieve water quality standards. The water quality standards constitute the goals of water quality adequate to fully support designated uses of streams, lakes, and wetlands.

TMDLs in Kansas are developed on a watershed basis and priority for implementation is established through the Kanas TMDL Prioritiazation Framework www.kdheks.gov/tmdl/download/Kansas_TMDL_Prioritization_Framework.pdf. TMDLs that are designated as a high priority are used to target applicable state and federal programs that can provide technical and financial assistance for implementation of BMPs that can address the applicable water quality impairment. High priority TMDL watersheds for implementation are identified in the applicable basin sections of the *Kansas Water Plan*. The 2014 DRAFT *Kansas Water Plan* includes 67 streams, 30 lakes and 4 wetlands with high priority TMDLs established. Bacteria, nutrients and sediment represent the most significant impairments in terms of NPS implementation efforts.
Key state and federal nonpoint source pollution related programs that currently incorporate some level of targeting or priority for implementation of BMPs in high priority TMDL watersheds include:

- KDHE Watershed Restoration and Protection Strategy & 319 Grant Programs
- KDHE Local Environmental Protection Program
- KDA-DOC Nonpoint Source Pollution Control Program
- KDA-DOC Water Resources Cost-Share Program
- KDA-DOC Water Quality Buffer Initiative
- KDA-DOC Riparian and Wetland Protection Program
- NRCS Environmental Quality Incentive Program
- USDA Conservation Reserve Program (Conservation Priority Area designations)

Tables showing all approved Kansas TMDLs, including maps of high priority TMDL watersheds, and the 2018 303(d) list of impaired waters are provided in Appendix 3. Additional information on Kansas TMDLs is available at: http://www.kdheks.gov/tmdl/planning_mgmt.htm.

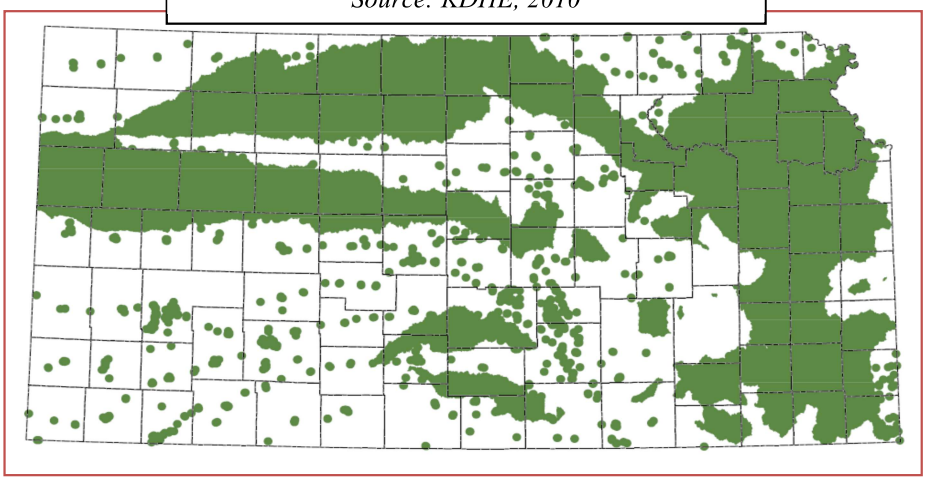
Surface Water Nutrient Reduction
In 2004, the KDHE developed the *Kansas Surface Water Nutrient Reduction Plan.* The plan established an overall goal of reducing nitrogen and phosphorus exported to other states from Kansas rivers and streams by 30%. As indicated in the plan, approximately 51,000 tons of total nitrogen (TN) and 7,700 tons of total phosphorus (TP) are exported from Kansas annually. Estimated point source contributions to this export are 18% for TN and 25% for TP, with the balance being from nonpoint sources.

In March 2011, EPA released a memorandum titled "Working in Partnership with States to Address Phosphorus and Nitrogen Pollution through the Use of a Framework for State Nutrient Reductions". The memorandum expressed EPA's desire to provide states with the opportunity to innovate nutrient reduction methods that best respond to local water quality situations and needs. In response to the memorandum a nutrient reduction steering committee was formed that included KDHE, KWO, KDA-DOC, and KDWPT, and ultimately Kansas' Nutrient Reduction Framework (appendix 6) was completed in March 2012.

At present, nutrient reduction from nonpoint sources of pollution are targeted primarily to nutrient related impairments in high priority TMDL watersheds in Kansas. However, increasing attention is being given to interstate watersheds where nutrient related water quality impairments are occurring in surface water bodies outside of the Kansas border.
BMPS implemented in Federal Fiscal Year 2017 (October 1, 2016 – September 30, 2017) as reported to KDHE reduced annual phosphorus loads by an estimated 214,393 pounds per year and nitrogen loads by an estimated 408,080 pounds per year.

Source Water Protection (www.kdheks.gov/nps/swap/)
The 1996 amendments to the Safe Drinking Water Act required each state to develop a Source Water Assessment Program. Additionally, each state was required to develop a Source Water Assessment (SWA) for each public water supply that treats and distributes raw source water. In Kansas, there are approximately 763 public water supplies that required SWAs. These assessments were completed in 2004.

Figure 1.9 Source Water Protection Areas
Source: KDHE, 2010



A SWA includes the following: delineation of the source water assessment area; inventory of potential contaminant sources; and susceptibility analysis (potential for being contaminated). The SWAs in Kansas showed 54% of the 677 systems utilizing a ground water source received a low susceptibility analysis score; 45% were scored moderate and 1% high. Fifty-one percent of surface water systems received low susceptibility scores, with 43% scoring moderate and 6% scoring high.

Due to limited resources, time, and guidance, many PWS have not developed nor implemented source water protection plans. Due to this, the Kansas Department of Health and Environment (KDHE) has begun the development of the Drinking Water Protection (DWP) program. The DWP process outlined below allows the PWS the ability to assess potential and current threats to their source water as well as plan appropriate strategies to address those concerns.

The Drinking Water Protection Program is built on the principle that prevention often costs less than treatment. KDHE encourages public water supply systems (PWSS) and their surrounding communities to complete DWP plans on a voluntary basis. The program strives to provide technical assistance to public water supplies to restore and protect water quality in order to meet drinking water standards. The DWP process is locally guided by stakeholders interested in the protection of the drinking water source. Similar to Kansas' Watershed Restoration and

Protection Strategy (WRAPS) program, this program identifies drinking water source restoration and protection needs, local stakeholders establish source water goals, action steps are created in the DWP plan, and the plan is implemented/monitored.

Drinking water protection stems from the data available from Source Water Assessments (SWA). These SWAs were completed for all active public water supply systems in 2004 as required to complete as part of the 1996 amendments to the Safe Drinking Water Act. Funding for this program was provided by the Environmental Protection Agency. The assessments identified all potential sources of contamination for each public water supply system as well as evaluated the susceptibility of the PWS for contamination.

A DWP plan outlines the current conditions of the drinking water protection area including age of the PWSS, environmental assessments/DWP investigation results, population, and land use. The plan will outline needed action steps to protection the drinking water source. Implementation of the action steps is clearly outlined and scheduled as well as needed resources (funding, technical assistance, regulations, etc.) to fulfil the objectives and goals. Milestones and a monitoring schedule will allow the PWSS to track efforts in the implementation of the plan.

Reservoir Sustainability

Surface water reservoirs represent an important source of public water supply in Kansas. The KWO estimates that about two-thirds of the Kansas population receives public water supply benefits from the state's federal reservoirs. The State of Kansas owns storage space in 13 of these 24 federal reservoirs (see Figure 1.10). The KWO administers a state water marketing program that provides water supplies to municipalities and industries. Other federal reservoirs provide water supply directly to municipalities, such as Cheney Reservoir (City of Wichita) and El Dorado Reservoir (City of El Dorado).

Figure 1.10 Federal Reservoirs with State Owned Storage
Source: Kansas Water Plan DRAFT 2014

Surface water reservoirs are affected by both water quality and water quantity impacts that are influenced primarily by their drainage areas. Once construction of a reservoir's dam is completed, sediment and pollutants are carried by incoming rivers and streams and deposited within the reservoir, resulting in loss of storage space as well as diminished water quality. Over time, this accumulation of sediment and pollutants can result in water quality impairments. Currently 22 federal reservoirs have one or more TMDLs developed to address a water quality impairment or are listed on the 303(d) list of impaired waters. Eutrophication and siltation are the most prevalent reservoir impairments resulting in large part from nonpoint sources of pollution. Smaller city owned water supply

reservoirs are also affected by sediment and other pollutants contributed by NPS runoff and in need of restoration and protection efforts.

In June 2008, a series of white papers on sedimentation issues were developed through an interagency effort and a report was published addressing a number of reservoir sedimentation issues. Since that time, the KWO has prepared a Reservoir Roadmap outlining a number of actions for reservoir restoration and protection. A sediment baseline assessment was also initiated to enhance the understanding of sediment sources and processes and evaluate various management strategies. These reports can be found on the KWO website (www.kwo.ks.gov).

Riparian and Wetland Management

Restoration and protection of wetland and riparian area resources are identified in the *Kansas Water Plan* as a major component in restoring and maintaining the water quality in rivers and lakes to fully support their designated uses. These resources provide important sinks that trap, filter and utilize various pollutants such as sediment and nutrients before they can enter surface waters.

The Wetland Program Plan (WPP) presented below was developed in consultation with the state agencies having responsibility for wetland programs and the broader WARP (Wetland and Aquatic Resources Plan) Team, in addition to numerous other informal presentations. It represents a compilation of recommendations made for wetland conservation over the past 25 years by representative entities. The entire slate of previous recommendations is included as an appendix to this Document. Discussions about what to include in this WPP for the next three to five years involved identification of highest priority needs, realistic assessment of what could be accomplished and recognition of the financial and political climate facing the state during this time frame. From these discussions, four primary areas of focus were identified:

1. Kansas has developed the Topographic Wetland Identification Process (TWIP), a landscape level LiDAR based tool that identifies potential areas for wetland protection, restoration and enhancement. We plan to continue acquisition of LiDAR statewide and to use the TWIP to enhance and target our exiting wetland programs on a watershed scale to accomplish broad wetland conservation while restoring and protecting our priority watersheds across the state.

2. Continued information and education to encourage wetland conservation is another important priority and we plan to greatly enhance the availability and quality of information available on a dedicated wetland webpage on the KWO website.

3. Recognition of the need to gain greater understanding of our wetland resources through continued monitoring, assessment and evaluation of function and condition.

4. Our playa lake resources in the western part of the state require additional attention for conservation and management.

The Vision of the Wetland Program Plan for Kansas is to protect, enhance and restore our wetland resources to be able to support the wealth of services that wetlands provide to the citizens and visitors of Kansas.

The Wetland Program Plan for Kansas can be found at https://kwo.ks.gov/docs/default-source/reports-page/water-conservation-reports/wetland-program-plan-for-kansas-feb2013.pdf?sfvrsn=4.

Riparian and wetland resources represent key components of local and regional green infrastructure networks that serve to restore and maintain a more natural hydrologic system that promotes infiltration of stormwater runoff and enhances a watershed's capacity to filter out harmful pollutants before they enter streams, rivers and lakes. Other benefits such as wildlife habitat, groundwater recharge, flood attenuation and recreation can also be associated with these resources.

Wetlands, vegetative grass or forest buffers along rivers and streams, and native grasslands, floodplains and woodlands are all examples of green infrastructure resources in both urban and rural watersheds. The *2010 Kansas Forest Assessment* estimates about 562,000 acres of riparian forestland bordering 23,731 miles of perennial streams and rivers. The report suggests that loss of forestland is occurring in riparian areas that compete with agricultural crops, urban uses and other forms of development and anticipates continued threats to riparian forest resources (KFS, 2010).

The 2009 American Recovery and Reinvestment Act (ARRA) promoted the utilization of green infrastructure projects to address stormwater quality issues in rural and urban watersheds through a supplemental appropriation to the Clean Water State Revolving Loan Fund program. Kansas received an appropriation of approximately $38 million for this program and utilized approximately $6 million for green infrastructure projects in urban and rural watersheds.

Streambank stabilization has been a key component in the reduction of sediment entering our water supply reservoirs and reestablishing crucial riparian forests along rivers and streams. ARRA funding led to the development of an inter-agency planning and implement The coordination between the Kansas Department of Health & Environment (KDHE) (Watershed Management Section), the Kansas Department of Agriculture (KDA) Division of Conservation, and the Kansas Water Office (KWO) have utilized the strengths, responsibilities, and resources of each agency to accomplish streambank protection work. In order to complete projects in the most efficient and cost-effective manner, the inter-agency team operates from a pooled funding system. Funds available through agency programs for streambank protection projects are targeted to priority areas and administered by this group. The Kansas Forest Service (KFS), Kansas Department of Wildlife, Parks, and Tourism (KDWPT), local conservation districts (CD), and local Watershed Restoration and Protection Strategy (WRAPS) groups continue to be essential to the success of this process.

Streambank stabilization efforts are currently being concentrated in three high priority watersheds, the Big Blue and Little Blue Rivers above Tuttle Creek Lake, the Delaware River above Perry Lake, and the Cottonwood and Neosho Rivers above John Redmond Reservoir. Past efforts have included implementation projects across the state, including within the Smoky Hill-Saline watershed. In 2016, 7 streambank sites were completed. In 2017, 13 projects were completed, and in 2018, 33 new projects have been started with completion scheduled for later this year. It is estimated the streambank stabilization projects implemented to date will prevent nearly 875,000 tons of sediment from entering the associated downstream reservoirs each year.

A Long-Term Vision for the Future of Water Supply in Kansas

In October 2013, Governor Brownback issued a call to action to his Administration to develop a 50-Year Vision for the Future of Water in Kansas stating, "Water and the Kansas economy are directly linked. Water is a finite resource and without further planning and action we will no longer be able to meet our state's current needs, let alone growth". Incorporating the Vision Action Items into the Kansas Water Plan will formalize the statutory process recognized in state law.

The writing is on the wall and if we don't act today, our future is bleak. The Ogallala Aquifer is declining faster than it is recharging. Reservoirs, which are critical water storage structures for much of our state, are filling with sediment. At this rate, with no changes in the next 50 years, the Ogallala will be 70 percent depleted and our reservoirs will be 40 percent filled with sediment.

The multi-year drought has brought water issues to the forefront; we must plan for the future now.

Since issuing the call to action in October 2013, a Vision Team comprised of the Kansas Water Office, Kansas Department of Agriculture and Kansas Water Authority, embarked on a one-year mission to seek input from water users, compile data, conduct research and chart a path forward.

Governor Brownback's Administration, and most importantly the citizens of Kansas, have responded to his call to action and have developed a Vision to ensure a reliable future water supply. If we remain united and committed to implementing the strategies defined in this Vision, future generations will look back on the work we do and say that's the generation of Kansans who worked together to protect and conserve the state's water resources today and for the future. (https://kwo.ks.gov/water-vision-water-plan/water-vision)

Harmful Algal Blooms

Blue-green algal (also known as cyanobacterial) toxins in freshwaters have been implicated in human and animal illness in at least 36 states in the United States. In Kansas, blue-green algae are naturally present in most surface waters. When certain conditions develop, such as high nutrients, temperatures, and sufficient light levels, these organisms can reproduce rapidly. This dense growth of algae is called a bloom and can sometimes lead to a harmful algal bloom (HAB). These conditions tend to occur in the warmer summer months after spring rainfalls wash accumulated high nutrient loads from animal waste, agricultural fertilizers, sewage effluent and urban stormwater runoff into surface waters. Subsequent summer conditions improve water clarity, allowing light to penetrate deeper into waters, fueling primary productivity where nutrients are plentiful. Dry summer conditions can also increase the impact of wastewater effluent on lakes and streams with lower water levels condensing nutrients. Blooms can also exist in winter months although algal species have been found to be different than those that exist in the spring and summer. Organisms most frequently responsible for these HAB outbreaks include cyanobacteria and, although not as common, dinoflagellates. In Kansas, the predominant genera of cyanobacteria are *Microcystis* and *Dolichospermum* (formerly *Anabaena)*. HABs can vary in toxicity and may pose a direct threat to human and animal health. Exposure to cyanobacteria toxins while recreating in surface waters can result in adverse human health effects such as: hay fever-like symptoms, skin rashes, vomiting, diarrhea and respiratory distress. Freshwater blue-green algae under bloom conditions are capable of producing potent toxins that can cause specific and severe hepatic or neurological dysfunction. These toxins have also been identified as the cause of several animal deaths. Exposure to these toxins most commonly occurs when persons or animals come in contact with, ingest or inhale contaminated water.

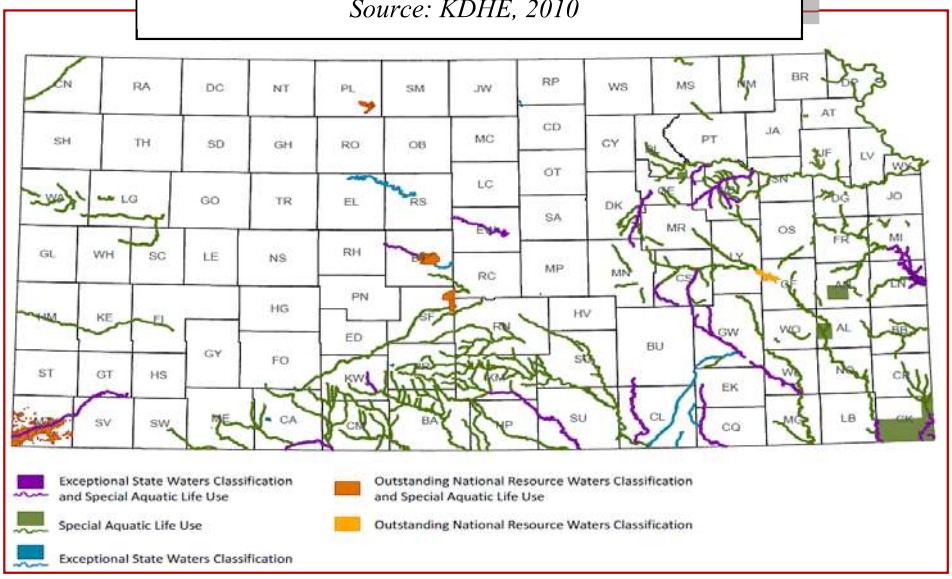
The KDHE agency response plan for Harmful Algal Blooms can be found at http://www.kdheks.gov/algae-illness/Response_Plan/2017_HAB_Response_Plan.pdf.

High Value and Threatened Waters and Watershed Resources

The Kansas Surface Water Quality Standards designate specific water bodies for high value uses including Special Aquatic Life Use, Exceptional State Waters and Outstanding National Resource Waters. Figure 1.11 shows a map of these water bodies.

In addition to these designated water bodies, properly functioning, minimally disturbed headwater watersheds represent an important resource for maintaining or improving water quality conditions in the future. The recent KDHE Reference Stream Assessment described earlier in this Document identifies potential areas where protection strategies may be considered.

Figure 1.11 - Kansas High Value Waters
Source: KDHE, 2010



Definitions

K.A.R. 28-16-28(aaa) "**Outstanding national resource water**" means any of the surface waters or surface water segments of extraordinary recreational or ecological significance identified in the surface water register, as defined this regulation, and afforded the highest level of water quality protection under the antidegradation provisions and the mixing zone provisions of K.A.R. 28-16-28c.

K.A.R. 28-16-28(dd) "**Exceptional state waters**" means any of the surface waters or surface water segments that are of remarkable quality or of significant recreational or ecological value, are listed in the surface water register as defined in this regulation, and are afforded the level of water quality protection under the antidegradation provisions of K.A.R. 28-16-28c and the mixing zone provisions of K.A.R. 28-16-28c.

K.A.R. 28-16-28d(b)(2)(A) "**Special aquatic life use waters**" means either classified surface waters other than classified stream segments that contain combinations of habitat types and indigenous biota not found commonly in the state or classified surface waters other than classified stream segments that contain representative populations of threatened or endangered species.

Changing Climate and Water Quality

Changing climate conditions are expected to impact the frequency, durations, and intensity of rainfall events in Kansas. Increased precipitation leads to flooding, increased pollutant runoff, undersized sewer and storm water pipes issues, and design complications on traditional best management practices. Decreased precipitation in some areas triggering drought can cause increased concentrations of pollutants, decreased in water resources (public water supplies, irrigation, etc.), and decreases in wildlife habitat. The variability of the climate could potentially increase harmful algal blooms. Water quality partners will work together in Kansas to mitigate the effect of changing climate conditions on water quality in surfaced and ground water.

CHAPTER TWO
NONPOINT SOURCE INSTITUTIONAL AND PARTNERSHIP FRAMEWORK

Sources of nonpoint pollution in Kansas are primarily unregulated and management of NPS pollution is a shared responsibility among numerous local, state and federal agencies, organizations and individuals. Sources of pollution include both urban and rural activities requiring a comprehensive approach to management of these sources. The following table provides a summary of common NPS pollutants and sources in Kansas. A comprehensive list of potential pollutant source categories is included in Appendix 4.

Table 2.1 Sources of Pollutants

Pollutant	1	2	3	4	5	6	7	8	9
Atrazine & Pesticides	+			+		+	+	+	+
Bacteria		+	+	+			+	+	
BOD		+	+	+	+		+	+	
Nitrogen	+	+	+	+		+	+	+	+
Phosphorus	+	+	+	+	+	+	+	+	+
Suspended Solids	+	+		+	+	+	+	+	+

1-Cropland
2-Livestock
3-On-site wastewater
4-Pasture/Rangeland
5-Riparian Areas
6-Transportation
7-Urban
8-Farms & Homes
9-Hydrologic Modification

Source: Adapted from Kansas Nonpoint Source Pollution Management Plan, 2010 Update

Multiple government programs provide information, technical assistance or financial assistance to landowners and citizens to implement BMPs on a voluntary basis. The term BMP (Best Management Practice) is used throughout this Document to refer to a wide variety of urban and rural structural and nonstructural practices that can be implemented by organizations and individuals to reduce or prevent nonpoint source pollution. The Kansas WRAPS Work Group established a set of characteristics for various land use/land cover components that would be reflective of a properly functioning watershed. Application of appropriate BMPs can be utilized to achieve these functions within watersheds in need of restoration. These characteristics are included in Appendix 4.

Institutional Partners

The following table provides an overview of some of the primary local, state and federal agencies and organizations with their associated NPS related program responsibilities.

Table 2.2 Organizational Responsibilities for NPS Related Program Implementation, Administration, and Facilitation								
Organization	**IE**	**FA**	**TA**	**TT**	**E**	**M**	**P**	**A**
Kansas Department of Health & Environment	●	●	●	●	●	●	●	●
Kansas Department of Agriculture	●	●	●	●				
Kansas Department of Agriculture Division of Conservation	●		●	●	●		●	
Kansas Water Office	●						●	●
Kansas Forest Service	●	●	●	●				●
Kansas Department of Wildlife and Parks	●	●	●	●	●	●		●
USDA Natural Resources Conservation Service	●	●	●	●	●		●	
USDA Farm Services Agency	●	●			●			
US Fish and Wildlife Service	●	●	●		●	●		●
US Army Corps of Engineers	●		●	●		●	●	●
US Environmental Protection Agency	●	●	●	●	●		●	
US Geological Survey	●					●		●
K-State Research & Extension Offices	●		●	●		●		●
Kansas Biological Survey & Geological Survey	●		●	●		●		●
County Conservation Districts	●	●	●	●			●	
Local Environmental Protection Programs	●		●	●	●		●	●
WRAPS Stakeholder Leadership Teams*	●	●		●			●	●
WRAPS Service Provider and Sponsor Organizations	●	●	●	●		●		●

KEY

IE – Information & Education
FA – Financial Assistance
TA – Technical Assistance
TT – Technology Transfer
E – Program Enforcement
M – Monitoring
P – Policy and Planning
A - Assessment

NOTES

* Provides oversight and direction to sponsoring organizations and service providers

Source: Adapted from Kansas Nonpoint Source Pollution Management Plan, 2010 Update

Following is a descriptive summary of state and federal agencies that have significant NPS related program responsibilities. See Appendix 5 for supplemental information on programs and authorities.

Federal NPS Partners

The **USDA Natural Resources Conservation Service** (NRCS - www.ks.nrcs.usda.gov/) and the **USDA Farm Service Agency** (FSA - www.fsa.usda.gov/ks) administer multiple federal Farm Bill programs that provide technical and financial assistance for implementation of water quality BMPs. A Kansas Technical Committee consisting of numerous agencies and organizations meets regularly to provide advice and input to NRCS and FSA on program implementation and state priorities. Primary programs that can benefit water quality in Kansas include:

- Environmental Quality Incentives Program (Federal Fiscal Year "FFY" 2017 Funding – more than $33 million)
- Agricultural Conservation Easement Program – Wetland Reserve Easements (FFY 2018 - $719,000)
- Agricultural Conservation Easement Program – Agricultural Land Easements (FFY 2018 - $193,000)
- National Water Quality Initiative (FFY 2017 – 683,000)
- RCPP
    - Water Quality Improvement through the Implementation of Forestry Practices Project (more than $8 million)
    - Middle and Lower Neosho River Water Quality Project (more than $1.4 million)
    - Milford Lake Regional Conservation Partnership Program (more than $2.8 million)

The **U.S. Environmental Protection Agency** (www.epa.gov/owow_keep/NPS) provides funding for implementation of the State's NPS Management Program through an annual CWA Section 319 grant to KDHE. EPA personnel also provide program guidance and implementation assistance through review of 319 project implementation plans for subgrants to local project sponsors. Other funding is also made available through EPA for water quality related activities, such as the State Wetland Development Grant Program and Targeted Watershed Grant Program, which have been utilized in Kansas by local and state partners. The annual 319 program grant to Kansas in FFY 2017 was about $2.873 million.

Other federal agencies involved in water quality related activities and projects include:

- U.S. Geological Survey (www.usgs.gov) - e.g. water quality monitoring and assessment
- U.S. Fish and Wildlife Service (www.fws.gov) - e.g. water quality activities that benefit wildlife
- U.S. Army Corps of Engineers; Kansas City District (www.nwk.usace.army.mil) and Tulsa District (www.swt.usace.army.mil) - e.g. planning and technical assistance to address ecosystem restoration and reservoir sedimentation issues, management of public lands around federal reservoirs and administration of CWA Section 404 permitting/Section 401 water

quality certification process for dredge and fill activities in the waters of the U.S., including wetlands.

State NPS Partners

The **Kansas Department of Agriculture - Division of Conservation** (http://agriculture.ks.gov/divisions-programs/division-of-conservation) provides state financial assistance to landowners through local county conservation district programs to implement BMPs on private or publicly owned land. All 105 county conservation districts have a state approved Local NPS Pollution Management Plan, which guides the implementation of NPS BMPs in their respective counties. Primary KDA-DOC NPS related programs include:

- The Nonpoint Source Pollution Control Program - provides funding to producers to implement water quality BMPs through county conservation districts that have developed a local NPS Pollution Control Management Plan (State Fiscal Year "SFY" 2019 Funding – more than $1.8 million)
- Water Resources Cost-Share Program – provides funding to producers for soil and water conservation practices through local county conservation district programs (SFY 2019 Funding –more than $1.9 million)
- Water Quality Buffer Initiative – provides state incentive funding for implementation of vegetative buffer strips through the USDA Continuous CRP program in state priority water quality and reservoir watersheds (SFY 2019 Funding – $200,000)
- Riparian and Wetland Protection Program – provides funding for technical and financial assistance to implement BMPs that protect or restore riparian and wetland resources (SFY 2019 Funding – more than $152,000)
- Sediment and Nutrient Reduction Initiative – Requirements for receiving a state incentive payment made to participants to supplement federal payments for certain conservation areas. (SFY 2019 Funding – More than $280,000)

KDA-DOC programs are funded through the State Water Plan Fund and technical assistance for implementation of many of these practices is provided through the NRCS.

The **Kansas Department of Health and Environment** administers several programs that support NPS management. These include:

- The Bureau of Environmental Field Services (BEFS), Watershed Management Section (WMS-www.kdheks.gov/nps/) administers CWA Section 319 and State Water Plan funding to local project sponsors to implement NPS BMPs and to develop and implement watershed restoration and protection strategies. The Local Environmental Protection Program currently provides State Water Plan funding support to county health departments and multi-county organizations to develop and implement local environmental protection plans addressing regulation of on-site wastewater systems, private water wells and other NPS related issues through enforcement of county sanitary/environmental codes and other activities. The WMS also provides 401 water quality reviews and certifications for federally funded/permitted projects when required.
- The Bureau of Water (BOW), Watershed Planning and Standards Unit (http://www.kdheks.gov/tmdl/planning_mgmt.htm) prepares the biennial 303(d) List of Impaired Waters and administers the TMDL Program to determine restoration needs for impaired water bodies.
- The Bureau of Environmental Field Services (BEFS), Livestock Waste Management (www.kdheks.gov/feedlots/) administers state laws and regulations that address smaller

confined feeding operations as well as those regulated under the federal National Pollutant Discharge Elimination System (NPDES) Confined Animal Feeding Operations program. Livestock facilities with a capacity of 300 or more animal units must register with KDHE. Additionally, any facility that presents a significant water pollution potential must register with KDHE. BMPs are required to be installed as needed to ensure that a significant pollution potential does not exist.

- The BOW, Municipal Programs Section, (www.kdheks.gov/muni/) administers the Kansas Water Pollution Control Revolving Fund, which provides funding for NPS projects in collaboration with the BOW Watershed Management Section. The Section also administers NPDES permitting for municipal (MS4) stormwater, land application of municipal wastewater and wastewater sludge, and Kansas Water Pollution Control permits.
- The BOW, Industrial Programs Section, (www.kdheks.gov/indust/) administers NPDES permitting for construction stormwater, industrial stormwater, land application of industrial wastewater and wastewater sludge, and Kansas Water Pollution Control permits.
- The BOW, Public Water Supply Section (www.kdheks.gov/pws/) administers programs for regulating public water supply systems and assisting them in providing safe and potable water to the people of Kansas. The Section's Capacity Development Program assists public water supply systems to acquire and maintain the technical, financial, and managerial capacity needed to meet the public health protection objectives of Safe Drinking Water Act.
- The BOW, Geology Section, (www.kdheks.gov/geo/) administers programs for regulation of underground injection control (UIC), underground hydrocarbon and natural gas storage, and water well licensing, water well construction and abandonment.
- The BOW, Monitoring and Analysis Unit (http://www.kdheks.gov/befs/tech_svcs_section.html) operates the State Water Quality Monitoring network and prepares the biannual Integrated Water Quality Assessment Report describing the water quality conditions of classified water bodies in the state, including the major sources and causes of impairments.
- BEFS District Office watershed field staff provide ongoing support and technical assistance for NPS water quality related programs including LEPP, WRAPS, 319 grants, 401 water quality certifications and other NPS activities.
- The KDHE Bureau of Environmental Remediation operates a State Water Plan Contamination Remediation Program (www.kdheks.gov/remedial/swp/) designed to address cleanup of contaminated sites that pose a health risk. Most of these sites involve groundwater impacts potentially affecting public or private drinking water supplies.

The **Kansas State University (KSU) Research and Extension Service** (www.ksre.ksu.edu/) provides water quality information, education and technical assistance services through its multiple extension and outreach programs. These include county extension offices, agricultural experiment stations, watershed specialists, Kansas Center for Agricultural Resources and the Environment (KCARE - www.kcare.ksu.edu/), and other related programs. KSU Research and Extension is also actively engaged in sponsoring and supporting individual WRAPS projects.

The **Kansas Department of Agriculture** (http://agriculture.ks.gov/) administers the Kansas Pesticide and Fertilizer Laws that provides for the inspection, registration and sampling of fertilizers products; and provides for the registration of pesticide products and dealers and establishes minimum standards for proper use, storage and disposal of pesticide products. The

agency also administers the Water Structures Program, which regulates structural alterations to streams and floodplains, and the Water Appropriations Program.

Other State NPS Partners include:

- The **Kansas Forest Service (**www.kansasforests.org/) provides technical assistance to landowners for proper management of private forestland to protect land and water resources, including the establishment and management of healthy riparian forest buffers to provide water quality benefits.
- The **Kansas Biological Survey** (www.kbs.ku.edu/) and the **Kansas Geological Survey** (www.kgs.ku.edu/) - conducts water quality related studies and provide information to water quality program managers to address a variety of surface and groundwater quality issues.
- **Kansas Department of Wildlife, Parks and Tourism** (www.kdwp.state.ks.us/) – conducts biological stream monitoring, assessments and environmental reviews; provides technical and financial assistance for habitat protection and improvement that also provides water quality benefits. KDWPT's Stream Survey and Assessment Program collects data pertinent to the fish, mussels and other invertebrate communities within Kansas streams and rivers for the purpose of reviewing publicly funded projects for state and federally permitted development. These efforts have been associated with rare and sensitive species, but the program maintains and updates an extensive database for all species of fish and invertebrates collected statewide. Surveys are performed on public and private lands with landowner permission. Educating and increasing awareness of the importance of streams and rivers has also been an important part of the program. KDWPT also manages a significant amount of public land, particularly around many of the states lakes and federal reservoirs.
- **Kansas Corporation Commission** (www.kcc.state.ks.us/) – regulates oil and gas drilling operations to protect water quality; administers a well plugging program for abandoned oil and gas wells.

In addition to state governmental agencies; numerous conservation, agricultural and environmental organizations are also involved in activities addressing NPS issues (see Table 2.2, page 31).

Local NPS Partners

Conservation Districts (www.kacdnet.org/)
Conservation districts were created to implement soil and water conservation practices for erosion control and water quality purposes under the Conservation District Law (K.S.A. 2-1901 et seq.) enacted in 1937. Conservation districts are governmental subdivisions of the state and are governed by a board of supervisors who are elected by the land occupiers of the district. Conservation district boundaries correspond geographically with county political boundaries. Each of the 105 counties in Kansas are served by a conservation district.

Conservation districts have broad powers to develop and implement soil and water conservation practices. All districts currently have a state approved Nonpoint Source Pollution Management Plan to guide the implementation of water quality protection measures in their respective counties with State Water Plan funds administered by the KDA-DOC. Some conservation districts also serve as the sponsoring organization for WRAPS projects.

County Health Departments and multi-county Local Environmental Protection Groups (www.kdheks.gov/nps/lepp/) The LEPP provides for the implementation of local environmental protection plans by county health departments and multi-county local environmental protection groups. Core program components include adoption, implementation and enforcement of sanitary/environmental codes to manage on-site wastewater systems and private water supply

wells; provide for information, education and technical assistance; and organization and coordination of a LEPP committee that provides advice and counsel on the LEPP plan. Other program components include solid waste management, hazardous waste management, subdivision water and wastewater, public water supply protection, and other nonpoint source pollution.

County Extension Offices (www.ksre.ksu.edu/Map.aspx)

K-State Research and Extension programs present useful information related to agriculture, home and family, health and nutrition, 4-H and youth development, business and economics, lawn and garden, and much more. Many extension office personnel actively engage in programs and activities to protect and restore water quality in the communities they serve.

Watershed Restoration and Protection Strategy (WRAPS) Stakeholder Leadership Teams

WRAPS Stakeholder Leadership Teams (SLTs) can be comprised of representatives of local agencies, organizations, interest groups and individuals. Each SLT has a sponsoring organization that provides administration support, including staff resources to facilitate coordination, planning, meetings, funding, project management and other duties. Service provider organizations can also be involved in a WRAPS project to provide specific services requested by the SLT. The SLT provides oversight and direction to the work activities of the sponsoring organization and service providers in implementing the WRAPS watershed plan.

Other local agencies involved in NPS management related activities include:

- Resource Conservation and Development Councils (RC&D) (www.ks.nrcs.usda.gov/partnerships/rcd/)

  The RC&D program was authorized by the Food and Agricultural Act of 1962 and provides opportunities for local units of government and individuals to improve their communities in multi-county regions. An RC&D works through a council of local citizens and USDA staff to find resources to benefit rural communities. Through RC&Ds, the NRCS helps coordinate interagency projects to improve environmental, social, and economic conditions throughout the State. Some RC&Ds serve as the sponsoring organization for WRAPS projects.

- Watershed Districts (www.sakw.org/)

  Watershed districts are authorized under the provisions of the Watershed District Act (K.S.A. 24-1202 et seq.). Districts develop and implement general plans to abate damages from rural flooding and watershed erosion through the construction of flood control structures and other works of improvement. Funding can be obtained through local taxing authority and from state and federal assistance programs. In recent years, some watershed districts have become involved in water quality restoration and protection efforts, including sponsorship of WRAPS projects. Over 80 watershed districts have been organized in Kansas.

- Regional Advisory Committees (www.kwo.org)

  Basin advisory committees (BACs) were organized in the mid-1980s as part of the Kansas Water Planning Process and correspond to the twelve major rivers basins used for state water planning. In October 2013, Governor Brownback issued a call to action to his Administration to develop a 50-Year Vision for the Future of Water in Kansas stating, "Water and the Kansas economy are directly linked. Through the 50-Year Vision, BAC groups were replaced with Regional Advisory Committees (RACs). Fourteen regional

planning areas were established in December 2014 by the Kansas Water Authority in conjunction with the Long-Term Vision for the Future of Water Supply in Kansas. In August of 2015, Regional Action Committee members were approved for each of these 14 planning areas and began to establish priority goals for their region. These committees established their priority regional goal and began development of Regional Goal Action Plans. In September - October 2016 all regional goal action plans were presented to the Kansas Water Authority and approved. These Regional Goal Action Plans can be found on the Water Vision web page.

- Groundwater Management Districts (www.ksda.gov/appropriation/content/295)
  Groundwater management districts (GMDs) were organized to provide for the prudent management and conservation of groundwater resources. Water quality can be an important component of a GMD's management program in addition to water quantity. There are five organized GMDs in Kansas.

- City and County Governments
  City and county governments represent important players in addressing NPS issues locally through their land use planning and regulatory authorities (the following figure shows the status of county planning and zoning in Kansas). This can include management of stormwater runoff from a variety of construction and development related activities. Implementation of water quality protection and restoration measures, such as stream setback ordinances and other "Green Infrastructure" practices, has occurred in several urban communities, primarily in the northeastern part of the state. Implementation of green infrastructure projects and programs is receiving increasing attention in urbanizing communities as a way to better manage stormwater while providing other community benefits.

- Non-Governmental Organizations
  Numerous organizations can play a significant role in addressing NPS issues through their local members and chapter organizations. Table 2.3 provides a list of agencies and organizations that have been active in sponsoring NPS 319 funded projects since 2000. Other groups not listed in Table 2.3 that can be involved in NPS related activities include but are not limited to the following organizations.

Arkansas River Coalition	Kansas Wildlife Federation
Audubon Society	Lake and River Recreational Interests
Groundwater Management Districts	Land Trusts
Ducks Unlimited	League of Kansas Municipalities
Friends of the Kaw	Local civic groups
Kansas Association of Conservation Districts	National Turkey Federation
Kansas Association of Counties	Pheasants Forever
Kansas Association of County Planning & Zoning Officials	Playa Lakes Joint Venture
Kansas Association of State Floodplain Managers	Scenic Byways
Kansas Corn/Sorghum/Wheat Growers Associations	Quail Unlimited
Kansas Farm Bureau	Sierra Club
Kansas Farmers Union	Sport Fishing Associations

Kansas Grain and Feed Dealers Assn	State Association of KS Watersheds
Kansas Grazing Lands Coalition	The Nature Conservancy
Kansas Homebuilders Association	The Watershed Institute
Kansas Livestock Association	Travel and Tourism agencies
Kansas Natural Resource Council	Certified Crop Advisors
Kansas Environmental Health Association	LEPP groups
Kansas Land Improvement Contractors Association	

Mechanisms for NPS Program Collaboration and Partnerships

Several mechanisms exist for facilitating program coordination and collaboration. Following is a list of coordination mechanisms commonly utilized for NPS management in Kansas.

- State Water Planning Process
  - Kansas Water Authority meetings (held 3-4 times per year)
  - Regional Advisory Committees (held 3-4 times per year)
  - Technical Advisory Committees (ad hoc committees utilized for policy issue development)
- KS-WRAPS Work Group and ad hoc issue-specific subcommittees (meets biannually)
- KS-WRAPS Partnerships (partners are invited to attend WRAPS Work Group meetings)
- WRAPS Annual Meeting (held every 12months)
- WRAPS Capacity-Building Workshops and Professional Development (held 2-3 time per year)
- Drinking Water Protection (partnership with KDHE Public Water Supply)
- Local Conservation Lending Program (LCLP) (partner with local financial institutions)
- Source Water Protection (partnership with Kansas Rural Water Association)
- Local Environmental Protection regional meetings and KDHE email distribution to LEPP contacts USDA State Technical Committee and subcommittees (meet as needed for recommending program guidance and priorities)
- Kansas Department of Agriculture - Division of Conservation and Kansas Association of Conservation Districts regional workshops and annual conference
- KDHE – email distribution to WRAPS Project Coordinators
- Participation and presentations at meetings and conferences of statewide/national organizations, such as:
  - Kansas Environmental Health Association
  - Kansas Small Flows Association
  - State Association of Kansas Watersheds
  - Kansas Rural Water Association
  - Kansas Association of Conservation Districts
  - Kansas Alliance for Wetlands and Streams
  - Kansas Association for Conservation and Environmental Education
  - Governors water conference
  - KNRC
  - KDA-DOC
  - Kansas Water Authority
  - RACs
  - EPA, AWWA, ACWA, MAP

Table 2.3 KDHE 319 Program Sponsoring Organizations (2010 – 2019)

- Butler County Conservation District (CCD)
- City of Council Grove
- City of Hutchinson
- City of Olathe
- City of Wichita
- Cowley CCD
- Dickinson County Department of Environmental Services
- Douglas CCD
- Ellsworth CCD
- Flint Hills Resource Conservation & Development (RC&D)
- Glacial Hills RC&D
- Grand Lake Watershed Alliance Foundation
- Grouse Silver Creek Watershed District 92
- Hillsdale Water Quality Project
- Kansas Alliance for Wetland and Streams (KAWS)
- Kansas Association for Conservation and Environmental Education
- Kansas Department of Agriculture - Division of Conservation
- Kansas Department of Wildlife, Parks, and Tourism
- Kansas Municipal Utilities
- Kansas Radio Networks
- Kansas Rural Center
- Kansas Rural Water Association
- Kansas Small Flows Association
- Kansas State University
- Lake Region RC&D
- Lakewood Middle School
- Lawrence-Douglas County Health Department
- Marion CCD
- Marion County Planning & Zoning
- Marmaton Joint Watershed District 102
- Miami CCD
- Morris CCD
- Norton CCD
- Osage CCD
- Reno CCD
- Rooks CCD
- Rush CCD
- See-Kan RC&D
- Shawnee CCD
- Smokey Solomon Resource Enhancement
- Solomon Valley RC&D
- Topeka Round Up Club
- Wichita State University

CHAPTER THREE
STRATEGIC PLAN FOR NPS MANAGEMENT

NPS management in Kansas utilizes a partnership approach that relies on active participation from local, state and federal agencies, organizations and individuals. Priorities are set at both the local and state level and multiple programs are used to address these priorities in a coordinated manner.

Nonpoint Source Pollution Long-Term Management Goals

Kansas has established the following long-term goals for NPS Management:

1. No lake, river, stream or wetland has a violation of Kansas Surface Water Quality Standards due to nonpoint sources of pollutants and all designated uses are fully supported;
2. Kansas surface and ground water are protected from all nonpoint pollutant sources through the use of recommended water quality best management practices;
3. *Kansas Water Plan* objectives are achieved by:
    a. Reducing the levels of pathogens, biochemical oxygen demand, dissolved solids, metals, nutrients, pesticides and sediment that adversely affect the water quality of Kansas lakes, rivers, streams and wetlands
    b. Reducing the levels of dissolved solids, metals, nitrates and volatile organic chemicals that adversely affect the quality of Kansas ground water
    c. Maintaining water quality conditions for unimpaired waters at a level equal to or better than existing conditions

The following priorities will be considered in the implementation of NPS programs utilized to achieve the long-term goals:

State NPS Priorities

1) Restoration of high priority TMDL watersheds
2) Protection of public water supply watersheds and wellhead capture zones used for public water supply
3) Protection of high value water bodies designated for special aquatic life uses, exceptional state waters, outstanding national resource waters
4) Restoration and protection of high priority wetlands and riparian areas
5) Restoration and protection of watersheds with interstate significance

Guiding Principles

The following guiding principles will be utilized in implementing strategies to achieve NPS management goals and objectives:

- *Utilize a watershed approach for restoring and protecting water resources that engages stakeholders within the affected watersheds and that transcends political boundaries, both intrastate and interstate;*
- *Integrate the management of surface and ground water to achieve comprehensive environmental protection and restoration, including full support of designated uses of water;*
- *Target financial and technical resources to priority watersheds for restoration of impaired waters and protection of high value waters;*
- *Protect public water supplies, surface and ground water, through the development and implementation of Drinking Water Protection plans;*

- *Encourage proper management of wetlands, riparian corridors, floodplains, natural areas and other green infrastructure resources in urban and rural watersheds to help achieve and maintain properly functioning watersheds;*
- *Promote voluntary, locally-led, incentive-based strategies to address NPS issues while ensuring that regulatory requirements are adhered to when applicable;*
- *Establish and strengthen partnerships among stakeholders at local, state and federal levels that play a role in the management of NPS pollution sources;*

The Kansas NPS Management Strategy embodies a two-prong approach for addressing NPS pollution. Figure 3.1 (page 43) outlines this approach consisting of a Base NPS Component and a Targeted NPS Component.

Base NPS Program Component

The base component consists of a statewide interagency infrastructure to address nonpoint source pollution issues through locally administered plans and programs. Key elements of this component include:

Local NPS Management Plans. All conservation districts in Kansas have developed a state-approved Local NPS Management Plan that guides the implementation of NPS water quality BMPs within their respective counties. The conservation districts determine the specific practices available for funding and the level of financial assistance available to producers based on state and local NPS priorities outlined in their Local NPS Management Plans. The primary funding source for BMP implementation is provided through the KDA-DOC's Nonpoint Source Pollution Control Program. Other KDA-DOC and USDA cost-share programs administered through the conservation districts and local USDA field offices also provide funding for implementation of BMPs that address local NPS goals and objectives.

Local Environmental Protection Plans. Currently local environmental protection plans are being implemented in 103 counties by county health departments or other multi-county organizations with authority to address local environmental/health issues. This includes the adoption, implementation and enforcement of county sanitary/environmental codes for on-site wastewater systems and private water wells, providing information education and technical assistance, and coordination of a local environmental protection committee. Additional issues are also addressed through local environmental protection plans such as subdivision water and wastewater, public water supply protection, solid waste management, hazardous waste management, and participation in other NPS management activities. These groups receive support through the Local Environmental Protection Program administered by KDHE.

Local Water Quality Protection Plans. These plans are developed on a project by project basis to address potential NPS pollution issues associated with specific urban or rural projects or activities. Specific best management practices are identified to address potential pollution concerns. A template for development of a local water quality protection plan is provided at: www.kdheks.gov/nps/resources/nwpwqppfrm.pdf .

Information, Education and Technical Assistance Programs. Water quality information and education programs are funded across the state through a variety of local, state and federal programs and outreach efforts. These programs are essential in developing an informed and knowledgeable citizenry that understands the importance of restoring and protecting our water resources for current and future generations. In addition local agencies such as conservation districts, NRCS field offices, local environmental protection offices, county extension offices and KDHE district offices provide technical assistance for implementing a wide variety of water quality BMPs.

Integration with Existing Plans and Programs. A variety of local, state and federal plans and programs can be utilized to address NPS issues across the state. Figure 3.1 shows some of the applicable plans and programs. Integration of water quality protection considerations early in ongoing land use planning, management and development processes can help ensure that impacts to water bodies are avoided or minimized.

2024 Goals, Objectives and Strategies

The following short-term goals, objectives and strategies will be utilized for the Base Program Component to achieve progress toward attainment of the NPS Long-Term Management Goals. Timeframes indicated are for state fiscal years (July 1 through June 30).

A. **2024 Goal:** Support local and state institutional capacity to address NPS issues and priorities.

Objectives

1. Maintain base funding and technical assistance for implementation of BMPs through local, state and federally funded NPS related programs administered through local, state and federal agencies.

   Strategies

   a. Coordinate with state agencies through the State Water Planning Process to maintain State Water Plan funding for nonpoint source pollution control programs administered through the KDA-DOC, and the KDHE.
   b. Participate on the Kansas Technical Committee and work with NRCS and FSA to ensure federal funding is being directed to address NPS priority issues to the extent possible through applicable federal programs such as EQIP and CRP.
   c. Support the development of water quality protection plans and implementation of water quality BMPs for activities and projects not addressed through other programs that could adversely affect water quality.
   d. Utilize the 401 Water Quality Certification process where applicable to address potential NPS issues for specific projects and develop local water quality protection plans when applicable.
   e. Promote better integration of water quality protection with local land use planning and development processes to avoid or mitigate future NPS pollution problems.
   f. Provide adequate technical assistance to implement water quality BMPs through collaborative partnerships among local, state and federal agencies and conservation organizations.

g. Maintain a statewide monitoring program to assess water quality conditions and determine attainment of water quality standards.
h. Inform local and state decision-makers of program accomplishments through publication and dissemination of program summaries, fact sheets and other media.

2. Provide adult and youth educational opportunities for multiple audiences including local citizens, community leaders, landowners, contractors and youth to develop an informed citizenry regarding water quality issues.

Strategies

a. Support youth education through programs that instill an understanding and appreciation for water resource protection, restoration and conservation in future generations.
b. Include information and education components in all local NPS plans (e.g. WRAPS, DWP, LEPP).
c. Coordinate with local extension and other outreach programs at the community level that address water quality education for youth and adults.
d. Develop and implement a statewide public relations strategy to better inform Kansas citizens about water quality issues and opportunities to address them through involvement and participation in local, state and federal water quality programs and projects.
e. Support community efforts to recognize individuals involved in local water quality restoration and protection projects and celebrate local project successes.
f. Work with other water resource agencies to establish a recognition program for communities that develop and implement effective water resource management programs, including water quality restoration and protection efforts.
g. Support landowner education to build capacity in new agriculture technologies that improve water quality through management BMPs.

B. **2024 Goal:** Enhance collaboration among local, state and federal agencies and private sector organizations addressing NPS pollution.

Objectives

1. Improve program communication and coordination.

Strategies

a. Continue to actively utilize existing coordination mechanisms, including
    1. Kansas Water Planning Process
        a. Kansas Water Authority
        b. Regional Advisory Committees
    2. USDA Kansas Technical Committee
    3. KS-WRAPS Work Group
    4. Other mechanisms described in Chapter 2.
b. Expand opportunities for enhanced collaboration with NPS partner organizations:

1. Enhance the KS-WRAPS Watershed Partnership to facilitate more interaction and dialogue with WRAPS groups and other rural and urban organizations regarding NPS and watershed related issues .
2. Establish more direct interaction with state agricultural, urban and environmental organizations on NPS issues and management needs at annual meetings, conferences, etc.
3. Conduct annual WRAPS Meeting to enhance collaboration with existing and potential NPS partners.
4. Develop and improve partnerships with industry, business, other agricultural economic organizations to implement NPS reduction strategies.

2. Improve information sharing among existing programs to track the status of NPS program implementation

   Strategies
   a. Identify information needs shared by multiple agencies and organizations.
   b. Establish a mechanism to efficiently report and share program information among interested parties.

3. Expand funding opportunities for NPS projects through cooperation with other programs and agencies.

   Strategies
   a. Continue to utilize the Kansas Water Pollution Control Revolving Fund for NPS projects and explore opportunities to expand use of this program in the future.
   b. Implement the Drinking Water Protection program through Safe Drinking Water act SRF set-asides to implement NPS reducing strategies for drinking water sides.
   c. Seek opportunities to collaborate with other agencies and organizations to leverage funding that can accomplish multiple environmental objectives, in addition to NPS pollution control, such as water and energy conservation, wildlife habitat and stormwater/flood management.
   d. Implement low interest loans through financial institutes with the Local Conservation Lending Program for the implementation of BMPs.
   e. Continue to partner and/or sponsor Regional Conservation Partnership Projects (RCPP) focused on implementing 9-Element plan strategies in high priority watersheds.

C. **2024 Goal:** Develop and implement a strategy to facilitate the management of green infrastructure resources in rural and urban watersheds.

   Objectives
   1. Work with rural and urban partners to enhance the understanding and management of green infrastructure resources in urban and rural watersheds throughout Kansas to enhance water quality protection and achieve other environmental benefits.

Strategies

a. Continue to utilize the Green Project Reserve component of the Clean Water State Revolving Fund program to fund green infrastructure projects where applicable).
b. Develop an educational program on green infrastructure planning, management and project implementation to increase awareness and understanding of the importance of wetlands, riparian areas and other green infrastructure resources for water quality protection and other environmental benefits.
c. Work with WRAPS stakeholder leadership teams, Conservation Districts, LEPP groups and RACs to promote green infrastructure and Low Impact Development concepts in their respective communities.
d. Conduct a statewide assessment of green infrastructure resources, functions and values.
e. Prepare a comprehensive strategy for promoting and monitoring protection and management of green infrastructure resources at the state and community level.

Targeted NPS Program Component

Targeting of NPS practices to priority issues has been a concept promoted through both the current *Kansas NPS Pollution Management Plan* and the *Kansas Water Plan*. Targeting can address both restoration and protection efforts. The primary priorities for targeting applicable NPS plans and programs include:

Restoration

- TMDL watersheds designated as high priority for implementation
- Water bodies listed as impaired on the 303(d) List of Impaired Waters

Protection

- Drinking Water Protection areas for public water supplies including surface water intakes and wellheads
- High value resources including Special Aquatic Life Use waters, Exceptional State Waters, Outstanding National Resource Waters and high quality wetland and riparian resources in priority watersheds
- Protection oriented TMDLs and other water bodies of local or regional significance identified in WRAPS plans

Implementation of water quality protection measures to address targeted NPS priorities will be accomplished through:

1. Developed targeted NPS water quality plans including:
    a. Watershed Restoration and Protection Strategies. WRAPS projects are stakeholder driven, watershed based projects that provide a planning and management framework to address water quality and other natural resource issues. Projects go through a process of developing a stakeholder leadership team; assessing watershed problems and opportunities and determining priority issues; developing a watershed plan that outlines goals, objectives and strategies to address priority issues; and implementing the plan and tracking progress.

The watershed plans developed by WRAPS projects are compliant with EPA's 9 required elements for restoration of impaired waters. A major focus of WRAPS plans is the restoration of water quality impaired water bodies and achievement of pollutant load reductions to address the specific impairments. A map of the current WRAPS projects is shown in Figure 3.2. More information on the KS-WRAPS Program and WRAPS Process is available at: www.kswraps.org.

The State of Kansas adopted this local watershed based approach in 2004 as part of the Kansas Water Planning Process to address State Water Plan priority issues. A Memorandum of Agreement was signed by the heads of the state agencies represented on the Natural Resources Subcabinet to establish the Kansas WRAPS Program. Two million dollars in annual EPA Section 319 funds and State Water Plan Funds are committed to support the WRAPS process and fund WRAPS projects in priority watersheds. An interagency work group comprised of state and federal agency representatives oversees program administration and makes annual funding recommendations to the Natural Resources Subcabinet for WRAPS projects. Agencies on the Work Group include:

Kansas WRAPS Work Group	
KS Dept of Agriculture	KSU Research and Extension
KS Dept of Health & Environment	KS Water Office
KS Dept of Wildlife & Parks	Kansas Department of Agriculture - Division of Conservation
KS Dept of Transportation	US Environmental Protection Agency
KS Biological Survey	USDA Natural Resources Conservation Service
KS Forest Service	USDA Farm Service Agency
KS Geological Survey	US Geological Survey

Other state and federal programs are utilized to support WRAPS project implementation of watershed plans by providing technical and financial assistance to implement water quality protection measures in priority watersheds.

b. Drinking Water Protection Plans. These plans are focused on protection of surface and groundwater sources that provide public water supply. WRAPS plans may serve as the Drinking Water Protection plan for surface water bodies – i.e. rivers and reservoirs used for public water supply or a separate Drinking Water Protection plan for a specific lake may be prepared within a WRAPS watershed. Specific measures to protect public water supply wellheads are typically not addressed in a WRAPS plan and are usually addressed through a separate wellhead protection plan prepared by the public water supplier. Drinking Water Protection plans can be implemented through local, state or federal assistance programs, depending on the specific protection measures included in the plan.

2. Integration of targeted areas with existing program and plan implementation, including:
   a. State Programs

i. The KDA-DOC has been allocating a portion of the cost-share funding received from the State Water Plan Fund to high priority TMDL watersheds since SFY 2000 to implement practices and projects through select county conservation district programs that address the specific NPS impairments identified in a TMDL. Conservation districts are also encouraged to consider TMDLs in prioritizing practices and projects for their base funding allocations. The primary KDA-DOC programs used for targeting HP TMDLs include the Nonpoint Source Pollution Control Fund, the Water Resources Cost-Share Program, the Water Quality Buffer Initiative and the Riparian and Wetland Protection Program.

ii. The KDHE Livestock Management Section considers TMDLs in program activities related to land application of manure. The applicable water quality impairments are noted and implementation of manure management plans are directed as needed to ensure compliance with the applicable TMDL.

b. Federal Programs: USDA Farm Bill Programs, USGS and other applicable federal programs

TMDLs and other state water quality restoration and protection priorities are included as factors in the ranking criteria for funding applications for USDA Farm Bill Programs, primarily the Environmental Water Quality Incentives Programs (EQIP). State water quality priority areas were also considered in selecting Conservation Priority Areas for the Conservation Reserve Program.

Other federal agencies such as the U.S. Geological Survey conduct a number of assessment and monitoring studies addressing TMDLs and other water quality issues through cooperative agreements with state and local partners. The Kansas Water Resources Institute (KWRI - www.kcare.ksu.edu/DesktopDefault.aspx?tabid=763), funded in part through the USGS, provides funding for research and other activities that support water quality and related issues. KWRI provided leadership on the development of a series of white papers addressing reservoir sedimentation issues, including water quality topics.

c. Local Programs: Conservation District NPS Programs, LEPPs, nutrient management plans, watershed district programs, urban stormwater programs, city and county comprehensive plans and other applicable local programs.

A number of locally developed plans and programs can be utilized to address TMDLs and restoration of impaired water bodies. Local NPS Management Plans developed by county conservation districts and Local Environmental Protection Plans developed by Local Environmental Protection groups are examples of local plans and programs that can be utilized to target resources to priority water quality watersheds. In addition, many city and county programs addressing land use and stormwater management also provide opportunities to address priority watersheds.

Nutrient management plans for handling manure applications from livestock facilities and local watershed district programs that promote water quality projects are also examples of local mechanisms that can be used to address water quality restoration in targeted watersheds.

3. Water Quality Monitoring
    a. Targeted Subwatershed Monitoring. A select number of priority subwatersheds identified in WRAPS 9-Element Watershed Plans will be monitored to assess water quality improvements resulting from targeted implementation of water quality protection measures. These monitoring activities will be accomplished through KDHE's Bureau of Environmental Field Services and WRAPS service providers in selected WRAPS watersheds. Additional monitoring of other priority WRAPS subwatersheds will also be accomplished utilizing various service providers.

    b. KDHE Water Quality Monitoring Network. The State Water Quality Monitoring Network is used for the tracking water quality improvements in impaired water bodies for 303(d) delisting purposes. Water bodies achieving standards are removed from the Impaired Waters List. Achievement of water quality protection goals will also be determined via this network through maintenance of water quality conditions. Additional listing of water bodies on the 303(d) list may also occur in the future where water quality data indicates impairment of designated uses.

    c. Seek opportunities to collaborate with other agencies and organizations to partner on potential additional monitoring activities used for tracking water quality improvements in impaired water bodies for 303 (d) delisting purposes,

2024 Goals, Objectives and Strategies

The following short-term goals, objectives and strategies will be utilized for the Targeted Program Component to achieve progress toward attainment of the NPS Long-Term Management Goals. Timeframes indicated are for state fiscal years (July 1 through June 30).

Restoration

D. **2024 Goal:** Reduce pollutant loads in high priority TMDL watersheds through the implementation of BMPs and increase the number of water bodies meeting surface water quality standards.

Objectives

1. Enhance targeting of state and federal programs that provide technical and financial assistance for the implementation of BMPs to high priority TMDL watersheds.

Strategies

a. Utilize the Kansas Water Planning process to provide guidance to State Water Plan funded programs to enhance targeting of TMDL high priority watersheds and critical restoration subwatersheds identified in WRAPS plans.
b. Actively participate on the Kansas Technical Committee and water quality related subcommittees to establish program priorities and ranking criteria that target applicable federal water quality programs to high priority TMDL watersheds and critical restoration subwatersheds identified in WRAPS plans.
c. Utilize the KS-WRAPS Work Group and Watershed Partnership to enhance program coordination to address TMDL priorities through applicable state programs.
d. Support the implementation of WRAPS projects that address high priority TMDL watersheds.
e. Develop an inventory of NPS BMP needs in high priority TMDL and WRAPS watersheds and high value protection watersheds.
f. Support targeted TMDL implementation efforts through Conservation District, LEPP, and other applicable programs.
g. Support and advise on RCPP water quality efforts in Kansas to target BMP implementation to high priority watersheds.

2. Work with WRAPS SLTs to ensure that existing WRAPS Projects address high priority TMDLs.

Strategies
a. Provide technical and financial resources to WRAPS projects that address high priority TMDLs.
b. Provide technical and financial resource to WRAPS projects for implementation of BMPs as outlined in 9-Element Watershed Plans.
c. Complete aerial assessments on high priority watersheds for each WRAPS project to identify areas of interest for potential BMP implementation.

E. **2024 Goal:** Reduce pollutant loads in state priority watersheds through targeted implementation of BMPs identified in WRAPS 9-Element Watershed Plans.

Objective
1. Work with WRAPS SLTs to maintain, update, and implement 9-element watershed plans for WRAPS projects to facilitate BMP implementation in high priority TMDL watersheds and restore impaired waters.

Strategies
a. Maintain and monitor 9-element watershed plan implementation for WRAPS watersheds that target implementation of BMPs to high priority TMDL watersheds and other priority water quality restoration and protection needs.
    i. Integrate WRAPS project implementation with TMDL planning and evaluation
    ii. Provide technical support where needed to update existing 9-Element Watershed plans.

iii. Continue to build organizational capacity of WRAPS groups through workshops, coordinator professional development and other capacity-building mechanisms.
iv. Target technical and financial assistance to implement BMPs in priority subwatersheds identified in 9-element watershed plans.
v. Enhance funding through the State Water Planning Process for WRAPS BMP implementation projects in high priority subwatersheds identified in WRAPS plans.
vi. Track progress of water quality improvements in priority subwatersheds through targeted monitoring programs for WRAPS watersheds.
vii. Celebrate Success Stories in watersheds where impaired waters have been restored or improved.

b. Continue to implement WRAPS scoring matrix to ensure that the highest priority watershed projects are being addressed with available technical and financial resources.
c. Encourage WRAPS stakeholder leadership teams to address source water and wellhead protection, habitat restoration and protection, urban stormwater and other watershed management concerns where applicable through collaborative, inter-jurisdictional watershed planning and coordination.

Protection

F. **2024 Goal:** Target the implementation of BMPs in urban and rural watersheds to prevent the occurrence of pollution problems affecting high quality water bodies and watersheds to avoid future impairment of state waters.

Objectives

1. Protect high value water bodies identified as Exceptional State Waters, Outstanding National Resources Waters and Special Aquatic Life Waters in the Kansas Surface Water Quality Standards.
2. Protect high priority wetland and riparian areas and other high value watershed resources, including water quality reference streams, in priority restoration and protection watersheds.

Strategies

a. Work with WRAPS groups and other organizations to implement a Healthy Watershed Initiative Grant to explore opportunities and mechanisms to protect high value watersheds.
b. Continue interagency support for wetland and riparian area protection including inventory, assessment, prioritization and planning projects through EPA's Wetland Development Grants and other funding programs.
c. Work with WRAPS projects to incorporate protection of high value water bodies and wetland and riparian resources in 9-Element Watershed Plans.
d. Work with agencies and stakeholder groups to implement the wetland and riparian protection policy subsection of the *Kansas Water Plan* including the identification of priority wetland and riparian areas.
e. Develop a state strategy for protection of high value watersheds through the State Water Planning Process.

G. **2024 Goal:** Implement statewide pollutant-specific strategies to reduce sediment and nutrients originating from nonpoint sources of pollution.

Objectives

1. Achieve reductions in total nitrogen and total phosphorus loads in priority water bodies as outlined in the *Kansas Surface Water Nutrient Reduction Plan.*
2. Reduce sediment loading to streams in priority watersheds to address high priority TMDLs and reduce sediment loading in public water supply reservoirs.

Strategies

a. Develop and implement pollutant specific strategies for sediment and nutrients to restore impaired waters and protect pubic water supplies through the Kansas Water Planning Process.
   i. Utilize the goals and approach outlined in the *Kansas Surface Water Nutrient Reduction Plan* to guide the implementation of BMPs that address nutrients contributed from nonpoint sources.
   ii. Work collaboratively with agencies and stakeholder groups in Kansas and in neighboring states to facilitate implementation of the strategies developed.
   iii. Work collaboratively with the agencies involved in the *Kansas Water Plan* Reservoir Sustainability Initiative, Reservoir Roadmap and Sediment Baseline Study to develop and implement sediment management strategies in priority reservoir watersheds.
b. Integrate pollutant-specific strategies with ongoing programs including the KDHE WRAPS/319 program, KDA-DOC cost-share programs, NRCS EQIP and other applicable programs to facilitate implementation.

H. **2024 Goal:** Increase protection of public water supply sources through the implementation of Drinking Water Protection plans, either as an integrated part of a WRAPS watershed plan or an independent Drinking Water Protection plan.

Objectives

1. Work with local public water suppliers to complete and initiate implementation of Drinking Water Protection plans.

Strategies

a. Work cooperatively with the DWP Technical Team and other organizations to provide planning support and technical assistance to KDHE to develop Drinking Water Protection plans.
b. Enhance outreach to public water suppliers to actively participate in applicable WRAPS projects or develop a Drinking Water Protection plan if supply is not addressed through a WRAPS project.
c. Work with WRAPS projects to facilitate Drinking Water Protection plan development and implementation within WRAPS watersheds.

2. Demonstrate progress in implementation of all approved Drinking Water Protection plans.

   Strategies

   a. Develop and maintain a system to effectively track progress in plan implementation.
   b. Work with the KDHE Public Water Supply Section's Capacity Development Program and other entities to explore potential funding opportunities for enhanced implementation of approved Drinking Water Protection plans.

Figure 3.1
Kansas Nonpoint Source Pollution Management Strategy
2017

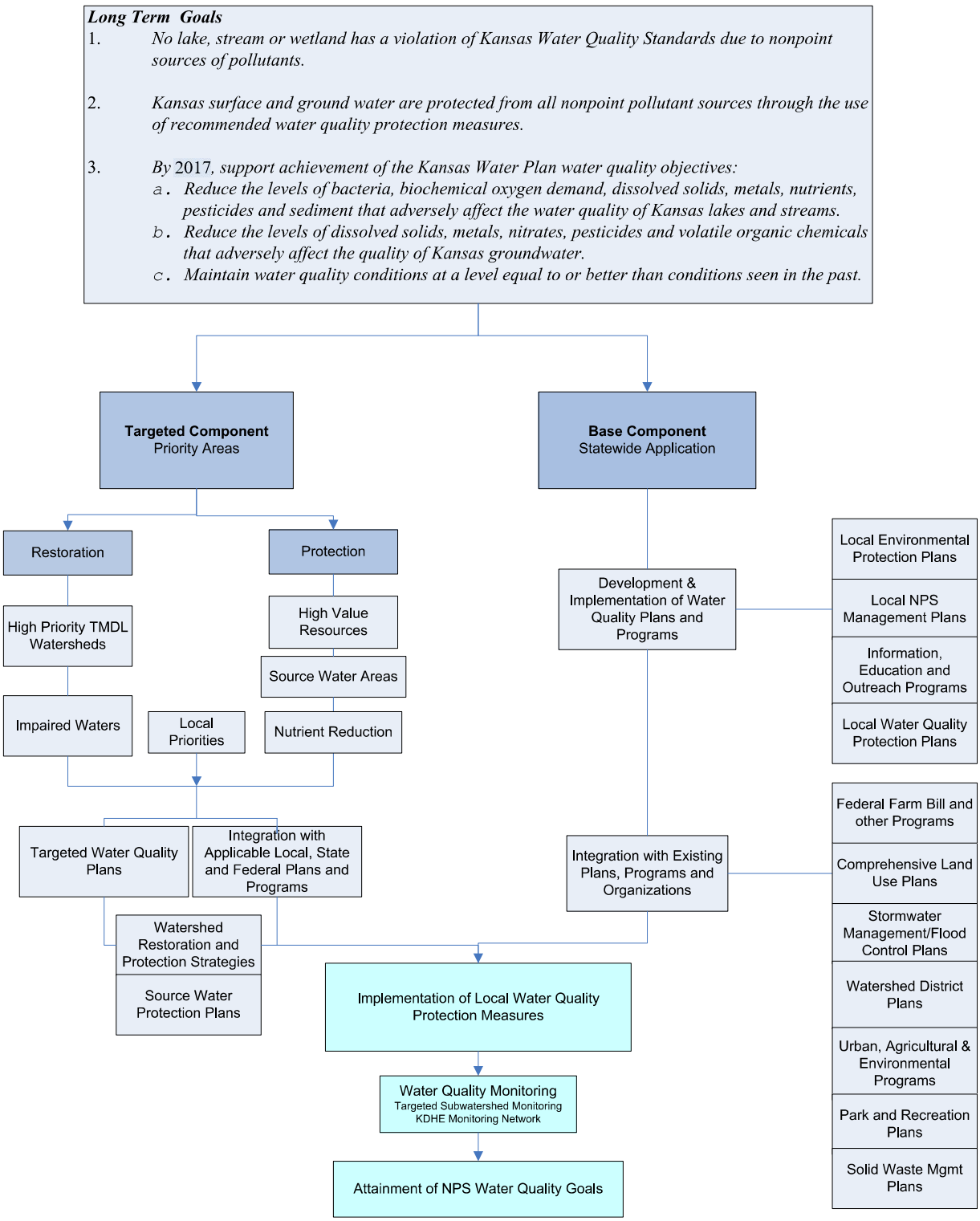
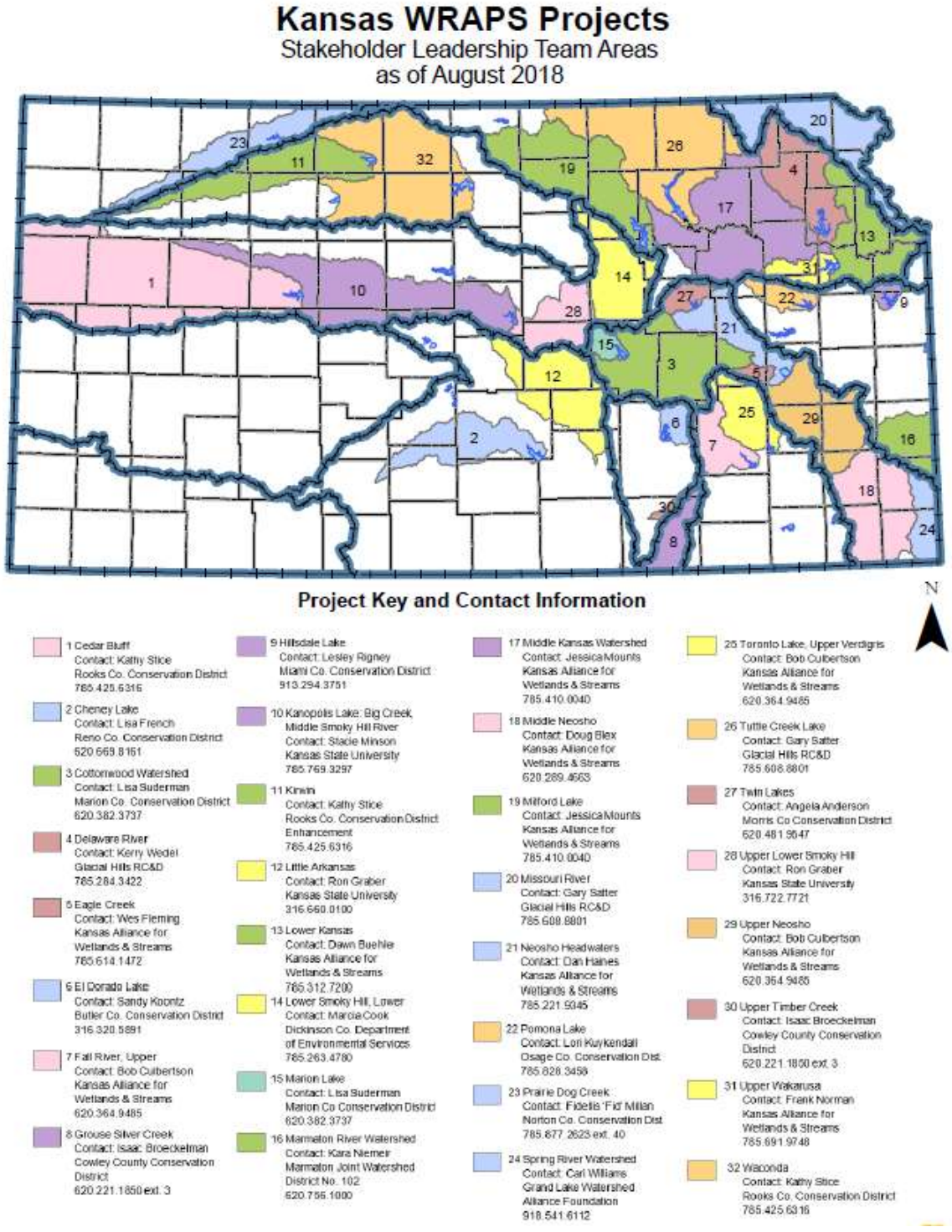


Figure 3.2


Kansas WRAPS Projects
Stakeholder Leadership Team Areas
as of August 2018
Project Key and Contact Information
N
1 Cedar Bluff
Contact: Kathy Stice
Rooks Co. Conservation District
785.425.6316
2 Cheney Lake
Contact: Lisa French
Reno Co. Conservation District
620.669.8161
3 Cottonwood Watershed
Contact: Lisa Suderman
Marion Co. Conservation District
620.382.3737
4 Delaware River
Contact: Kerry Wedel
Glacial Hills RC&D
785.284.3422
5 Eagle Creek
Contact: Wes Fleming
Kansas Alliance for
Wetlands & Streams
785.614.1472
6 El Dorado Lake
Contact: Sandy Koontz
Butler Co. Conservation District
316.320.5891
7 Fall River, Upper
Contact: Bob Culbertson
Kansas Alliance for
Wetlands & Streams
620.364.9485
8 Grouse Silver Creek
Contact: Isaac Broeckelman
Cowley County Conservation
District
620.221.1850 ext. 3
9 Hillsdale Lake
Contact: Lesley Rigney
Miami Co. Conservation District
913.294.3751
10 Kanopolis Lake: Big Creek,
Middle Smoky Hill River
Contact: Stacie Minson
Kansas State University
785.769.3297
11 Kirwin
Contact: Kathy Stice
Rooks Co. Conservation District
Enhancement
785.425.6316
12 Little Arkansas
Contact: Ron Graber
Kansas State University
316.660.0100
13 Lower Kansas
Contact: Dawn Buehler
Kansas Alliance for
Wetlands & Streams
785.312.7200
14 Lower Smoky Hill, Lower
Contact: Marcia Cook
Dickinson Co. Department
of Environmental Services
785.263.4780
15 Marion Lake
Contact: Lisa Suderman
Marion Co Conservation District
620.382.3737
16 Marmaton River Watershed
Contact: Kara Niemer
Marmaton Joint Watershed
District No. 102
620.756.1000
17 Middle Kansas Watershed
Contact: Jessica Mounts
Kansas Alliance for
Wetlands & Streams
785.410.0040
18 Middle Neosho
Contact: Doug Blex
Kansas Alliance for
Wetlands & Streams
620.289.4563
19 Milford Lake
Contact: Jessica Mounts
Kansas Alliance for
Wetlands & Streams
785.410.0040
20 Missouri River
Contact: Gary Satter
Glacial Hills RC&D
785.608.8801
21 Neosho Headwaters
Contact: Dan Haines
Kansas Alliance for
Wetlands & Streams
785.221.9045
22 Pomona Lake
Contact: Lori Kuykendall
Osage Co. Conservation Dist.
785.828.3458
23 Prairie Dog Creek
Contact: Fidelis 'Fid' Milan
Norton Co. Conservation Dist
785.877.2623 ext. 40
24 Spring River Watershed
Contact: Carl Williams
Grand Lake Watershed
Alliance Foundation
918.541.6112
25 Toronto Lake, Upper Verdigris
Contact: Bob Culbertson
Kansas Alliance for
Wetlands & Streams
620.364.9485
26 Tuttle Creek Lake
Contact: Gary Satter
Glacial Hills RC&D
785.608.8801
27 Twin Lakes
Contact: Angela Anderson
Morris Co Conservation District
620.481.9647
28 Upper Lower Smoky Hill
Contact: Ron Graber
Kansas State University
316.722.7721
29 Upper Neosho
Contact: Bob Culbertson
Kansas Alliance for
Wetlands & Streams
620.364.9485
30 Upper Timber Creek
Contact: Isaac Broeckelman
Cowley County Conservation
District
620.221.1850 ext. 3
31 Upper Wakarusa
Contact: Frank Norman
Kansas Alliance for
Wetlands & Streams
785.691.9748
32 Waconda
Contact: Kathy Stice
Rooks Co. Conservation District
785.425.6316

CHAPTER FOUR
NONPOINT SOURCE PROGRAM MANAGEMENT AND ADMINISTRATION

Measuring Progress

The following indicators will be utilized to measure success in NPS program management. Annual or interim goals and 2024 milestones are listed for each indicator. Interim goals and milestones will be measured on a state fiscal year (SFY) basis (June 30 – July 1). 2024 milestones indicate program status as of June 30, 2024.

Program Indicators

A. Amount of local, state, and federal BMP funding spent in WRAPS priority subwatersheds identified in 9-Element Watershed Plans.
    i. Interim goals
        - Evaluate SFY13-18 implementation data to create baseline six-year average.
        - Create six-year average from SFY19-24.
    ii. 2024 milestone – Increase local state and federal BMP implemented in WRAPS priority areas by 10% from SFY13-18 average compared to SFY19-24 average.

B. Amount of estimated pollutant load reductions achieved for sediment, phosphorus and nitrogen from local, state, or federal funded BMPs in high priority TMDL and WRAPS watersheds, including priority subwatersheds.
    i. Interim goals
        - Evaluate SFY13-18 implementation data to create baseline six-year average.
        - Create six-year average from SFY19-24.
    ii. 2024 milestone – Increase local state and federal BMP implemented in WRAPS priority areas by 10% from SFY13-18 average compared to SFY19-24 average.

C. Efficiency of estimated load reductions per dollar of funding spent in WRAPS priority area.
    i. Interim goal
        - Establish base efficiency cost of sediment (ton), nitrogen (lb.), and phosphorus (lb.) average for SFY 13-18.
    ii. 2024 milestone – Increase average efficiency cost of sediment (ton), nitrogen (lb.), and phosphorus (lb.) by 10% from SFY 13-18 compared to SFY 19-24.

D. Number of 9-Element Watershed Plans updated and drinking water protection developed.
    i. Interim goals:
        - Update five 9-Element plans each year starting SFY2019.
        - Develop two DWP plans on pilot communities by SFY2021.
    ii. 2024 milestones:
        - All active WRAPS projects with approved plans have completed at least one update review.
        - Six drinking water protection plans approved.

E. Number of TMDLs developed or revised in support of WRAPS 9-Element Watershed Plans.
    i. Interim goal: develop/revise 5 TMDLs annually.
    ii. 2024 milestone: Complete development or revision of 20 TMDLs.

F. Number of priority subwatersheds identified in 9-Element Watershed Plans showing water quality improvement based on water quality milestones identified in the watershed plans.
    i. Interim goal:
        - Continue targeted monitoring in priority subwatersheds to establish baseline conditions in established second suite by SFY2021.
        - Establish third suite of priority subwatersheds for monitoring before SFY 2020.
    ii. 2024 milestone: Characterize baseline conditions and establish timeframe for subsequent monitoring following BMP implementation in initial and second suite subwatersheds.

G. Number of HUC-12 subwatersheds containing previously impaired water bodies that now show water quality improvement as a result of watershed-based implementation of TMDLs and WRAPS.
    i. Interim goal: By April 1, 2022 (submission date of 2022 303(d) list), five HUC-12 subwatersheds will have been identified as having improved water quality since 2002.
    ii. 2024 milestone: A total of eight-to-ten HUC-12 sub-watersheds will have been identified to EPA as having improved water quality since 2002.

H. Number of impaired waters removed from the impaired waters list due to WRAPS/NPS implementation.
    i. Interim goal: remove one water body from impaired waters list per year
    ii. 2024 milestone: delist impaired water body from 6 streams or lakes from 2024 impaired waters list.

I. Increased nutrient load reduction estimates and improved water quality in HUC 8 watersheds identified in the Kansas Nutrient Reduction Framework (see Figure 4.1)
    i. Interim goal:
        - Establish six-year average baseline of load reductions from BMP implementation in SFY13-17.
    ii. 2024 milestone:
        - Increase estimated nutrient load reductions from implementation of NPS BMPS in the selected HUC 8 watersheds by 10% or greater from SFY13-18 average baseline to SFY19-24 average.
        - Show improving water quality trends in regard to nutrients in identified HUC 8 watersheds.

J. Trends in water quality data for major river basins and HUC 8 watersheds with established high priority TMDLs.
    i. Interim goal: Continue trend analysis for nitrogen, phosphorus, total suspended solids and bacteria in HUC 8 watersheds with high priority TMDLs and on active WRAPS watersheds as of 2010.

ii. 2024 milestone: show improving water quality trends for five HUC 8 TMDL watersheds with active WRAPS projects relative to trends of 1990-2010.

In addition to the 2024 milestones listed above, the following mid and long-term milestones will be utilized for plan evaluation. These milestones will be revisited during each 6-year review period and revised as appropriate.

Short, Mid and Long-Term Milestones
2019-2023 (complete by June 30, 2023)
• Establish baseline and incremental conditions for program indicators • Complete first update of all existing watershed plans • Complete baseline sampling for second set of WRAPS priority subwatersheds • Remove all 2002 NPS related impairments from five streams or lakes • Assess interim and 2024 progress milestones • Review and update plan as needed
2024-2030 (complete by June 30, 2031)
• Show significant progress towards completion of implementation activities for all 9-Element Watershed Plans • Demonstrate water quality improvement in 50% or more of the monitored priority WRAPS subwatersheds resulting from plan implementation activities • Show significant reduction in pollutant loadings in 50% or more of the high priority TMDL watersheds identified in the 2009 Kansas Water Plan • Show annual increases in funding and quantities of BMPs implemented in high priority TMDL watersheds and WRAPS priority subwatersheds • Remove one water body per year from the 2010 303(d) list
2030-2050 (complete by June 30, 2051)
• Complete BMP implementation for 75% of the 9-Element Watershed Plans approved during 2010-2015 timeframe • Remove 50% or more of high priority TMDLs from 2010 303(d) list

Monitoring and Reporting Progress

1. Water Quality Monitoring
    a. WRAPS targeted monitoring program
        i. KDHE monitoring – the KDHE will conduct targeted monitoring in selected WRAPS priority subwatersheds. Monitoring will be done for a period of 5 years and then rotated to other priority subwatersheds. Follow-up monitoring will be done in subsequent years following substantive BMP implementation to assess changes in water quality conditions.
        ii. WRAPS Service Providers – Selected WRAPS projects will be considered for monitoring projects for priority subwatersheds to assess water quality changes following BMP implementation.
        iii. All monitoring projects will be conducted in accordance with Quality Assurance Plans approved by KDHE.

b. KDHE statewide monitoring program

Surface water quality data collected through the KDHE statewide monitoring program will continue to be evaluated for water quality conditions and utilized for determining compliance of classified water bodies with Kansas Surface Water Quality Standards.

c. Partner Agency Monitoring

Water quality data and studies performed by other agencies will be utilized to help assess water quality conditions and changes in priority watersheds when available to assist with evaluation of BMP implementation.

2. Reporting
   a. BMP Reporting – quantities and types of BMP projects will be reported using the KDA-DOC and KDHE's online reporting systems (see NPS Program Administration). Load reduction estimates will be calculated and entered into the EPA Grant Reporting and Tracking System (GRTS). Efforts will be made to also work with USDA agencies to capture other BMPs funded through Farm Bill Programs for high priority TMDL watersheds and WRAPS watersheds.
   b. Water Quality Reporting – Annual progress reports will be compiled for all targeted water quality monitoring projects in priority WRAPS subwatersheds funded with WRAPS/319 funding. A standard template will be developed for reporting of project monitoring data and data will be made available.
   c. All WRAPS and 319 grant projects will be required to submit a final project report for KDHE approval.
   d. Annual 319 Program Reports required by EPA will be compiled by KDHE and submitted to EPA in accordance with the grant reporting timelines.

NPS Program Administration

An annual work program and workplan will be submitted to EPA for utilization of CWA Section 319 funding. The annual workplan will outline the specific components of the Kansas NPS Pollution Management Plan to be accomplished during that year. Adjustments to strategies and timelines may be made on a year to year basis as needed.

Applications for 319 funding will be solicited annually for subgrant projects to implement the strategies outlined in this Document. Project Implementation Plans will be developed and approved for subgrant projects outlining the project objectives, tasks, deliverables and timeframes.

Federal 319 and State Water Plan funds for NPS implementation will be administered by KDHE and KDA-DOC. Both agencies utilize automated financial management systems for program administration and all accounting and financial transactions are done in accordance with State of Kansas accounting procedures and guidelines.

KDHE utilizes an online grant management system to manage NPS grant applications, project implementation plans, financial transactions and reporting requirements called the Kansas Clean Water (KCW) system. The Kansas Clean Water System is a web-based system located at: http://kanphix.kdhe.state.state.ks.us/public/kcw/ .

The Kansas Department of Agriculture-Division of Conservation utilizes an online system for contract administration and management of cost-share programs called the Cost-Share and Information Management System (CSIMS). This system tracks allocations and expenditures of all funds contracted for implementation of NPS practices and allows for mapping of NPS projects. Additional information on this system is available at: http://www.scc.ks.gov/node/149 .

Plan Evaluation and Revisions

Progress in implementing the Kansas NPS Management Plan will be reviewed in 2021 by an interagency committee consisting of the following agencies:

- Kansas Department of Health and Environment
- Kansas Department of Agriculture-Division of Conservation
- Kansas Water Office
- Kansas Biological Survey
- United States Geological Survey

The primary purpose of the review will be to consider the status of the goals, objectives and strategies outlined in the plan and identify areas that may need additional emphasis. Results of the review will be discussed with the KS-WRAPS Work Group and adjustments made as needed.

A comprehensive interagency review of the plan will be conducted in 2024 in collaboration with the KS-WRAPS Work Group and updates completed as needed. This will include a review of the 2024 Program Indicators to determine the level of program success achieved during the preceding 6 year period.

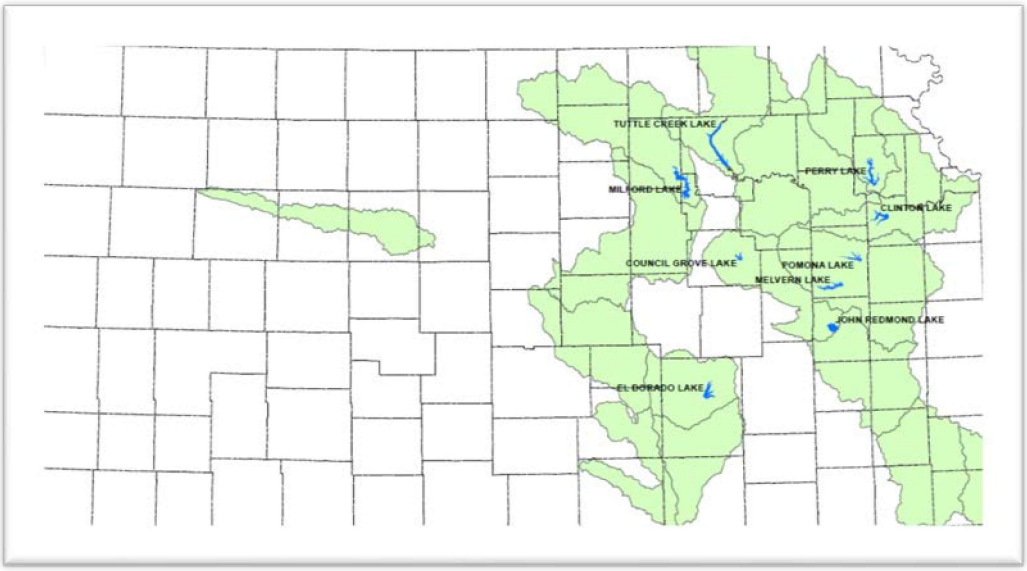


Figure 4.1 *Kansas Nutrient Reduction Framework Watersheds*

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