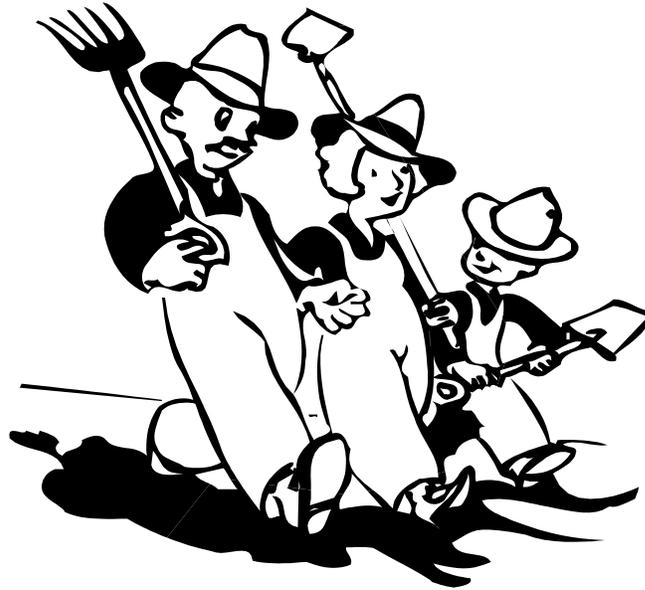


BUTLER COUNTY



RURAL LIVING

HANDBOOK

(Updated) March 2018

Acknowledgements

Thanks to the following agencies and organizations that provided information for this handbook:

**Butler County
Butler County Community Development
Butler County GIS/Mapping Department
Butler County Public Works
K-State Research and Extension
Kansas Department of Transportation
Kansas Pipeline Association**

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RURAL LIVING IN BUTLER COUNTY

Table of Contents	Page
Chapter 1	
Introduction - So, you want to live in the country?	5
Chapter 2	
Rural living checklist for purchasing land, building or buying a home.	6
Chapter 3	
Items to consider when looking at property.	
• Water	8
• Electricity	9
• Natural Gas or Propane	9
• Telephone	9
• Mail and Packages	10
• Newspaper	10
• Trash	10
• Recycling	11
• Composting	11
• Household Hazardous Waste	11
• Sewage	12
• Roads	12
• Emergency Services	14
• Floodplains	15
• Soils	15
• Drainage	16
• Ponds	16
• Weeds	17
• Wildlife	17
• Pets	18
• Farm Animals	18
• Weather	19
• Easements and Rights of Way	20
• Hazardous Materials	21
Chapter 4	
Living with your agricultural neighbors.	22
Glossary of Agricultural Terms	24

Chapter 5

Information Sheets

- Butler County Planning and Development Regulations and Building Codes 28
- Get to Know Your Septic System 31
- Household Hazardous Waste Program 35
- Electronic Waste (E-Waste) Program 36
- Recycle Trailer Program in Butler County 37
- Pipeline Safety and Awareness 38
- Plugging Abandoned Water Wells 39
- Private Well Maintenance 45
- Testing to Help Ensure Safe Drinking Water 49
- Wastewater Pond Operation, Maintenance and Repair 53

Chapter 6

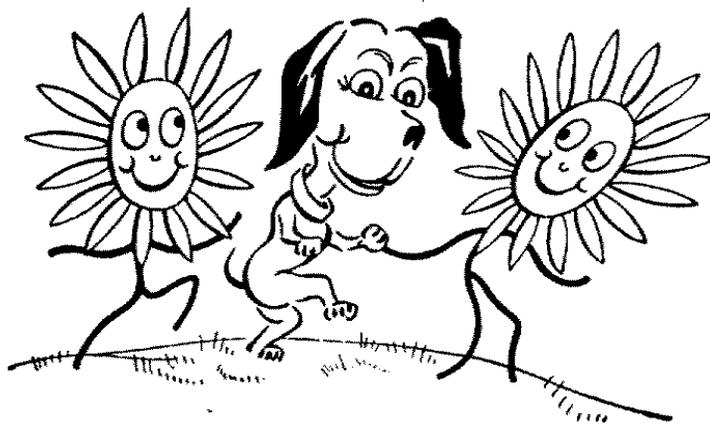
References

57

Chapter 7

Maps

- County Commission Districts 78
- Fire Districts 79
- Rural Water Districts 80
- School Districts 81
- Townships 82
- Watershed Drainage Basins 83



CHAPTER 1

INTRODUCTION

So, you want to live in the country!

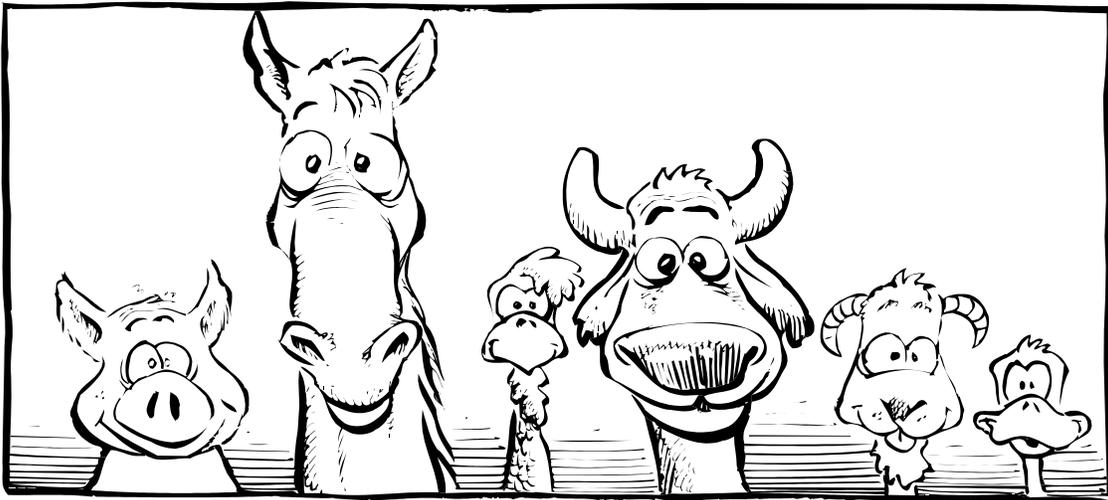
Are you a new resident to Butler County? Are you contemplating buying a home in the country? Are you thinking about purchasing land? Are you planning to build a new home in unincorporated areas of Butler County? Well, this booklet is for you!

Many of us want to live in the country. We yearn for those wide-open spaces, the quiet-ness of living in the country, no neighbors close by and a place for our kids to play without worry.

Rural living has its benefits, but it is important to realize (before you buy that land or country home) that living in the country is quite different than living in the city. You and your family will be faced with many new challenges, responsibilities, chores, and in some cases, extra expenses for the privilege of living in the country. In addition, some services that are available in the city may not always be readily available in the country.

So, before you buy that piece of land or dream home in the country, do a little research, know what to expect and know what to look for. In some cases, rural living may be more than what you bargained for.

This booklet is provided to you to as an educational and informational resource. The information is by no means complete, but it will give you the necessary references, connections and contacts to get you going in the right direction.



CHAPTER 2

Rural Living Checklist for Land and House Hunting

Property Address:

This list is designed to help you ask the right questions when looking at property or homes in the country. For additional information on the topics discussed below, refer to the following chapters in this booklet.

- Is there a flood plain on the property? *Yes* *No*

- Is/Will the home be served by a rural water district or a private well?
 Rural Water Available *Private Well* *Both*

- With an existing house, how old is the sewage treatment system? Does it meet current County Code?

- If building a home, what type of sewage system will I need to treat household wastewater?
 Lagoon *Septic tank with laterals* *Alternative System*

- How do I access the property? Blacktop, dirt, gravel or sand roads? Are the roads maintained?

- What utilities are available?

☺ Electricity _____	☺ Water _____
☺ Natural Gas _____	☺ Trash _____
☺ Propane _____	☺ Other _____
☺ Telephone _____	☺ Other _____
☺ Cable _____	
☺ Mail _____	

- What school district is the property located in? Will bus service be available?

School District _____

- Are there any restrictive covenants or easements on the property? Yes No

List covenants or easements:

- Where are the nearest emergency services located? _____
- What is surrounding land use? Cropland, rangeland, livestock, other _____
- Is the property impacted by noises or odor? _____
- Is there a creek or pond located on the site? _____
- What direction does water flow off the property? _____
- What types of homes would be allowed on the site?
Modular Manufactured Residential Designed Other _____
- What kind of soils are located on the property? _____
- What is the topography (slope, terrain) of the site?

- What type of vegetation is currently on site?

- Do you know what to do if severe weather threatens?
 - ☺ Does/Will the home have a basement?
 - ☺ If no basement, where is the nearest shelter in case of severe weather?
- How will I locate my home on the site, based on the above considerations?

CHAPTER 3

ITEMS TO CONSIDER WHEN LOOKING AT PROPERTY

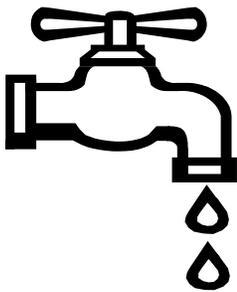
Not all property that comes up for sale can have a home or building put on it. Check with the Butler County Community Development Office before you purchase land to make sure that the property can be built on.

Easements may require you to allow utility companies or others to dig, trench or install roads, water lines, sewer lines, electrical lines or telephone lines across your land. Typically on an easement, no permanent structures can be built.

The property owner does not always own mineral rights. Check the title policy to know what minerals may be located on the property, and who owns them.

Don't assume that a fence is located on the property line. A professional survey is the only way to confirm where the true property boundaries lie.

Water



Many parts of Butler County have access to a Rural Water District water supply. In most cases, the City of El Dorado Water Treatment Plant sells treated water to the rural water districts. Some parts of Western Butler County get water from the City of Augusta, Sedgwick or Harvey County. Rural Water Districts charge homeowners for installing pipe from the nearest mainline to the home. Contact the Rural Water District in your area to find out the cost of installing water lines to your home.

In areas where no public water supply is available, the homeowner must drill a private well. Some disadvantages of drilling your own well are that the quality and quantity of water can vary during the year. Loss of electrical power will interrupt your supply of water from a well. In addition, drilling a well does not guarantee you will find water. The Butler County Environmental Health Division strongly recommends that homeowners hook up to a Rural Water supply if possible. If you choose to dig a well, it must be 25 feet from property lines and 50 feet or more from any sources of contamination such as septic systems, lagoons, seepage pits, fertilizer or pesticide storage areas, feed lots or any other potential contamination sources.

Refer to the fact sheets in Chapter 5 for more information on drinking water and water quality.

Electricity

There are two electric companies, Westar Energy and Butler Rural Electric Cooperative that serve most of Butler County. These two companies have lines throughout the County, and it will depend on where your home is as to who will be your electricity provider.

Some items to consider if you are building a new home in the country:

- Where is the nearest electrical pole? If the area you are building in doesn't have an electrical pole nearby, you may have to pay to have service extended to your home site. In addition, you may need to get easements from other property owners in order to extend electrical service to your property.
- Rather than have electrical poles running through your property, you may want to consider burying your electrical lines.
- Power outages may occur more frequently in rural areas.



Natural Gas or Propane?

Natural gas is available in certain areas where underground lines have been established in the county. Kansas Gas Service provides gas service to some areas in the county. If a natural gas line is close to your property, you may be able to hook onto it, but you will have to pay for the line from the main line to your home.

Propane is another alternative for persons out in the country who do not have access to natural gas lines. A propane tank is set up in the homeowner's yard and a line is run from the tank to the house. Rather than having a meter like you would for the natural gas line, a propane gas hauler comes to the house and fills your tank when it's empty.

The other alternative is to have all electric appliances.



Telephone

As with other services, you may have to pay to have a land line installed from the nearest main line to your property if you are building a new home in the country.



Mail and Packages



The United States Postal Service delivers mail to rural homes through their rural delivery service, or you can get a post office box in town. In most cases, if the home or land you are buying is on a mail route already, there will be no problem with establishing service to your new address. You may want to check with the Post Office to assure that your mailbox meets their regulations on size and height. If you are building a new home where there isn't an established route, check with the Post Office first to see if service can be extended to that area.

The United Parcel Service, Roadway Package System, Federal Express, and other private mailing services will deliver to rural addresses but you may want to check with them to make sure before you have packages delivered to your country home.



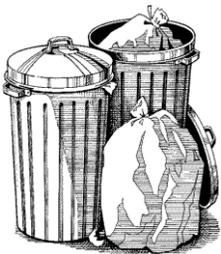
Newspaper Delivery

Newspaper delivery is not always available in the country. Check with your newspaper before assuming you can get delivery to your home in the country.



Trash

In most rural parts of Butler County, trash service is available. Check the yellow pages under trash hauling for companies that collect trash and ask them about rural collection. Generally, if you are close to a town, trash haulers will pick up your trash.

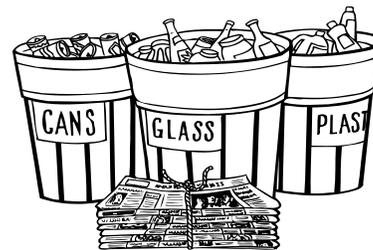


If trash service is not available, you will have to haul trash to the landfill yourself. This can be rather inconvenient to the rural homeowner, not to mention having to store trash till one finds time to take it to the landfill when the landfill is open. And there is more possibility of rodents or animals getting into your trash when it is not collected regularly.

Burning trash in unincorporated areas of the county is still legal; however, you must call your fire department for a burn permit. Trash burning is not recommended due to the fire hazard. There are also environmental concerns with trash burning.

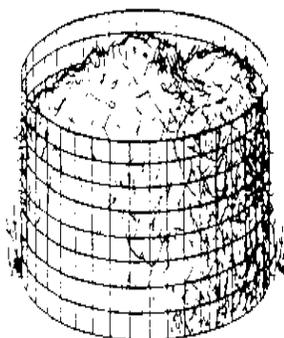
Recycling

Recycling is available at the landfill and in most cities in Butler County. Recycling reduces the amount of trash that goes into the landfill. Items that can be recycled include newspapers, tin and aluminum cans, mixed paper, glass, cardboard and some plastic containers. Contact the nearest city for recycling services, dates and times. You can also contact the Butler County Solid Waste Coordinator at 316-322-4127 for more information.



<http://ks-butlercounty.civicplus.com/282/Recycling>

Composting



In January 2002, a yard waste ban went into effect at the landfill. Leaves and grass clippings are acceptable in your regular trash; however, the Landfill requests you haul tree limbs, brush or other large vegetative items to the compost site at the landfill, or compost at home. Contact K-State Research and Extension office for more information on home composting. You can also contact the Butler County Solid Waste Coordinator at 316-322-4127 for more information. Website on making and using compost at home:

<https://www.bookstore.ksre.ksu.edu/pubs/MF1053.pdf>

Household Hazardous Waste

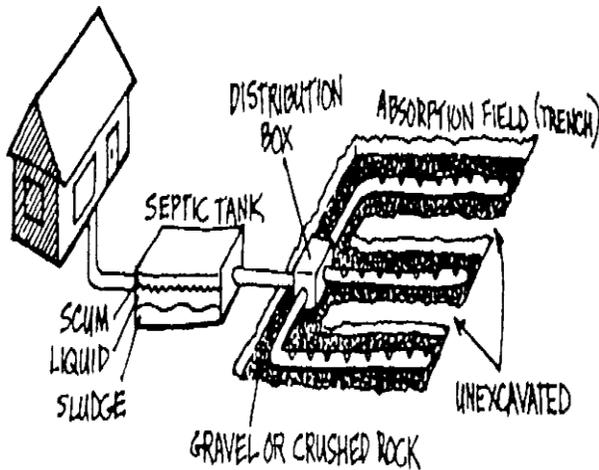
Household wastes such as motor oil, antifreeze, batteries, paint, paint thinners, lawn and garden chemicals and household cleaners are considered hazardous waste and should not be disposed of in your regular trash. A Household Hazardous Waste

Facility is located on the east side of the Butler County Landfill at SW 40th and Boyer Road (access at 4295 SW Kickapoo Road). Butler County residents can use the facility for free to dispose of any unused or unwanted household hazardous materials. The facility is open Monday through Friday from 8:30 AM to 5 PM and Saturday from 8:30 AM to 2:30 PM. Call 316-322-4127 for more information.

Website: <http://ks-butlercounty.civicplus.com/284/HHW-Household-Hazardous-Waste>



Sewage



Sewage is not something we like to think about, but it must be addressed. Rural homeowners don't have a lot of options when it comes to sewage disposal. Unless you are close enough to a town that will extend their sewer lines into a small development, you are faced with handling your sewage with a lagoon or septic system. In many parts of Butler County, the soil is not suitable for septic systems due to high clay content. In order to have a lagoon, the rural property must be at least 5 acres.

Maintenance is another issue with on-site sewage systems. Many times, after a system is completed, maintenance is not thought about until the homeowner starts having problems, such as sewage backing up into the house. Refer to Chapter 5 for fact sheets on lagoon and septic system maintenance. Butler County Environmental Division Website: <http://ks-butlercounty.civicplus.com/318/Planning-Zoning>

Roads

When living in the rural setting, you will most likely be driving township roads with dirt, gravel or sand surfaces. These roads are often rough, so don't expect to be able to drive on them as you would a blacktop road. When it rains, some roads will be impassable due to the mud surface or flash flooding. And don't expect your cars to stay clean!



Butler County is divided into townships. Each township is 36 square miles. Each township has a township board that is responsible for road repair and maintenance on roads not maintained by the County or State.



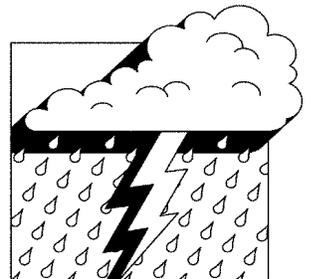
Money for road maintenance is provided through Butler County. In most cases, money the townships receive each year is limited, so they cannot do a lot of extra road repair and work. If you have problems with plugged culverts, ditches that don't drain, roads that need maintenance, etc. call one of your township trustees for assistance. Website for township officials:

<http://ks-butlercounty.civicplus.com/DocumentCenter/View/266>

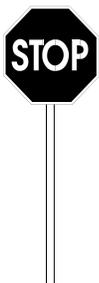
Before establishing a driveway to your new home, check with the Butler County Public Works Department and your township official. You may not be able to put a driveway right where you want to. Factors that determine driveway access include whether the road is paved or not, how much traffic uses the road, drainage factors, etc. Paved roads are classified as arterials for high-speed travel and therefore, your access might be limited. Culverts are required when establishing a driveway over a ditch. The Public Works Department can assist you in determining what size the culvert should be for the water that flows through the ditch during rainfall events. Butler County Public Works Website: <http://ks-butlercounty.civicplus.com/327/Public-Works>

Extreme weather conditions may create difficult driving conditions in the country. Rain or melting snow can make usually good roads impassable.

Floodwaters can temporarily close roads not to mention washing all the sand or gravel off. You may not be able to get out for a day or two if floodwaters make roads impassable. Drifting snow can also make roads impassable. Township equipment will not open your driveway for you. In fact, they may grade your driveway shut when opening the road.



In the summer, dust can be a problem on unpaved roads. You may not like dust drifting into your yard every time a car drives by.



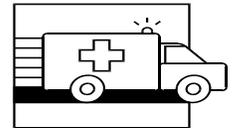
Most township road intersections don't have stop signs, yield signs or other traffic control devices such as railroad crossing lights, so extra caution should be used when traveling. Bridges are narrower. Slow moving farm vehicles and equipment travel township roads to get to their fields. You may also see an increase in vehicle maintenance costs due to more flat tires, front-end alignments, etc.

School buses travel only on roads designated as school bus routes by the school district. Check to make sure that your school district has a bus route out to your home.



Emergency Services

Emergency services in the city are usually very prompt. In the country; however, this can be a different story. Volunteers provide many of our emergency services in the country. This adds time onto an emergency run. If you live in a secluded or hard to reach area, it may take even longer. If your driveway is narrow or has a bridge or culvert under it that won't support large equipment (such as a fire truck) other hazards are in the way, emergency personnel may not be able to get you at all. Keep these things in mind when looking at property.



Fire Departments - Butler County is served by a total of 9 Butler County Fire Districts, 4 City Fire departments, 1 Cowley County Fire District, 1 Consolidated Fire District, and Frontier El Dorado Refinery Fire Department in El Dorado. With the exception of El Dorado, Rose Hill, Augusta and Andover, every city has volunteer fire departments. This means that when you dial 9-1-1, volunteers are paged and must drive to the fire station before they get into the fire truck to make their way to your home. Another issue you must take into consideration is water supply. There are no fire hydrants in the county, thus fire departments have to haul their own water supply to put out fires. Website for Butler County Fire Districts:

<http://ks-butlercounty.civicplus.com/258/Fire-Departments>

<http://www.bucoks.com/204/Non-Emergency-Contact-Info>

Ambulance - Butler County Emergency Medical Services (BCEMS) provides ambulance service for all Butler County. BCEMS normally operates five 24-hour Advanced Life Support (ALS) medic units from four EMS stations located around the county. If needed, BCEMS has the potential of operating up to eight ALS medic units. Each unit is normally staffed with two EMS professionals, at least one of which is a Kansas certified Paramedic. These crews work 24-hour shifts (8:00 am to 8:00 am) and are divided into five teams across three duty shifts. All total, the operations fleet of Butler County EMS consists of eight ambulances, four rapid response vehicles, and two mass casualty support vehicles.

Website: <http://ks-butlercounty.civicplus.com/242/Emergency-Medical-Service>

Law Enforcement - Normally, people think of country living as a good place to raise their kids and get away from all the crime in the city. Even so, crime and vandalism do occur in rural areas. You must still take precautions to protect yourself, your family and your property.



The County Sheriff has jurisdiction in unincorporated areas of Butler County. In some cases, if you are close to a town that has a police officer, they will assist in an emergency.

Keep in mind that in the city, police protection covers square blocks. In the country, the county sheriff's area covers square miles. Report any unusual activity, crimes, burglaries or thefts to the County Sheriff. For emergencies, dial 911. To report a crime that is a non-emergency, call 316-320-1294. The office number is 316-322-4254 or 1-866-484-5924.

Website: <http://ks-butlercounty.civicplus.com/384/Sheriff>

Floodplains

Construction in a floodplain is very restrictive. The Butler County Community Development Office has the Federal Emergency Management Agency (FEMA) floodplain maps for Butler County. Floodplain maps were developed to help planners, homeowners and others determine whether a property in question is in a floodplain or floodway. Homes in these areas can be insured through the National Flood Insurance Program, but insurance rates will be higher. Butler County does not allow construction in a floodway. Construction is allowed in the flood plain but more strict regulations are put in place to assure that the home and any other structures are protected from floodwaters.

Websites:

<http://www.bucoks.com/DocumentCenter/View/1374>

<https://www.fema.gov/national-flood-insurance-program>

<http://agriculture.ks.gov/divisions-programs/dwr/floodplain/mapping>

<http://maps.bucoks.com/depts/regdeeds/disclaimer.htm>

Soils

Soils in Butler County vary from rocky in the eastern portion to clayey in the western portion with just about everything in-between. When purchasing land, building a home or buying a home in the country, it is good to know what soil types you are dealing with on the property. For instance, you wouldn't want to buy property in the Flint Hills if you plan to till the land and plant crops. Some soils have limiting factors such as bedrock close to the surface, slow permeability, high erosion potential, etc.



A soil survey can tell you what type of soil(s) are found on site, how deep the soil is before you hit rock, whether the soil is suitable for a septic system, lagoon, basement, foundation or pond, provides information on drainage or how fast water moves through a particular soil type and what type of trees or crops will grow best in that particular soil. Soils information for all of Butler County is on line using the Web Soil Survey. The website is <http://websoilsurvey.nrcs.usda.gov/app/>. Refer to Chapter 6, USDA Natural Resources Conservation Service for information on how to use the application.

Drainage

Drainage can be a big problem in many areas of Butler County. Many times, drainage is not a problem when we first move to a site, but when additional homes are built, more drainage problems can occur. It is not always clear that drainage can be a problem because many times when we are looking at property, we don't go when it's raining. A topographic map, available from the local Natural Resources Conservation Service, is a good resource to determine how and where water flows from a property. The United States Geological Survey has topographic maps online. Website: <https://store.usgs.gov/maps> or <https://www.topoquest.com/find.php#mapname>.

Some key items to look for when purchasing property:

- ☺ Look for low spots where water sets.
- ☺ Look for vegetation that you normally associate with wetlands or swampy areas.
- ☺ Look for ditches or low areas where water will run to during a heavy rainfall.
- ☺ Look at surrounding land-does it slope towards your property or away from your property?

Now, imagine your house located on this site and try to determine how this will affect the drainage around the site.



Ponds

Many homeowners are interested in having a pond on their property. Ponds can add value to a property, but they could also become a liability. Your insurance may be considerably higher if a pond is constructed on your property. You could be held liable if an accident occurs at your pond as well. In addition, some ponds will require federal or state permits before construction begins, depending on their size. Some items to consider:

You will need 30 to 50 acres of drainage area above the pond, depending on the type of pond you construct, to fill up the pond once completed.

Land area requirement: The land area requirement is dependent on several factors such as topography, drainage, soils, type of pond, etc. As a rule of thumb, you will need at least 20 acres to be able to construct a pond on your property.

Remember, you cannot back up water on another person's property without written approval from that property owner. Websites for more information:

<http://agriculture.ks.gov/docs/default-source/dwr-ws-fact-sheets/fish-pond-construction.pdf?sfvrsn=4> or

<http://nrcspad.sc.egov.usda.gov/DistributionCenter/product.aspx?ProductID=115>

Weeds

Kansas has a noxious weed law that requires all persons who own or supervise land in Kansas to control and eradicate all weeds declared noxious by legislative action. Control is defined as preventing the production of viable seed and the vegetative spread of the plant.



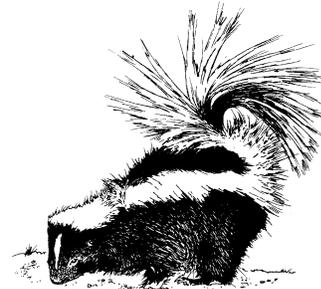
The most common noxious weeds found in Butler County are Field Bindweed, *Sericea Lespedeza*, Musk Thistle and Johnson Grass. Other noxious weeds that have been found in Butler County in small infestations are Canada Thistle, Quackgrass, and Hoary Cress.

The Butler County Weed Department (316-321-5190) can help you identify noxious weeds. They provide herbicides at reduced prices to help you control any infestations you may have. Remember, any time you use chemicals, you have the responsibility to protect our groundwater and surface water sources. Read and follow all label directions and practice safety when working with chemicals. Keep a safe distance from wells and surface water.

Website: <http://www.bucoks.com/313/Noxious-Weed>

Wildlife

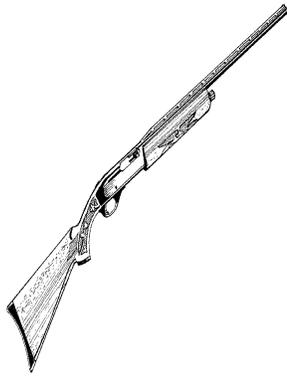
You will probably see more wildlife in the country than you did in the city. Wildlife in Butler County include skunks, opossums, raccoons, deer, coyotes, turkey, pheasant, quail, fox, badgers, geese and ducks, to name a few. Wildlife are fun to watch but remember, they are wild creatures and should be treated as such.



Wildlife pose dangers in a couple ways. For instance, skunks are known to carry rabies. If you see a skunk (or any wild animal) acting unusual, such as a nocturnal animal walking around during the daytime, do not approach the animal. Animal bites are handled through the Butler County Health Department at 316-321-3400 or 1-800-940-6083.

Another way wildlife pose a danger is crossing roadways. They can do serious damage to your vehicles.





Kansas is known for good hunting, so expect to see more traffic, hear gunshots and see hunters during the hunting season in rural areas. Hunters do not have the right to hunt on your property unless you give them the right to do so. If trespassing occurs, or you suspect illegal hunting activities, contact your local Kansas Department of Wildlife and Parks conservation officer. If you can, get a license tag number if the hunters leave the area before an officer arrives. Website: <http://ksoutdoors.com/>

Pets

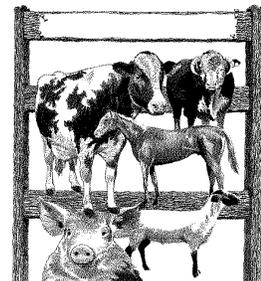


Having a pet or pets is fun and rewarding but along with pet ownership comes the responsibility to take care of that pet. If you have pets, provide food, shelter and a fenced in area for them. Make sure your pets have all the necessary shots (such as rabies), as required.

Sometimes, pet owners decide they don't want their pet anymore and go out into a rural area to dump it off to fend for itself. This usually results in the pet being run over by a car, getting shot, getting killed by a wild animal or starving to death. If the pet is lucky, some other homeowner will take it in, but this is usually not the case.

The Butler County Animal Control Program was established in Butler County by Resolution #98-87. Complaints regarding stray, nuisance or vicious dogs should be directed to the Animal Control Officer at 316-322-4325. The Sheriff's Office (316-322-4254) is responsible for calls pertaining to livestock, exotic animals, and animal cruelty. The Health Department (316-321-3400) is responsible for calls pertaining to animal bites. After hours calls are taken by Butler County Sheriff Dispatch (316-320-1294) and distributed to the appropriate department. Note: Incorporated cities will have their own animal control contacts.

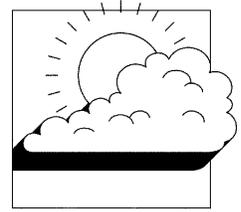
Farm animals - There are restrictions on the kind and Number of livestock you can have on 3 acres or less. Contact Butler County Community Development Department At 316-322-4325 for more information.



Weather

Weather occurs everywhere, but you will probably notice it more in the rural environment.

Some things to consider about weather when living in the country:



- In the city, you are protected from wind by other houses and trees. In the country, you may not have this protection.
- Straight-line winds during thunderstorms can cause as much damage as a tornado.
- Lawn furniture, grills, garbage cans, children's toys and similar items are more likely to be blown away in the country.
- Along with the wind comes dust. Dust will come from roads and farm fields. In the winter, the wind can whip snow into deep drifts around your home.
- Tornadoes are always a threat in Kansas.
 - In the city, when tornadic activity approaches, warning sirens are sounded to alert people of upcoming danger. In the country, there are no sirens.
 - It is your responsibility to watch the weather and take the necessary precautions to assure your own safety.
 - A weather radio is a good investment. A weather radio will warn you of severe weather in the area and give you extra time to take shelter.
 - When buying a home, check to make sure there is adequate shelter for use during severe weather. A small, reinforced room in the center of the basement is the best shelter. If there isn't a basement, consider putting in an underground shelter adjacent to the home.
 - When building a home, include building a storm shelter for you and your family's safety. Also consider additional reinforcement of trusses, roofs, etc. to provide even more protection against strong winds and tornadoes.
- Townships are not responsible for removing snow from your driveway. Keep this in mind when you are looking at property. You may be stuck if you do not have a snow blower or good neighbor with a tractor to clear your drive.
- When it rains, flooding of roads and low-lying areas is a common occurrence in the country. You may not be able to get out for several hours or several days, depending on your location to major rivers, creeks and tributaries.



- Never walk through flowing water. Six inches of moving water can knock you off your feet.
- Do not drive through a flooded area. "Turn Around, Don't Drown"



The weather can play havoc on utilities, especially electrical services. In the country, if your electricity goes off, you may not get it turned back on for several hours. If you rely on a water well for household water, you won't have any water during that time either. During winter weather, your mail may not be delivered if the mail carrier can't get through. When your electricity goes off, call your electrical supplier to alert them of the outage.

- Utility companies do their best to restore service to rural areas as quick as they can. Even so, prompt service will not always occur because of the extent of line damage or damage in several areas. When living in the country, patience is a good virtue.

Website for Disaster Preparedness: <http://www.ready.gov/>

Website for Weather: <http://www.weather.gov/ict/>

To get involved locally: <http://www.bucoks.com/222/Community-Emergency-Response-Team-CERT>

Easements and Rights of Way

There may be existing easements on land you wish to purchase that are not visually apparent. Easements give another party, such as a utility company or pipeline, the right to install, repair or replace a pipeline, electrical line, water line, or other facility or utility on your property.

There are 6 watershed districts in Butler County with 120 watershed dams built with federal or state funding. All these dams have easements for control of any waters in, over, upon or through the structure together with any waters that are impounded, stored or detained by the structure. In addition, breach routes below watershed structures prohibit the building of homes or buildings. Contact the Watershed District Office for additional information on watershed easements and breach routes at 316-320-3549.

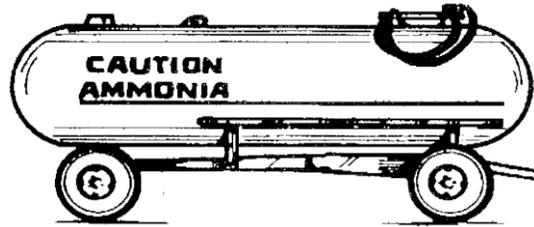


In Butler County, no permanent structures can be placed on an easement. This may reduce the amount of property you would have to construct a home or other building, or prevent you from building where you want to. When considering buying a property, be sure to check for easements. A title search is helpful. Also check with Butler County Community Development.

Website: <http://www.bucoks.com/503/Zoning-Regulations>

Hazardous Materials

Hazardous materials travel across Butler County every day by way of train, truck, tractor and automobile. In the country, you will see anhydrous ammonia tanks being transported to and from farm fields by truck and tractor. Large field sprayers carrying pesticides move from field to field and farm to farm. Farmers transport large gas or diesel tanks on the back of their trucks for fueling tractors and other equipment.



Rail cars and semi trucks carry hazardous materials across the county. Would you know what to do or who to call if an accident occurs? For emergencies, always call 911. They will contact other agencies who need to be involved with cleanup or emergency response.

CHAPTER 4

LIVING WITH YOUR AGRICULTURAL NEIGHBORS



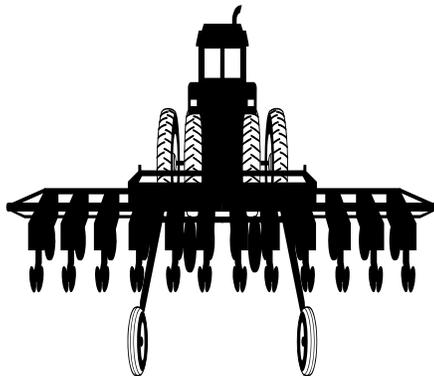
For farmers and ranchers, getting their crops sown and harvested and tending to their livestock is how they make their living.

Most non-agricultural people work the hours of 8 AM to 5 PM. Your agricultural neighbors, on the other hand, may head to the field at 6 AM to work farm ground or tend to livestock and they may not return home until 10 PM at night. During their planting and harvest seasons, it's not likely they will take the weekend off either.

Farming activities produce noise, odor, increased vehicle traffic, dust, pollen and mold spores. These activities may not suit your personal lifestyle and could be detrimental to your health if you suffer from allergies or asthma.

If you have a farmer for a neighbor in the country, here's what to expect:

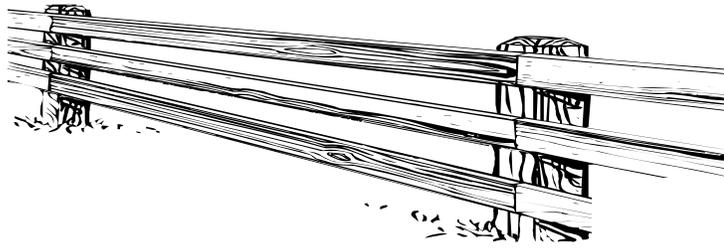
- During the spring and summer and during planting and harvest seasons, there will be trucks and trailers parked along the road, slow moving combines and tractors moving from field to field and farmers burning wheat stubble or rangeland.



- Your closest neighbors could also be the four-legged kind. Cattle, sheep, horses, pigs, chickens and other farm animals create manure and noise. Typically, manure is used as a fertilizer on the farmer's fields. If you happen to be adjacent to a field that is spread with manure, you can expect odor and even an increase in flies until the manure is worked into the soil.



- Keep in mind that farm animals do break out of fences and might decide to check out your new landscaping project or taste the garden fare.

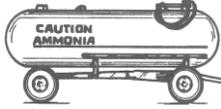


- Remember that some farm animals can be dangerous.
- Land preparation, harvesting and planting can create large amounts of dust, especially during dry and windy conditions.
- Burning stubble or rangeland creates a lot of smoke and odor. Ashes from burned stubble or rangeland will fall on neighboring properties.
- Fertilizers, herbicides and other chemicals are used extensively in farming and ranching operations. Wind may drift these chemicals onto neighboring properties. In addition, there is always that chance of an accidental spill.
- Persons with asthma or allergies may need to be more cautious and aware of the farming and ranching activities surrounding them for health reasons.



Glossary of Agriculture Terms

Acre - 1 acre equals 43,560 square feet. An acre is $208\frac{3}{4}$ feet by $208\frac{3}{4}$ feet. A section of land (1 mile square) is 640 acres.



Anhydrous Ammonia - Carried in tanks, usually white and capsule shaped. Farmers use anhydrous ammonia as a fertilizer on their fields.

Cattle

Bull - male

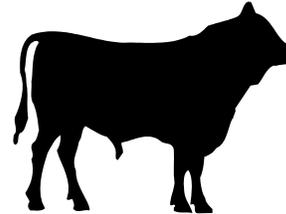
Calf - the young of the cow. Calves are usually weaned from the cow at 400 - 600 pounds.

Cow - female

Heifer - a young cow that has not had a calf

Steer - a "fixed" or former male

Stocker - a 500 to 750 pound calf



Beef cattle weigh approximately 1,100 pounds when sent to market. The Flint Hills in Eastern Butler County provides excellent rangeland for beef cattle.

Chicken

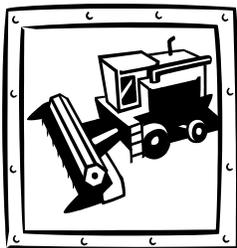
Hen - female

Rooster - male

Chick - young chicks

Pullets - young chicks that are ready to start laying

Broilers - grown for meat



Combine - A farm machine which combines the processes of heading, threshing and cleaning grain while harvesting it in the field.

Corn, Milo, Sorghum, Soybeans - Planted from early May to June. Harvested in the fall.



Cotton - A relatively new crop to Butler County. Planted from May to June and harvested in late fall or winter.



Goat

Doe - female
Billy or Buck - male
Kids - the young of the doe



Hay - Alfalfa, brome, clover, native grass and the like, that is cut and dried and then baled and stored in a barn or along the edge of a field.

Horse

Mare - female
Stallion or Stud- male
Colt - young male
Filly - young female
Gelding - a "fixed" or former male



Noxious Weed - Weeds that are declared noxious by Butler County. All persons who own or supervise land in Kansas are required to control noxious weeds.

Pasture - Grass or herbage that cattle or other grazing domesticated animals eat. May consist of native grasses such as Big or Little Bluestem or introduced grasses such as brome or fescue.

Rabbit

Doe - female
Buck - male



Range - A row of townships, six miles in width, between two successive meridian lines.

Rangeland - The Flint Hills in Eastern Butler County is an excellent example of rangeland. Typically, rangeland consists of grasses native to the area. In many cases, these areas have never been broken out for raising crops.

Riparian - Pertaining to the banks of a creek or river. A riparian zone is the area of land adjacent to the creek or river.

Section - an area of land, one-mile square, containing 640 acres and constituting 1/36 of a township.

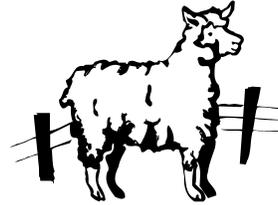
Sheep

Ewe - female

Ram - male

Lamb - the young of the ewe

Wether - a "fixed" or former male



Slow Moving Vehicles - Tractors and/or tractors pulling farm machinery, combines, or any other farm related machinery use state, county or township roads. These vehicles move slowly and will not be able to get out of your way quickly, especially when the machinery is pulling a large implement.

Swine

Sow - female

Boar - male

Piglet - baby pig

Gilt - a young female

Barrow - a "fixed" or former male



Township - A unit of area in surveys of lands, six miles square, subdivided into 36 sections of one square mile each.

Tractor - Used for fieldwork such as plowing, disking, sowing, baling hay, etc.



Watershed - An area of land that drains water to a common downhill point such as a river, lake, creek or stream.

Wetland - An area of land that remains wet for a period of days and supports wetland vegetation.

Wheat - Sown in the fall and harvested from late May to July.



CHAPTER 5 INFORMATION SHEETS

• Butler County Community Development Regulations and Building Codes	28
• Get to Know Your Septic System	31
• Household Hazardous Waste Program	35
• Electronic (E-waste) Waste Recycling	36
• Recycle Trailer Program in Butler County	37
• Pipeline Safety and Awareness	38
• Plugging Abandoned Water Wells	39
• Private Well Maintenance	45
• Recommended Water Tests for Private Wells	49
• Wastewater Pond Operation, Maintenance and Repair	53

**Butler County
Community Development Department
121 South Gordy, Suite 202
El Dorado KS 67042
316-322-4325**

<http://www.bucoks.com/324/Applications>

Filing Fees - <http://www.bucoks.com/DocumentCenter/View/197>

Requirements, Regulations and Building Codes

The following information is provided to help you determine the steps you'll need to take when you purchase property and build a home or other permanent structure on the property:

In order to build or build onto a home, build an accessory building (such as a garage or swimming pool), build a commercial building, place a single-wide or double-wide manufactured home, construct a lagoon or septic system, or drill a water-well, one needs a permit from the Butler County Planning and Zoning/Community Services Department. After the permit application has been received, we will do an inspection. If construction has proceeded before the permit has been issued, the permit will cost quadruple the normal amount. The permit application needs to be filled out completely and accurately in order to avoid delays in the inspection process. You are responsible for contacting the Rural Water District and finding out locations of water lines near your property as well as the location of any easements (such as for utilities or petroleum pipelines) running through your property. The following are some of the things that you need to know and answers to commonly asked questions. This sheet is not a comprehensive summary of the Butler County Zoning Regulations and/or the Butler County Sanitary Code and should not be construed as such.

Setback Requirements - All structures must be a certain distance from the front, side, and rear property lines. If your property is on a corner, the two road-facing sides are considered front yards. Ask for a setback schedule showing the requirements categorized by acreage.

Single-Wide Manufactured Homes – A single wide home may be placed only on land zoned MH – Manufactured Housing; to replace an existing single-wide; and for farm help on forty (40) or more acres zoned AG – Agriculture. The permit fee is \$150.00.*

Double-Wide Manufactured Homes - Double-wide manufactured homes, manufactured after June 15th 1976, can be placed anywhere that a site constructed home is allowed. It is a State of Kansas requirement that these types of homes be placed on a permanent foundation built to Uniform Building Code Standards. The permit fee is \$200.00.*

Site-Constructed Homes – Homes must be built to Butler County Building codes. The permit fee is \$150.00.*

Commercial Buildings - A commercial building is any building used for commercial purposes. The applicant will have gone through the process of obtaining a conditional use permit, which is necessary if one wants to operate a business in the unincorporated areas of Butler County. The permit fee is based on valuation.

Water-Wells – It is strongly recommended that homeowners hook up to Rural Water if possible. If you cannot, or choose to dig a well, it must be 50 feet from any sources of contamination such as septic systems, lagoons, sewer lines, pit privies, seepage pits, fuel or fertilizer storage areas, pesticide storage areas, feed lots, or any other potential sources of pollution or contamination. One may want to consider a house and any accessory buildings as sources of pollution. For example, one may find it necessary to treat a house for termites in the future. Wells must be 25 feet or more from the nearest property line and must be disinfected before using. The permit fee is \$100.00.*

Septic Systems - One must have at least three acres in order to install a septic system. A soil percolation test must be performed and passed successfully to obtain approval for a septic system. Septic systems must be 50 feet away from all surface waters such as streams, lakes, wetlands, and ponds. All parts of the septic system and lateral field must be at least 25 feet away from adjoining property lines and potable water lines (you are responsible for contacting the Rural Water District, if any, and having the water line location staked). The initial inspection will consist of an inspector examining the staked site and checking required distances to the aforementioned entities. A final inspection is required after construction is complete and before the lateral field is covered with soil. Ask for a copy of minimum requirements for more information and specifications. The permit fee is \$200.00.* If you are replacing a failing system - \$75.00*.

Waste Stabilization Ponds (Lagoons) - One must have at least five acres in order to construct a lagoon. Lagoons require three inspections. The first is for site approval, which will be performed after the four corners of the inside of the lagoon's berm have been staked. The second inspection is performed after construction to ensure that the lagoon has been built to specifications. A common problem in some areas of Butler County are rocks. You must communicate to your contractor that rocks on the lagoon's berm are unacceptable. The third inspection will be performed after the lagoon has been fenced and seeded with grass. The use of the lagoon is prohibited until after the final inspection and concurrent approval. A lagoon must be 50 feet from the house it is servicing, 100 feet from all property lines, including public right-of-ways, 50 feet from all water wells, 25 feet from potable water lines (you are responsible for contacting the Rural Water District, if any, and having the water line location staked), and 50 feet from all surface waters such as streams, lakes, wetlands, and ponds. When considering the site of the lagoon, one should keep in mind that nothing should be constructed as to block the prevailing southwest winds from reaching the surface of the lagoon. Wind action is necessary and vital for proper lagoon functioning. For example, unpleasant odors could result without proper wind action. Ask for a copy of minimum requirements for more information and specifications. The permit fee is \$200.00.* For replacement of a failing system - \$75.00*.

Common Violations of the Butler County Zoning Regulations and Sanitary Code--

The following are some of the most common causes of landowners being issued a violation letter and/or being prosecuted by the County Attorney. Illegal dumping of trash, dumping trash down riverbanks, operating a junkyard or salvage operation without proper County and State permits, unfenced lagoons, sewage surfacing from failing septic systems, junk or inoperable vehicles in excess of two, having a single-wide mobile home in addition to an existing dwelling, use of a single-wide mobile home for other than a dwelling, living in a recreational vehicle or camper, livestock on less than three acres, portable signs, storage of waste tires, building without a permit, having more than four adult dogs without a kennel license and running a business without a conditional use permit. If any violations of the Butler County Zoning Regulations and/or the Butler County Sanitary Code are discovered during any construction authorization inspection, you will be issued a violation letter and your application will not be considered until the violation is abated. When a violation is discovered during an inspection or at any other time, the violation will be photographed and a violation letter mailed to the record landowner of the property where the violation exists. Approximately 30 days after receiving the letter, the property will be re-inspected. If a violation still exists, the case will be turned over to the County Attorney for prosecution. It is easier to avoid violations beforehand by keeping your property in compliance.

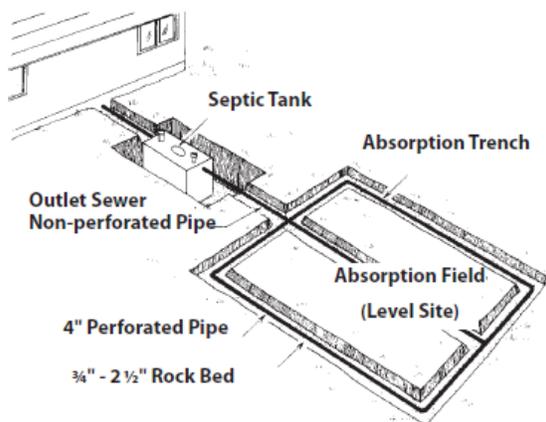
**** Permit Fees are Subject to Change.***



Get to Know Your Septic System

(Onsite Wastewater Treatment)

Where sewers and central wastewater treatment plants are not available, some type of onsite wastewater treatment system is necessary. Onsite systems must completely treat the wastewater and allow it to be absorbed by the soil or through evaporation without causing contamination, nuisance, or odor. Surface discharge of wastewater from individual homes is illegal in Kansas.



Typical Onsite Wastewater System

A septic system composed of a septic tank and absorption field is the most common onsite system for homes. Treatment of the wastewater begins in the septic tank. Final treatment and absorption of the wastewater occur in the absorption field (also called lateral, leach, or drain lines/fields). Other types of onsite systems include lagoons and alternative systems that provide additional treatment before reaching the absorption field.

The Importance of Soil

Under the right conditions, soil is an excellent wastewater treatment system. The type and depth of soil determines the size and kind of onsite system that can be used. The soil with attached microbial life treats wastewater by:

1. Filtering out small solids,
2. Destroying pathogens,
3. Breaking down dissolved organics, and
4. Holding nutrients for plant growth.

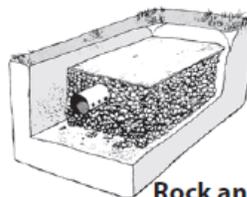
Enough soil depth is required to get sufficient treatment of wastewater. An adequate oxygen supply in the soil is essential for efficient treatment. If the thickness of soil below the trench bottom is not great enough to treat the wastewater before it reaches groundwater or a layer of rock, an alternative system can be used to pretreat the wastewater before it is applied to the soil.

The ability of the soil to absorb and treat wastewater is determined by careful soil profile examination or sometimes by percolation (perc) tests. A soil profile is the identification and evaluation of soil properties as seen in a trench at the field site. A percolation test measures the rate of drop of the level of water in a hole in thoroughly saturated soil. A soil profile can provide more information and more consistent results than a perc test.

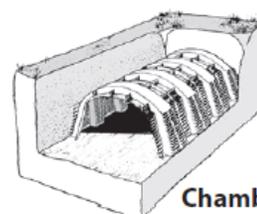
Soil Absorption Field: What Are The Options?

The soil absorption field disperses septic tank effluent (outflow) throughout a large area where it is further treated and absorbed. The size of the absorption field is based on soil properties and the expected wastewater flow.

Laterals or Trenches. The most common absorption field design is a system of trenches, usually 2 to 3 feet wide and spaced 7 to 10 feet apart. The bottom of a trench should be no more than 3 feet deep. For best oxygen transfer, 2 feet deep is more effective. To convey the wastewater throughout the field, the trenches are filled with rock surrounding a perforated plastic pipe or with chambers. Chambers are interconnecting plastic structures with open bottoms and side slots that allow the septic tank effluent to reach the soil.



Rock and Pipe



Chamber

The lateral system provides optimum treatment because oxygen enters through the soil on each side to reach the wastewater around the trench. The rock or

chambers should be covered with 6 to 12 inches of soil to allow grass to grow and to prevent freezing. Shallow, widely spaced laterals maximize the opportunity for nutrient removal and evaporation.

To divide wastewater between lateral lines, pipe systems or distribution boxes can be used. When an absorption field is on a slope, the laterals should be level and parallel to the contours of the hill. Drop boxes or raised pipe segments transfer the wastewater to the next lower line when the higher one is full.

Drip Irrigation. Subsurface drip irrigation may be used for an absorption field. Pretreatment by an alternative system is used ahead of the drip system.

Beds. When space is very limited, a seepage bed or an evapotranspiration bed is sometimes used because it can fit into a smaller area than a lateral system. Beds lack most of the sidewall area of laterals and thus the oxygen supply is very limited in the center of the bed. These systems are more effective in dry climates than in wet, humid conditions.

Seepage pits and cesspools (dry wells). These systems have been illegal in Kansas since regulatory changes in 1996. They are not designed for good wastewater treatment and may cause groundwater contamination.

The Importance of a Septic Tank

To reduce the amount of waste that the absorption field must treat and to protect the field, raw sewage flows through a tank where the solids separate from the liquid before it enters the field. Lighter materials such as soap scum, oil, and fats form a floating layer at the water surface. Heavier solids accumulate at the bottom and are partially decomposed by microbial activity. The anaerobic environment in the tank begins the treatment process and digests accumulated solids, reducing sludge volume. Effluent from the tank contains small solids, dissolved organics, nutrients, and microorganisms including pathogens. Although wastewater is partially treated in a septic tank, the effluent is still sewage.

The septic tank should be watertight, corrosion-proof and of proper size and dimensions. A tank that has easy

surface access and inspection ports is essential to perform needed inspection and maintenance.

Safety. Never go into a septic tank unless properly equipped. The natural processes in a septic tank generate gases that are poisonous, flammable, and will cause asphyxiation.

Should I Use Septic Tank Additives?

A "starter" is not needed for a new septic system and additives are not needed for an operating system. A wide range of bacteria is already present in the sewage entering the septic tank. Those bacteria that are best adapted to the conditions in a septic system thrive in the septic tank and soil absorption field, treating the wastewater.

Septic tank additives are of no benefit. Some of them, especially solvents or petrochemicals, do not degrade easily and may damage the system or contaminate groundwater.

Additives that clean solids out of the tank may result in early absorption field failure. Money saved by not using additives will pay for regular septic tank pumping.

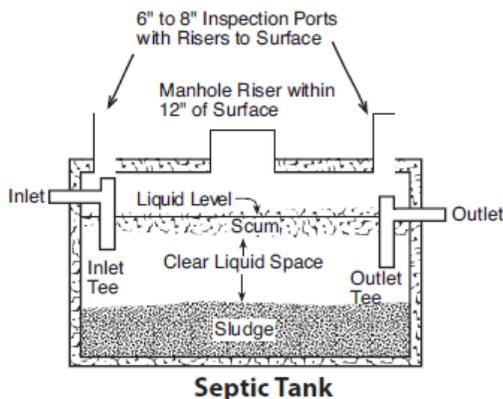
Are There Alternatives to Traditional Septic Systems?

Yes! If a site does not have enough deep, permeable, well-drained soil for a septic system, there may be several alternatives, depending on site conditions.

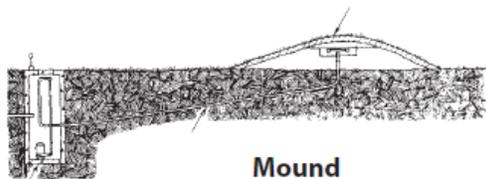
Lagoons. A lagoon is a constructed pond, 6 to 7 feet deep, surrounded by a berm, and fenced to prevent animals and children from entering. All wastewater is discharged into the lagoon where it is treated by bacteria. For slowly permeable, high-clay soil, it is an effective, inexpensive option. A good lagoon that is properly operated and maintained rarely has an offensive odor. A lot size of 2 to 3 acres or more may be required to adequately accommodate a lagoon and provide setback distances.

Alternative Systems. Onsite systems designed to pretreat wastewater before it is sent to an absorption field are called alternative systems. Options include mounds, aeration systems, sand filters, filters using other materials, and rock-plant filters. Although all onsite systems require some maintenance, the mechanical and electrical parts or vegetation in alternative systems mean that additional monitoring and maintenance is required for good performance. Having a contract for maintenance service with a provider such as an installer or manufacturer is strongly recommended. Except for mounds, all alternative systems in Kansas still require an absorption field following the system.

Mound. When the soil has a shallow depth to a restrictive layer, such as a seasonal high water table, rock,



or slowly permeable layer, a mound may be a suitable alternative. A mound system consists of a layer of clean sand of a specific size on a prepared natural soil surface, and a pumped dosing system that applies the septic tank effluent over a distribution bed on top of the sand. Topsoil and grass cover the mound. Pump dosing of the distribution area is essential for uniform application to avoid overloading any one area. Mounds are usually limited to slopes

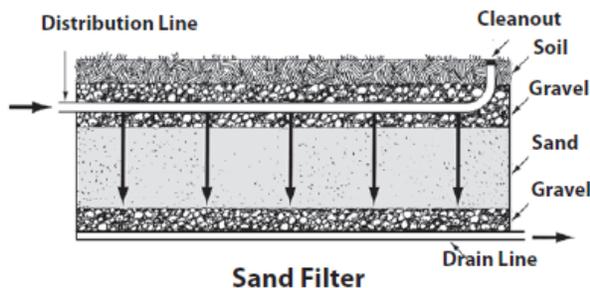


Mound

of less than 15 percent. A well-planned mound blends into the site and adds visual interest, but requires a site-specific design. The soil beneath the mound serves as the absorption field, eliminating the need for a separate field.

Sand Filter. A sand filter is similar to a mound but smaller, with the sides and normally the bottom of the sand bed lined with an impermeable material. Pre-engineered sizes and kit components enable easy installation, predictable costs, and a minimum of installation problems.

Systems similar to sand filters, but using expanded shale, peat, textiles, or other materials may also be used.



Sand Filter

Aeration. An aeration system increases the rate of microbial activity in the wastewater by adding oxygen. The oxygen is added by injecting air into the wastewater or by spraying the wastewater through air. There are many manufacturers of these units. Be sure that the system that you select has good service support in your location and a good warranty. NSF International has a certification program for aeration units.

Rock-Plant Filters, sometimes called constructed wetlands, have been developed since 1980. Wetland plants are set into a bed of rock in an impermeable liner. Septic tank effluent flows through this treatment cell. Soil absorption can be in a conventional absorption field or a second unlined wetland cell. A healthy stand of wetland vegetation contributes to wastewater treatment and removal. Rock-plant filters require maintenance to keep the plants vigorous.

Other Systems. The onsite treatment field is changing rapidly with many new products being developed. Many show promising results. As with any other major purchase, check the information on performance, length of time it have been in use, and the reputation and experience of the manufacturer, dealer, and installer.

How to Avoid a Septic System Failure

Each septic system has a certain capacity. When this capacity is exceeded, there will be problems of effluent oozing to the surface or wastewater backup in the house. Reduction of water use relieves a primary cause of system failure and is a great benefit for onsite systems.

Discharge all wastewater from the home into the septic tank. Laundry wastes must be run into the septic tank so that lint, detergent scums, and dirt are retained, and do not cause failure by clogging soil pores. Do not drain floor sumps or roof drains into the system. Only wastewater should go into the septic tank.

When selecting plumbing fixtures and water-using appliances, choose those that are water-efficient. Some toilets, shower heads, dishwashers, and washing machines use much less water than others.

Lagoon Maintenance. Lagoons operate best when the level of the wastewater is 3 to 5 feet deep. More water may have to be added to maintain this depth. Vegetation in the water, such as cattails and duckweed, must be removed for good operating conditions, reducing sludge accumulation, and preventing mosquito breeding. Berms should be planted with grasses that are mowed regularly.

Alternative System Maintenance. The manufacturer and installer should provide information on the maintenance requirements for your specific system. Maintenance can include testing pumps, alarms, and blowers for correct operation. Testing of dosing systems may include measuring squirt height of a water column from the end of a line to check for plugged orifices. Maintenance may involve back-flushing or brushing out the lines.

Good Septic System Performance May Require Learning New Habits

Taking Care of Your System

Pump the tank regularly to remove the sludge and scum. For example, about every 3 years, pump a 1,000-gallon tank serving a three-bedroom home having four occupants and limited use of a garbage disposal. See K-State Research and Extension publication, *Septic Tank Maintenance*, MF-947, for details.

Do not dump grease down the drain. It may clog sewer pipes or build up in the septic tank and plug the inlet. Use a separate container for waste grease and dispose of it in the trash.

Do not dispose of materials such as coffee grounds, cooking fats, bones, high wet-strength paper towels, facial tissues, or cigarette butts in the house sewer. These materials accumulate as solids in the septic tank and do not decompose readily, resulting in the need for more frequent tank pumping.

Modest amounts of household detergents, bleaches, drain cleaners, and other household cleaners do not harm the bacterial action in the septic tank. Do not put excessive amounts of any household chemicals down the drain. Avoid automatic toilet cleaners that contain chlorine.

To help avoid overloading the system, use water carefully. Turn off the faucet when not using the water. If the toothbrush is in your mouth or the razor is on your face, running water is being wasted and adding to onsite system load. Save laundry and dishes until you have enough to run a full load in the washing machine or dishwasher. Be alert to leaky faucets and toilets — repair all leaks.

Softened water may cause problems in absorption fields installed in high-clay soils. The added salt in the water may reduce the permeability of the soil, shortening the life of the field. Returning the softener discharge to the septic system or only softening the heated water can reduce the impact of a water softener on a septic system.

What To Do Before Buying Real Estate

A home or building site not served by central sewer or a public water supply needs careful evaluation to avoid bitter consequences. When buying an existing home, get complete information about the existing water supply and wastewater system before completing the purchase. Find out exactly where the property boundaries, well, and wastewater systems are located. Be sure that the existing system meets all setback and separation requirements from wells, water lines, and property lines given in the sanitary code. An area meeting the same requirements should be reserved for a replacement field. Inspection by a trained person is essential to learn if the system meets the local code and state requirements.

Before buying a lot, determine the most desirable locations for your home, well, and wastewater system. Evaluate the soil suitability on the site for building foundations, septic system or wastewater lagoon, roads, drives, and other uses. Remember that steep slopes, rock, high-clay soils, water bodies, stream floodplain, and marshy areas will cause construction and drainage problems. Before finalizing any purchase contract, check with the appropriate office to find out what permits are needed, including a permit to install the wastewater system. It is wise to make the purchase of the property contingent on locating an adequate site for a reasonable cost wastewater system and a sufficient source of safe drinking water.

Sources of Additional Information

- Local Health Office or Zoning/Planning Office
- County K-State Research and Extension Office
- Kansas Department of Health and Environment
- Local Natural Resources Conservation Service/ County Soil Conservation District Office

The following K-State Research and Extension publications are available from your county Extension office, local health office, or from K-State Research and Extension Distribution Center, 16 Umberger Hall, Manhattan, KS 66506-3402, (785) 532-5830

- *Septic Tank Maintenance: A Key to Longer System Life*, MF-947
- *Why Do Septic Systems Fail?*, MF-946
- *Wastewater Pond Design and Construction*, MF-1044
- *Wastewater Pond Operation, Maintenance and Repair*, MF-2290

Grateful acknowledgement is made to the original authors: Barbara L. Dallemand and G. Morgan Powell, Extension engineers in the areas of onsite wastewater systems and water quality.

Revised by Judith M. Willingham, extension assistant, Bio and Ag Engineering.

Publications from Kansas State University are available on the World Wide Web at: <http://www.ksre.ksu.edu>

Publications are reviewed or revised annually by appropriate faculty to reflect current research and practice. Date shown is that of publication or last revision.

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Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-2179 (Revised)

August 2010

K-State Research and Extension is an equal opportunity provider and employer. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Gary Pierzynski, Interim Director.

Website: <http://www.ksre.ksu.edu/bookstore/pubs/MF2179.pdf>

Household Hazardous Waste Program



**Collected Monday thru Friday 8:30 AM until 5:00 PM
Saturday – 8:30 AM till 2:30 PM**

**Located at the Butler County Landfill
(SW 40th and SW Boyer Road – Look for signs on SW 40th
directing you to the east side of the landfill, then south
on SW Kickapoo Road)**

Household limit is 5 gallons or 40 pounds.

***NOTE: Small Quantity Generators (ie. those who generate waste
as part of their business) should call the Sedgwick County
Household Hazardous Waste Site at 316-660-7464.***

- 🌐 Paint
- 🌐 Paint Thinners
- 🌐 Paint Strippers
- 🌐 Household Cleaners
- 🌐 Motor Oil
- 🌐 Lawn & Garden
Chemicals
- 🌐 Aerosol Cans
- 🌐 Batteries
- 🌐 Rodent Poison



**For More
Information:
316-322-4127**

- Bring items in a sturdy box and preferably in their original container.
- Be prepared to leave your containers.
- DO NOT Mix products together!

**Check out our re-use site before
purchasing new! We might have what
you need for FREE!**



**Butler County
Electronic
Waste
(E-Waste)
Collection
Program**

Don't Throw It Away!!



Who Can Participate in the E-Waste Program?
The Program is FREE to Butler County:

- Households
- Educational Institutions
- Government Agencies

A Small Fee (\$7.00 Maximum) will be charged to:

- Businesses
- Non Profit Groups
- Hospitals

What is E-Waste?
E-waste is produced when electronic products are no longer functional or become obsolete and need to be discarded.



Why Not Throw Unwanted E-waste in My Household Trash?

- By taking e-waste to a special collection point, materials such as gold, copper, silver, plastic and steel can be recovered and recycled.
- Hazardous materials such as lead and mercury are present in e-waste. It is best to keep those materials out of our landfill.
- By recycling e-waste, we are conserving our natural resources and energy as well as protecting air and water quality.

What About Personal Data Stored on Electronic Equipment?
Collection centers follow strict guidelines to ensure safe and secure storage and handling to restrict third party access to data stored on electronic devices.



Where Can I Recycle My E-Waste?
Butler County Landfill

2963 SW 40th Street (SW 40th and SW Boyer Road)
8:30 AM to 5:00 PM, Monday thru Friday
8:30 AM to 2:30 PM Saturday
The E-Waste Site is located off Kickapoo Road on the east side of the landfill.

NOTE: Call First if bringing large quantities of E-Waste!

For more information, contact the
E-Waste Coordinator
316-322-4127
www.bucoks.com



The E-Waste Program is funded by Butler County Public Works.

Materials Accepted:
Computers, monitors, CPU's, laptops, keyboards, cords, scanners, printers, copy machines, cell phones, pagers, answering machines, PDA's, TV's, microwaves, video games, fax machines, stereos, camcorders, DVD players.

<http://www.bucoks.com/283/E-Waste-Electronic-Waste>

Recycling Trailer Program in Butler County

Recycling services are available in these towns each month on the days listed below. Contact Butler County Landfill at 316-322-4127 for more information.



Andover - 1st & 3rd Saturday
 Augusta - Saturdays
 Benton - 1st & 3rd Saturday
 Cassoday - 2nd Thursday
 Elbing - 1st Tuesday
 El Dorado - Tuesday - Saturday
 Landfill - Monday - Saturday

Latham - 2nd Tuesday
 Leon - 2nd & 4th Wednesday
 Potwin - 3rd Thursday
 Rosalia - 3rd Tuesday
 Rose Hill - Monday - Saturday
 Towanda - 2nd Saturday
 Whitewater - 1st & 3rd Wednesday

How do I get Started Recycling?

- Single stream recycling is currently being implemented for most recyclables. All recyclables can be mixed in the bins on the trailer **EXCEPT** for cardboard and glass. Place glass in the front of the trailer and cardboard in the back of the trailer as indicated on the signs.
- Rinse cans, plastic and glass containers. It's okay to leave labels on metal cans, glass and plastic. Paper, magazines and cardboard should be clean and dry.



THESE ITEMS ARE ACCEPTED AT THE TRAILER:

- ✓ **Cardboard (corrugated and chip board (cereal boxes, etc.))**
- ✓ **Mixed Paper (junk mail, office paper, shredded paper, school papers)**
- ✓ **Tin (steel) Food Containers**
- ✓ **Newspaper**
- ✓ **Magazines, Books, Phone Books**
- ✓ **Glass, any color, lids removed (no light bulbs of any kind)**
- ✓ **Aluminum Cans**
- ✓ **Plastic – PETE #1 and HDPE #2 plastics such as opaque milk jugs, colored detergent bottles, juice and pop bottles, look for the recycle symbol.**
- ✓ **Mixed Plastic – currently being accepted; however, may not be in the future depending on the market.**



DO NOT RECYCLE!

Containers that have contained motor oil, antifreeze, vegetable oil or toxic substances.

Please, no trash in the trailer!

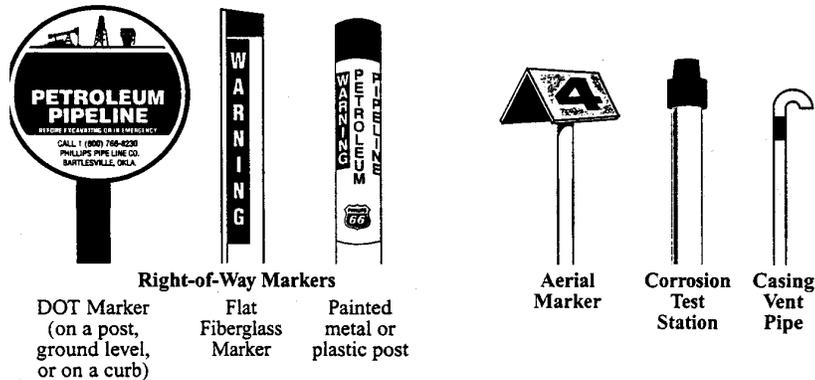
Styrofoam IS NOT recyclable!

<http://www.bucoks.com/285/Recycle-Trailer-Program>

PIPELINE SAFETY AND AWARENESS

Several pipelines criss-cross Butler County. These pipelines carry oil and natural gas. Any leak in a pipeline can have serious environmental impacts. The quicker a pipeline leak is reported, the sooner authorities can get to the site to fix the leak and minimize damage to the environment and safety hazards to humans and animals.

Markers identify pipelines that run through Butler County. These markers help identify the approximate location of the pipeline. The markers list the commodity transported, the company name and a 24-hour telephone number. Look for these markers:



How to Identify a Pipeline Release:



Sight:

- Accumulation of petroleum products on the ground.
- A dense white cloud or fog.
- A spot of discolored or dead vegetation.
- A rainbow colored sheen on the surface of water.
- Fire and smoke if the petroleum product has ignited.



Sound:

- Listen for unusual noises - a slight hiss to a roaring sound, depending on the magnitude of the leak.



Smell:

- Any strange or unusual odor can be an indication of a leak. Each petroleum product has its own characteristics.

For more information, contact the Kansas Pipeline Association: <http://kpa-awareness.com/home>



WATER

Q U A L I T Y S E R I E S

Plugging Abandoned Wells

A source of clean, safe household water is important to all Kansans. Groundwater is often the only source, especially in areas with no public water supply. Groundwater is usually preferred for individual homes because it does not require filtering.

Groundwater use does require wells, and wells act as conduits for possible entrance of contaminants. Many test holes and unused (abandoned) wells are located in fields, farmsteads, industrial sites, and urban areas without being properly plugged. Not only are wells sources for potential contamination of groundwater, many are a physical hazard to animals and people, particularly children (see photo).



A 6-year-old child can easily slip through a section of 10-inch PVC pipe.

Landowners are liable for contamination or injury from unplugged wells or holes. The hazards of abandoned wells and test holes should concern everyone. They should be properly eliminated. This bulletin is provided to help landowners, service providers, and others understand the correct plugging procedure.

The Kansas Department of Health and Environment (KDHE) estimates more than 250,000 abandoned wells and test holes exist in Kansas. Kansas law defines an abandoned well as one that

- has not been used during the last 2 years;
- is in such disrepair that it cannot be used; or
- poses a groundwater-contamination hazard.

Kansas law requires that all abandoned wells and test holes be properly plugged. Proper plugging accomplishes five goals:

- restores protective barrier to minimize groundwater contamination;
- removes physical hazards by removing tempting openings for curious children and animals;
- restores stability to the land surface, (load carrying capacity);
- eliminates or reduces liability exposure; and
- protects and improves property values.

Kansas Regulations

The Kansas Department of Health and Environment administers laws regulating construction, reconstruction, and plugging of wells. Articles 12-K.S.A. 82a-1212 and 1213 and 30-K.A.R. 28-30-4(a) and 28-30-7 specifically address plugging of abandoned wells. The regulations provide instructions for all types of wells and aquifer conditions. Well drillers and landowners alike are required by law to follow these procedures, which are available from KDHE.

This publication describes the easiest plugging procedure for the most-common well and aquifer conditions. If well or aquifer conditions are unknown or different from those described, landowners should contact KDHE for the proper plugging procedures. Landowners may plug wells on their property by following these procedures. Landowners also can hire a licensed water well contractor to plug a well.

The plugging procedure requires a plugging report (form WWC-5 or form WWC-5P) be filed with KDHE. These forms can be obtained by calling (785) 296-5524

and are frequently available locally through county health or Extension offices. Failure to file this report documenting proper closure leaves the owner liable for contamination. Documentation of the plugging procedure transfers the burden of proof to the complainant.

Aquifer Classification

Often times for older wells, little specific information is available about the well or the aquifer source. The type of aquifer or water formations penetrated by the well must be known for proper plugging. Sometimes this information can be obtained by asking questions of knowledgeable sources. Well logs for the actual well or nearby wells may be available from local drillers or KDHE. Geological and groundwater reports are available for most counties. Check the library or call the Kansas Geological Survey at (785) 864-3965.

A little must be known about the soil and geology (sand, gravel, clay, rock) of the well in order to ensure plugging will restore the integrity of the formation. Aquifers, the permeable water-bearing materials supplying a well, are classified based on the geology of the formation.

When water from the surface moves directly into an aquifer, it is called unconfined. Confined aquifers, on the other hand, have impervious layers that significantly restrict direct local recharge from the surface. Water in confined aquifers may be under pressure greater than atmospheric, and water rises above the restricting layer (artisan).

When the water-bearing layer is made up of individual grains of sand and gravel, the aquifer is called unconsolidated. All other aquifers are considered to be consolidated aquifers, often referred to as rock aquifers. Thus, there are four types of aquifers: unconfined-unconsolidated, unconfined-consolidated, confined-unconsolidated, and confined-consolidated.

Many aquifers are more complex than this simplified explanation. A consolidated formation may have several water-bearing zones separated by confining layers of varying permeability. Each zone may have a different yield and

water quality. Good quality may lie above, below, or between zones of poor-quality water. Experienced well drillers recognize and note these differences as the well is drilled and connect or exclude various zones, based on the quality and quantity of water needed.

The procedure described here applies when plugging wells located in unconfined aquifers with unconsolidated formations. If it is suspected the formation is rock (consolidated formation), has confining layers, or the well penetrates multiple water-bearing formations, contact KDHE before proceeding or hire a licensed well driller to do the plugging. Do not attempt to use these procedures to plug wells in conditions other than unconfined and unconsolidated.

The procedure described generally applies to the sand and gravel aquifers shown in Figure 1. Other areas may not be sand and gravel aquifers. Generally, shallow wells (less than 50 feet near streams and 100 feet on uplands), can be plugged with this procedure. Large-diameter (12 inches or more) irrigation, industrial, or municipal wells also might be best handled by a licensed well driller.

Well Classification

Wells are classified according to construction. Understanding well construction methods is important because different types of wells require different plugging procedures. The oldest type is the dug well. These are large diameter, relatively shallow, hand-dug wells, usually lined with rock or brick. Typical dug wells are 3 to 6 feet in diameter and 15 to 50 feet deep (see Figure 2). The depth depends on depth to water, and size can vary from 2 feet in diameter to larger than 30 feet.

A driven well, used mainly for shallow, unconsolidated aquifers, is named for the process of driving the suction pipe with screened section into the sandy water-bearing formation. These wells are generally small in diameter with pipe sizes of 1 to 2 inches for home water supplies and up to 6 inches for irrigation and livestock wells. Driven wells are limited to sandy formations with high water tables,

Figure 1. Sand and Gravel Aquifers

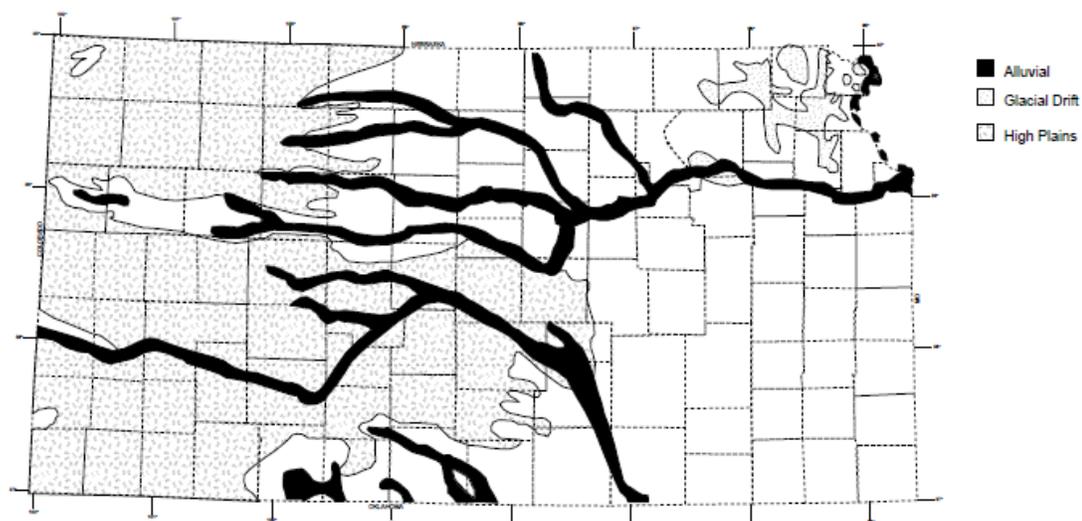
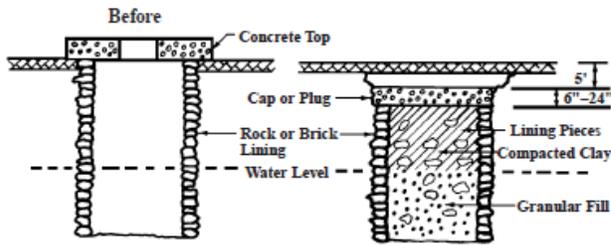


Figure 2. Plugging Diagrams for a Hand-dug Well



where centrifugal or shallow well jet pumps can be used. Driven or sandpoint wells are still being installed. To be legal, however, they must be grouted to a depth of 20 feet or to the water table. Because of shallow depths and grouting difficulties, they are discouraged for domestic use.

The drilled well is the most common type of well in Kansas (see Figure 3). Typically, a hole is drilled into the aquifer, and a casing 3 to 8 inches smaller than the bore hole is installed. Domestic and livestock watering wells are generally 4 to 10 inches in diameter, while irrigation wells generally range from 10 to 18 inches.

The depth of a drilled well varies depending on the aquifer and water depth. Depths greater than 300 feet are common in some places. The small-diameter well casings, usually 6 inches or less, are generally installed in bore holes only a few inches larger than the casing. Typically, the casing is inserted after the bore hole is drilled.

For large-capacity wells for irrigation, industrial, or municipal uses, the casing is installed into oversized holes. The space between the casing and bore hole is filled with gravel. This gravel pack allows unrestricted water flow into the perforated portion of the casing and acts as a filter to retain the aquifer particles. Near the surface, this space is filled with grout to prevent water movement from the surface along the casing.

Prior to 1975, grouting was not required and the common practice was to gravel pack to very near the surface to induce the greatest yield possible. This practice made flow along the outside of the casing an easy pathway for contaminants to enter the groundwater from the surface.

Plugging Procedure

The plugging procedure described is for wells in an unconfined-unconsolidated aquifer (figures 2, 3, and 4). If the well has more than one water-bearing layer, penetrates a confining layer (aquiclude), or is into rock, contact KDHE to make certain of the proper plugging procedure or hire a licensed well driller. Plug wells using these steps:

Step 1. Prepare site. Remove all pumping equipment and any foreign objects from the well and remove debris from the surface around the well site.

Step 2. Remove top of casing. Excavate around the casing of a drilled or driven well to a depth that allows the casing to be cut off at least 3 feet below the surface. The more casing removed the better.

Figure 3. Plugging Diagram for a Drilled Well in an Unconfined-unconsolidated Aquifer

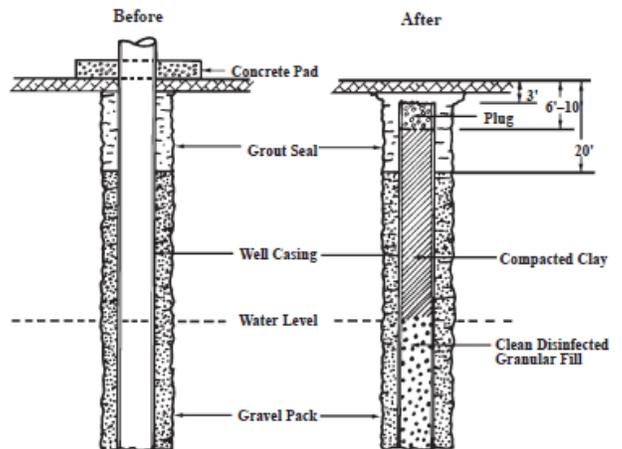
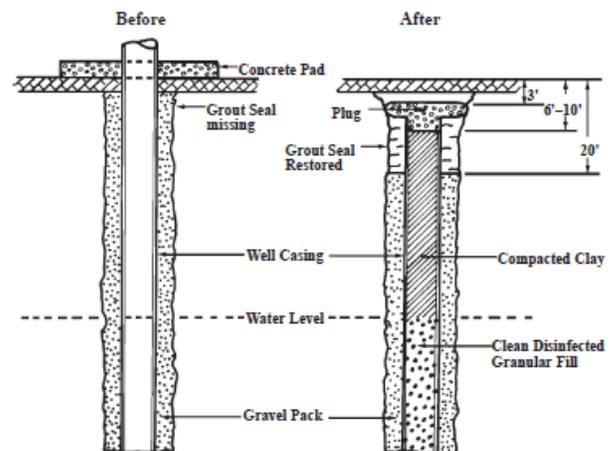


Figure 4. Plugging Diagram for a Drilled Well Without Proper Grouting in an Unconfined-unconsolidated Aquifer



When excavating around the old casing, look for evidence that the well was properly grouted (Figure 3). Establishing a proper seal is critical to preventing contaminants from migrating along the outside of the casing. When a well does not have a proper grout seal, it should be restored. This requires 20 feet of excavation around the outside of the casing to allow placement of the grout. However, if it is possible to excavate this deep, the casing should be removed to this depth rather than be grouted.

Since deep excavation of a nongrouted well is often not practical, another option is to extend the plug beyond the edges of the original bore hole at least 1 foot outside the casing in all directions. This mushroom plug, shown in Figure 4, will help prevent water movement along the out-

side of the casing. Deeper excavation than the 3-foot minimum around the casing is especially desirable when no grouting exists outside the casing.

In dug wells, the casing of the well is the rock or brick lining of the well. This lining can be used as part of the fill material. The lining for dug wells should be removed to a depth of at least 5 feet. Be certain to mix lining material with fill material (see steps 4 and 5).

Step 3. Disinfect water. Existing bacteria or bacteria carried to the water by the fill material should be killed. This helps prevent contamination of nearby wells. Determine the amount of chlorine necessary by measuring the depth of water and diameter of the well and estimating the amount of water in the well. Then use Table 1, which lists the amount of chlorine product to add to produce a solution concentration in the well of approximately 500 milligrams per liter of chlorine.

The amount of chlorine needed depends on the product concentration. Four concentrations representing various chlorine products from household bleach (5.25 percent) to dry chlorine disinfectant (70 percent) are shown in Table 1. When dry chlorine is used, dissolve it in water before adding it to the well to make certain the material does not settle to the bottom.

If no working wells are within 100 feet of the abandoned well being plugged, the concentration of chlorine could be halved since bacteria migration beyond 100 feet is unlikely.

Example: A 6-inch diameter well, 60 feet deep, has 20 feet of water present. How much chlorine is needed for disinfection?

At the intersection of the 6-inch and 5.25-percent column in Table 1, 1.8 fluid ounces of bleach is needed for each foot of water, so 36 ounces, or 2.25 pints, (1.8 × 20) of bleach should be added.

Step 4. Fill water zone with clean porous material. Approved fill material is sand and gravel of less than 1-inch diameter. Generally the preferred fill is washed, coarse river sand. The fill material is chlorinated when it is added to the previously disinfected water in step 3.

Table 1 also shows the volume of fill needed per foot of well for various diameter holes. The water in the well may rise as the sand is added, depending on the permeability of the formation and the fill material. Estimate the volume of fill needed to avoid filling above the normal water level. Measure the normal water level using a weighted string that just touches the water surface. Mark the string with a knot at the top of the casing. Begin adding fill, but periodically check progress of the fill. Once the weight touches the top of the fill at the marked spot, stop adding fill. Even though the water level may have risen, add fill only to the original water level. Any water above the normal water level should be removed by pumping or allowed to soak away with time. The use of coarse sand and slow addition to the well will prevent bridging of the sand at the water surface. The sound of the sand hitting the water surface should be heard.

In dug wells, more fill than predicated from the table generally is required to fill this zone because mud in the bottom of the well compresses and voids in the rock lining. It may be necessary to bring as much as 30 percent more fill than predicted from the table.

Table 1. Computing Volume of Fill Material and Disinfectant for Wells

Diameter of opening	Volume of well per foot		Amount of product to disinfect 1 foot ^(a)			
			Liquid chlorine (fluid ounces)		Dry chlorine (dry ounces)	
	gal/ft	ft ³ /ft ^(b)	5.25%	10%	65%	70%
2 inches	0.16	0.02	0.20	0.10	0.02	0.02
3 inches	0.37	0.05	0.45	0.22	0.05	0.02
4 inches	0.65	0.09	0.80	0.42	0.07	0.07
5 inches	1.02	0.14	1.25	0.65	0.10	0.10
6 inches	1.47	0.20	1.80	0.95	0.15	0.15
8 inches	2.61	0.35	3.20	1.67	0.27	0.25
10 inches	4.08	0.55	5.00	2.60	0.42	0.40
12 inches	5.88	0.79	7.20	3.75	0.60	0.55
14 inches	8.00	1.07	9.77	5.12	0.82	0.77
16 inches	10.44	1.40	12.77	6.67	1.07	1.00
1.5 feet	13.22	1.77	16.17	8.45	1.35	1.25
2.0 feet	23.50	3.14	28.75	15.05	2.42	2.25
2.5 feet	36.72	4.91	44.92	23.50	3.77	3.50
3.0 feet	52.88	7.07	64.70	33.85	5.42	5.05
4.0 feet	94.00	12.57	115.02	60.15	9.65	8.97
5.0 feet	146.9	19.64	179.75	94.00	15.07	14.00
6.0 feet	211.5	28.27	258.75	135.37	21.72	20.17
7.0 feet	287.9	38.48	352.25	184.25	29.55	27.45
8.0 feet	376.0	50.27	460.25	240.65	38.60	35.85
9.0 feet	475.9	63.62	582.25	304.50	48.87	45.37
10.0 feet	587.5	78.54	719.00	376.00	60.32	56.02

^(a) 500 mg/L concentration of chlorine; 128 oz. = 1 gallon

^(b) 27 ft³ = 1 cubic yard

Although the lining rocks can be added in either the sand or subsoil layers, it is preferable to add with the subsoil as discussed later. This will keep the water-bearing area much cleaner, as it is difficult to remove the rock lining without a lot of debris from the surface falling into the well.

In some wells, especially those less than 20 feet deep, there may not be enough volume to dispose of the rocks in the subsoil layer only. In this case, some of the rock lining should be placed in the fill. Generally, the rock or brick lining can be pried loose with large pry bars. However, a backhoe or front-end loader may be desirable for large-diameter wells. When using heavy equipment, the surface soil around the well site should be scraped away to expose the subsoil layer. As the rock walls are added, be certain to add sufficient fill material to eliminate any voids among the rocks.

Example: For the 6-inch diameter well with 20 feet of water, how much sand is required?

From Table 1, at the intersection of 6-inch diameter and the column from the left side, 0.20 cubic foot of fill is needed for each foot of the 20-foot water zone, therefore, 4 cubic feet (0.20 ft³/ft × 20 ft) of fill is needed. Since there are 27 cubic feet per cubic yard, 4 cubic feet equals 0.15 cubic yard.

Step 5. Add compacted subsoil above the water zone. The casing above the water level is filled with natural subsoil clay material (subsoils low in organic matter and other potential contaminants) and compacted to form a solid column. The subsoil should be placed in a dry hole. The subsoil should be damp to allow it to compact easily. The clay fill should be placed in layers not exceeding 2 feet.

For small-diameter wells, a section of steel pipe with a cap on one end attached to a rope makes a good tamping tool. The fill should stop at least 3 feet below the top of the casing (6 feet below the surface) to leave adequate space for an approved plug.

Dug wells are filled to no more than 5 feet below the surface. At this point, the rock lining and subsoil fill should be leveled off.

Step 6. Place approved grout plug. Pour the approved grout material into the drilled or driven well casing making a plug at least 3 feet thick, the minimum required. In a dug well, the plug of approved grout material is 6 to 24 inches thick. KDHE-approved grout material includes commercial hole plug sodium bentonite clay, cement, and neat cement. Cement grout is a mixture of equal volumes of portland cement and sand. Use 10 to 12 gallons of water for each bag of cement. Neat cement is a mixture of portland cement and water, and 5 to 6 gallons of water should be used for each 94-pound bag of cement.

Sodium bentonite clay, normally sold in 50-pound bags that contain 0.7 cubic foot, is recommended for use because it is easy to handle, remains pliable, and expands when in contact with water. Because of bentonite's expansive and pliable nature, it will conform to the uneven rock edges and expand to fill voids in the wall. If any settlement should occur, the bentonite seal will not crack or lose its integrity.

Table 2 provides information to help determine the number of bags of sodium bentonite clay needed for placing the plug or filling the entire well with bentonite. A cement

Table 2. Number of Bags of Sodium Bentonite Clay Needed for Various Well Diameters

Diameter of opening (inches)	Feet of fill per bag ^(a)	Bags ^(a) per foot	Bags ^(b) per 3-foot plug
2	35.0	0.03	0.1
3	14.0	0.07	0.2
4	7.8	0.13	0.4
5	5.0	0.20	0.6
6	3.5	0.29	0.9
8	2.0	0.50	1.5
10	1.3	0.79	2.4
12	0.9	1.13	3.4
14	0.7	1.53	4.6
16	0.5	2.0	6.0
18	0.4	2.5	7.5

^(a) Table values based on 50-pound bags, which have a volume of 0.7ft³ per bag.

^(b) Additional bags are required for mushroom plugs extending outside the casing (see step 6).

plug must be much thicker and may need reinforcing to have enough strength to prevent cracking and collapse.

Example: A 6-inch diameter well is ready for the plug material. How many bags of bentonite are needed?

From Table 1, a 6-inch diameter well has a volume of 0.2 cubic feet per foot of casing. A typical bag of bentonite contains 0.7 cubic feet of material. Dividing 0.7 cubic feet per bag by 0.2 cubic feet equals 3.5 feet of casing per bag. Therefore, one bag will make a 3.5-foot plug inside the well casing. Several more bags will be needed to make the mushroom plug on top to protect the outside of the casing (see step 2).

Example: A 4-foot diameter well is ready for the plug material. How many bags of bentonite are needed?

Since bentonite is expansive, the minimum 6-inch plug will be used. Remember, the plug should extend beyond the rock lining to the original hole diameter. For this example, assume the rock lining is 1 foot thick; therefore a 6-foot diameter plug must be placed.

From Table 1, a 6-foot diameter hole requires 28.27 cubic feet of material. Since only a 6-inch plug is required, only 14.14 cubic feet of material is needed. Dividing 14.14 cubic feet by 0.7 cubic foot per bag determines that 20.2 bags (round up to 21 bags) are needed.

Step 7. Fill hole at top. Once the grout plug and mushroom cap have been completed, the remaining hole above the plug should be filled. Subsoil material can be placed in the bottom of the hole and compacted as the fill progresses in layers of 6 inches. Topsoil should be used in approximately the top foot of the hole. The fill should be mounded up at least 10 inches in the center to allow for settling and drainage away from the fill site.

Step 8. File the plugging report. Abandoned wells are an environmental and safety hazard. They are a liability. Following the plugging procedure described here and filing form WWC-5P or WWC-5 with KDHE to document the action minimizes further liability.

The well is not legally plugged until the form is filed. WWC-5 is the form used by drillers for reporting a new well.

It asks for location, property owner, physical characteristics of formation, well, casing, and the plugging procedure used. A new WWC-5P form was developed specifically for reporting well plugging. Forms are available from KDHE, but many county Extension, county health, and conservation district offices also have these forms available.

Alternative Plugging Option

For small-diameter wells, especially shallow ones, it is simpler to plug the entire casing with approved grout material or with sand fill below water and grout above water. This is a good choice for very-small-diameter wells where placement of the various layers of fill especially the subsoil fill, may be difficult. Filling the entire casing with grout may be the best option for small-diameter driven wells. A 2-inch diameter well needs only 0.02 cubic foot of fill per foot of casing. This means one bag of bentonite will fill 35 feet of well. The well water still needs to be chlorinated.

Sodium bentonite clay chips or pellets can easily be used to completely fill the casing. Bentonite clay powder or granular should never be poured into wells with water. Proper placement of powder or granular materials requires making a slurry and using a grout pump.

Placing cement grout into water. If cement or neat cement is used as grout, placement into water requires special procedures to avoid separation. A tremie pipe, which is usually about 3 inches in diameter and in sections of 5 to 10 feet long, will be needed to place the cement without passing through water. Use enough pipe to reach within a foot or two of the bottom and cut the end at a 45-degree angle. A hopper box or large funnel is attached to the top of the tremie pipe. The grout is mixed and placed in the hopper or funnel.

The mix must be thin enough to flow, but thick enough to set properly once in place. The proper ratio for neat cement grout is one 94-pound bag of cement to 5 or 6 gallons of water. For cement, use 5 or 6 gallons of water for each cubic foot of cement-sand mix. The volume of material must be monitored during placement because the tremie pipe is raised as the fill progresses. The end of the tremie must be kept below the surface of the grout at all times to prevent dilution and separation of the grout mix.

Precaution: Remember how much material is in the tremie pipe at all stages and approximately how much depth it will fill. A 10-foot section of 3-inch diameter tremie contains nearly a half a cubic foot, so 100 feet would contain 5 cubic feet. If filling an 8-inch casing, which contains 0.35 cubic feet per foot of length, ignoring the volume in the tremie would be an error of 14.3 feet. Tag or measure the progress of the plugging material as the well is filled, and pump or siphon off any excess water that is displaced as the grout is added.

Plugging Confined, Multiple-zone or Rock Aquifers

If the aquifer is known to contain confining layers or more than one water-bearing zone, a plug at each confining layer between each aquifer is required. If the outside of the casing was not grouted at those locations, as is common with old wells, the casing should be ripped and grout pumped into the gravel pack to restore a good seal at the confining layer. Most licensed well drillers have equipment to rip or puncture casing so grout can be forced into the gravel pack. Landowners are advised to hire a competent licensed water well driller to plug all confined, multiple-zone or rock aquifers and other unusual formations. In addition to having needed equipment, a driller should know the local geology, so grout plugs and other materials are placed correctly.

Oil and Gas Wells

Plugging abandoned oil, gas, or brine-disposal wells is equally important. Report these wells to the Kansas Corporation Commission to assure they are properly plugged. The KCC's district offices are in Dodge City, (316) 225-8888; Wichita, (316) 337-6231; Chanute, (316) 431-6946; and Hays, (785) 628-1200.

Conclusion

Abandoned wells are potential sources of direct contamination of valuable groundwater. Wells larger than a few inches in diameter also are a safety hazard for children and animals. All abandoned wells should be properly plugged to prevent contamination and eliminate the safety hazard. Plugging is required by Kansas law. When a replacement well is drilled, the old well, according to law, must continue to be used, upgraded to current standards, or plugged. It is not uncommon to visit a farmstead and find three or four wells with only one or perhaps two currently in use. While there is a reluctance to pay to get rid of something that has outlived its usefulness, groundwater protection, safety, and Kansas law make plugging important. Abandoned water wells can no longer be ignored.

Related References:

Plugging Cisterns, Cesspools, Septic Tanks, and Other Holes, K-State Research and Extension Publication MF-2246.

Plugging Packet, Kansas Department of Health and Environment.

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MF-935 (Revised)

January 1998

Issued in furtherance of Cooperative Extension Work, acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, Richard D. Wootton, Associate Director. All educational programs and materials available without discrimination on the basis of race, color, national origin, sex, age, or disability.

File Code: Engineering 4-5 (Water Quality)

MS 1-98-9M

Website: <http://www.ksre.ksu.edu/bookstore/pubs/MF935.pdf>
Also see "Plugging Cisterns, Cesspools, Septic Tanks and Other Holes"
<http://www.ksre.ksu.edu/bookstore/pubs/MF2246.pdf>



Private Well Maintenance and Protection

Recent surveys of private wells have shown that on average only 40 percent meet safe drinking water standards used for public systems. Less than 20 percent of dug wells meet these standards. The primary reasons for this poor condition of water quality from private wells are the following factors:

- well down slope or near contamination sources
- well not constructed to present standards
- inadequate well maintenance and service
- well not protected from activities that risk contamination

Well Maintenance Needs

Maintenance is required to assure that private wells with good location and construction continue to be safe. A well that is not maintained can not be expected to reliably produce safe water. Conversely, wells that receive regular maintenance are more likely to produce safe water.

Annual well maintenance is recommended to include: check of the well casing for cracks or leaks, check of the well cap for water tightness, ground surface sloped away from the well for 15 feet in all directions, shock chlorination of the well and water system, and test of water for coliform bacteria, nitrate, pH and total dissolved solids. See Table 1 for a private well checklist of actions.

Every well needs a wellhead protection plan to assure protection of water quality especially wells being used for human consumption. The plan must then be implemented to have any benefit. The wellhead protection plan indicates site vulnerability to groundwater contamination and rates the risk of activities within 500 feet of the well. With so many problems of poor well water quality, it is in the owners' interest to take steps to protect their own wells so they can have safe water.

The first concern is that the location meets recommended separation distances between the well and sources of contamination as shown in Table 2. Well location with respect to potential contamination sources is the most important factor for protection of water quality. Without a plan to protect the well from contamination, some high risk activities will very likely occur near the well. In time, there is increased risk of groundwater contamination and well water quality deterioration, which may be permanent.

A good wellhead protection plan involves careful planning and may include a primary and secondary protection area as shown in Figure 1. In the primary protection area all high risk situations and activities are avoided and moderate risk activities are managed carefully. The radius for the primary protection area should be 100 feet minimum and up to 300 feet or more is preferred.

In the secondary protection area, high risk situations and activities employ additions or management to shift them to low or moderate risks. The radius for the secondary protection area should be a minimum of 200 feet and 400 feet or more is preferred. Guidelines for high, moderate, and low risk are shown in Table 3.

Table 1. Private Well 12-Point Check

Do at least once a year:

- Check to see that well casing is free of cracks or other leaks from water table to at least 1 foot above the ground surface or highest flood level.*
- Check that the sanitary seal is secure and watertight and is a KDHE-approved type.*
- Make sure the ground slopes away from the well for at least 15 feet in all directions.*
- Shock chlorinate the well and water system.*
- Test water and file the results with other records and information about the well.*

Always do:

- Have a licensed well driller or knowledgeable landowner do all work on well or well casing and be sure well meets all current construction standards*
- Find and fix the cause of any change in water color, taste, or odor. Shock chlorinate the well.
- Maintain 50 feet (100 preferred) of open space between the well and any buildings, waste system, parked vehicle, equipment, compost, or other contamination source.
- Store chemicals such as fertilizer, pesticides, oil, fuel or paint at least 100 feet down slope.
- Properly plug all abandoned wells and other holes not used in last 2 years and plug all unused cesspools and septic tanks*
- Prevent backflow and back-siphonage by maintaining an air gap above the container you are filling, or by using an adequate backflow prevention device.
- Shock chlorinate the well after any service work on the pump, well or water system*

* see Extension bulletins for additional information

The Farm•A•Syst or Farmstead Assessment System, K-State Research and Extension publication EP33-48, is designed to help the landowner to assess potential contamination sources and develop a wellhead protection plan.

Operation needs

Each year many wells are threatened or damaged by accidents that occur near the well. Examples include: fuel tank springs a leak, fertilizer nurse tank loses its contents, or parked sprayer is hit, and spills pesticide. These are all things that happen. The impact of these activities can be eliminated or minimized with diligent management decisions. By simply moving these activities far away from the well, the impact to the well is delayed and may even miss the well completely.

Anticipating possible accidents and taking precautions takes a small amount of time and expense compared to cost of cleanup or environmental damage. An ample supply of good quality water is an absolute necessary for living and operating the land. Permanent contamination of groundwater ultimately means loss of property value and may involve liability. Replacing the hose on the fuel tank when it is deteriorated and providing secondary containment are management actions that add protection inexpensively.

Liquids that would contaminate water should be managed carefully to avoid possible damaging accidents. Plan all storage locations including temporary ones away from at least the primary protection area and perhaps the secondary area also. State law requires

any spills or accidental releases to be reported to Kansas Department of Health and Environment, (KDHE) 785-296-1678.

Backflow of contamination into the water system or well can easily result from a loss in pressure due to pump failure, line break, or power interruption. These accidents can be hazardous or fatal to people and animals. The most common backflow hazard results from a hose placed into a tank or container. This hazard is most inexpensively and reliably eliminated by maintaining an air gap above the lip of the receptacle. Instead of putting the hose into the tank, use a holder to support it above the container lip. Backflow prevention devices (backflow preventers) should be installed to protect from backflow or back siphonage whenever maintaining an air gap is not possible.

Important Well Records

A well is an important long-term investment to a homesite or farmstead. All information regarding its construction, modification, maintenance and water testing should be kept in a safe, accessible place. The following paragraphs briefly describe the important records. Extension bulletin, *Private Water Well Owner/Operator Manual*, S-116 is a file folder designed to keep these records together.

Well Record. Since 1975, well drillers have been required to file a well log with KDHE. The well log gives important information about well construction including well depth, geologic layers penetrated, well casing, well

Table 2. Minimum Separation Distance from Private Wells

This table gives the minimum separation distance required by regulation, K.A.R. 28-30-8, and recommended distances from the well site to sources of contamination. Greater separation distances should be provided where possible.

Potential Source of Pollution	Separation Distances (in feet)	
	Minimum Required	Recommended
Sealed sewer line (cast iron, tight line, etc.)	10	50
Unsealed sewer lines	50	>400
Septic tanks (water tight)	50	>100
Wastewater absorption field (septic lateral lines)	50	>400
Pit privies	50	>400
Stables, livestock pens, lagoons and manure piles	50	>400
Streams, lakes and ponds	50	>100
Silage pits, fertilizer and fuel storage (above or below ground)	50	>400
Seepage pits (or rat holes) prohibited after May, 1996	50	>400
All other wastewater systems	50	>100
Property line	25	> 50
Public water supply sources (i.e., wells) ¹	100	>100
Building/structure (termite treatment) ²	50	>100
Pesticide storage, mixing and disposal areas or areas of repeated pesticide use	50	>400

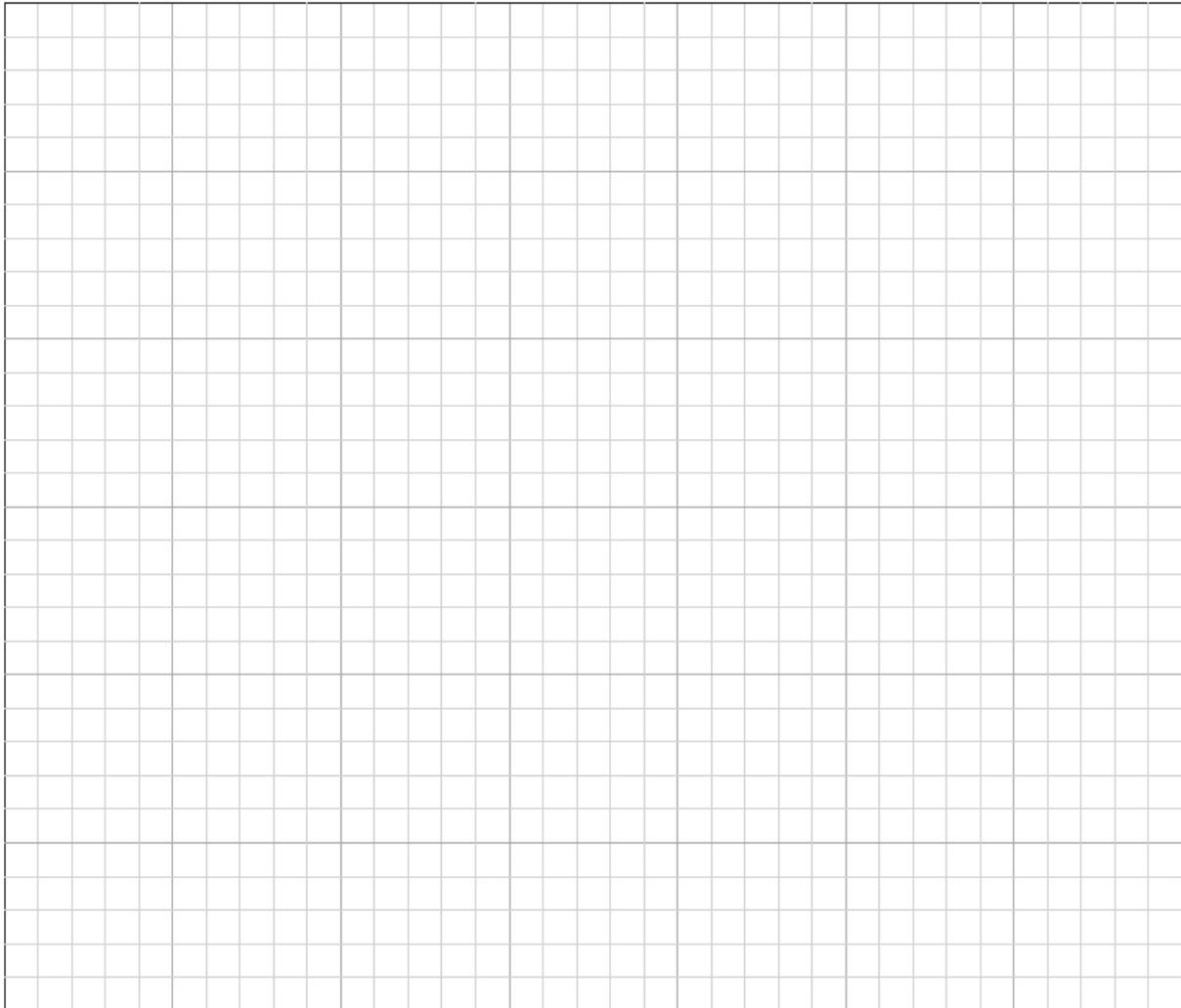
* These distances do not necessarily assure that no contamination will reach the well.

¹ Required by Policies, General Consideration and Design Requirements for Public Water Supply Systems in Kansas [K.S.A. 65-162a(b)].

² Not required by K.A.R. 28-30-8(a) but is required when injecting liquid pesticides into the soil.

Date _____ Modifications _____, _____, _____

_____ Well Site Plan and Wellhead Protection Plan
(name)



Scale: 1" = 50' 1" = 100' other _____

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Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-2396

June 1999

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File code: Engineering 4-5

Website: <http://www.ksre.ksu.edu/bookstore/pubs/MF2396.pdf>



Recommended Water Tests for Private Wells

The decision to have your water tested is one that may affect the health of everyone in your household. People want and need water that is safe to drink. Testing is the only reliable way to find pollutants and to evaluate safety of water. Color, turbidity, taste, and odor are discernible by the senses, but offer few clues concerning impurities that affect health. Water that appears problem-free may not be safe or acceptable for all uses.

The purposes of water testing discussed here are:

- to ensure water is safe to drink (meets Drinking Water Standards);
- to evaluate need for water treatment;
- to form a baseline of water quality for comparison.

You must understand that the most important factors for safe water are good well location and construction following current standards. Also critically important are management of activities near the well and annual maintenance including shock chlorination. See K-State Research and Extension bulletins: *Private Well Safe Location and Construction*, MF-970, *Private Well Maintenance and Protection*, MF-2396, and *Shock Chlorination for Private Water Systems*, MF-911 for more information. If well location, construction or maintenance are deficient, they should be corrected before testing the water.

One in nine Kansas households depend on private water supplies. System integrity, water quality, and well protection are the owner's responsibility. Lending institutions may require water tests and evaluation of the water system before approving a loan. Some county sanitary codes require water tests for private systems, but no state or federal law or regulation does. Public water systems are tested for bacteria at least twice a month. More than \$1,000 of testing is done before a new well is put into service. These tests are repeated regularly.

This publication is provided to help users understand important factors and make critical decisions about when to test and which water tests to request.

How Water Becomes Contaminated

Chemically pure water does not exist for long in nature. Water, an excellent solvent, dissolves and carries with it some of almost everything it touches. While falling as precipitation, water picks up gases, ions, and

dust particles from the atmosphere. When water reaches the earth, it flows over or through plant materials and surface layers of soil and rock, dissolving minerals. Minerals like calcium, magnesium, carbonate, sodium and chloride are of little concern in fresh water, and are even desirable because low levels contribute to good-tasting water. However, many undesirable chemicals also dissolve in water. See K-State Research and Extension bulletin *Groundwater and Well Contamination*, MF-932 for more information.

Monitoring shows that, in most cases, natural groundwater is quite safe. When contamination is detected, it is often a result of poor well location, poor well construction, lack of maintenance or poor management. Man's activities can overload the soil's natural filtering, absorption, and removal capacity. When pollutants from the surface or underground overload the soil's protection, they eventually reach the groundwater. Evidence of such things as sewage, fuel, wastes, pesticides, and fertilizer are found in groundwater. See K-State Research and Extension publications *Nitrate and Groundwater*, MF-857; and *Managing the Farmstead to Minimize Groundwater and Well Contamination*, MF-948; and Department of Biological and Agricultural Engineering publications *Farm•A•Syst*, EP33-48 for information about contamination and how to protect water.

Ensuring Safe Drinking Water

Health effects from contaminated water are often acute toxicity, an immediate response — within hours or days. Until the 1970s, drinking water limits mostly addressed acute effects like bacteria, nitrate, toxic elements, and heavy metals that accumulate in the body.

Chronic toxicity results from low-level exposure over years, decades, or a lifetime. Because many chemicals are found at low concentrations in water, the concern about long-term exposure is heightened. New standards based on chronic effects, long-term exposure, have been added including organic chemicals, pesticides and radioactive materials.

This publication focuses on acute toxicity because the risk is known, direct, short-term and much more common. The highest priority is to ensure that water is free of disease-causing organisms and pollutants that

immediately affect body functions and health. Tests for the highest risk factors should be requested first. K-State Research and Extension bulletins, *Understanding Your Water Test Report*, MF-912 and *Organic and Radiological Chemicals*, MF-1142 give drinking water standards or the maximum contaminant levels (MCL).

For parameters that affect health, it is important for decisions to be based on the best information. A record of several tests over a year or more is ideal before making critical decisions about water quality.

Recommended Tests and Frequency

Kansas Department of Health and Environment (KDHE) and K-State Research and Extension strongly recommend at least annual water tests for coliform bacteria and nitrate. However, a reliable indicator of safe water requires more bacteria tests, at least each quarter.

Water should be tested for common impurities and nuisance contaminants every few years. Except for a few cases of gross contamination, they change slowly so a test every 3 to 5 years is adequate. These tests form a basis for comparison to detect possible contamination.

Total Coliform Bacteria. An annual water test for total coliform bacteria is the most important (the primary indicator) to evaluate safety of drinking water. Tests at least four times a year are required for a reliable indication of safe water. Get screening test, sample kit, or information from local health department or K-State Research and Extension office. The sample for a bacteria test must reach the laboratory within 24 hours of collection. For more information, see K-State Research Extension bulletin: *Quality Water: Coliform Bacteria, Program 3, EP-27*.

Most coliform bacteria strains are not pathogens (disease-causing). They are found in large numbers in feces of warmblooded animals, in soil, and the environment. These bacteria indicate the well has been exposed to the environment and may be contaminated with sewage or animal wastes. Bacteria, viruses, and cysts, that would make you sick, may be present.

Environmental factors which suggest special or more frequent bacteria tests include:

- flooding of the well or near the well
- surface water supply
- change in color, turbidity, odor, or taste of water
- recurring digestive illness in people or animals
- following repair of well or plumbing system.

Fecal Coliform or *E. coli* Bacteria. A test for fecal coliform or *E. coli* bacteria is recommended any time total coliform bacteria are present. Finding fecal or *E. coli* bacteria means there is contamination from a human or animal fecal source. Pathogens can exist in the drinking water. Water must not be used for drinking, cooking, or washing without disinfection.

Fecal coliform live in the intestines of warm blooded animals and are included in the total coliform test. *E. coli*, short for *Escherichia coli*, are specific fecal coliform strains. Most fecal or *E. coli* bacteria are not disease agents but their presence suggests a high possibility of pathogens and disease.

Nitrate. An annual test for nitrate is the second most important for safe water. Obtain a screening test, sample kit, laboratory information, or wellhead protection information from local health department or K-State Research and Extension office. Surveys of private drinking water in Kansas showed 24 percent of home wells and 28 percent of farmstead wells were above the nitrate standard.

In warmblooded animals, nitrate may be reduced to nitrite, which readily enters blood. Nitrite attaches to the hemoglobin and restricts the blood's ability to carry oxygen. In extreme cases, it causes methemoglobinemia ("blue baby" syndrome) in human and animal infants. If untreated, death may result. It may affect adult horses and ruminant animals. Nitrate often interferes with livestock milk production, weight gain, or reproduction before other symptoms are observed.

Nitrate tests are especially important when livestock facilities, fertilizer storage or handling, or a septic system are or have been within 400 feet of the well. If no nitrogen sources or activities occur near the well, and a record of consistent low nitrate is established, the test interval may be lengthened. See *Nitrate and Groundwater*, MF-857, for more details.

Pesticide and Other Organic Chemicals. A test for pesticide is recommended when nitrate is above the standard and pesticide has been stored, mixed, handled, or disposed within 400 feet of the well. Also test when a large source such as a spill or accident, or commercial storage, handling and mixing site is within a quarter mile, especially upslope.

Pesticides have been detected with increasing frequency in Kansas well water. A 1986 study detected pesticide in 8 percent of farmstead wells. The 1994 private well survey, using a more sensitive test, detected atrazine in 19 percent of the wells. Pesticides also are found in large reservoirs and many streams and rivers. The chance of finding pesticide above the drinking water standard in groundwater is quite low - less than one half percent.

The farmstead well study found that wells with high nitrate are more likely to contain pesticide. When nitrate exceeded the drinking water standard, the chance of finding pesticides doubled. The likelihood tripled (to about 25 percent) when nitrate was more than twice the standard. By contrast, low nitrate, less than 4 milligram per liter, resulted in only a 2 percent chance of finding pesticides.

Tests for pesticides and other organic chemicals are expensive, and interpretation of results and health effects may be difficult and uncertain. Pesticide in groundwater is not considered an immediate health threat.

Lead and Other Metals. A lead test is recommended when plumbing contains lead pipe, fittings, or there is evidence of corrosion (bluish or greenish stains on fixtures), low pH, soft water, or a combination of these. EPA reduced the MCL for lead to 0.015 milligram per liter because of increased concern about lead exposure. Groundwater normally does not contain significant lead or other toxic metals. Lead may be leached from the plumbing system. Hard water deposits in the plumbing helps prevent lead from leaching.

Selenium. Testing for selenium is not recommended at this time. Concentrations above the MCL were found in only 2 percent of farmstead wells.

Nuisance Contaminants, Need for Treatment

The most common water quality problems are nuisances that make water less desirable for household uses but do not directly affect health. Standards are designated "secondary" when there is no direct health concern. These include chloride, copper, iron, manganese, sulfate, total dissolved solids (TDS) and zinc. Some laboratories have a drinking water suitability test that includes the most common anions and cations and nuisance impurities. These chemicals should be tested every 3 to 5 years as discussed above.

Below are common nuisance contaminants that make water less desirable. Testing helps identify the problem, evaluate the need for treatment, and size treatment equipment. Dealers usually do free tests for nuisance impurities to help select and size treatment equipment.

Additional information about nuisance contaminants is available in K-State Research and Extension publications: *Quality Water series: Hardness, Program 1, EP-25; Red Water (Iron), Program 2, EP-26; Sulfate-Sulfide, Program 6, EP-29; and Hard Water: To Soften or Not to Soften, MF-848. The Home Water Treatment Handbook, NRAES-48* addresses water treatment and standards.

Acidic (low) or basic (high) pH may cause corrosion that contributes to health concerns and staining of plumbing fixtures when some metals are corroded. PH adjustment is simple with treatment.

Hardness is the most common nuisance problem in Kansas groundwater. It causes difficulty with cleaning and laundry, deposits in water heater, and shortened life of water using appliances. Softening is readily available.

Hydrogen sulfide gives water a disagreeable "rotten egg" or sulfur odor. A sensitive nose is a highly effective test. Shock chlorination or periodic disinfection of the well are highly effective treatment.

Iron and manganese are called the stainers because they contribute to permanent black or red stains of water fixtures and laundry. Special iron filters are effective.

TDS/salts are the sum of all impurities dissolved in water which gives it the characteristics. At low levels they are a benefit because they give water its taste.

Showing Contamination

The activities of businesses and people may damage the quality of well and groundwater. Water tests before pollution or in the early stages are helpful in showing damage to the supply. Some activities that may affect groundwater quality and tests that may help show a cause are shown in Table 1.

To prove damage for litigation requires careful planning. The strongest evidence is provided when an unbiased third party, such as licensed engineer or health department sanitarian, collects the sample and delivers it to the laboratory using a chain-of-custody record. This record shows who handled the samples and the time so accountability is available for testimony.

How to Take a Water Sample

Instructions for collecting a water sample usually accompany the sample container from the laboratory. Use the container provided and follow directions to ensure a representative sample. If no directions are given, contact the laboratory or refer to K-State Research and Extension publication *Taking a Water Sample, MF-963*. Samples should always be taken from cold, unsoftened, and untreated water. Select a faucet that is regularly used. Remove the aerator and allow the water to run several minutes. For lead tests, sample the first flush after water has remained in the system overnight.

Where to Get Water Tested

Some local health or environmental departments provide screening tests. Water treatment dealers often do tests for nuisance problems. However, for decisions that affect health use a laboratory certified by KDHE for the tests needed or desired. A certified laboratory is vitally important if results might be used as evidence of pollution or in litigation.

More than 12 laboratories in Kansas and adjacent states are certified for bacteria and nitrate tests. About 20 laboratories in Kansas and nearby states are certified for drinking water testing. See the latest copy of *Testing to Help Ensure Safe Drinking Water, MF-951* for laboratory information. Current information about certified laboratories is available through KDHE. Laboratory Improvement <<http://www.kdhe.state.ks.us/lipo>> or phone (785) 296-1639.

Interpreting a Laboratory Test Report

A water test report may look confusing. It often has terms and abbreviations that are unfamiliar. The laboratory may not provide information about the MCL. The local health department or K-State Research and Extension office may help interpret, or contact the laboratory. See K-State Research and Extension publication *Understanding Your Water Test Report, MF-912* for help with interpreting test reports, MCLs, possible sources of contaminants, and health risks.

Table 1. Common activities, causes of contamination and suggested test parameters.

Activities	Possible Causes	Parameters to Test
Bulk storage facilities, cleanup	Leaks, spills, disposal,	Material(s) being stored or that have been stored
Mining: salt, coal, lead, zinc other metals and minerals	Mine drainage, leaks, spills, storage areas, subsidence areas, mined lands, tailings, or spoil piles	Total dissolved solids (TDS), chloride, sodium, pH, heavy metals, corrosion index, sulfate
Oil and gas: test holes, old wells, abandoned wells, storage, brine disposal, etc.	Leaks, failed casings, poor plugging, unplugged test holes or abandoned well, spills	TDS, sodium, chloride, hydrocarbons, volatile organic chemical (VOC) scan, petroleum components
Landfills, waste disposal sites	Percolation from site, spills, pollutant plume in groundwater	Chemical oxygen demand (COD), total organic carbon (TOC), ammonia, dissolved oxygen (DO), VOC scan, heavy metal scan, synthetic organic chemicals (SOC).
Wastewater: lagoons, septic systems, sludge, and septage disposal, etc.	Leaks, spills, overloading, poor maintenance	Total and fecal coliform bacteria, fecal streptococcus, nitrate, ammonia, TDS, TOC, chlorides, sodium
Livestock facilities	Accumulation of waste, improper storage or disposal of wastes, runoff of wastewater	Total and fecal coliform bacteria, biochemical oxygen demand (BOD) ammonia, nitrate, phosphorus, TOC, COD, TDS
Industrial sites	Leaks, disposal, failures, poor management, spills	VOC and SOC scan of chemical used, produced, or stored on the site; process chemicals
Water wells for household, domestic or livestock uses	Wells with poor: location, construction, maintenance or management	Total and fecal coliform bacteria, nitrate

This publication is provided to help improve management of private water supplies. It was written by K-State Research and Extension specialists in cooperation with Kansas Department of Health and Environment.

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Kansas State University Agricultural Experiment Station and Cooperative Extension Service

MF-871

May 1999

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File code: Engineering 4-5 (Water Quality)

Website for certified water testing labs:

<http://public1.kdhe.state.ks.us/labaccredit/labaccredit.nsf/frmfrontend?openform>



Wastewater Pond Operation, Maintenance and Repair

Wastewater ponds, or lagoons, are used to treat and disperse wastewater from individual homes, churches, businesses and institutions. The desirability of a new lagoon depends largely on its design and construction. However, the desirability of an established lagoon (more than three years old) depends more on the operation maintenance and repair it receives.

A desirable lagoon looks like it has received good care, which includes:

- a secure and tight fence and gate that keeps children and animals out,
- a 3-foot-deep water level,
- no plants floating on the water or tall plants at the water's edge or that droop into the water,
- a vigorous and dense perennial grass cover on the embankment (berm),
- no trees or woody plants that shade the lagoon or whose roots would get into the berm,
- grass is no taller than 8 inches on the inside berm surfaces,
- the berm top around the lagoon is level and is at least 4 feet wide, and
- the berm slopes have no eroded or damaged spots.

The owner or user is responsible for operation, maintenance and repair of the lagoon. This publication gives an overview and provides guidance for these tasks.

Figure 1 shows a lagoon with features that indicate a good condition and Figure 2 depicts a neglected lagoon that will not give desirable results. This publication gives an overview and provides guidance for operation, maintenance, and repair.

Operation Assessment

All lagoons should be desirable wastewater treatment systems. The assessment involves evaluating the lagoon condition to maintain a standard of good care. This includes oversight, identifying maintenance and repair needs, and management decisions regarding the lagoon. The assessment needs to be done regularly, usually monthly, but does not necessarily require a lot of time. The required tasks are discussed here and the actions are covered in later sections.

Check vegetation in and near water. Watch for new plants, such as cattails, at the water's edge and for floating plants, like duckweed, that need to be controlled. Note tall plants that could droop onto the

Table 1. Color an Indicator of Lagoon Condition

COLOR	CONDITIONS	CAUSE OR SYMPTOM
Dark sparkling green	Good; best condition	Dissolved oxygen (DO) and pH high.
Dull green to yellow	Not so good	DO and pH are less than optimum. Blue-green algae may be becoming predominant.
Gray to black	Very bad	Anaerobic or septic conditions prevail; odors likely. Too much sludge is possible.
Tan to brown	Bad in Kansas where this algae is not found	Usually means erosion or inflow of surface water. Okay if brown algae.

Source: EPA, Operations Manual: Stabilization Ponds, MO-15, 430/9-77-012, August 1997



Figure 1. A lagoon with a good fence and gate outside the toe of the embankment.

water and the health of perennial grass on the lagoon embankment (berm). Is more frequent mowing needed to keep the grass no taller than 6 or 8 inches on the inside slope?

Observe and record water color. The lagoon water's color indicates its condition. Green is the goal as it indicates balanced pH and a good oxygen level. Table 1 shows the color, the interpretation, and what causes the color. A decline to a less-desirable color has a cause and may require a correction. Observe and chart a record of the water's color, date and water depth.

Measure and record water level. Recording lagoon water level is a good operation practice. Depth can be obtained from a post with depth marks, installed in the center of an empty lagoon, or by measuring from a permanent reference on the berm. Keep a record of water levels and dates for at least five years and use this to identify problems and make operating decisions.

Look for indicators and needed repair. Evidence of possible problems include: odor, high or low water levels, profuse algae bloom, and rooted plants in the water. These indicators may result from too much sludge or other causes. The operator must also look for erosion, damage to fence, and other problems that require immediate repair.

Maintenance

Maintenance includes tasks done on a routine schedule: monthly, seasonally, or annually.

Caution: Take precautions to minimize exposure to wastewater by wearing protective clothing and waterproof gloves. After working



Figure 2. This neglected lagoon shows animal damage and poor grass care.

with wastewater, thoroughly wash hands or shower and disinfect any breaks in the skin.

Control rooted plants in water. Rooted plants in the water promote mosquito breeding, encourage aquatic animals, and add to sludge. The desired 3-foot minimum water depth helps control rooted plants. Plants at the water's edge can be controlled either by physical removal or herbicide treatment. Pull or dig them when plants first appear and before the root system is established.

When plants are well established, control is quite difficult and may not be successful. Dead plants are organic debris that may cause odor, and add to the sludge. To control, use herbicides that protect algae and are labeled for the target plants. Apply it directly using an applicator. Use broadcast spraying sparingly because it requires more chemical and may get into the water.

Control vegetation on berm. To keep the grass on the inside slope no taller than 6 to 8 inches, mow often enough that no more than half of the growth is removed each time. Mow cool-season grasses such as fescue every week or two in cool months and monthly when it is hot. Discharge clippings away from the water or collect and remove them.

Mow the top and outside of the berm to stimulate a dense, healthy grass cover. Cut cool-season grasses in early May and mid-June. Cut warm-season (native) species in early July and mid-August. Burn areas as needed to control woody plants, residue, and unwanted species. The ideal time to burn is in the spring when new growth is just beginning. Try every three to five years for warm-season grasses and every five to seven years for cool-season

grasses. Always follow fire safety precautions and check with local authority before burning.

Control floating plants. Remember, green color is good. Bacteria are essential for good treatment in lagoons and they require oxygen. This is best supplied by dispersed, single-cell algae, which are green. Sunlight must penetrate the water and reach the algae to produce the oxygen. Floating plants like water lilies, duck weed, or filamentous algae (moss) intercept the light. This causes the oxygen level to drop and when that happens the lagoon color will not be as green. As discussed for rooted plants, control floating plants when they first appear either by removal or with herbicides.

Adjust supplemental water. Because of low inflow or seepage losses many lagoons need supplemental water to maintain the 3-foot depth needed to control rooted plants. Supplemental water may be added from downspouts or hose, but it must be easily controllable. A 2-foot vertical distance, or freeboard, above the water level to the top of the berm is essential to prevent overflow from an extreme rainfall. When the depth approaches the freeboard reserve, shut off or divert supplemental water.

Check and adjust fence and gate. Check the fence and gate at least twice a year to be sure it is in good condition. The gap between the gate and post or space at the bottom of the fence to the ground should not be wider than 2 inches. Holes in the fencing should not be larger than two by four inches. Check for loose or damaged posts, loose anchors to posts, sags in wire or gate, and any damage. Add or remove treated boards on the posts or gate for adjustment to keep the gap no more than 2 inches and to allow the gate to move freely. The fence must keep animals, especially pets, and children away from the lagoon.

Remove trees and woody plants. Remove trees within 50 feet and shrubs within 20 feet of the berm to reduce shading and the risk of roots in the berm and lagoon. This also helps keep leaves out of the lagoon and avoids their addition to sludge. Remove or trim trees that shade the lagoon on the east, south, and west sides. Sunlight must reach the surface year around and air must freely move across it. Oxygen enters the water through exchange at the water surface and photosynthesis by algae.

Check sludge. For best lagoon performance, maintain at least 18 inches of water above the

sludge. Measure the depth to sludge in the same area, preferably near the center after 10 years and again every three to five years. Measuring the depth to sludge is not easy. It is not safe to walk into a lagoon with waders, so do not try that. A good option is to use a small pump with an intake suspended from a float at an adjustable depth. Move the intake deeper until solids are first noticed; the depth of the intake below the surface is the depth to sludge. Keep a record of depths to sludge and the years it was measured.

Repairs

Repairs are unscheduled work needed to prevent further malfunction, damage, or possible failure of the lagoon.

Repair fence and gate. The fence should be tight and securely attached to sturdy posts. A good fence has a barbed wire not more than an inch from the ground. When large animals are near, two tight barbed wire strands should top the fence to discourage them from reaching over it. Holes in the fence or gate larger than two by four inches must be repaired so animals and children cannot get through. The gap between the gate and posts should be no more than 2 inches. Attach a board to the post to fill a wider gap. Be sure the gate is securely hung and opens and closes easily. Keep it locked to prevent unauthorized entry.

Repair leakage. There should never be evidence of leakage around a lagoon. Leakage must be corrected by repairing the berm and sealing the inside surface to meet the KDHE guideline of less than a ¼ inch per day loss. Leakage is best controlled by thorough compaction of thin layers of wet soil during the construction process, creating a compacted lining at least 18 inches thick. If a leak can be found in an existing lagoon, adding bentonite clay or soil amendments may fix it. Prevent surface inflow to the lagoon with good drainage and keeping the top of the berm at least a foot above the adjacent surface or highest flood level.

Fill eroded places and reseed. The berm must be maintained at the original elevation and surface shape. Any time there is erosion or damage to the berm, the affected area must be filled, **compacted**, smoothed, and reseeded to the desired perennial grass. Mulching helps control erosion until vegetation is established. Watering can help establish the grass without repeated seeding.

Emergency dewatering. Under normal conditions, the lagoon water depth should be at least 2 feet below the top of the berm. Occasionally short-term conditions, such as a long wet spell or extra water use, may result in high water. If the freeboard reserve is less than 2 feet, excess water (with no solids) should be pumped to a vegetated area through a sprinkler so runoff does not occur. This dewatering must be approved by the local health department. People and animals must be kept out of the application area for at least 30 days. Wait at least 30 days to harvest hay or graze animals in the area. If dewatering is required more than once in several years, find the cause and if necessary enlarge, reconstruct, or add a second cell. Overflow or discharge lines are absolutely forbidden by KDHE for small lagoons.

Remove sludge. Sludge accumulates in lagoons and in time it must be removed or a new lagoon built. Experts do not agree about the best time or method to remove sludge. If livestock waste-handling equipment is available, a few loads of sludge could be pumped from the bottom every few years. A seepage hauler can do the same but this will be more expensive. Removal would slow sludge accumulation and delay cleaning or rebuilding the lagoon. Regulations for sludge disposal are found in the EPA's 40 CFR Part 503, which covers allowed techniques and required record keeping. Check requirements of the county permitting agency.

When sludge accumulation fills a lagoon, removal is expensive. If it must be hauled away from the area, the cost could be thousands of dollars. If suitable space is available, it will be much cheaper to build a new lagoon and fill the old one rather than remove and haul the sludge away. When closing a lagoon, pump the liquid from the surface to reduce drying time, following the local code and guidelines above. If the dry sludge is more than 18 inches thick it should be removed and disposed following local code and CFR 503 regulations and then the lagoon filled.

Other Sources of Information

Lagoon design and construction details are in K-State Research and Extension publication *Wastewater Pond Design and Construction*, MF-1044, and *Minimum Standards for Design and Construction of Onsite Wastewater Systems*, MF-2214 (KDHE Bulletin 4-2). Guidelines for selection of herbicides are available in *Aquatic Plants and Their Control*, C-667. Other publications that address fences, grass management, and onsite wastewater options are available from the local extension office, health office, or K-State Research and Extension website, www.ksre.ksu.edu/library/.

Ann Mayo, Lyon County Sanitarian
Judith M. Willingham, Extension Associate,
Biological and Agricultural Engineering
G. Morgan Powell, Extension Engineer, Water
Quality, retired

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In each case, credit Ann Mayo, Judith M. Willingham, and G. Morgan Powell, *Wastewater Pond Operation, Maintenance and Repair*, Kansas State University, September 2010.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service
MF2290 rev.

September 2010

K-State Research and Extension is an equal opportunity provider and employer. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating. Gary Pierzynski, Interim Director.

Website: <http://www.ksre.ksu.edu/bookstore/pubs/MF2290.pdf>

CHAPTER 6 REFERENCES

Access Kansas- Official State of Kansas Website - <http://www.kansas.gov/>

Aerial Photos, Maps - See USDA Farm Services Agency or visit the Butler County GIS Website at <http://www.bucoks.com/298/Mapping-GIS>

Topographic Maps - <https://www.topoquest.com/find.php#mapname>
or <https://store.usgs.gov/maps>

Animal Control - For complaints regarding stray, nuisance and vicious dogs, contact the Animal Control Officer at 316-322-4325. For calls pertaining to livestock, exotic animals and animal cruelty, contact the Butler County Sheriff at 316-322-4254. Animal bites are handled by the Butler County Health Department, 316-321-3400. Incorporated cities will have their own animal control.



Blue-Green Algae - Some blue-green algae produce toxins that could pose a health risk to people and animals when they are exposed to them in large enough quantities, yet the mere presence of blue-green algae is not a cause for alarm. For more information on blue-green algae, refer to these websites:

<http://www.kdheks.gov/algae-illness/>

http://www.kdheks.gov/algae-illness/download/Jar_Test.pdf

Building Permits - See Butler County Community Development Department.

Butler County Website - www.bucoks.com

Butler County Board of Commissioners

Butler County Courthouse

205 West Central

El Dorado KS 67042

316-322-4300

Website: <http://www.bucoks.com/115/Board-of-County-Commissioners>

County Commissioners meet on Mondays and Tuesdays of each week at the Butler County Courthouse. Meetings are open to the public. Concerned citizens are encouraged to speak at these meetings and time is allotted for public comment.



Butler County Community Development Department

121 South Gordy, Suite 202

El Dorado KS 67042

316-322-4325

Website: <http://www.bucoks.com/318/Planning-Zoning>



Permits are required for any construction activity such as building a house, putting up a barn, building or other structure, repairing or installing a septic system or lagoon, and requesting zoning changes. Complaints on zoning violations and other development or environmental issues should be directed to this agency. They also are responsible for calls pertaining to stray, nuisance and vicious dogs.

If you are buying or selling a house, you will need to contact the Community Development Department for an inspection of your septic system and water well, if you have them, to assure they meet county regulations. They are also responsible for inspections of septic systems and water wells. Flood plain maps are available for review at this office.

Butler County Conservation District

2503 Enterprise, Suite B

El Dorado KS 67042

316-320-3549

Websites:

<https://www.butlercountyconservationdistrictks.com>

<http://agriculture.ks.gov/divisions-programs/division-of-conservation>



Conservation districts are grassroots organizations that provide local leadership and direction on conservation issues and concerns. Conservation Districts encourage voluntary cooperation in protecting our natural resources.

The Non-Point Source Pollution Control and Water Resources Cost Share Programs are managed through the Butler County Conservation District. Cost share is available to eligible applicants for plugging abandoned water wells, water well improvement, repairing failing septic systems, establishing waterways, terraces, pasture, range and hayland plantings, filter strips, tree planting, spring developments, riparian and wetland protection and installing livestock waste storage structures. Educational materials and information are available through the Conservation District. District staff can also come and speak to your group or organization.

Butler County Department of Emergency Management

2100 North Ohio Street, Suite B

Augusta KS 67010

316-733-9796

For Emergencies, Dial 911

Website: <http://www.bucoks.com/206/Emergency-Management>



This office is in charge of planning, preparing and coordinating emergency teams for natural and man-made disasters that could occur in Butler County. Disasters include tornadoes, floods and hazardous materials spills or releases. Butler County Emergency Management is responsible for the reporting of spills to the State of Kansas, the primary contact for securing the services of the Butler County Hazardous Materials Team and the venue for collection of fees associated with the cost of clean ups. Emergency Management is the administrative arm of the Local Emergency Planning Committee (LEPC). LEPC is responsible for tracking and reporting hazardous materials in Butler County.

Butler County Health Department

206 North Griffith

El Dorado KS 67042

316-321-3400

1-800-940-6083

Website: <http://www.bucoks.com/260/Health>

The Health Department performs such things as child vaccinations and addressing health related issues. They are responsible for calls pertaining to animal bites. They also check out complaints from residents on various health or environmental related matters.



Butler County Public Works Department

121 South Gordy, Suite 200

El Dorado KS 67042

316-322-4101 or 316-322-4158 or 316-322-4127 (E-Waste/Household Hazardous Waste)

1-800-822-7091

Website: <http://www.bucoks.com/327/Public-Works>

The Public Works Department operates the landfill and maintains county roads. Household hazardous waste, composting, electronic waste and recycling services are located at the landfill southwest of El Dorado at the corner of SW 40th Street and SW Boyer Road.

Butler County Sheriff

141 South Gordy

El Dorado, KS 67042

Kelly Herzet, Sheriff

Phone: 316-322-4254

1-800-794-0190

For emergencies, dial 911. To report a crime that is not an emergency, 316-320-1294

Website: <http://www.bucoks.com/384/Sheriff>



The Butler County Sheriff's Department serves the citizens of Butler County by maintaining law and order, implementing and monitoring traffic control and providing warning support in the event of evacuation or severe weather. The Sheriff's Office is responsible for calls pertaining to livestock, exotic animals and animal cruelty.

Butler County Weed Department

475 SE Poor Farm Road

El Dorado KS 67042

316-321-5190 or 1-800-940-6180

Website: <http://www.bucoks.com/313/Noxious-Weed>

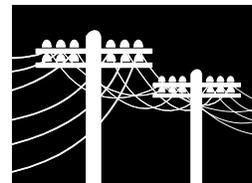
The Weed Department administers and enforces the Kansas Noxious Weed Law in Butler County. The Kansas Noxious Weed Law requires all persons who own or supervise land in Kansas to control and eradicate all weeds declared noxious by legislative action. The Weed Department can help you identify noxious weeds and provide you with information on chemicals commonly used to kill a particular noxious weed. You can also purchase chemicals from them.

Butler Rural Electric Coop Association, Inc.

316-321-9600

1-800-464-0060

Website: <http://www.butler.coop/>



Cable Television, Satellite TV - Look in the yellow pages under "Television" or "Cable Television".

City Offices:

Website: <http://www.bucoks.com/196/Cities>

Andover - 316-733-1303

<http://www.andoverks.com/>

Augusta - 316-775-4510

<http://www.augustagov.org/>

Benton - 316-778-1625

<http://bentonks.org/>

Cassoday - 620-735-4252

Douglass - 316-747-2109

<http://www.cityofdouglassks.com/>

Elbing - 316-799-2196

<http://www.elbingks.com/>

El Dorado - 316-321-9100

<http://www.eldoks.com>

Latham - 620-965-3121

Leon - 316-742-3438

Potwin - 620-752-3422

Rose Hill - 316-776-2712

<http://www.cityofrosehill.com/>

Towanda - 316-536-2243

Whitewater - 316-799-2445

<http://www.whitewaterks.com/>



Composting, Yard Waste - In January 2002, the landfill banned all yard waste from the landfill. Since then, they loosened the restrictions and have allowed residents to dump grass clippings and leaves in their regular trash bin; however, tree limbs, brush and other large vegetative material are still banned from the landfill. The landfill has a compost site where you can take all your yard waste. When you arrive at the scale house, they will direct you to the compost site. Some cities in Butler County provide yard waste collection sites. Contact your nearest city office for more information. You can also compost yard wastes at home. See K-State Research and Extension office for more information on home composting.

Website: <https://www.bookstore.ksre.ksu.edu/pubs/MF1053.pdf>

El Dorado Water Treatment Plant

380 East Central

El Dorado KS 67042

316-321-9100

Website: <http://www.eldoks.com/130/Public-Utilities>

The City of El Dorado treats water from El Dorado Lake and provides water to rural residents throughout Butler County through the Rural Water Districts. El Dorado Lake supplies the majority of Butler County residents with drinking water.

Electricity/Power

Look in the yellow pages under Electric Light and Power Companies

Environmental Protection Agency (EPA)

Region 7

11201 Renner Blvd

Lenexa KS 66219

1-800-223-0425 or 913-551-7003

Website: www.epa.gov

Region 7 Website: <https://www.epa.gov/aboutepa/epa-region-7-midwest>



Responsible for implementing the federal laws designed to protect the environment.

Emergency 911 - Direct Emergency Hotline

911 is an emergency telephone number that provides immediate and direct contact to Fire, Police and Emergency Medical Services.

When to use 911:

Dial 911 in any situation that requires immediate response by the fire department, police/sheriff officers or ambulance. Examples include a crime in progress, a fire, a heart attack, serious medical conditions, accidents involving injuries or a release of chemicals.

Fire Districts/Departments

Websites:

<http://www.bucoks.com/258/Fire-Departments>

<http://www.bucoks.com/204/Non-Emergency-Contact-Info>

Andover Fire and Rescue - Andover

For emergencies, dial 911

316-733-1863

Atlanta (Cowley County Fire District #2)

For emergencies, dial 911

620-394-2222



Butler County Fire District # 2 - Augusta

For emergencies, dial 911

316-775-4500

Butler County Fire District # 3 - Rose Hill

For emergencies, dial 911

316-776-0401; <http://www.bcf3.com/>

Butler County Fire District # 4 - Cassoday

For emergencies, dial 911

316-322-4398

Butler County Fire District # 5 - Rosalia

For emergencies, dial 911

316-322-4398

Butler County Fire District # 6 - Latham

For emergencies, dial 911

316-322-4398

Butler County Fire District # 7 - Benton

For emergencies, dial 911

316-322-4398

Butler County Fire District # 8 - Douglass

For emergencies, dial 911

316-322-4398

Butler County Fire District # 9 - Leon

For emergencies, dial 911

316-322-4398

Butler County Fire District # 10 - Burns

For emergencies, dial 911

316-322-4398

El Dorado Fire Department

For emergencies, dial 911

316-321-9100

Potwin Fire Department

For emergencies, dial 911

316-322-4398

Towanda Fire Department

For emergencies, dial 911

316-322-4398

Whitewater River Consolidated Fire Department

For emergencies, dial 911

316-283-4190



Fires, Open Burning, Range Burning, Etc. - Contact your local fire department for restrictions or to get a permit. Website: <http://www.bucoks.com/203/Controlled-Burning>
Website for Range Burning/Smoke Management: <http://ksfire.org/>

Flood Plain Maps - See Butler County Community Development Department or the Federal Emergency Management Agency.

Website: <https://msc.fema.gov/portal>

Flood Information, Butler County: <http://www.bucoks.com/DocumentCenter/View/1374>

<https://www.fema.gov/national-flood-insurance-program>

<http://agriculture.ks.gov/divisions-programs/dwr/floodplain/mapping>

<http://maps.bucoks.com/depts/regdeeds/disclaimer.htm>

Gas Companies - Look in the yellow pages under "Gas Companies".

Kansas Gas Service - <https://www.kansasgasservice.com/>

Atmos Energy - <http://atmosenergy.com/>

Household Hazardous Waste Program - Take unwanted or unused paint, paint thinners, automotive oil, antifreeze, batteries, household or garden chemicals, etc. to the household hazardous waste collection site at the Butler County Landfill during regular landfill hours (see "Landfill" below for additional information). For more information, contact the Butler County Household Hazardous Waste Coordinator at 316-322-4127. Website: <http://www.bucoks.com/284/HHW-Household-Hazardous-Waste>



Junk Vehicles or Trash in Yards - See Butler County Community Services Department - Environmental Health and Sanitary Code. Website: <http://ks-butlercounty.civicplus.com/DocumentCenter/View/179>

K-State Research and Extension

206 North Griffith

El Dorado KS 67042

316-321-9660

Websites:

<http://www.ksre.k-state.edu/>

Local Website - <http://www.butler.k-state.edu/>

Soil Testing Information: <http://www.ksre.ksu.edu/bookstore/pubs/MF734.pdf>

Local extension agents can answer questions you have on horticulture, landscaping, soils, agriculture, livestock, pasture and range management, family and consumer sciences, 4-H, etc. Soil tests are handled through this office.



Kansas Corporation Commission (KCC)

District Office No. 2

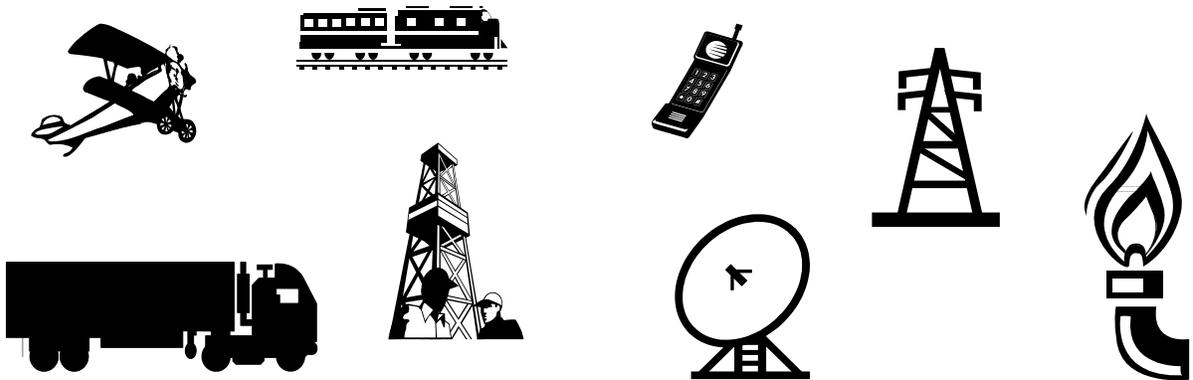
3450 North Rock Road, Building 600, Suite 601

Wichita KS 67226

316-337-7400

Website: www.kcc.state.ks.us

The KCC regulates the state's telecommunications, electric and gas utilities, transportation and oil and gas production to protect fresh and usable water and soil and prevent the waste of oil and gas resources. The KCC will investigate abandoned oil and gas wells and will identify the person or company responsible for plugging the well.



Kansas Department of Agriculture

Division of Water Resources

Manhattan Office

1320 Research Park Drive

Manhattan, Kansas 66502

(785) 564-6700

Website: <http://agriculture.ks.gov/divisions-programs/dwr>

The Kansas Department of Agriculture (KDA) Division of Water Resources (DWR) is a water regulatory agency, dealing with water quantity and water rights issues. Persons in Kansas wishing to modify a stream channel cross section (put in a dam, straighten channel, remove gravel, etc.) must obtain a permit from the Kansas Department of Agriculture, Division of Water Resources. Contact DWR for assistance with water rights or stream modifications.

Kansas Department of Agriculture (KDA)

Plant Health Division
Manhattan Office
1320 Research Park Drive
Manhattan, Kansas 66502
(785) 564-6700



Website: <http://agriculture.ks.gov/divisions-programs/pesticide-fertilizer> or
<http://agriculture.ks.gov/divisions-programs/plant-protect-weed-control>

The KDA Plant Health Division regulates pesticide labeling and use within Kansas. They also work closely with the US-EPA on programs to protect endangered species, groundwater and surface waters from pesticides. They investigate cases of misuse, improper storage and improper disposal of pesticides and containers as well as oversee noxious weed control, biological control and pest survey programs.

Kansas Department of Health and Environment (KDHE)

South Central District Office
300 West Douglass, Suite 700
Wichita KS 67202
316-337-6041



Website: http://www.kdheks.gov/befs/dist_offices/sc.htm

The KDHE district office conducts field inspections of permitted livestock facilities and conducts site appraisals at livestock facilities that apply for a KDHE permit. The district office coordinates a wide number of state programs with county and city agencies. Complaints of environmental pollution can be reported through the district office.

Kansas Department of Health and Environment

Bureau of Water, Watershed Management Section
1000 SW Jackson Street, Suite 420,
Topeka, KS 66612-1367
Phone: 785-296-5500 or 785-296-6170



Website: <http://www.kdheks.gov/water/index.html>

Responsible for assuring a safe drinking water supply. Oversees monitoring and control of the discharge of pollutants into both surface and groundwater. Provides funding locally through grants for protecting water supplies, water quality information and education activities and riparian and wetland protection. This office regulates water well plugging and drilling.

Kansas Department of Transportation (KDOT)

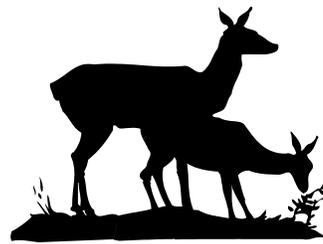
District 5 Office
500 N Hendricks
Hutchinson KS 67501
620-663-3361
El Dorado Office
205 Oil Hill Road
El Dorado KS 67042
316-321-3370
Website: www.ksdot.org



Coordinates the planning, development and operation of the various modes and systems of transportation in the state including roads, aviation, railroads and public transit.

Kansas Department of Wildlife and Parks

618 NE Bluestem Road
El Dorado KS 67042
316-321-7180
Fisheries Biologist 316-772-2706
Website: <http://ksoutdoors.com/>
Fish Kills - <http://www.kdheks.gov/befs/fishkills.htm>



Kansas Department of Wildlife and Parks is in charge of the day to day activities at El Dorado Lake State Park. They also enforce hunting and fishing regulations throughout Butler County. Fish kills in the County can be reported to the local office or the KDHE South Central District Office Administrator - (316) 337-6020 or email SCDOAdministrators@kdheks.gov

Kansas Forest Service

2610 Claflin Road
Manhattan KS 66506
785-532-3300
Website: <http://www.kansasforests.org>
South Central District Area Forester
Dennis Carlson - dcarlson@ksu.edu
9 West 28th, Suite B
Hutchinson KS 67502
620-921-3554



The Forest Service provides assistance to communities and landowners for urban forestry, rural forestry, logging, forest inventories, conservation tree plantings, fire management and forest health.

Kansas Geological Survey

1930 Constant Avenue
University of Kansas, West Campus
Lawrence KS 66047
785-864-3965
Website: <http://www.kgs.ku.edu/>

Studies the State's resources and prepares publications on its findings. Publishes information on Kansas geology in books and maps and has geologic maps of Kansas.

Kansas Gas Service

Website: <https://www.kansasgasservice.com/>

Kansas Water Office

900 SW Jackson Street, Suite 404
Topeka KS 66612
785-296-3185
1-888-526-9283
Website: <http://kwo.ks.gov/>

The Kansas Water Office is the water planning, policy and coordination agency of the State of Kansas. It prepares a state plan of water resources development, management and conservation, reviews all water laws and makes recommendations to the Governor and Legislature for new or amendatory regulation.

Landfill

Open 8:30 AM to 5:30 PM Monday - Friday; 8:30 AM to 2:30 PM Saturday
2963 SW 40th Street (SW 40th and Boyer Road)
El Dorado KS 67042
Office: 316-322-4158
Household Hazardous Waste/Electronic Waste
4295 SW Kickapoo Road - 316-322-4127
Website: <http://www.bucoks.com/274/Landfill-Recycling>

The landfill is located southwest of El Dorado and is a division of the Butler County Public Works Department. Other services at the landfill include recycling, electronic waste, composting and household hazardous waste collection.



Nonpoint Source Pollution Program

Butler County Conservation District

2503 Enterprise, Suite B

El Dorado KS 67042

316-320-3549

Website: <https://www.butlercountyconservationdistrictks.com>



Non-point source pollution occurs when rainfall, snowmelt or irrigation runs over land or through the ground, picks up pollutants, and deposits them into rivers, lakes and coastal waters, or introduces them into ground water. Examples of non-point source pollution include the pollutants carried by eroded soil particles, nutrients and pathogens from agriculture, forestry, construction activity, runoff from urban areas, human and animal wastes, pesticide application and fertilizer application.

The goal of the non-point source program is to restore and/or protect groundwater and surface water sources in Butler County. Current activities of this program include educating the public on non-point source pollution and its impact on the environment, collection of water samples from streams above El Dorado Lake (the major water supply for Butler County) and providing cost share incentives for plugging abandoned water wells, repairing failing on-site waste systems, upgrading livestock waste systems and restoring riparian and wetland areas.

Oil Field and Related Problems

The Kansas Corporation Commission (KCC) is the regulating agency for the Oil and Gas industry in Kansas. Oil field spills of oil and salt should be reported to the District Office in Wichita at 316-337-6231. Abandoned oil wells and non-used pits on non-active and active leases should be reported to the Kansas Corporation Commission. A field investigation will be made of any complaint filed with the KCC and results of the investigation will be given to the person filing the complaint, if requested. Questions that a landowner has regarding oil field operations can be directed to the District Office.

Kansas Corporation Commission (KCC)

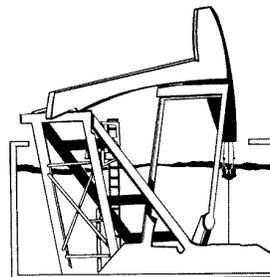
Conservation Division (Oil and Gas)

266 North Main Street, Suite 220

Wichita KS 67202

316-337-6200

Website: <http://www.kcc.state.ks.us/oil-gas>





Open Burning, Range Burning, Controlled Fires, Etc. - Contact your local fire department for restrictions or to get a permit. See Fire Districts/Departments, or go to this website: <http://www.bucoks.com/256/Fire-Service>. For range burning and the Flint Hills Smoke Management Plan, go to www.ksfire.org.

Pipeline Safety - Kansas Pipeline Association - <http://kpa-awareness.com/home>

Poison Control Center - 1-800-222-1222.

Website: <http://www.aapcc.org/>

<http://www.kansashealthsystem.com/medical-services/poison-control>



Ponds - The Natural Resources Conservation Service can provide you with technical assistance concerning ponds and pond construction. Contact 316-321-5803. Also check out this website:

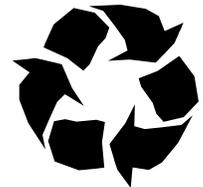
<http://nrcspad.sc.egov.usda.gov/DistributionCenter/product.aspx?ProductID=115>

Propane Gas - Look under "Propane Gas" in the Yellow Pages.

Recycling - Recycling is available at the landfill (see Landfill).

The landfill also offers electronic waste (E-Waste) recycling and household hazardous waste (HHW) disposal. Call the nearest town for information on recycling services available locally. For additional information, call 316-320-3549 or 316-322-4127.

Website: <http://www.bucoks.com/DocumentCenter/View/359>



Rural Development

1405 South Spencer

Newton KS 67114

316-283-0370

Website: <https://www.rd.usda.gov/>



USDA Rural Development offers loans, grants and loan guarantees to support essential services such as housing, economic development, health care, first responder services and equipment, and water, electric and communications infrastructure. They promote economic development by supporting loans to businesses through banks, credit unions and community-managed lending pools. They offer technical assistance and information to help agricultural producers and cooperatives get started and improve the effectiveness of their operations and also provide technical assistance to help communities undertake community empowerment programs. They also help rural residents buy or rent safe, affordable housing and make health and safety repairs to their homes.

Rural Water Districts

Website: <http://www.bucoks.com/595/Rural-Water-Districts>

Kansas Rural Water Association: <https://www.krwa.net/>

Rural water districts provide water to rural residents. Most of the water provided through the Rural Water Districts comes from El Dorado Lake and is treated at the City of El Dorado Water Department. Rural water districts purchase the water from the City of El Dorado and then sell it back to rural residents.



Number 1 (El Dorado Area) - 316-452-5433

Number 2 (Augusta Area) - 316-320-9276

Number 3 (Rosalia Area) - 620-476-2288

Number 4 (Towanda Area) - 316-775-5088

Number 5 (Benton Area) - 316-778-1631 or 316-778-1800

Number 6 (Leon Area) - 316-320-1301

Number 7 (Whitewater Area) - 316-799-2775

Sedgwick County - Number 3 - 316-777-0877

Harvey County - Number 1 - 620-837-5634

Cowley County - Number 7 - 620-222-1084

Greenwood County - Number 1 - 620-583-7181

School Districts (Look in the yellow pages for private/Christian schools)

USD 205 - Bluestem/Leon/Haverhill - 316-742-3261

<http://www.usd205.com>

USD 206 - Remington/Whitewater/Potwin - 316-799-2115

<http://www.usd206.org/>

USD 375 - Circle/Benton/Towanda/El Dorado - 316-541-2577

<http://www.usd375.org>

USD 385 - Andover - 316-218-4660

<http://www.usd385.org>

USD 394 - Rose Hill - 316-776-3300

<http://www.usd394.com>

USD 396 - Douglass - 316-747-3300

<http://www.usd396.net>

USD 398 - Peabody/Burns - 620-983-2198

<http://www.usd398.net/>

USD 402 - Augusta - 316-775-5484

<http://www.usd402.com/>

USD 462 - Central of Burden - 620-438-2218

<http://www.usd462.org/>

USD 490 - El Dorado - 316-322-4800

<http://www.eldoradoschools.org/>

USD 492 - Flint Hills/Rosalia/Cassoday - 620-476-2215

<http://www.usd492.org/>



Soil Testing - For an analysis of the soil on your property to determine nutrient needs, see "K-State Research and Extension Office".

Website: <http://www.ksre.ksu.edu/bookstore/pubs/MF734.pdf>

Soils Maps - Web Soil Survey - <http://websoilsurvey.nrcs.usda.gov>

Telephone

Look in the yellow pages under "Telephone Companies".



Townships Boards

Township Boards are responsible for road maintenance and repair, mowing and spraying weeds in the ditches and repairing/replacing signs.

Website: <http://www.bucoks.com/DocumentCenter/View/266>

Augusta Township: Nick McClure, 316-775-6119

Benton Township: Dick Dalton, 316-778-1193

Bloomington Township: Francis Sowers, Jr. 316-742-3573

Bruno Township: Eric Becker, 316-259-5777

Chelsea Township: David Stackley, 316-321-4615

Clay Township: Joe Hall, 620-394-2473

Clifford Township: David Nellans, 620-726-5566

Douglass Township: Craig McClure, 316-644-4376

El Dorado Township: Darcy McCoy, 316-322-0676

Fairmount Township: Tim Stuckey, 316-799-2373

Fairview Township: Curtis Wood, 620-752-3153

Glenco Township: Lorna Lyon, 316-207-5370

Hickory Township: Wayne Chambers, 316-214-7973

Lincoln Township: Coy Gannon, 316-993-0126

Little Walnut Township: Gary Sphar, 316-742-3454

Logan Township: Gerald Dixon, 316-321-3773

Milton Township: David Toevs, 316-323-4598

Murdock Township: Chris Brackenridge, 316-253-5958

Pleasant Township: Jeff Haengi, 316-765-1118

Plumb Grove: Jim Sommers, 620-752-3162

Prospect Township: Ron Busenitz, 316-734-1476

Richland Township: Rick Morriss, 316-746-3033

Rock Creek Township: Paul Rick Stewart, 316-747-2392

Rosalia Township: Bart Hamilton, 316-322-5974

Spring Township: Kathy McDowell, 316-253-9273

Sycamore Township: William Stacey, 316-304-1351

Towanda Township: David Wohlgemuth, 316-641-4075

Union Township: Larry Hodges, 620-965-3591

Walnut Township: John Danler, Sr. 316-775-6006

U S Army Corps of Engineers

Tulsa District
1645 South 101st East Avenue
Tulsa, Oklahoma 74128
918-669-7366

Website: <http://www.swt.usace.army.mil/>



US Army Corps
of Engineers®
Tulsa District

Local Office:

U S Army Corps of Engineers
Kansas State Regulatory Office
2710 NE Shady Creek Access Road
El Dorado KS 67042
316-321-9974

Any person wishing to place fill materials in the waters of the nation (rivers, creeks, etc.) must receive a Section 404 permit from the U.S. Army Corps of Engineers. The Corps of Engineers has regulatory responsibility of administering Section 404 of the 1972 Clean Water Act, which covers all waters of the nation. This includes dredging, filling or channeling water courses or wetlands.



USDA Farm Service Agency (FSA)

2503 Enterprise, Suite A
El Dorado KS 67042
316-321-5803

Website: www.fsa.usda.gov



Aerial photos are available through this office. The USDA Farm Service Agency administers farm commodities, farm credit and conservation programs for farmers through a network of state and county offices. FSA programs are primarily directed at agricultural producers or, in the case of loans, at those with farming experience.

USDA Natural Resources Conservation Service (NRCS)

2503 Enterprise, Suite B
El Dorado KS 67042
316-321-5803

Website: www.ks.nrcs.usda.gov



Information about local soils and other natural resource and conservation issues are available through the NRCS. NRCS is also a resource for topographic maps, flood plain maps and aerial photos. NRCS provides survey and design work for terraces, waterways, livestock waste systems and ponds. The NRCS can also develop range management plans, conservation plans and nutrient management plans.

United States Post Office

For Zip Codes, Mailing Rates and Post Office Hours and Locations 24 hours a day, 7 days a week, call 1-800-275-8777.

Website: www.usps.com

<u>City</u>	<u>Zip</u>	<u>Phone Number</u>
Andover	67002	316-733-0617
Atlanta	67008	620-394-2306
Augusta	67010	316-775-6141
Beaumont	67012	No Office
Benton	67017	316-778-1071
Burns	66840	620-726-5217
Cassoday	66842	620-735-4471
Douglass	67039	316-746-2691
Elbing	67041	316-799-2681
El Dorado	67042	316-321-5950
Latham	67072	620-965-2495
Leon	67074	316-745-3547
Potwin	67123	620-752-3268
Rosalia	67132	620-476-2282
Rose Hill	67133	316-776-2515
Towanda	67144	316-536-2613
Whitewater	67154	316-799-2301

United States Geological Survey

Website: www.usgs.gov

Provides water, earth, biological science and civilian mapping information to individuals to assist in natural resource and conservation planning.

U S Fish and Wildlife Service

Website: www.fws.gov

Enforces federal wildlife statutes and regulations.

They work with various federal, state, local and

private individuals on a variety of educational and wildlife habitat improvement projects.



Walnut Basin - Equus/Walnut Regional Advisory Committee

Kansas Water Office

900 SW Jackson Street, Suite 404

Topeka KS 66612

785-296-3185 or 1-888-526-9283

Website: <http://kwo.ks.gov/about-the-kwo/regional-advisory-committees>

The Equus/Walnut Regional Advisory Committee identifies water related problems, issues and concerns within the Equus/Walnut Basin to help identify goals and objectives that can be used to direct subsequent planning efforts through the Kansas Water Office which is a part of the State's Long Term Vision for the Future of Water Supply in Kansas. Every Kansan in the region should know the water resources in the region, the dangers potentially impacting the resource, and the value of and the actions necessary to protect it. The current focus is to achieve and maintain a sustainable balance of groundwater recharge in the Equus Beds Aquifer, develop a plan to manage and mitigate areas of groundwater contamination and implement and continue watershed protection activities to maintain regional reservoir storage capacity for an additional 100 years.

Watershed Districts

Website: <http://agriculture.ks.gov/divisions-programs/division-of-conservation/watershed-districts>

Little Walnut Hickory Watershed Joint District #18

Muddy Creek Watershed Joint District #27

Rock Creek Watershed Joint District #28

Upper Walnut Watershed Joint District #33

Whitewater Watershed Joint District #22

2503 Enterprise, Suite B

El Dorado KS 67042

316-320-3549

Middle Walnut Watershed Joint District #60

P. O. Box 652

Douglass KS 67039

316-746-2644

The Kansas legislature established the Watershed District Act in 1953. The purpose of the watershed district is to construct, operate and maintain works of improvement needed to provide for water management within designated boundaries. The primary function is to develop a comprehensive general plan for a watershed that will provide flood protection for residents and landowners. Organized watershed districts have taxing authority (within limitations) and the power of eminent domain, in addition to other powers granted by K.S.A. 24-1209. Each watershed district incorporated under the provisions of this act is a political subdivision of state government. A locally elected board of directors of three to fifteen members is responsible for administration of the watershed district.

Water Well Drilling - Obtain a permit from Butler County Community Development (316-322-4325). In the yellow pages, look under *Water Well Drilling/Services*.

http://www.kdheks.gov/waterwell/download/ActiveKansasLicensedWaterWellContractors2016-2017_sorted_by_city.pdf

What You Should Know - Drilling a Well: <http://www.kgs.ku.edu/Publications/PIC/pic23.html>

Westar Energy - 1-800-794-6101 - Website: <http://www.westarenergy.com/>

Yard Waste - See Composting or Landfill.

811 Kansas One Call (Dig Safe)

<http://kansasonecall.com/>

Kansas 811 - Know What's Below - Call Before Your Dig!

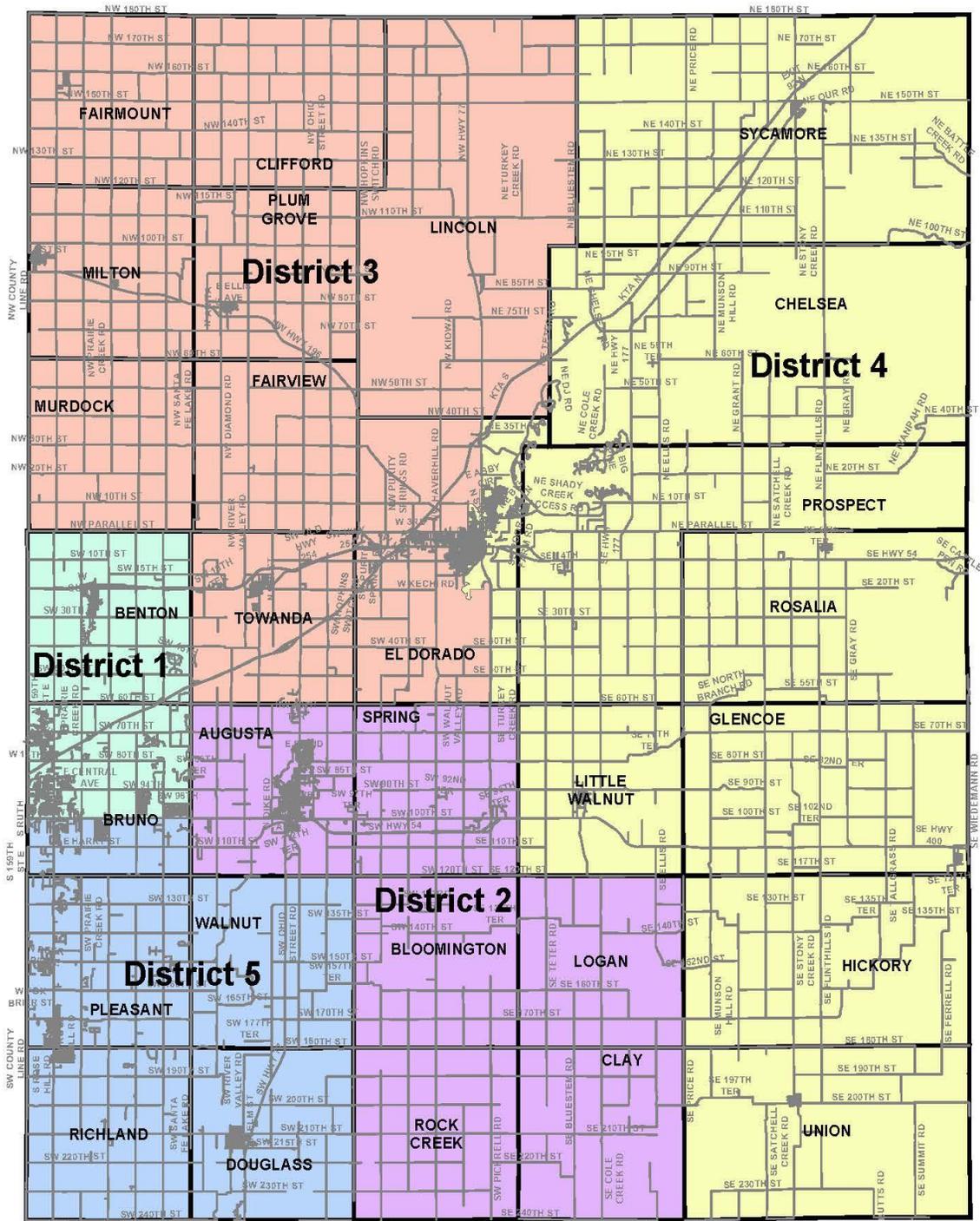
If you are planning to do any construction work, earthwork or other work which might affect underground pipelines, waterlines, phone lines, etc., call this number. They will mark the area with flags free of charge.



CHAPTER 7 MAPS

	Page
County Commission Districts	78
http://www.bucoks.com/DocumentCenter/View/9	
Fire Districts	79
http://www.bucoks.com/DocumentCenter/View/645	
Rural Water Districts	80
http://www.bucoks.com/DocumentCenter/View/1183	
School Districts	81
https://www.ksdot.org/bureaus/burtransplan/maps/SchoolDistrict.asp	
USD 205 https://www.ksdot.org/Assets/wwwksdotorg/bureaus/burTransPlan/maps/SchoolDistrict/School%20District_205.pdf	
USD 206 https://www.ksdot.org/Assets/wwwksdotorg/bureaus/burTransPlan/maps/SchoolDistrict/School%20District_206.pdf	
USD 375 https://www.ksdot.org/Assets/wwwksdotorg/bureaus/burTransPlan/maps/SchoolDistrict/School%20District_375.pdf	
USD 385 https://www.ksdot.org/Assets/wwwksdotorg/bureaus/burTransPlan/maps/SchoolDistrict/School%20District_385.pdf	
USD 394 https://www.ksdot.org/Assets/wwwksdotorg/bureaus/burTransPlan/maps/SchoolDistrict/School%20District_394.pdf	
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USD 462 https://www.ksdot.org/Assets/wwwksdotorg/bureaus/burTransPlan/maps/SchoolDistrict/School%20District_462.pdf	
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USD 492 https://www.ksdot.org/Assets/wwwksdotorg/bureaus/burTransPlan/maps/SchoolDistrict/School%20District_492.pdf	
Townships	82
http://www.bucoks.com/DocumentCenter/View/265	
Watershed District Map	83
http://agriculture.ks.gov/docs/default-source/doc---directories/watershed-districts-map-2014.pdf?sfvrsn=2	

Butler County Commission Districts



District 1
 Jeff Masterson
 2039 Marc Avenue
 Andover, Ks 67002
 (316) 733-0178 office
 (316) 733-6310 home

District 2
 Marc Murphy
 6140 SW Hunter Rd
 Augusta, Ks 67010
 (316) 648-9629 cell

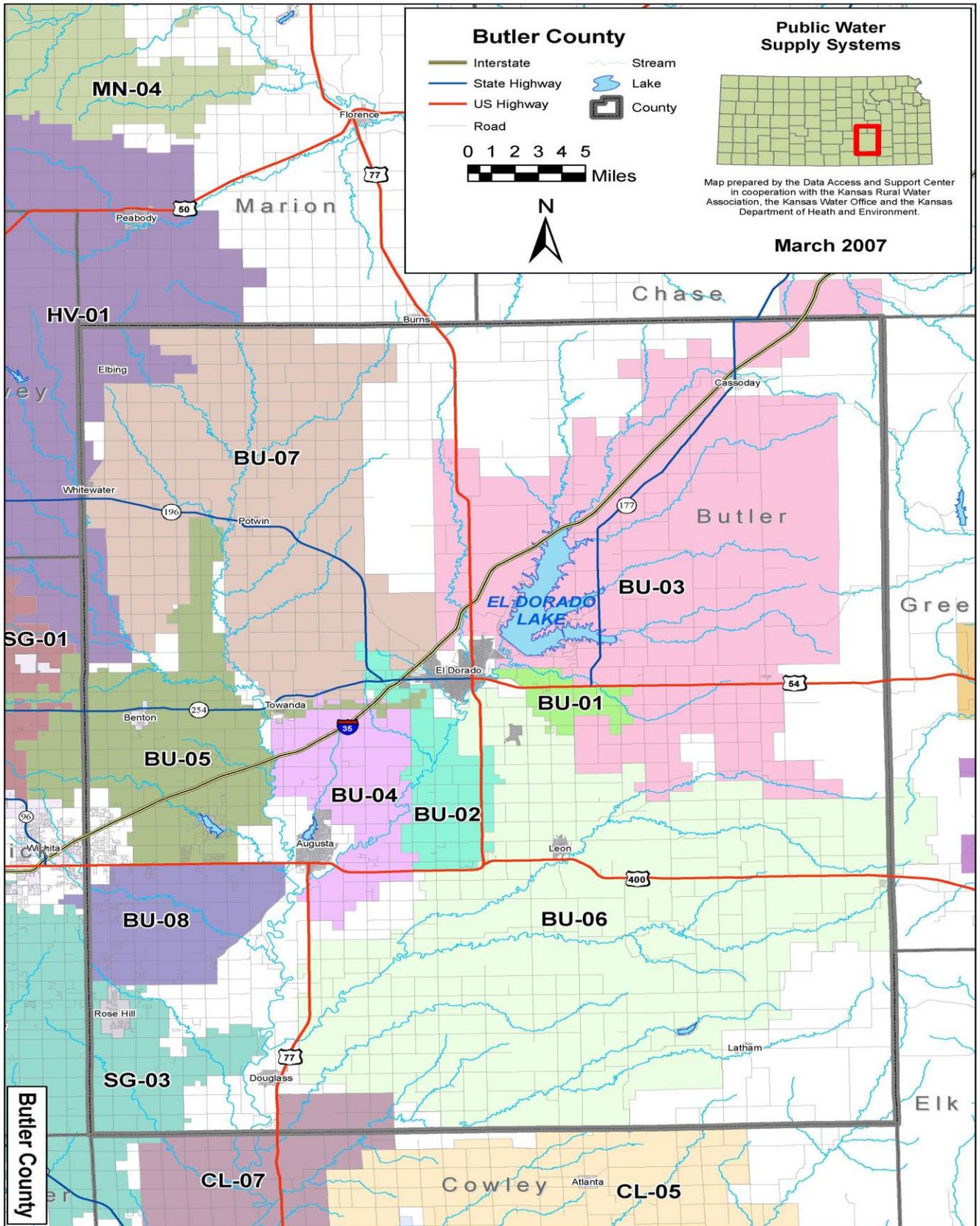
District 3
 Ed Myers
 14566 NW 110th St
 Whitewater, KS 67154
 (316) 799-2882 home

District 4
 Mike Wheeler
 1951 Chelsea Dr.
 El Dorado, Ks 67042
 (316) 377-1000 cell

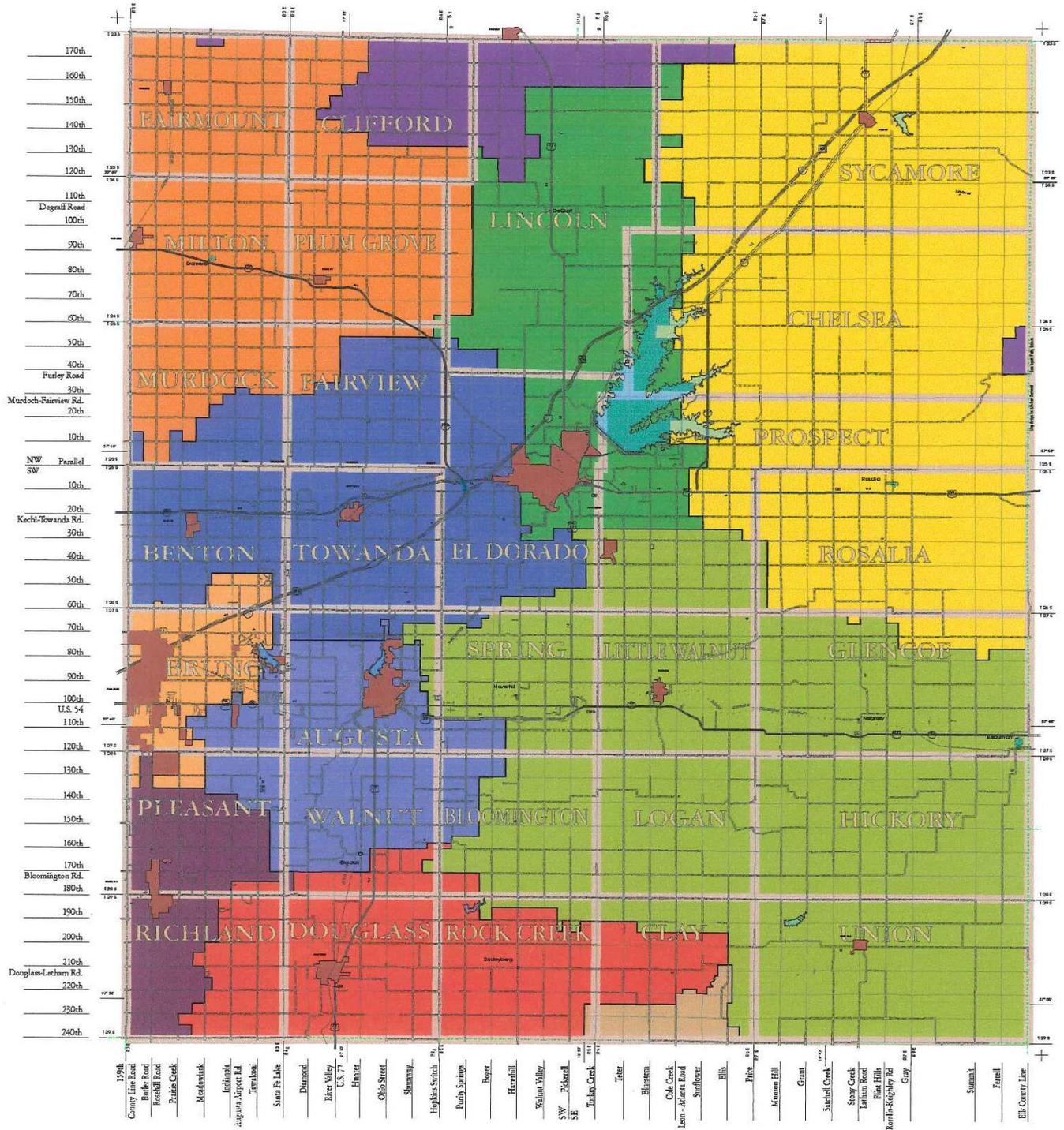
District 5
 Dan Woydziak
 320 N. Driftwood Ct.
 Rose Hill, Ks 67133
 (316) 776-0355 hm

January 2017

Butler County Rural Water Districts



School Districts located in Butler County

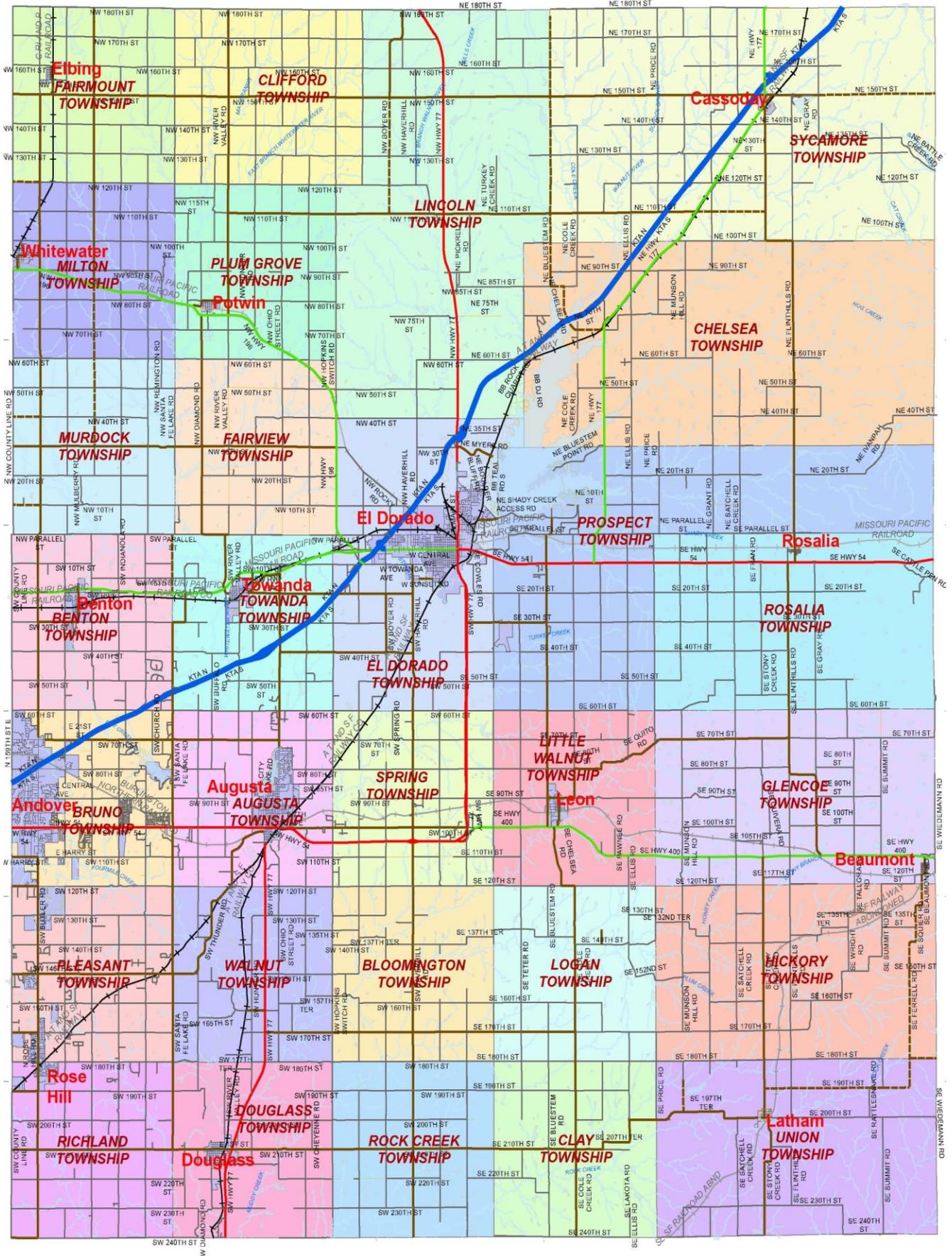


SCHOOL DISTRICTS

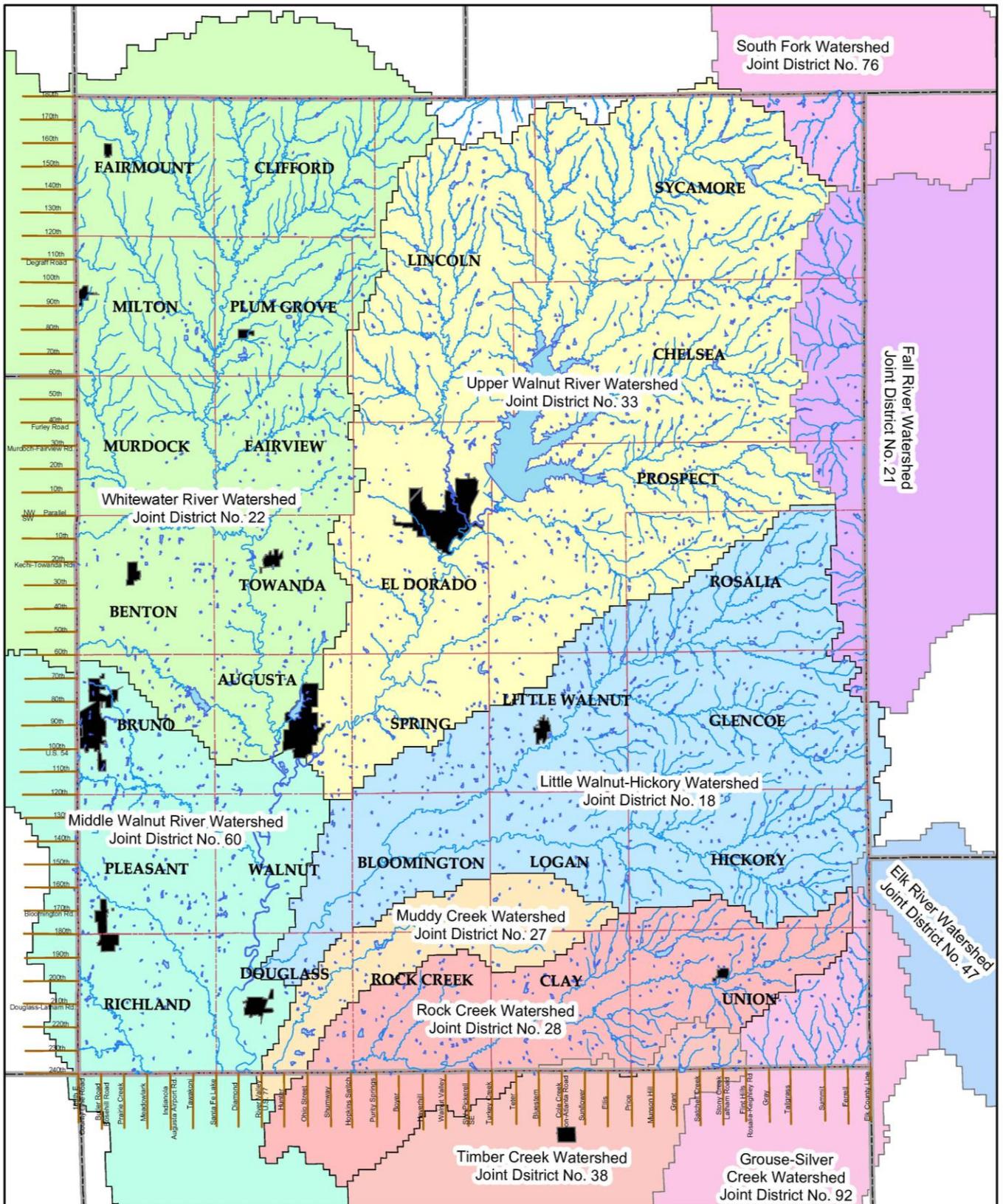
LEGEND

	USD 205		USD 385		USD 398		USD 490
	USD 206		USD 394		USD 402		USD 492
	USD 375		USD 396		USD 462		

Butler County Townships



Butler County Watershed Districts



Legend

- Streams
- Counties

