

# Kansas Dry Cleaning Program



Semi-Annual Newsletter

Kansas Department of Health & Environment

Spring 2006

## Drinking Water Wells Impacted by Contaminated Groundwater

Kansas ranks high among states using groundwater as a drinking water source, especially in western and central Kansas. Public water supply (PWS) systems and private domestic wells are the primary methods for delivering groundwater to the users. PWS wells typically include several large volume wells pumping to a main treatment system that distributes water to urban or rural customers. Domestic wells are typically smaller volume wells that only supply a single urban home or rural property.

Maintaining a clean water supply for citizens using public or private wells is a primary concern for the Kansas Department of Health and Environment (KDHE). Water quality monitoring requirements for PWS operators allows KDHE to easily monitor groundwater quality in PWS wells. Unfortunately, identifying potentially contaminated domestic wells can be difficult, if not impossible. KDHE geologists spend a lot of time locating as many domestic wells as possible when they identify potential receptors at risk of being impacted by contamination from dry cleaning sites.

KDHE uses several methods to identify domestic wells. Geologists search a water well database maintained by KDHE

*Continued on page 2*



## Trust Fund Applications On the Rise

KDHE gets a variety of responses when dry cleaners and/or property owners are notified their property is contaminated by dry cleaning solvents. Owners are often apprehensive because a state agency is informing them they are responsible for a contamination problem. Invariably the conversation turns to how much it's going to cost them to fix the problem. When KDHE indicates the Trust Fund Program has a \$5,000 deductible, we encounter every emotion from anguish to confusion to a huge sigh of relief. Basically it comes down to one's perception of the problem. None of these reactions are necessarily wrong because they are reality for that individual.

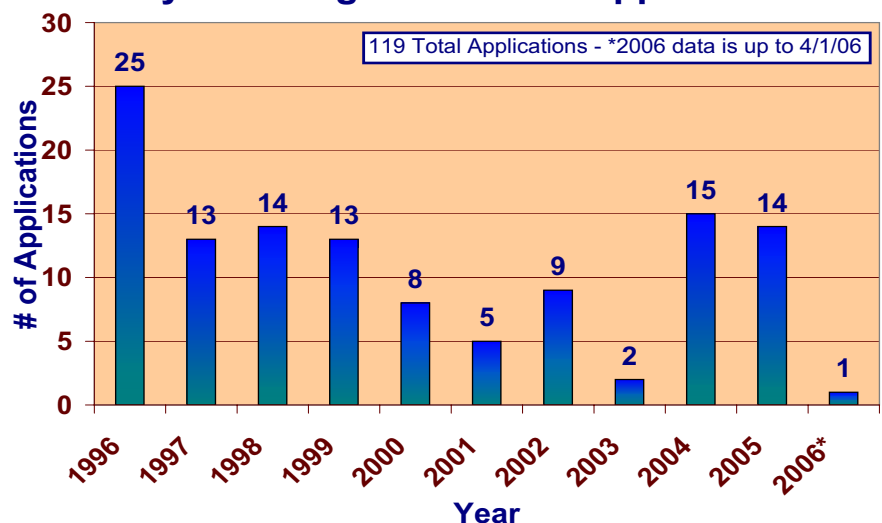
A common question is: "How did you find out my property is a source for contamination?" New sites are commonly found during assessments for real estate transactions, such as property sales or refinancing. Many lending agencies require Phase I and/or Phase II real estate assessments to show the owner has used due diligence to find environmental problems with their property. Sites are also found during investigations to identify the source of contamination found in water supply wells or monitoring wells at other contaminated sites, such as gas stations. Since tetrachloroethylene (PCE) is not typically found at gas stations, KDHE's Pre-Remedial Site Assessment Program will track down the source of the contamination. If the

*Continued on page 2*

### For Better or Worse

A young man came home from the office to find his bride sobbing uncontrollably. "I feel terrible," she told him. "I was pressing your suit and I burned a big hole right in the seat of your trousers." "Forget it," consoled the husband. "Remember that I've got an extra pair of pants with that suit." "Yes, and it's lucky you have," said the young woman, drying her eyes. "I used them to patch the hole."

## Dry Cleaning Trust Fund Applications



## Meet the Staff

### Ryan Weiser - Project Manager

Ryan is a project manager for KDHE with responsibilities in the Kansas Dry Cleaning and Landfill Remediation Programs. Ryan has a bachelor's degree in geology from Fort Hays State University in Hays, Kansas. He has experience with soil and groundwater sampling as a consultant in Salina, Kansas prior to coming to KDHE. His practical field experience is very beneficial to KDHE's efforts to assess and remediate contaminated soil and groundwater.



*"Wells" Continued from page 1*

and the Kansas Geologic Survey (KGS). However, not all wells are identified in these databases. Another method is comparing city records and postal addresses to determine which addresses have sewer accounts, but no water accounts. This comparison shows KDHE a property is occupied by a home or business, but not getting water from the city's PWS system. The third option is old fashioned "knock and talk" where KDHE staff interview residents in a target area to identify properties with private wells. Sometimes the wellhead is visible from the street, but often the well is in a basement, garage or hidden by landscaping.

Technological advances in digital mapping allow KDHE to map property in target areas using electronic city maps with property boundaries already mapped with the addresses. Once a domestic well is identified in a potentially contaminated area, KDHE samples the well to determine if the groundwater is safe for consumption. If a well is determined to be unsafe due to dry cleaning solvent contamination, KDHE arranges for the occupants to receive bottled water until the property can be connected to a municipal or rural PWS system. As of April 2006, KDHE has completed city water connections for 118 properties and 18 more are planned for late spring 2006.



*"Applications" Continued from page 1*

source is identified as a dry cleaner, it is turned over to the Kansas Dry Cleaning Program.

Some owners immediately understand payment of the \$5,000 deductible is a bargain compared to several hundred thousand dollars needed to remediate a small site or several million dollars to remediate a large contaminant plume with high-risk receptors, such as public water supply wells. On the other end of the spectrum, some owners are more concerned about how difficult it is to come up with \$5,000 in today's economy. KDHE's objective is to explain the pros and cons of the Trust Fund Program. Fortunately, the end result is typically an owner applying to the trust fund, which is beneficial to all those involved.

Application numbers were up the last couple years and KDHE anticipates 2006 will be another busy year with an expected 10 to 20 new applications. Many of the sites include multiple dry cleaning facilities identified as sources for a large contaminant plume. These are commonly found in larger cities, but smaller communities such as Emporia and Derby also have these multiple-source plumes since the dry cleaners are commonly found in the more commercialized areas.

Any dry cleaner, property owner, or municipality with questions about KDHE's Dry Cleaning Trust Fund Program may visit our Web Site at [www.kdheks.gov/dryclean](http://www.kdheks.gov/dryclean) or call (785) 296-6370.



### ***A little windy?***

A traveler driving through western Kansas saw a man sitting by the ruins of a house that had blown away.

*"Was this your house, my friend?"*

*"Yep," said the man.*

*"Any of your family blown away with the house?"*

*"Yep, wife and four kids."*

*"Great Scot, man, why aren't you hunting for them?"*

*"Well stranger, I've lived in this area awhile. The winds due to change this afternoon. So I figure I might as well wait till it brings them back."*

## Remediation Technology Spotlight "In Situ Chemical Oxidation"

Dry cleaner facility remediation can be a very complicated process. The presence of buildings, overhead and underground utility lines, landscaping, traffic flow, etc. can complicate efforts to reach contaminant source areas that are often underneath buildings or near sewer lines. KDHE's goal is to design a remediation system that is effective around the existing surface and subsurface obstructions. One such remediation method is **In Situ Chemical Oxidation (ISCO)**. ISCO is a remedial process that injects chemical oxidants into contaminated soil or groundwater to "destroy" dry cleaning solvents, such as tetrachloroethylene (PCE). The process turns the contaminants into relatively harmless substances such as carbon dioxide, water and inorganic chloride. The most common oxidants are ozone, sodium or potassium permanganate, hydroxide peroxide and sodium persulfate.

ISCO is a good remedial alternative when the bulk of the contamination exists as a relatively small area. Most designs only address the contamination near the source area and then a different technology may be used to treat the groundwater plume that extends from the site. KDHE's goal with most ISCO projects is to remove the source of contamination so the remainder of the plume can more easily be remediated.

With the exception of ozone, which is in vapor form, the liquid-phase ISCO oxidants are relatively easily injected into the subsurface with direct-push equipment (Figure 1). A key factor for successful remediation is getting the oxidant into physical contact with the contaminant in the subsurface soil and/or groundwater. Oxidant is pumped from a holding tank through a hose into a well or direct-push probe rod in the subsurface. KDHE targets certain depths based on the contamination concentrations and ability of the soil to take in the oxidant. Chemical destruction occurs at a rapid pace as soon as the oxidant comes into contact with the contaminant.



Figure 1

The use of a hand-held lance system is also an option that allows injection in areas not accessible by vehicle-mounted probes. A lance is a small diameter pipe (<1/2-inch diameter) with a sharp point and is manually pushed into the soil. The operator simultaneously injects fluid as the lance is pushed into the subsurface soil. Additional sections of lance rod can be added to reach the proper depth. This system can be used at shallow groundwater sites or when ISCO is used to remediate contaminated soil above the groundwater.

One drawback of ISCO is that groundwater directly downgradient of the injection area cannot be used until the oxidant has been completely used up during the remedial process. Permanganate will cause the groundwater to turn purple (Figure 2). Another drawback of ISCO is that oxidants are not chemically specific for contaminants, but instead will react with a wide range of naturally occurring organic and inorganic compounds. This is called "natural oxidant demand" (NOD) and some soil types may consume up to 99 percent of the oxidant delivered into the subsurface. Therefore, an excess amount of oxidant must be supplied to the subsurface to overcome the NOD, making ISCO methods impractical because of the high volume of oxidant that may be required. The NOD can easily be determined in lab tests with soil collected from the subsurface zone of interest. These tests are performed before selection of ISCO as the remedy.



Figure 2

Even with the need to overcome the NOD, ISCO often remains a good technology for remediating dry cleaning solvent contamination sites. KDHE continues to study the use of oxidants in various types of soils and situations. Advances in the methods of delivery and types of oxidants will help with site remediation at dry cleaning facilities and ISCO continues to show promise as an effective technology for remediating both soil and groundwater. KDHE recently completed a remedial plan for an ISCO project at a dry cleaning facility in Topeka. The project calls for injection of sodium permanganate in the soil above the water table to destroy the source of the contamination. KDHE will evaluate the results of the Topeka project. If successful, KDHE's consultants will be designing similar remedial approaches for sites across the state.

## Frequently Asked Questions

**"When do I need to report a spill?"** A spill is an accidental or intentional discharge that is detrimental to the quality of the waters of the state or causes pollution of the soil. All spills, splatters and releases must immediately be cleaned up to prevent potential contamination. Mop-up water disposal should be handled in the same manner as solvent and wastewater.

**Inside of Secondary Containment:** If a discharge occurs inside secondary containment, you do not need to report the spill to KDHE. The responsible party must still clean up the discharge within the secondary containment using standard industry practices. The discharge should also be noted on the calendar or maintenance log and followed up with necessary repairs to ensure the discharge will not happen in the future.

**Outside of Secondary Containment:** If a discharge occurs outside the secondary containment, it must be immediately reported and cleaned up because of the potential threat of the solvent reaching soil beneath the floor or outside the building. Some dry cleaning solvents are proven to infiltrate concrete and/or small cracks.

Spills can be reported to KDHE's 24-hour spill response line at (785) 296-1679. For more information on spill reporting requirements for federal, local and state agencies, please visit the KDHE Spills Web Site at: [www.kdheks.gov/spill](http://www.kdheks.gov/spill) or call KDHE's Spill Response Program at 785-296-1679.

Kansas Dry Cleaning Program  
Kansas Department of Health & Environment  
Bureau of Environmental Remediation  
1000 SW Jackson, Suite 410  
Topeka, KS 66612-1367  
264-27

## Who to contact if you have questions

**KDHE:** Bob Jurgens, Unit Manager  
Kansas Dry Cleaning Program  
1000 SW Jackson, Suite 410  
Topeka, KS 66612-1367

Phone: 785-291-3250

Fax: 785-296-4823

E-mail: [bjurgens@kdhe.state.ks.us](mailto:bjurgens@kdhe.state.ks.us)

Web site: [www.kdheks.gov/dryclean/](http://www.kdheks.gov/dryclean/)

### Dry Cleaning Technical Advisory Committee

- ◆ Scott Shmalberg: (785) 843-0639  
Scotch Fabric Care, Lawrence
- ◆ Robert Bayless: (620) 793-3576  
Bayless Cleaners, Great Bend
- ◆ Brian Gieber: (785) 539-4211  
Stickel Cleaners, Manhattan
- ◆ Ross Markle: (913) 682-3535  
Harris Brothers Cleaners, Leavenworth
- ◆ Dan Miller: (316) 942-5180  
Miller Cleaners, Wichita
- ◆ Darrell Spoon: (816) 444-7774 (Main office)  
Olathe Cleaners, Olathe