

**KANSAS STORAGE TANK PROGRAM
CORRECTIVE ACTION POLICY MANUAL**

March 5, 2012



<http://www.kdheks.gov/tanks/index.html>

Copies of this document are available at:

[http://www.kdheks.gov/tanks/download/Corrective Action Policy Manual.pdf](http://www.kdheks.gov/tanks/download/Corrective_Action_Policy_Manual.pdf)

As the state's environmental and public health agency, KDHE promotes responsible choices to protect the health and environment for all Kansans.

Through education, direct services, and the assessment of data and trends, coupled with policy development and enforcement, KDHE will improve health and the quality of life. We prevent illness, injuries and foster a safe and sustainable environment for the people of Kansas.

**KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT
BUREAU OF ENVIRONMENTAL REMEDIATION
1000 SW Jackson, Suite 410
Topeka, KS 66612-1367**

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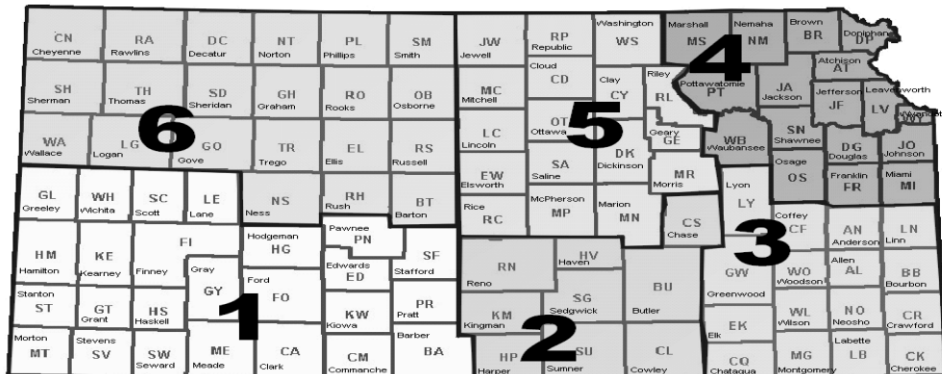
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KDHE UST CONTACT INFORMATION

If you should need additional information regarding UST requirements, or if you need to register UST tanks within Kansas, you should contact the appropriate individual listed below:

<u>STAFF</u>	<u>CENTRAL OFFICE STAFF</u>	<u>DISTRICT</u>
Program Area	Telephone No.	
General Program Information	(785) 296-1678	1. Southwest District Office-Dodge City – (620) 225-0596 Vacant Geol. Associate Fax - 3731 Wade Kleven Geol. Associate
Underground Storage Tank Trust Fund		
Remedial Action	Scott O’Neal (785) 296-1597	2. South Central District Office - Wichita – (316) 337-6020 Kyle Parker Prof. Geologist Fax - 6023 Meer Parker Prof. Geologist Stan Marcotte Env. Scientist Vince Ressel Env. Scientist
Reimbursements	David Caldwell (785) 296-5625	
Monitoring	Sharon Elder (785) 296-1030	
Underground Storage Tanks (USTs) Prevention		
Unit Chief	Marcus Meerian (785) 296-6372	3. Southeast District Office – Chanute – (620) 431-2390 Vacant Prof. Geologist Fax - 1211 Renee Brown Geo. Associate
Cathodic Protection		
New Installations, Repairs, Upgrades & Release Detection	Chris Eichman (785) 296-1685	4. Northeast District Office – Lawrence – (785) 842-4600 Tom Winn Prof. Geologist Fax – 3537 Nathan Luna Env. Scientist Meredith Roth Env. Scientist Michael Law Env. Scientist
Trust Fund Compliance, Fed. Financial Responsibility, & Tightness Testing	Gary Richardson (785) 296-1677	5. North Central District Office - Salina – (785) 827-9639 Howard Debauche Prof. Geologist Fax – 1544 Scott Lang Prof. Geologist
Contractor Licensing	Cathy Herring (785) 296-1661	6. Northwest District Office - Hays – (785) 625-5663 Bill Heimann Prof. Geologist Fax - 4005 Darrell Shippy Env. Scientist
UST Permits & Registration, Fees, Ownership Changes, and Tank Abandonment	Debbie Clure (785) 296-1599	
Leaking USTs		
Tank Closure, Leaks Tank Removals and Site Assessments	Roger Boeken (785) 296-1674	

KDHE ADMINISTRATIVE DISTRICTS



KANSAS REPORTING REQUIREMENTS FOR UNDERGROUND STORAGE TANK RELEASES

The Kansas Department of Health and Environment (KDHE), Bureau of Environmental Remediation (BER) is responsible for responding to releases from underground storage tanks and the associated piping. As part of the response, field staff makes an evaluation of the release and determine what remedial action is necessary to protect public health and the environment. BER is receiving federal funding through the Leaking Underground Storage Tank (LUST) Trust Fund, which is administered by the Environmental Protection Agency. The Trust Fund is financed by a tax on motor fuels of 1/10 of one cent per gallon and provides BER with funding for staff, as well as, funding for actual clean up of sites where no responsible party can be found.

Kansas Administrative Regulations 28-48 Parts 1 and 2 (Article 48) requires the reporting of spills to BER. The telephone numbers for reporting spills have been included with this information. Reporting requirements under Article 48 are totally independent of the "Community Right to Know" program and reportable quantities associated with those requirements. Many owners of buried tank systems are not aware of the requirements under Article 48 or do not realize that leakage from buried tanks or associated lines is reportable spillage. There are numerous service stations located throughout the state many of which operate buried tank systems. A system such as this may store large quantities of fuel, which can be accidentally released. A release of this type can cause contamination of soil and groundwater resulting in odor or product in basements, sewers, or water wells. If you observe or receive information regarding a reportable incident, this information should be referred to BER. Reportable incidents include: 1) any loss from a buried tank system or 2) discovery of product of fuel odors in groundwater, sewers, or the basement of a structure.

BER responds to both new releases and existing problems that result from leakage from buried tanks or associated piping. KDHE has six district offices located throughout the state as well as a central office in Topeka. The staff responsible for this program is quite limited at this time so extensive field surveys of service stations is not possible. BER must rely on the responsible parties, local agencies and private citizens to insure that petroleum releases are reported. Problems resulting from leaks of this type seem to compound over time so early reporting and proper clean up of these sites is very important.

BER would appreciate any assistance that you can provide with reporting or oversight of buried tank release incidents. For additional information or to report a problem you should call Roger Boeken (785) 296-1674, Randy Carlson at (785) 296-1684 or the appropriate district office for your area.

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT
Article 48 - Spill Reporting

28-48-1. Definitions. The following words and phrases when used in these regulations have the meanings respectively ascribed to them in this section.

- (a) "Owner" means individual, partnership, firm, trust, company, association, corporation, institution, political subdivision or agency which is financially responsible for the material or facility.
- (b) "Person responsible" means person or organization which has been placed in control of the material or facility by the owner.
- (c) "Waters of the state" means all streams and springs, and all bodies of surface or groundwater, whether natural or artificial, within the boundaries of the State.

28-48-2. Action required. All sewage, substances, materials, or wastes, as set forth in 65-171d, regardless of phase or physical state, which are, or threaten to contaminate or alter any of the properties of the waters of the state or pollute the soil in a detrimental, harmful, or injurious manner or create a nuisance, shall be reported in the following manner:

- (a) The owner or person responsible for the discharge or escape of materials detrimental to the quality of waters of the state or pollution of the soil under conditions other than provided by a valid permit issued by the secretary of health and environment shall report the discharge or escape to the Kansas Department of Health and Environment.
- (b) Emergency or accidental discharge of materials which are detrimental to the quality of waters of the state or tend to cause pollution of the soil shall be immediately reported to the Kansas Department of Health and Environment by the owner, owner's representative, or person responsible. In the event the pollution causing material is in transit or in storage within the state, the owner, carrier, or person responsible for storage shall be responsible for immediate notification to the Kansas Department of Health and Environment that the pollutant will gain admittance to the waters of the state or the soil.

(Authorized by and implementing K.S.A. 1984 Supp. 65-171D; effective 5/1/86.)

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT REQUIREMENTS FOR UST REMOVAL

Listed below are Kansas requirements for a tank removal project under federal and state regulations.

1. Removal of USTs must be performed by a licensed contractor. (A contractor list is available upon request.)
2. A thirty day notification to KDHE prior to the tank removal is required. The appropriate KDHE district office, as indicated on page 3 of this pamphlet, must be notified for this requirement to be met. The exact date and time of the removal must be provided to the appropriate district office at least three working days prior to the on-site activity proceeding. Limited staff is available to perform assessments, so staff may be unavailable on short notice.
3. An environmental assessment is required for all buried tank removal sites. KDHE field staff will provide this assessment when present on site. If the assessment is done by someone other than KDHE personnel, documentation of the assessment performed including the analytical results must be provided to KDHE within 30 days of the tank removal.

A qualified environmental professional familiar with sampling techniques must perform the assessment if a KDHE representative is not present. The assessment must include analyses by a laboratory using KDHE & EPA approved methods for total petroleum hydrocarbons and benzene of representative soil samples from the excavation. Readings from field monitoring equipment may be used for screening, but will not be a sufficient evaluation alone. At least one discrete soil sample per UST in the basin must be submitted for laboratory analysis. The soil sample must be taken from an area in the basin where the impact from a release would most likely be located. Discrete samples must also be taken from any area where field screening shows that contamination above actionable levels exists. The use of an environmental assessment firm of this type does not eliminate the notification requirement outlined above. Analysis must be performed by a KDHE certified laboratory.

4. Remediation of all backfill material and soil around the tank excavation with: (1) total petroleum hydrocarbon levels exceeding those levels shown on page 11, or (2) total petroleum hydrocarbon vapor levels exceeding 100 ppm as indicated by KDHE field sampling is required. If land farming is the remedial option chosen for contaminated soils or backfill, an "Application to Land farm Petroleum Contaminated Soils With Out a Permit" must be prepared and provided to KDHE's Bureau of Waste Management. Applications may be requested from Joe Cronin with the Bureau at (785) 296-1600. The site at which the contaminated soil is "stored" will be considered active until which time analysis shows levels below Kansas remedial levels. The district geologist will determine whether or not the results from the analyses warrant closure.
5. Abandoned lines are considered a part of the tank system. Assessment of the backfill material and soils associated with the piping are required. At least one discrete soil sample for every 20 feet of piping trench must be submitted for laboratory analysis. Contaminated material with levels exceeding those set for tank excavations must be remediated.
6. If contamination is encountered which cannot be physically removed, further assessment of the soil and groundwater will be required.
7. At sites where the depth to groundwater is less than 40 feet, a groundwater sample must be submitted for laboratory analysis if requested by the KDHE District Geologist. If contamination levels are at or above those levels listed in this Corrective Action Policy and the contamination cannot be physically removed, an application to the Petroleum Storage Tank Release Trust Fund will be made available to the responsible party. If the depth to groundwater is greater than 40 feet, sampling of groundwater will be determined by the district geologist on a site by site basis. If contamination exists above levels shown on page 11, remedial action will be required.

Arrangements should be made so that the tank and any contaminated soil can be disposed of without delay. If materials are to be disposed of in a landfill, a special waste authorization number must be obtained. Special Waste authorization numbers may be obtained from the KDHE Bureau of Waste Management (phone: 785-296-6171). If you have any questions regarding these requirements, contact Roger Boeken (785-296-1674) or the appropriate KDHE district office for your area.

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT REQUIREMENTS FOR IN-PLACE UST ABANDONMENT

Listed below is Kansas Department of Health & Environment requirements for in-place tank abandonment under federal and state regulations.

1. In-place abandonment of USTs must be performed by a licensed contractor. (The licensed contractor list is available upon request.)
2. Check to see if local ordinances prohibit the in-place abandonment of buried storage tanks.
3. An environmental site assessment must be performed by an environmental professional. This assessment must consist of a number of test borings installed within the tank excavation area. One soil boring must be located at each end of every UST in the basin. The number of borings required will depend on the number and size of the USTs to be abandoned. Discrete representative samples should be collected for laboratory analysis from one, five, ten, and fifteen feet below the surface at each boring.
4. Assessment for contamination associated with the piping system must be included either by test borings or line removal.
5. If the depth to groundwater is less than 40 feet, a sample of the groundwater must be submitted for laboratory analysis. If the depth to groundwater is 40 feet or greater, sampling will be determined by the district geologist on a site by site basis. If the groundwater is contaminated with levels at or above those levels listed on page 11 and cannot be physically removed, an application to the Petroleum Storage Tank Release Fund will be made available to the responsible party and remedial action must be started.
6. A report outlining investigative procedures and the findings, including all analyses, must be submitted to KDHE. All analyses must be performed using KDHE & EPA approved methods. **Analyses must be performed by a KDHE Certified Laboratory.**
7. If contamination is encountered, assessment of the extent of contamination will be required. For sites where contamination levels exceed the acceptable levels (page 11), a remedial action plan must be submitted for KDHE approval. Once the remedial action plan has been approved the plan must be implemented within 30 days of approval. If contamination is within acceptable levels, the in-place closure may commence.
8. Tanks are to be cleaned of any remaining sludge and filled with an inert solid material and capped with cement or cement/grout mixture.*

For in-place abandonment, consider completing the soil borings and testing before filling the tanks. Removal of the tanks may prove difficult if filled. The submittal of a short work plan by the consultant before work commences should be considered but is not required.

* Sludges from USTs must be considered a hazardous waste. Appropriate testing will be required before transport to a disposal facility.

BURIED LINE REMOVAL OPTIONS

As part of the buried storage tank removal process the department has required that associated buried piping be removed. This line removal has been required to determine if petroleum contamination of soils has resulted from the operation of the product lines. The department has investigated numerous petroleum releases from buried storage tank systems during recent years. Of those releases, a considerable number have been documented as resulting from buried line failures. These releases are caused by any one or a number of potential causes which include corrosion leaks, line ruptures, and thread leaks.

The department has been asked to consider allowing buried lines to remain on site where removal would cause considerable disruption to the facility. The lines will be allowed to remain on site only if all of the following conditions exist.

1. The lines are pressure tested at above operating pressure for at least 30 minutes. For suction lines a minimum of 30 psi should be used. For pressurized lines a minimum of 50 psi should be used, unless operating pressures exceeded 50 psi. The line test must be performed in such a manner that no more than 10% loss of pressure occurs over a 30 minute time period.
2. No visible product staining is observed around the exposed soil or pavement immediately around or above the product lines.
3. No evidence that line leakage has occurred in the past such as inventory losses, past line repairs, or evidence that buried lines have been replaced (concrete patches in the driveway could be an indication of line repairs).

The lines may need to be removed at some future date if contamination is discovered to be present. The department prefers that removal of all buried piping take place but will allow the above approach in areas which are not extremely environmentally sensitive. In sensitive areas soil sampling will be required to take place in the area of the buried piping to assess potential contamination prior to allowing in-place abandonment. If contamination is discovered to exist in unacceptable levels removal will be required.

In all cases where product lines are left in place without soil testing, closed status of the site will not be issued. A closed status can only be issued once lines have been removed or the soil testing has been performed within the line trenches.

STANDARD MONITORING WELL DESIGN

WELL HEAD PROTECTOR

Steel or PVC cover with water tight cap, set in the concrete pad. Should be equipped with a locking device to prevent tampering. Cover should provide adequate space to allow access to the well.

CONCRETE PAD

Should be a minimum of 2'x2'x4" thick to secure the protective cover, prevent pooling of water and vegetative growth around the well, and allow for placement of a surveyor pin.

IMPERVIOUS GROUT

The upper 20' of the well must be grouted with impervious grout as required by K.A.R. 28-30-2k and 6b (see next page for quotes)

SCREEN SEAL

A 2' layer of bentonite chips or pellets should be placed on the gravel pack to prevent infiltration of grout into the gravel pack.

GRAVEL PACK

The gravel pack should be sized to prevent infiltration of fines into the well. The source of the gravel pack material should be carefully determined to eliminate the possibility of contamination of the well during construction.

WELL CASING

Well casing shall terminate not less than one foot above ground surface. The following well casings are acceptable for monitoring well use.

2" I.D. PVC schedule 40 or thicker

4" I.D. PVC SDR 26 or thicker

5" I.D. PVC SDR 26 or thicker

Steel casing shall be 10 gauge or thicker

All casing materials must be connected without use of solvents, glues, or materials which would induce contamination into the well.

Some other casings are approved for well construction but are not as commonly used. All casing materials must be selected so that incompatibility problems do not occur.

SCREEN

Wells must be equipped with manufactured well screen which provides adequate communication with the aquifer to provide a representative sample without allowing the sediments to enter the well.

CONTRACTOR LICENSING

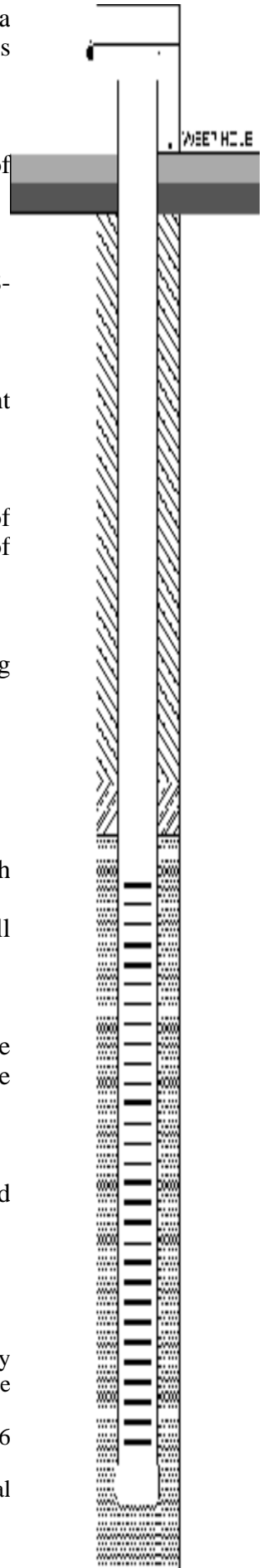
All monitoring wells must be constructed by a licensed water well contractor as specified under K.A.R. 20-30-2. (See next page for quotes)

K.A.R. 28-30-2 (k) Grout

Grout means cement grout, neat cement grout, bentonite clay grout or other material approved by the department used to create a permanent impervious watertight bond between the casing and the undisturbed formation surrounding the casing or between two or more strings of casing.

(1) "Neat cement grout" means a mixture consisting of one 94 # bag of portland cement to 5-6 gallons of clean water.

(2) "Cement grout" means a mixture consisting of one 94 # bag of portland cement to an equal



- volume of sand having a diameter no larger than 0.080 inches (2 millimeters) to 5-6 gallons of clean water.
- (3) "Bentonite clay grout" means a mixture consisting of water and commercial grouting or plugging sodium bentonite clay containing high solids such as that manufactured under the trade name of "volclay grout", or an equivalent as approved by the department.
- (A) The mixture shall be as per the manufacturer's recommendations to achieve a weight of not less than 9.4 pounds per gallon of mix. Weighing agents may be added as per the manufacturer's recommendations.
 - (B) Sodium bentonite Pellets, tablets or granular sodium bentonite may also be used provided they meet the specifications listed in K.A.R. 28-30-2(k), (3), above.
 - (C) Sodium bentonite products that contain low solids, are designed for drilling purposes or that contain organic polymers shall not be used.

K.A.R. 28-30-6 (b) Grouting

- (1) Constructed or reconstructed wells shall be sealed by grouting the annular space between the casing and the well bore from ground level to a minimum of 20 feet or to a minimum of five feet into the first clay or shale layer, if present, whichever is greater. If a pitless well adapter or unit is being installed, the grouting shall start below the junction of the pitless well adapter or unit where it attaches to the well casing and shall continue a minimum of 20 feet below this junction or to a minimum of five feet into the first clay or shale layer whichever is greater.
- (2) To facilitate grouting, the grouted interval of the well bore shall be drilled to a minimum diameter at least three inches greater than the maximum outside diameter of the well casing. If a pitless well adapter or unit is being installed on the well's casing, the well bore shall be a minimum diameter of at least three inches greater than the junction diameter of the well casing through the grouted interval below the junction of the pitless well adapter or unit where it attaches to the well casing.
 - (c) If groundwater is encountered at a depth less than the minimum grouting requirement, the grouting requirement may be modified to meet local conditions if approved by the department.

K.A.R. 28-30-3 Licensing

- (a) Eligibility. To be eligible for a water well contractor's license an applicant shall:
 - (1) Have passed an examination conducted by the department; or
 - (2) Meet the conditions contained in subsection (c).
- (b) Application fees.
 - (1) Each application shall be accompanied by an application fee of \$ 10.00.
 - (2) Before issuance of a water well contractor's license, each contractor shall pay a license fee of \$ 100.00 plus \$ 25.00 for each drill rig operated by or for the contractor. These fees shall accompany the application and shall be by bank draft, check or money order payable to the Kansas Department of Health and Environment- water well licensure.
- (c) Reciprocity.
 - (1) Upon receipt of an application and payment of the required fees from a nonresident, the secretary may issue a license, providing the nonresident holds a valid license from another state and meets the minimum requirements for licensing as prescribed in K.S.A. 82a-1207, and any amendments thereto.
 - (2) If the nonresident applicant is incorporated, evidence shall be submitted to the Department of Health and Environment showing that the applicant meets the registration requirements of Kansas Secretary of State.
 - (3) Nonresident fees for a license shall be equal to the fee charged a Kansas contractor by the applicant's state of residence but shall not be less than \$ 100.00. The application fee and drill rig license fee shall be the same as the Kansas resident fees.

KANSAS PETROLEUM SITE REMEDIATION LEVELS

SOIL

If contaminant levels of the following Chemicals of Concern are above the levels listed below, the contamination must be reported to the appropriate district office. Approved analytical methods may be more specific for State Trust Fund sites.

Soil Pathway

Contaminant	Residential (mg/kg)	Non-Residential (mg/kg)
Benzene	15.9	28.2
Toluene	4320	29800
Ethylbenzene	82	145
Xylene (mixed)	936	1410
1,2-Dichloroethane (DCA)	6.27	10.9
Methyl Terbutyl Ether (MtBE)	585	1050
Ethylene Dibromide (EDB)	0.483	0.859
Naphthalene	30.5	64.7
Total Petroleum Hydrocarbons (TPH) as diesel	2000	20000
Total Petroleum Hydrocarbons (TPH) as gasoline	220	450

Soil to Ground Water Protection Pathway

Contaminant	Residential (mg/kg)	Non-Residential (mg/kg)
Benzene	0.168	0.168
Toluene	51.2	51.2
Ethylbenzene	65.6	65.6
Xylene (mixed)	809	809
1,2-Dichloroethane (DCA)	0.06	0.06
Methyl Terbutyl Ether (MtBE)	0.848	1.66
Ethylene Dibromide (EDB)	0.000598	0.000598
Naphthalene	.349	.659
Total Petroleum Hydrocarbons (TPH) as diesel	5440	7830
Total Petroleum Hydrocarbons (TPH) as gasoline	79.3	79.3

TPH analysis for any volatile or semi-volatile fuel must use extraction and detection methods which are appropriate for the hydrocarbon fractions present in the specific fuel. KDHE will only accept methods based on summation of peaks using gas chromatography (GC) analysis method. **Infrared analysis methods will not be accepted for any compounds except waste oil or motor oil.**

TPH analysis for motor or waste oil must use extraction and detection methods appropriate for heavier hydrocarbon fractions. Analysis of these compounds can be performed using either GC or infrared analysis methods. If both volatile and non-volatile fuels have been stored at a site and are potential contaminants, analysis must be performed using GC methods. Methods and detection limits must be documented on all analytical results submitted to KDHE. All laboratories performing soil analysis must be certified by KDHE for volatile organic compounds.

GROUNDWATER

For storage tank sites, the following is a list of the chemicals of concern. Maximum allowable contaminant levels may be found below. If contaminants exceed the levels described below, those levels must be reported to KDHE and remedial action should be implemented as required.

Ground Water Pathway

Contaminant	Residential (mg/L)	Non-Residential (mg/L)
Benzene	5	5
Toluene	1000	1000
Ethylbenzene	700	700
Xylenes (mixed)	10000	10000
1,2-Dichloroethane (DCA)	5	5
Methyl Terbutyl Ether (MtBE)	133	262
Ethylene Dibromide (EDB)	0.05	.05
Naphthalene	1.11	2.11
Total Petroleum Hydrocarbons (TPH) as diesel	500	720
Total Petroleum Hydrocarbons (TPH) as gasoline	500	500

Water analysis for volatile organic constituents and lead must be performed by a laboratory certified by the KDHE for those specific constituents. To obtain information about KDHE laboratory certification, contact Michelle Wade at (785)296-6198. To obtain information about KDHE UST site remedial levels or site remediation requirements contact Roger Boeken at (785)296-1674. A list of KDHE certified labs can be obtained at: www.kdheks.gov/envlab/.

**STATE OF KANSAS
UST CLOSURE PROCEDURE**

The Kansas Department of Health & Environment provides the following guidelines for acceptable closure of Underground Storage Tanks. Failure to follow these guidelines may result in closure refusal by the KDHE and the need for additional work to be performed. Specific requirements may be provided by the KDHE district geologist.

If a representative from the KDHE is present during the removal of the UST(s) and associated product lines, closure can be granted without laboratory analyses being performed.

1. Inform the respective district office of the intent to permanently close UST(s). This notice should be made, at least, 30 days prior to the day the closure is to take place.
2. Following the removal of the UST(s) and associated piping, the following samples must be taken and submitted for laboratory analysis:
 - A. At least one discrete soil sample per UST must be taken from the excavation. This sample must be taken from a location in the basin that is most likely to be affected by a release. Excavation into native soil should be done before the sample is taken. Field screening should be performed at locations where there is visible staining. If field screening indicates TPH levels above remedial levels, a discrete sample from that location must be submitted for laboratory analysis.
 - B. At least one discrete sample per 20 feet of line trench must be submitted for laboratory analysis. If field screening indicates TPH levels above remedial levels, discrete samples from those locations must be submitted for laboratory analysis.
 - C. If groundwater is encountered during excavation, a water sample must be submitted for laboratory analysis.

*NOTE- All samples must be collected according to EPA Quality Assurance/Quality Control guidelines. Waste authorization number(s) must be obtained from Solid Waste Section for contaminated soil disposal and included in all closure reports.

Land farming of contaminated soil is permissible. However, a site cannot be closed until the land farmed soil is analyzed, and contamination levels fall below remedial levels. Permits must be obtained from KDHE for land farming of petroleum contaminated soils. Applications for permits may be obtained from KDHE's Bureau of Waste Management (785) 296-1600.

If UST(s) and/or associated product lines are to be abandoned in place, the following procedures must be followed for acceptable closure.

1. The UST must be disconnected from all associated piping, drained of product and cleaned. Sludge's that remain must be removed. The UST must then be filled with an inert, solid material and capped with cement or grout/cement mixture.
2. In place closure of product lines will not depend solely on pressure testing. In order to properly close product lines, discrete soil samples must be collected along the line trench. At least one sample per 20 feet of line trench must be submitted for laboratory analysis.
3. Discrete soil samples must be taken from locations adjacent to both ends of the UST. These samples must be taken from a depth of one, five, ten and fifteen feet and submitted for laboratory analysis. It is advisable that the analysis be completed before the UST is filled.

For closure of any site where field screening and/or laboratory analysis indicates contamination levels above remedial levels and groundwater is at a depth of 40 feet or less, a monitoring well may be required to be installed in a down gradient position. The installation of a monitoring well is at the discretion of the district geologist.

If laboratory analysis indicates contaminant levels below remedial levels, closure will be granted pending review

of the report by KDHE district personnel. If levels are above remedial levels, the KDHE will request that additional remedial work be performed.

The accepted analytical methods for soils and water are attached. For TPH in soils, EPA method 418.1 will not be accepted for any contaminant other than lubrication or waste oil. Any removal or abandonment operations must be performed by a KDHE licensed contractor and all analyses must be performed by a KDHE certified laboratory. If you have any questions about these guidelines, you may contact Roger Boeken at (785)296-1674.

SITE RANKING AND RISK BASED CORRECTIVE ACTION

KDHE developed a site ranking system in 1992 to assign relative priority to sites that required corrective action to be implemented. The ranking system assigns scores for parameters including: hydrogeology, product released, presence of free phase product, presence of likely conduits, property use and availability of useable groundwater. Use of groundwater is a primary component of the final score a site receives. A public or private well being used in the area will significantly raise the priority of a specific site.

In an effort to enhance the risk based decision making process, KDHE has developed and implemented a Kansas Risk Based Corrective Action (KRBCA) program. The program generally follows the ASTM prototype and is intended to develop defensible decision making criteria. The KRBCA guidance may be requested from the department by contacting Roger Boeken at (785) 296-1674.

For sites where the owner does not wish to apply for assistance from the Petroleum Release Trust Fund (Pet Fund), the KRBCA process will be overseen by the district staff. District office staff and their phone numbers are listed on the second page of this document. Staff in the KDHE central (Topeka) office will oversee and implement the KRBCA process for sites where corrective action is addressed through the Pet Fund.

APPROVED ANALYTICAL METHODS FOR ORGANIC COMPOUNDS

ANALYTE	SOLID AND HAZARDOUS WASTE METHODS		WATER METHODS	
	No.	PARAMETER	No.	PARAMETER
Benzene	8020*	Aromatic Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524.2	Purgeable Organic Compounds
BTEX	8020*	Aromatic Volatile Organics	602	Purgeable Aromatics
	8021*	Halogenated and Aromatic Volatiles	624	Purgeables
	8240	Volatiles	1624	Volatile Organic Compounds
	8260	Volatiles		
1,2-DCA	8010*	Halogenated Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524	Purgeable Organic Compounds
	8261	Vacuum Distillation in Combination with GC/MS	502.1	Volatile Halogenated Organic Compounds
			502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
Ethylbenzene	8020*	Aromatic Volatile Organics	504.1	Microextraction and GC
	8021*	Halogenated and Aromatic Volatiles	524.1	Purgeable Organic Compounds
	8240	Volatiles	524.2	Purgeable Organic Compounds
	8260	Volatiles	601	Halogenated Volatile Organics
MtBE			624	Purgeables
	8020*	Aromatic Volatile Organics	1624	Volatile Organic Compounds
	8021*	Halogenated and Aromatic Volatiles	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8240*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8260	Volatiles	524.1	Purgeable Organic Compounds
			524.2	Purgeable Organic Compounds
Naphthalene	8021*	Halogenated and Aromatic Volatiles	602	Purgeable Aromatics
	8100	Polynuclear Aromatic Hydrocarbons	624	Purgeables
	8250	Semivolatile Organic Compounds	1624	Volatile Organic Compounds
	8270	Semivolatile Organic Compounds		
	8310	Polynuclear Aromatic Hydrocarbons	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8260	Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
			524.2	Purgeable Organic Compounds
Toluene			550	Polycyclic Aromatic Hydrocarbons
	8020*	Aromatic Volatile Organics	550.1	Polycyclic Aromatic Hydrocarbons
	8021*	Halogenated and Aromatic Volatiles	610	Polynuclear Aromatic Hydrocarbons
	8240	Volatiles	625	Base/Neutrals & Acids
	8260	Volatiles	1625	Semivolatile Organic Compounds
			502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
			503.1	Volatile Aromatic & Unsat. Organic Cmp.
			524.1	Purgeable Organic Compounds
		524.2	Purgeable Organic Compounds	
		602	Purgeable Aromatics	
		624	Purgeables	
		1624	Volatile Organic Compounds	

APPROVED ANALYTICAL METHODS FOR ORGANIC COMPOUNDS

ANALYTE	SOLID AND HAZARDOUS WASTE METHODS		WATER METHODS	
	No.	PARAMETER	No.	PARAMETER
Xylene	8020*	Aromatic Volatile Organics	502.2	Volatile Org. Cmp., Purgeable Org. Cmp.
	8021*	Halogenated and Aromatic Volatiles	503.1	Volatile Aromatic & Unsat. Organic Cmp.
	8240	Volatiles	524.1	Purgeable Organic Compounds
	8260	Volatiles	524.2	Purgeable Organic Compounds
EDB	8260	Volatiles	504.1	Microextraction and GC
	8011	Micorextraction and GC with Electron Capture	555.1	Liquid-Liquid Extraction and GC with Electron Capture
	8021B	GC using Photoionization and/or Electrolytic Conductivity Detectors		
Polynuclear Aromatic Hydrocarbons	8310	Polynuclear Aromatic Hydrocarbons	610	Polynuclear Aromatic Hydrocarbons (High performance Liquid Chromatography)
	8270C	Semi Organic Compounds by GC/MS, Cap Column		
Lead	7420	AA Direct Aspiration	239.2	Atomic Absorption Spectrometry (Graphite Furnace)
	7421	Atomic Absorption, Furnace Technique	200.8	Inductively Coupled Plasma Mass Spectrometry
			200.9	Atomic Absorption Spectrometry-Stabilized Temperature (Graphite Furnace) Method

* Water samples must be prepared using method 5030 (purge & trap extraction) if this test method is used.

Air Sample Analysis:

40 CFR Ch. 1 (7-1-91 Edition) Part 60, Appendix A, Method 18 (Flexible Bag Procedure)

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