

Training for Class I Disposal Wells Module #1 Monitoring & Reporting

Disclaimer

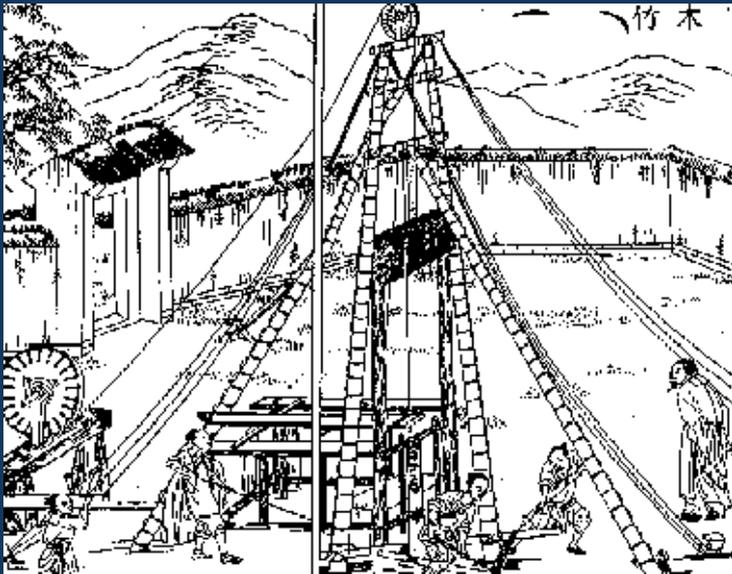
This outreach module is for informational and educational purposes only. It is not to be considered as a complete listing of requirements. The operator must review the applicable state and federal regulations and statutes and the facility UIC permit to determine the requirements. Nothing contained herein should be construed as legal advice by KDHE.

Purpose of KDHE's Environmental Programs

- The mission of the KDHE Division of Environment, which the UIC Program is located, is the protection of the public health and environment.
- The Division conducts regulatory programs involving public water supplies, industrial discharges, wastewater treatment systems, solid waste landfills, hazardous waste, air emissions, radioactive materials, asbestos removal, refined petroleum storage tanks, and other sources which impact the environment. In addition, the Division administers other programs to remediate contamination, lessen nonpoint pollution, and evaluate environmental conditions across the state.

Regulatory History of UIC Wells

China – Drilling for Salt Circa 400 AD
to Depths of 3000 Feet – First Injection Well



Chinese technology included drilling into a salt deposit, with at least two holes one to feed and flood fresh water into the salt formation, and the second hole to allow the water to ‘well’ up after dissolving the salt, into evaporation pans, where it could be again concentrated by evaporation. Evaporation would then occur either by solar, heat, or by manual boiling using convenient fuel for burning.

Regulatory History of UIC Wells

- Since the 1930s, oilfield brines have been injected into formations containing naturally occurring mineralized waters.
- Industrial waste injection started in 1950 with Dow Chemicals injecting industrial fluids into deep wells.
- In the 1960's, DuPont Chemicals also started injecting industrial wastes into deep wells.

Regulatory History...cont'd

- In the early 1970s, wastes injected into an abandoned oil well by a paper mill in Hammermill, PA spilled out and contaminated the surrounding areas.
- This attracted the attention of the EPA and the State of Pennsylvania.
- There were several other incident.

Regulatory History...cont'd

- In order to provide EPA the authority to regulate injection wells, Congress, in passing the Safe Drinking Water Act (SDWA) in 1974, provided EPA the authority to control underground injection to protect underground drinking water sources (SDWA, Part C, Sections 1421-1426).
- EPA published final technical regulations for the UIC program in 1980, which included minimum standards state programs must meet to receive primacy for the Section 1422 UIC Program.

Regulatory History...cont'd

- Primacy – State UIC Programs have primary enforcement responsibility once their UIC Program has been approved by EPA.
- Direct Implementation – If a state does not obtain primacy for all or some classes of wells, EPA implements the program directly through one of its Regional Offices.

Regulatory History...cont'd

- In 1981, Congress passed amendments to the SDWA (Section 1425), which allowed the delegation of the UIC program for oil and gas related injection wells to states.
- Between 1981 and 1996, EPA granted primacy to 34 states for all injection wells (except those in Indian Lands).
- EPA implements the program directly in 10 states and shares responsibility in 6 states.

The UIC Program in Kansas

- The KDHE received primacy from EPA, Region 7 on December 2, 1983 to implement the Section 1422 UIC program.
- The major elements of the primacy document consist of State statutes and regulations, Statement of Legal Authority, Memorandum of Agreement and Program Description.

KDHE EPA Relationship

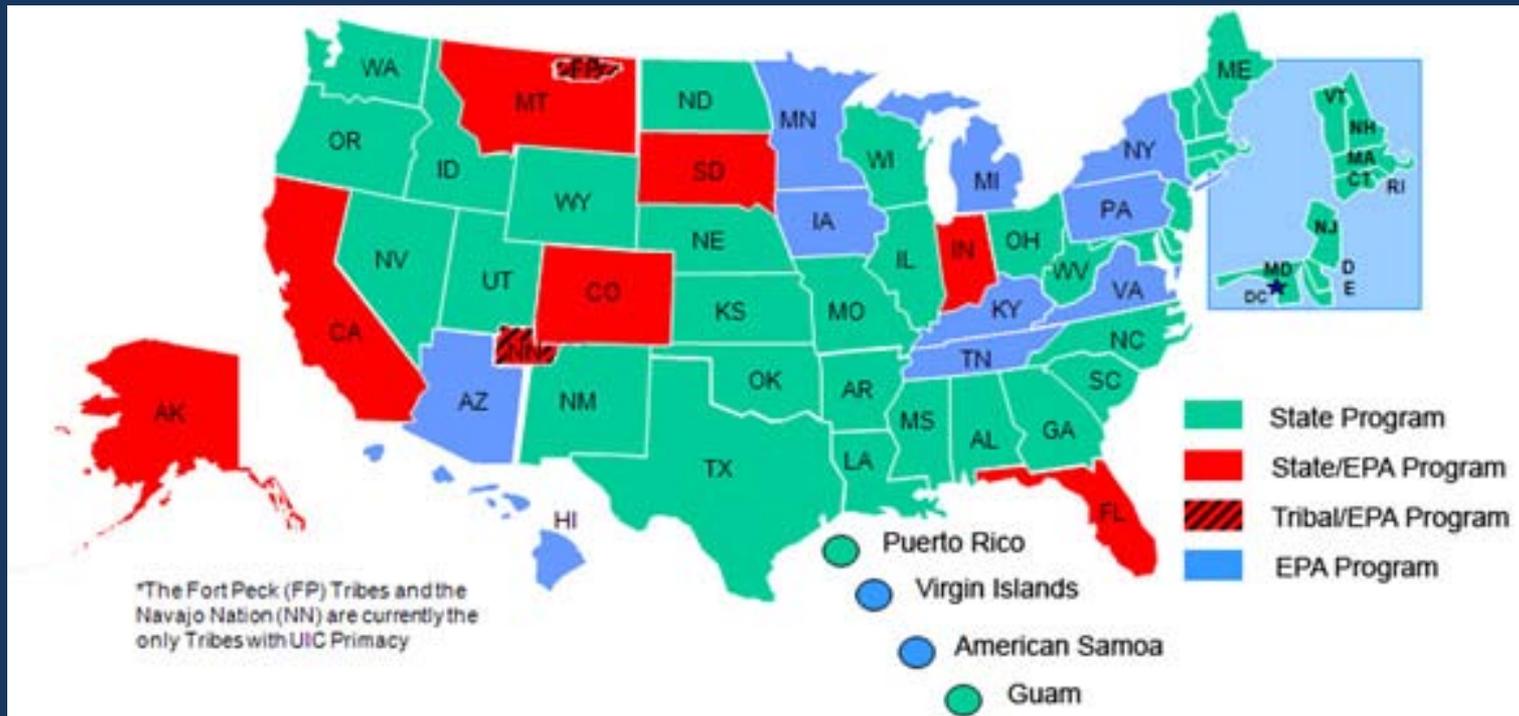
KDHE IMPLEMENTS THE UIC PROGRAM IN KANSAS FOR EPA

KDHE - Has Primacy over the UIC Program for Class I, III, IV and V wells. This means KDHE administers in Kansas the program for EPA.



Other states have Direct Implementation. That means the EPA administers the program for that state.

UIC Programs



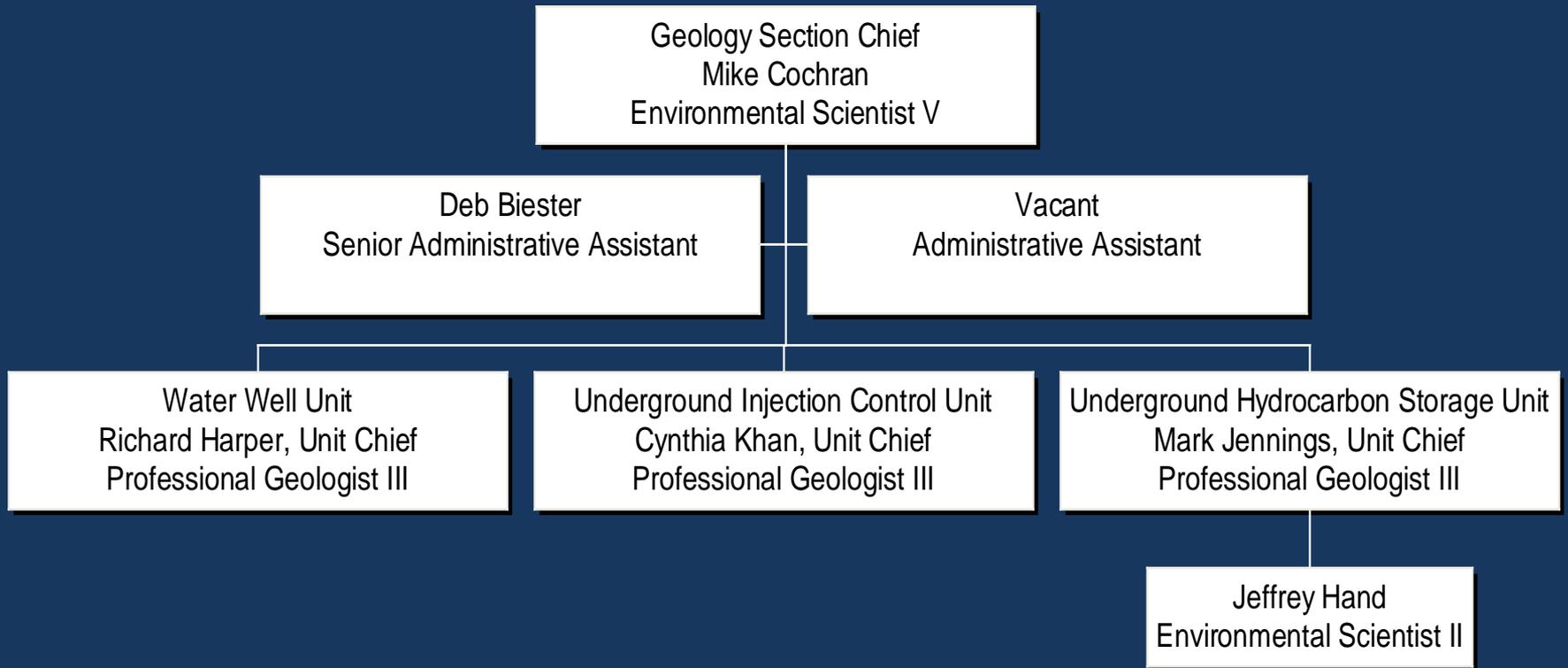
State UIC Programs

CLASS I WELL INVENTORY FOR THE UNITED STATES
TOP FIVE STATES WITH LARGEST NUMBER OF CLASS I WELLS

STATE	NON-HAZARDOUS	HAZARDOUS	TOTAL
Florida	216	1	217
Texas	45	62	107
Kansas	60	5	65
Wyoming	63	0	63
California	46	0	46

Geology Section

Bureau of Water



Purpose of the UIC Program

Function of the UIC program is to ensure the injection of fluids is done in a controlled manner that will:

- Protect the soils and waters of the state from contamination.
- Protect public health.
- Conserve the water resources of the state.

How do we dispose of waste?



- The generation of waste is an unavoidable result of the manufacturing and industrial processes which produce thousands of the products we use every day.
- Industry continues to reduce waste by recycling and waste minimization activities, but there are still many wastes which require disposal.
- There are many environmentally sound disposal methods including incineration; biological or chemical treatments; properly located and constructed landfills; and for certain wastes, disposal through injection wells.
- KDHE has a policy for determining which wastes are eligible for disposal into Class I injection wells.



Wastes Eligible for Disposal

- Wastes that cannot feasibly be treated, stored or disposed by other methods.
- For new injection proposals a report must be submitted detailing the results of studies of alternate methods of:
 - waste treatment,
 - storage or disposal technologies
 - including an economic analysis based on a 30 year time period, justifying why subsurface disposal is considered the most feasible method of disposal.

UIC DEFINITIONS

- **INJECTION**

The subsurface emplacement of fluids through a well.

- **INJECTION WELL**

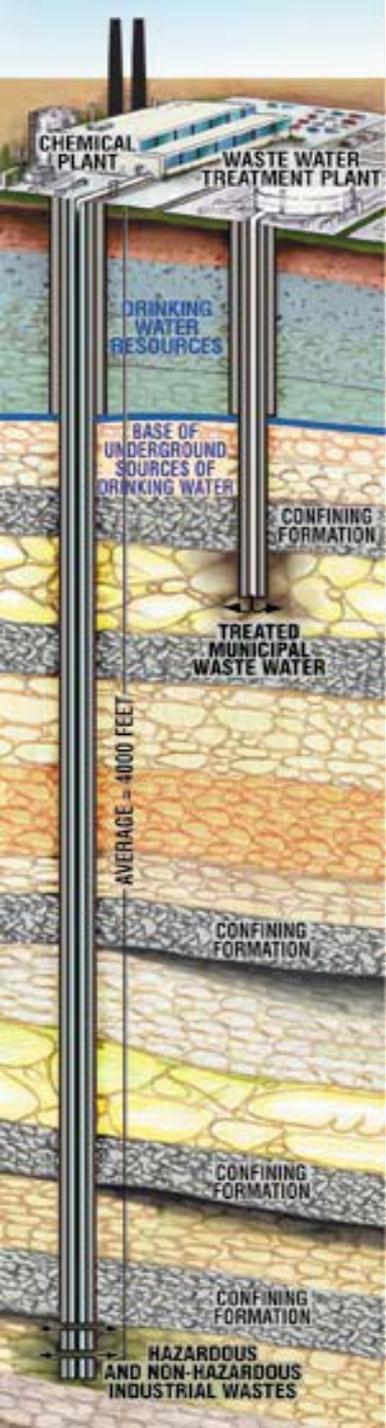
A bored, drilled or driven shaft whose depth is greater than the largest surface dimension; or, a dug hole whose depth is greater than the largest surface dimension; or, an improved sinkhole; or, a subsurface fluid distribution system.

- **SUBSURFACE FLUID DISTRIBUTION SYSTEM**

An assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground. This includes a leachfield system.

- **FLUID**

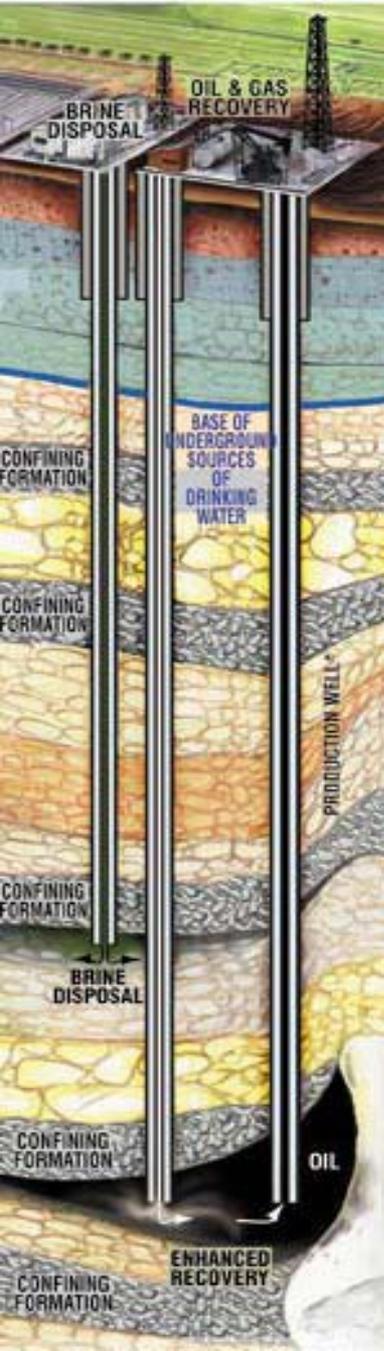
Any material that flows or moves whether it is semi-solid, liquid, sludge or gas.



CLASS I INJECTION WELLS

REGULATED BY KDHE

These wells inject hazardous waste as defined under the Resource Conservation Recovery Act (RCRA) and non-hazardous wastes into deep rock formations that are separated vertically from the lowermost source of fresh or usable water by many layers of impermeable shales and limestones.



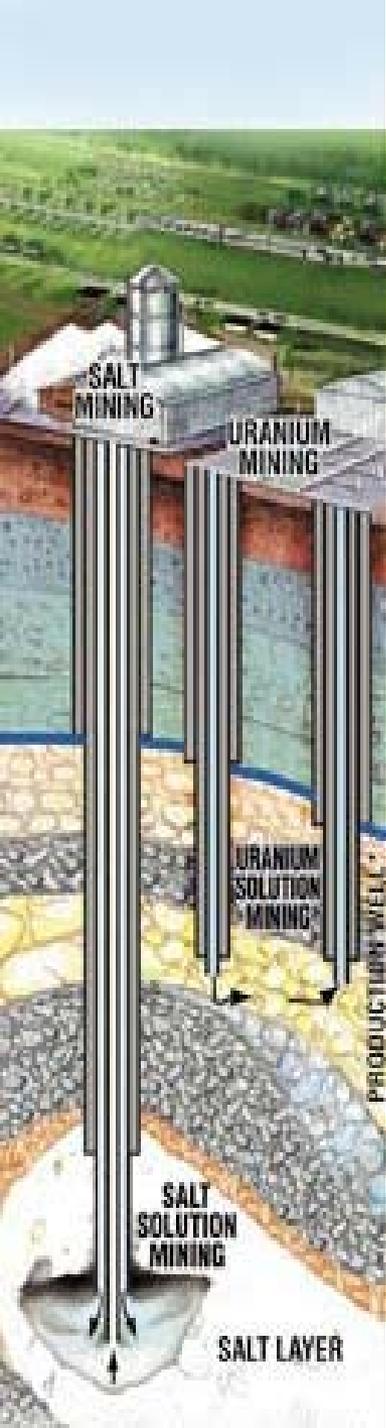
CLASS II INJECTION WELLS

REGULATED BY KCC

These wells are used for injection of fluids brought to the surface in connection with oil and natural gas production. The Kansas Corporation Commission regulates Class II wells.

CLASS III INJECTION WELLS

REGULATED BY KDHE



- Class III wells inject steam or water into mineral formations, which dissolves or loosens minerals, which are then pumped to the surface and extracted. More than 50 percent of the salt and 80 percent of the uranium extracted in the U.S. are produced this way.
- In Kansas the only mineral mined in this manner is salt.



CLASS IV INJECTION WELLS

REGULATED BY KDHE

These wells inject hazardous waste as defined under RCRA or radioactive wastes into or above the fresh or usable water zone.

These wells are prohibited because they directly endanger the environment and public health.

CLASS V INJECTION WELLS

REGULATED BY KDHE



These injection wells are not included in Class I, II, III, IV or VI. Typically Class V wells are **shallow** wells used to place a variety of nonhazardous fluids, that is those wastes which are not hazardous waste under RCRA, directly below the land surface. The fluid injected into certain types of Class V wells is non-hazardous, but can in some cases contain contaminants. Remedial wells fall in this category.

CLASS V INJECTION WELLS....cont'd

Common Types of Class V Wells

- **Large Capacity Septic/Cesspool Systems**
- **Motor Vehicle Waste Disposal Wells**
- **Storm Water Drainage Wells**

Other Types of Class V Wells

- **Aquifer Recharge/Recovery**
- **Aquifer Remediation (BER)**
 - **In-Situ Fossil Fuel Recovery**
 - **In-Situ Bioremediation**
 - **Air Sparging**
- **Geothermal Return Flow**
 - **Heat Pump/Air Conditioning Return Flow**
- **Mine Backfill**
- **Subsidence Control**
- **Salt Water Intrusion Barrier**
- **Agricultural Drainage**
- **Special Drainage**
- **Sewage Treatment Effluent**
- **Food Processing Disposal**

NEW
Class VI wells-
Inject CO₂ for
long-term storage to
reduce emissions
to atmosphere



Not drawn to scale

CLASS VI INJECTION WELLS

REGULATED BY US EPA

A new class of injection well

Class VI wells are used for injection of carbon dioxide for geologic sequestration (geosequestration).

Operation, Monitoring and Reporting Requirements



Where do I look for the monitoring requirements?

- **40 CFR 146.13 lists the “Operating, Monitoring and Reporting Requirements” for the federal program.**
- **K.A.R. 28-46-30 which references 40 CFR 146.13 establishes the “Operating, Monitoring and Reporting Requirements” for the KDHE program.**

Where do I look for the monitoring requirements? cont.

- **K.A.R. 28-46-9 Establishes Permit Conditions and references 40 CFR 144.52 This allows KDHE to establish additional monitoring requirements in the permit.**
- **40 CFR 144.52 states “ the Director shall establish conditions, as required on a case-by-case basis.”**

What does this mean?

KANSAS UNDERGROUND INJECTION
CONTROL PERMIT
CLASS I NON-HAZARDOUS WASTE INJECTION WELL

Pursuant to the provisions of Kansas Statutes Annotated (65-164, 65-165, 65-166, 65-170g and 65-171d) and Kansas Administrative Regulations (Chapter 28, Article 46),

Owner:

Operator:

Facility Address:

Telephone Number:

Facility Name:

Facility Location:

Facility Telephone Number:

Well Identification: #2

Well Location:

Receiving Formation: Arbuckle

is authorized to inject non-hazardous liquid wastes from this facility in accordance with the construction, operation, monitoring and reporting requirements as set forth herein.

The permittee shall comply with all conditions in this permit, federal and state regulations governing Class I non-hazardous waste injection wells and the requirements of the Kansas Department of Health and Environment (KDHE).

This permit shall become effective November 10, 2006, will supersede all previous permits and/or agreements in effect between KDHE and the permittee, and will expire July 18, 2015.

FACILITY DESCRIPTION: The facility is used for underground storage of hydrocarbons.

Secretary, Kansas Department of Health and Environment

June 11, 2008

Date

I. INJECTION LIMITATIONS, MONITORING, REPORTING AND TESTING REQUIREMENTS

- A. The permittee is authorized to inject non-hazardous liquid waste from this facility consisting of waste brines from the underground hydrocarbon storage operation, cooling tower blowdown, storm water, filter washwater, non-hazardous equipment washwater, amine water and instrument air knockout water.
- B. Such injection shall be controlled, limited and monitored by the permittee as specified in this permit. Monitoring data required to be submitted to KDHE on a monthly basis shall be submitted no later than twenty-eight (28) days after the last day of the month for which the monitoring data are being reported. Monitoring data required to be submitted to KDHE on a quarterly basis shall be submitted no later than twenty-eight (28) days after the last day of the calendar quarter for which monitoring data are being reported. All monitoring data required for reports shall be submitted on forms prescribed by KDHE. Monitoring reports and other information required by this permit shall be directed to:

Kansas Department of Health and Environment
 Bureau of Water
 1000 SW Jackson St. Suite 420
 Topeka, Kansas 66612-1367

C.

Injection and Operational Parameters	Injection or Parameter Limitation	Measurement or Analysis Frequency	Reporting Requirement	Sample or Measurement Type
Injection Pressure (inches mercury or pounds per square inch gauge)	Gravity flow, no pump pressure allowed	*	Monthly	Gauge and Continuous Recording Device **
Maximum Daily Injection Volume (gallons per day)	882,000 gpd	*	Monthly	Meter or Continuous Recording Device **
Injection Rate (gallons per minute)	Monitor	*	Monthly	Meter or Continuous Recording Device **

Injection and Operational Parameters	Injection or Parameter Limitation	Measurement or Analysis Frequency	Reporting Requirement	Sample or Measurement Type
Minimum Allowable Operating Annulus Pressure (pounds per square inch gauge)	60 psig	*	Monthly	Gauge and Continuous Recording Device **
Seal Pot Liquid Level (inches)	Liquid level must be visible in sight glass	*	Monthly	Sight Glass **
pH (standard units)	5.0-10.0	Weekly	Monthly	Grab
Temperature (°F)	Monitor	Weekly	Monthly	Grab
Chloride (mg/l)	Monitor	Weekly	Monthly	Grab
Conductivity (Mmhos)	Monitor	Quarterly	Quarterly	Grab
Total Alkalinity as CaCO ₃ (mg/l)	Monitor	Quarterly	Quarterly	Grab
Total Hardness as CaCO ₃ (mg/l)	Monitor	Quarterly	Quarterly	Grab
Calcium (mg/l)	Monitor	Quarterly	Quarterly	Grab
Magnesium (mg/l)	Monitor	Quarterly	Quarterly	Grab
Sulfate (mg/l)	Monitor	Quarterly	Quarterly	Grab
Iron (mg/l)	Monitor	Quarterly	Quarterly	Grab
Total Dissolved Solids (mg/l)	Monitor	Quarterly	Quarterly	Grab
Benzene Daily Maximum (mg/l)	***L.T. 0.5	Quarterly	Quarterly	Grab

* Conduct one daily inspection reading for reporting purposes

** The gauge, meter, continuous recording device or sight glass shall at all times be maintained operational and shall at all times be located to properly measure the activity being monitored.

*** L.T. denotes "less than"

Note: Quarterly analysis frequency and reporting is based upon calendar quarters.

Your Permit Tells You.....

- What you are authorized to inject.
- How often monitoring reports are to be submitted to KDHE (no later than 28 days after the end of the month being reported).
- Injection and operational parameters and limits. (Example -Maximum Daily Injection Volumes)
- Data that must be reported.

The federal and state regulations establish the monitoring requirements and these regulations also allow KDHE to establish additional requirements to address a specific situation.

- To sum it up: Your Class I Permit will have all of the necessary information you need to know about monitoring requirements, but you still must be familiar with the Federal and State Regulations.
- You must follow your permit requirements to be in compliance.
- The permit must be readily available for reference purposes to those responsible for operation of the well.

Permit Violations

- Occasionally operators violate permit requirements.
- Operators usually correct compliance problems quickly and effectively, however, there are some instances in which administrative orders and fines must be issued.



What can happen if you violate your permit?



- The company may receive a notice of violation, a directive order or an administrative order.
 - The company may be issued an administrative penalty order of up to \$10,000 a day for each day the company is in violation. Penalty provisions are authorized by KSA 65-170d.
- Revocation of permit.

What to send in to KDHE?

No later than 28 days after the end of the month.

- The monitoring report form properly completed.
- Explanation of any anomalies or violations and description of corrective action implemented.
- Explanation for any monitoring data not obtained and corrective action implemented.



All monitoring data required for reports shall be submitted on forms prescribed by KDHE.

CLASS 1
INJECTION WELL MONITORING REPORT

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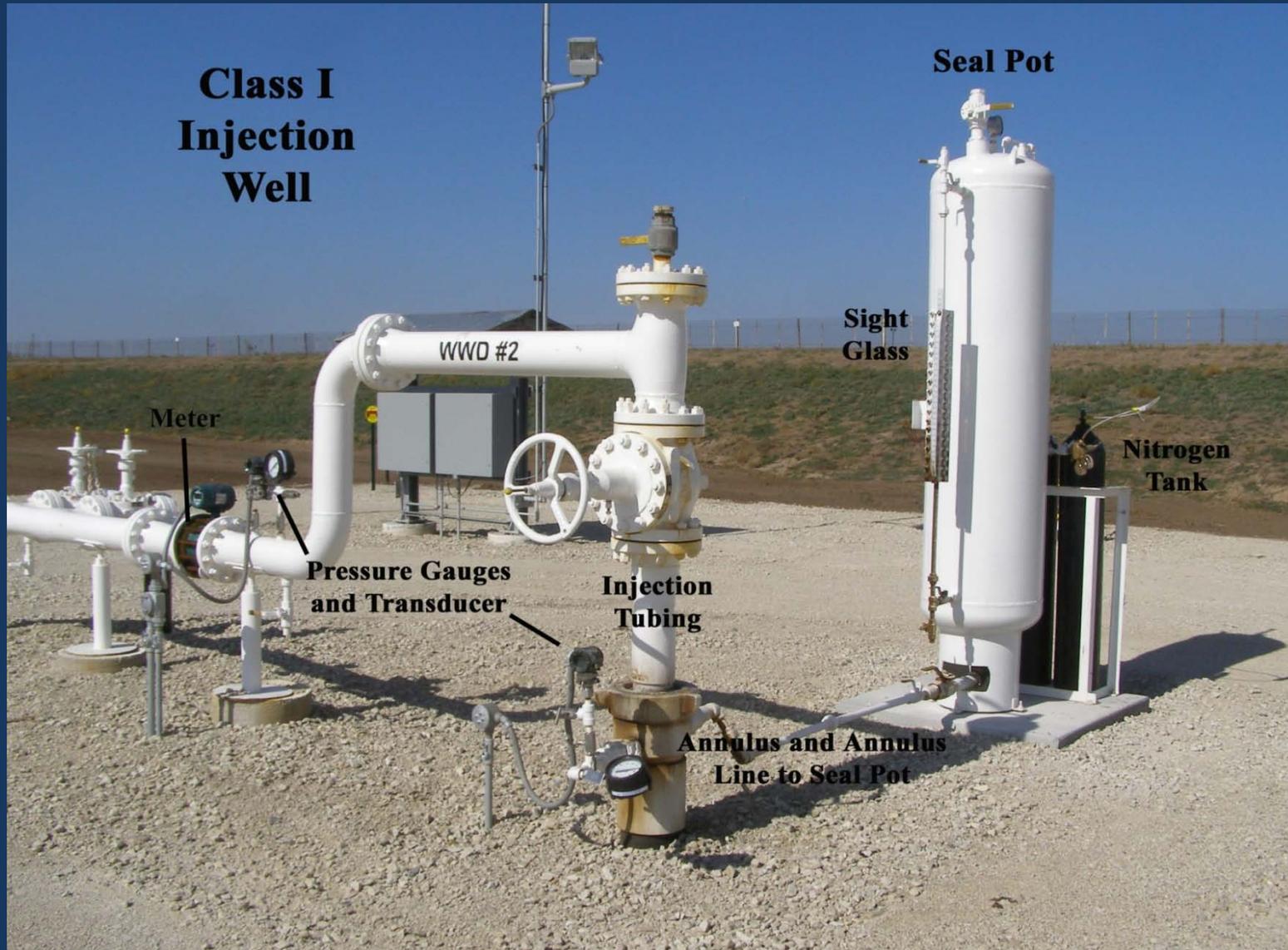
Month of _____, 19__
Parcel # _____

Company: _____ County: _____
 Address: _____ Legal Description: _____
 Facility: _____ Well No: _____

Day	Time	Injection Volume (gpd) 264,000 max.	Injection Rate (gpm)	Anulus Pressure (psig) 30 (psig) min		Injection Pressure (psig) (psig) max (psig) min		Conductivity (µmhos)	Seal Pot. Fluid Level (mbs)	Addition of Fluid to Seal Pot. (gpg, max.)	Notes
				Charge	Cont. Record	Charge	Cont. Record				
1											
2											
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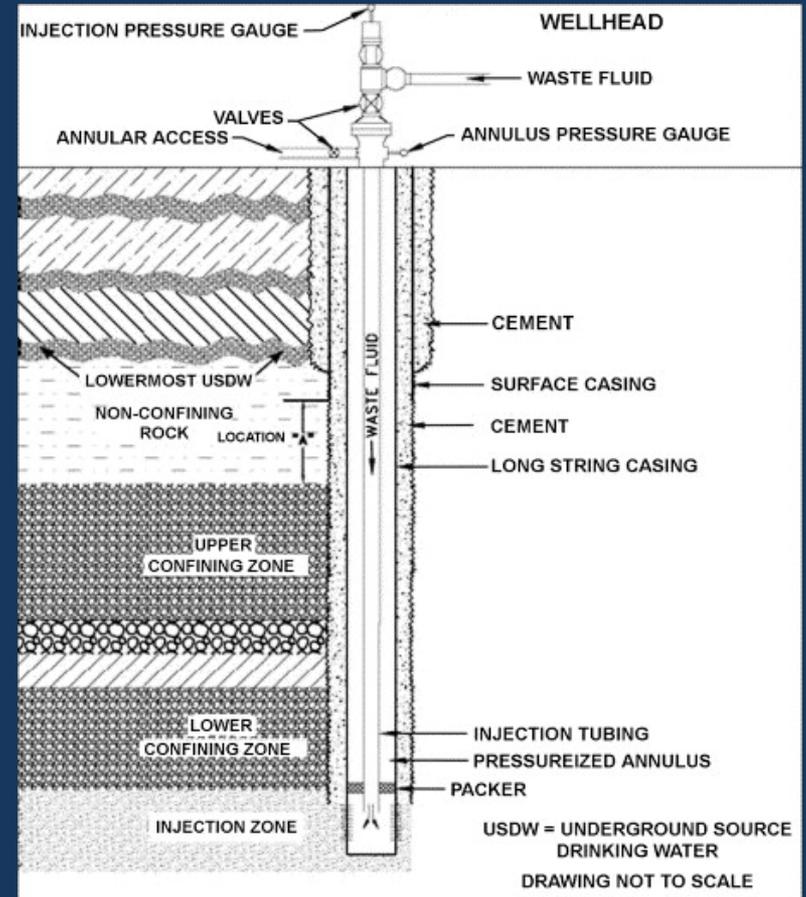
KDHE allows companies to make their own forms as long as it provides the information required and is in a format acceptable to KDHE.

Class I Wells

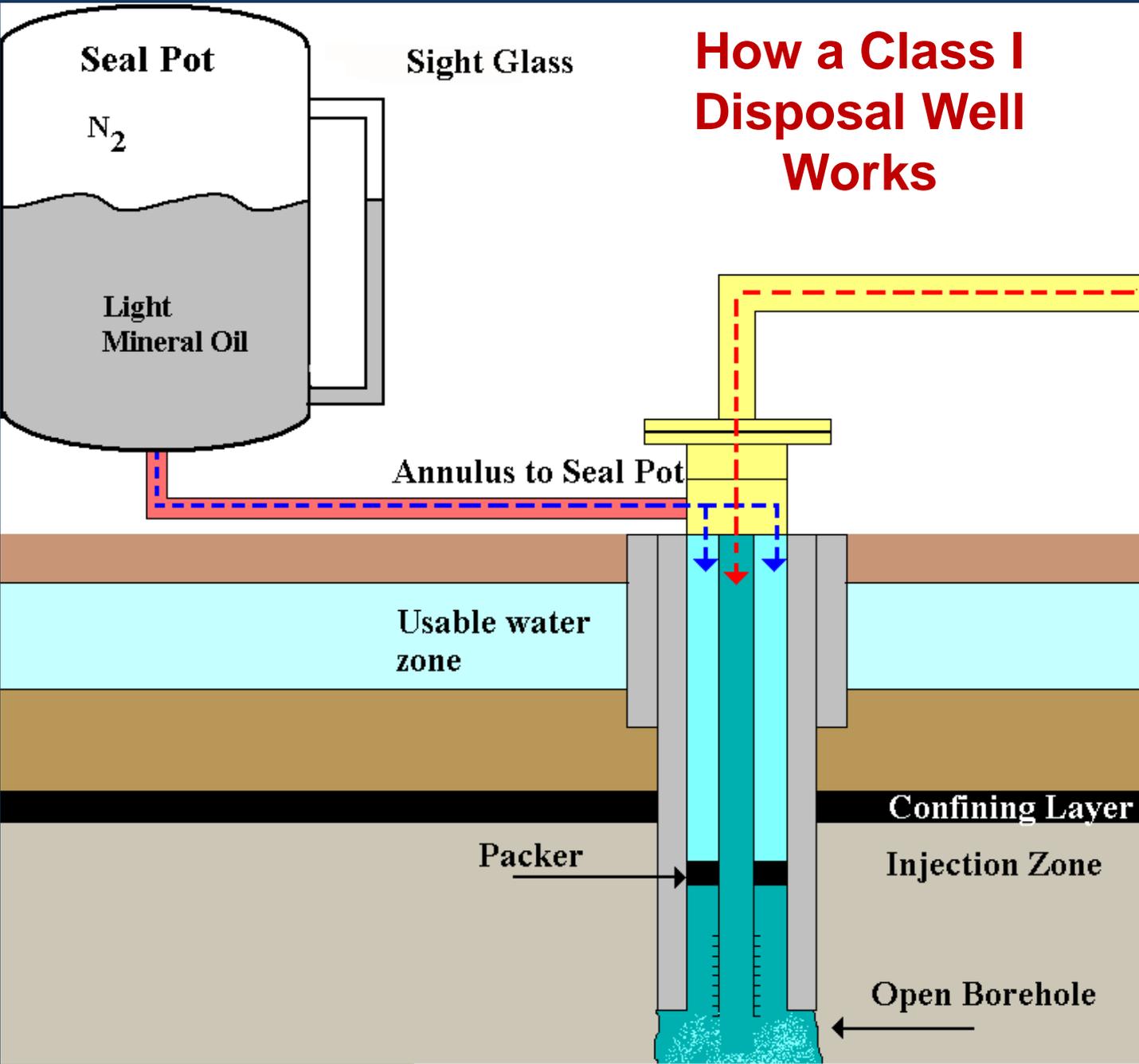


KDHE considers a Class I well to have at least six layers of protection:

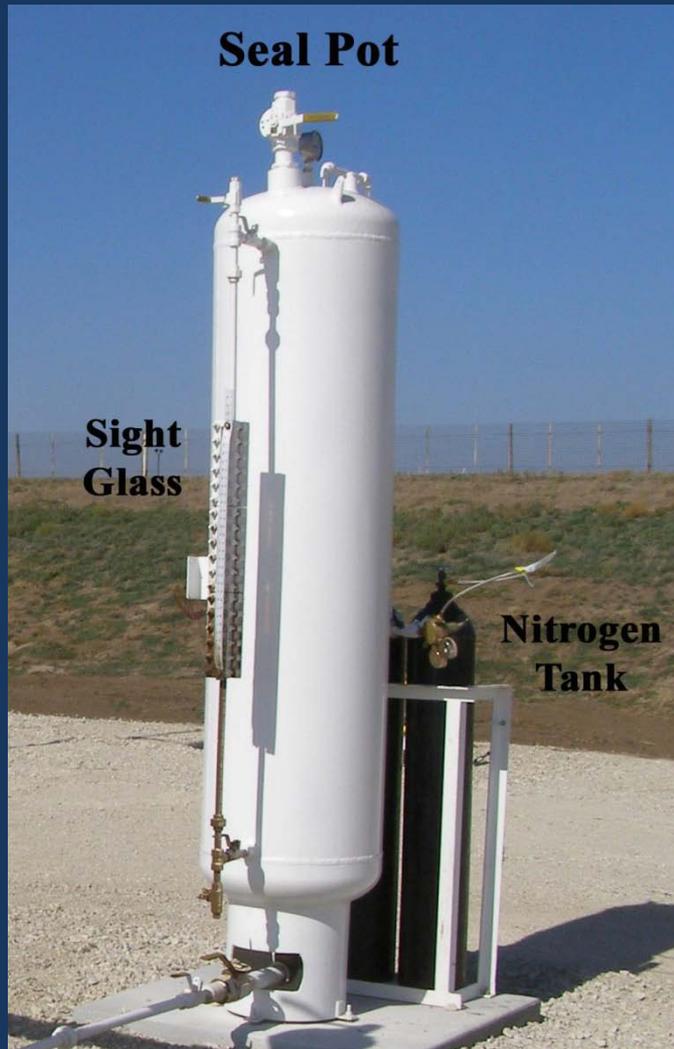
1. Surface casing
2. Cemented surface casing
3. Longstring casing
4. Cemented longstring casing
5. Injection tubing
6. Casing tubing annular fluid



How a Class I Disposal Well Works



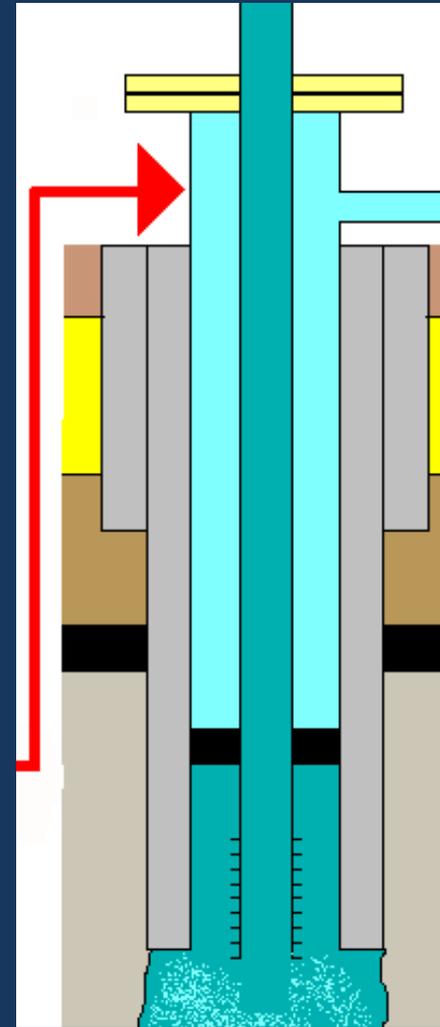
Seal Pot Expansion / Contraction



- Allows for expansion of annular fluid to prevent damage to well components.
- Maintains pressure on annular monitoring system.
- Allows us to monitor the annulus liquid level for indications of leakage.

Operating Annulus Pressure and Annulus Liquid Level

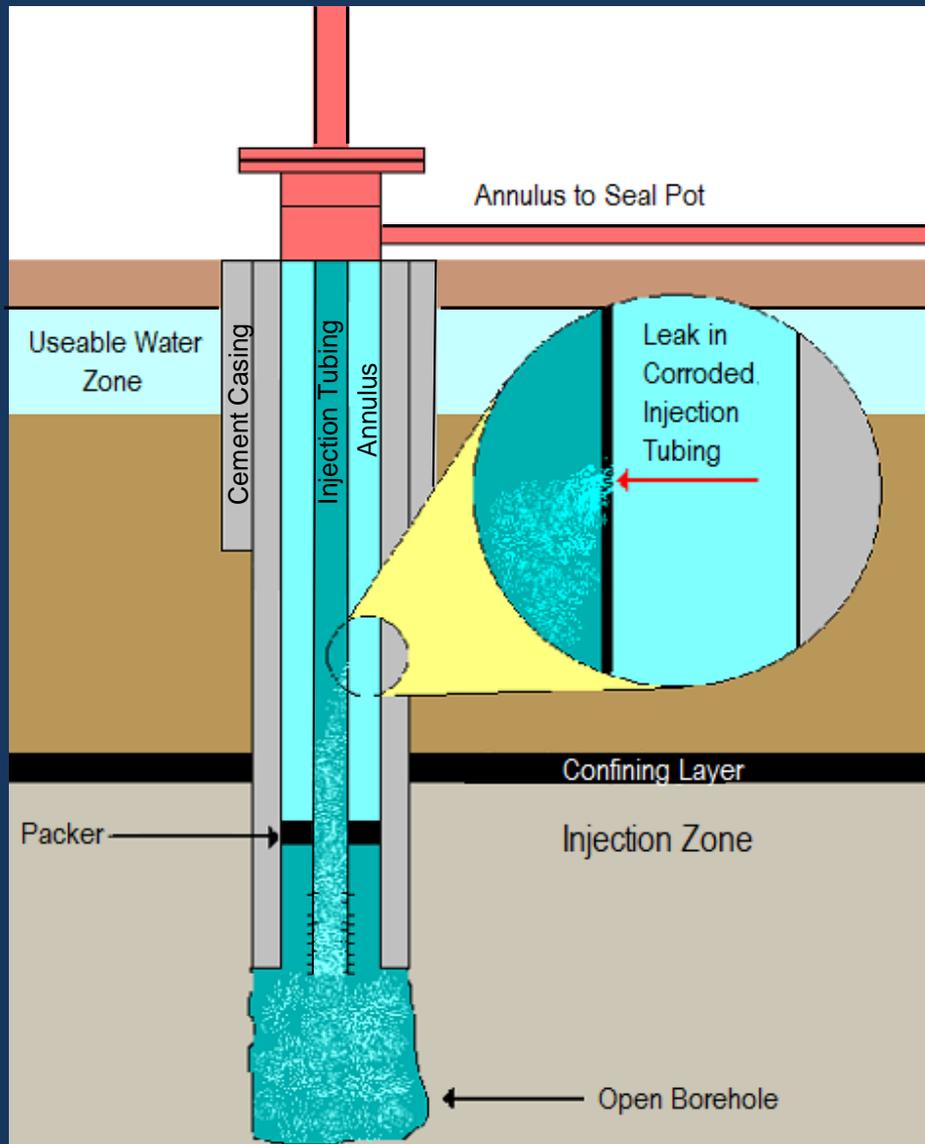
- Purpose:
 - To provide early detection of a leak
 - To prevent the contamination if a leak should develop
 - Indicates a leak in the injection tubing, packer or casing.
- Continuous monitoring of the annulus pressure and annulus liquid level can reveal a mechanical integrity problem before losing mechanical integrity.
 - Principle of the annulus monitoring system: The annulus functions like a sealed jar. If there are no leaks in the system, the annulus pressure and liquid both remain within a constant range of values.
- A down-hole problem will be indicated by a loss in annulus pressure and/or loss of annulus liquid.



Three Well Component Leaks Annulus Pressure or Annulus Liquid Level Losses Can Detect

1. Leak in the tubing
2. Leak in the Casing
3. Leak in the Packer

1. Through the tubing

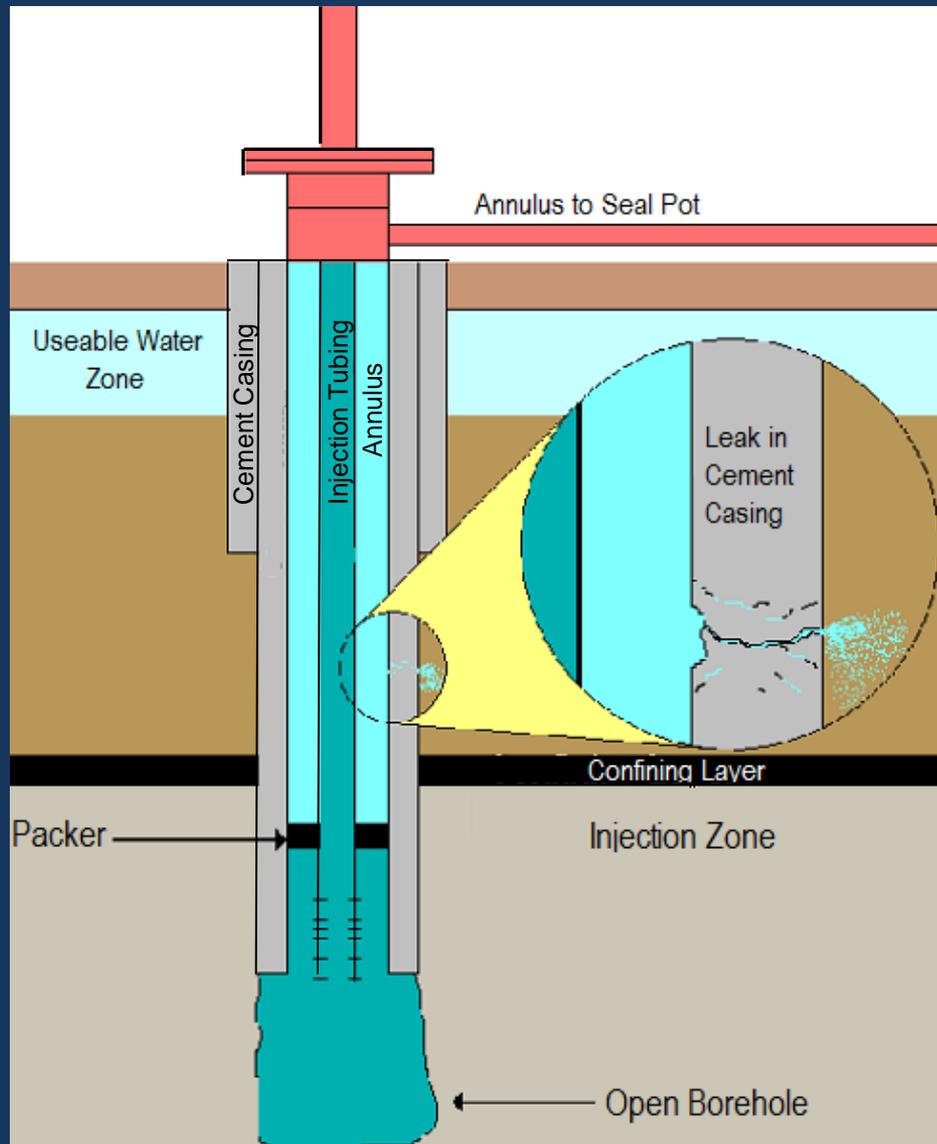


Years of use can cause the injection tubing to corrode.

Corrosion of the tubing can be caused by low pH waste, or oxygen in the presence of other constituents.

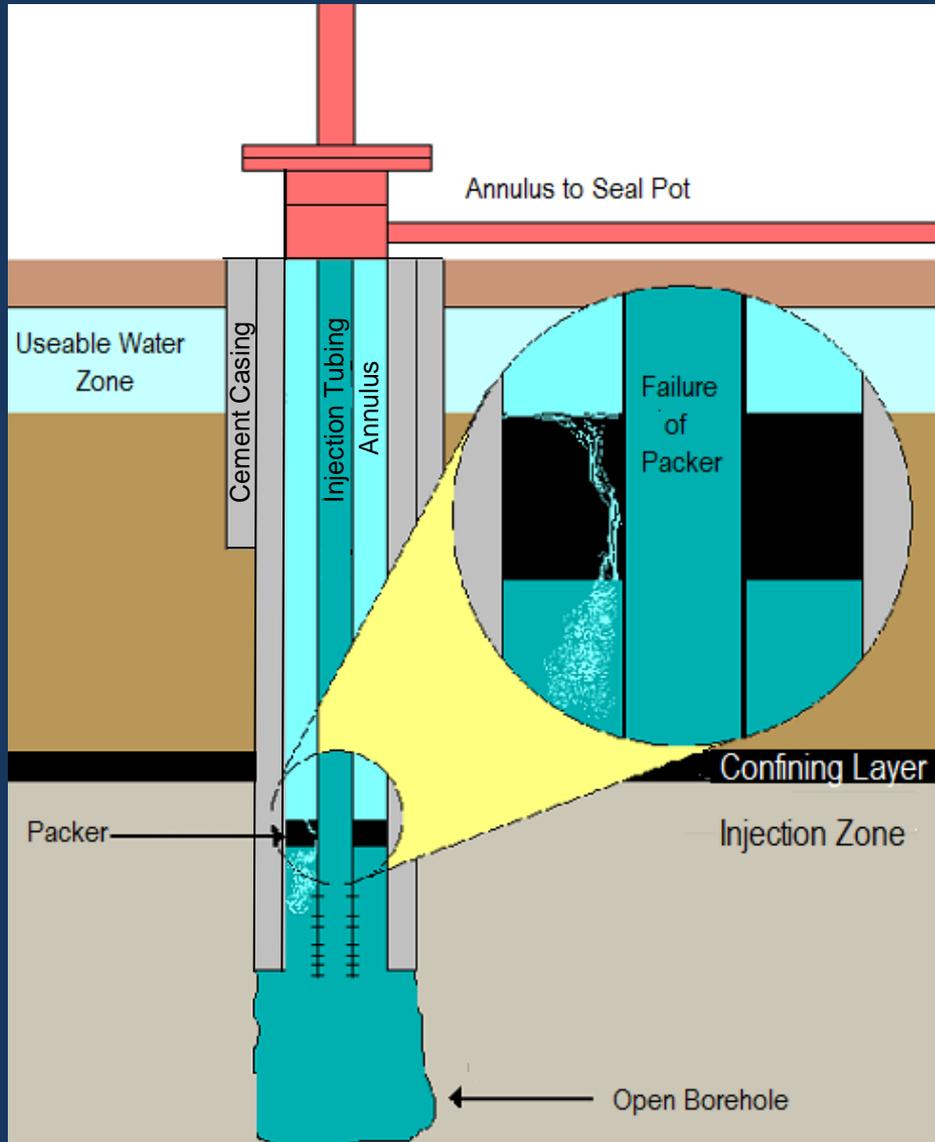
Suspended solids can also cause abrasion in the tubing.

2. Through the Casing



Defects in cementing can allow corrosive formation fluids to corrode the casing.

3. Through the Packer



Deterioration of the rubber sealing elements can cause the packer to leak.

Metal components in the packer can be corroded.

Reporting Annulus Pressure

Annulus pressure inspection readings must be recorded daily.

- Annulus pressure must be monitored by both a gauge and an electronic continuous recording device.
- Gauge readings and continuous recorder must correspond to each other.
- Annulus pressure must be maintained above the minimum pressure as described in the permit.
- Failure to maintain this minimum pressure is a significant violation of your permit, which can lead to an enforcement action.



Injection Volume

Injection volume must be recorded daily.

- Injection volume must be monitored by use of an appropriate type of flow meter.
- QUESTION: How much waste can be injected into the Class I well?
 - The permit states the maximum volume that can be injected for a single day.
- QUESTION: WHY must there be a limit?
 - It encourages waste minimization
 - Too large a volume could increase the extent of the cone of influence allowing movement through conduits not accounted for or evaluated.
 - Must be a practical volume for gravity fed wells.
- Injecting more than the maximum volume is a permit violation.

Injection Pressure

Injection pressure inspection readings must be recorded daily.



- Injection pressure must be monitored by both a gauge and an electronic continuous recording device.
- Injection Pressure for a Kansas Class I well is limited to gravity flow.
- Injection pressure is limited to reduce stress to the wells components.
- Limits injection pressure in the formation reducing potential problems such as reduced earthquakes.
- Limits severity of impact should a release occur.
- Gauge readings and continuous recorder must correspond to each other.

Specify what the units are: in Hg or PSIG.

Seal Pot

Liquid level inspection readings must be recorded daily.

- The liquid level must be monitored by use of a sight glass with a scale in inches.
- Addition of liquid must be reported in gallons, not inches.
- Report the volume of any liquid added to the seal pot.

Why?

- The seal pot monitors for significant leaks in the well. This allows us to monitor rate of liquid loss in the annulus.



Injection Rate

Injection rate must be recorded daily.

- This is a parameter that is required to be monitored, but is not a significant concern because of the injection pressure and daily volume limitations.
- Provides information on the performance of the well and injection capacity.



Injection Liquid Sample Analyses

- Sampling analysis are based on industry types.
 - Example: a beef packing company will have different constituents going down the well than a hydrocarbon fractionation facility
- Why are injectate samples analyzed?
 - To characterize the waste and determine if hazardous or nonhazardous.
 - Public, operators and regulators need to know what's going into the ground.
 - To detect characteristics that could damage the well components and/or disposal zone requiring a need for corrective action to be taken.
- For example, why test for pH?
 - If the pH is too low the waste is considered a hazardous waste and,
 - Low pH can damage well components.



Sampling

Weekly sampling should be done every 7 days.

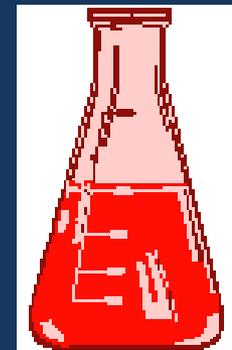
* To obtain an accurate representation of what is being injected, try to keep from sampling back to back.

November 2000 ▾

Monday Tuesday Wednesday Thursday Friday Saturday - Sunday

30	31	1 SAMPLE	2	3	4
					5
6	7	8 SAMPLE	9	10	11
					12
13	14	15 SAMPLE	16	17	18
					19
20	21	22 SAMPLE	23	24	25
					26
27	28	29 SAMPLE	30	1	2
					3

🗓️ 1 2 7 14 31



Signature

- The monitoring report form must be signed by someone who has signatory authorization. K.A.R. 28-46-22 establishes the signatory requirements.
- A responsible corporate officer such as: president, vice president, treasurer, secretary of the corporation in charge of a principal business function or any other person who performs similar policy or decision making functions for the corporation, must sign the form.
- Signatory authorization can be appointed by a responsible corporate officer:
 - A Plant Manager if that company has 250 people employed or gross annual sales or expenditures exceeding \$25 million in 1985 dollars.
 - Or by a duly authorized representative of the above describe plant manager.
(must be presented in writing)
- WHY?
 - To have someone of responsibility to attest to the correctness of the report.

Maximum Annulus Pressure _____
Minimum Annulus Pressure _____
(*** This information shall be determined from review

Signature, Authorized Representative

Problems we encounter with Monitoring Reports

- ✘ The name of the company is incorrect.
- ✘ The units are incorrect or not specified.
- ✘ Samples are not analyzed within their specific holding times.
- ✘ Annulus pressure below minimum permitted value.
- ✘ First page of the report was missing.
- ✘ Maximum injection volume is exceeded.
- ✘ Fluid volume added to seal pot written in inches and not in gallons.
- ✘ Weekly samples not taken.
- ✘ Quarterly samples not taken.
- ✘ Gauges and continuous recorders do not correspond with each other.
- ✘ Data not reported.
- ✘ Data left on spreadsheet from previous reports.
- ✘ Incorrect monthly average injection rate.
- ✘ Reports turned in late.

Resolution to Monitoring Report Errors or Violations

Typical Responses to Report Error

Phone or Email for notification of problem and resolution

Further determination

A violation may be issued:
If situation can not be resolved or
some cases may be an automatic violation

In most cases an e-mail message will be sent



REMEMBER



If a Class I disposal well is operated, maintained, monitored and tested in accordance with the regulations, permit, and KDHE requirements, such a well poses a minimal risk to the public health and the environment.



CLASS I WELL DISPOSAL WELL TRAINING EXAM

A. ADMINISTRATIVE SECTION:

1. What is the purpose of the Underground Injection Control (UIC) Program?

ANSWER:

To protect the public health and the environment from injection activities. It is a preventive program.

2. Is the UIC Program in Kansas a state program only, or is it an Environmental Protection Agency Program that is administered by the State of Kansas?

ANSWER:

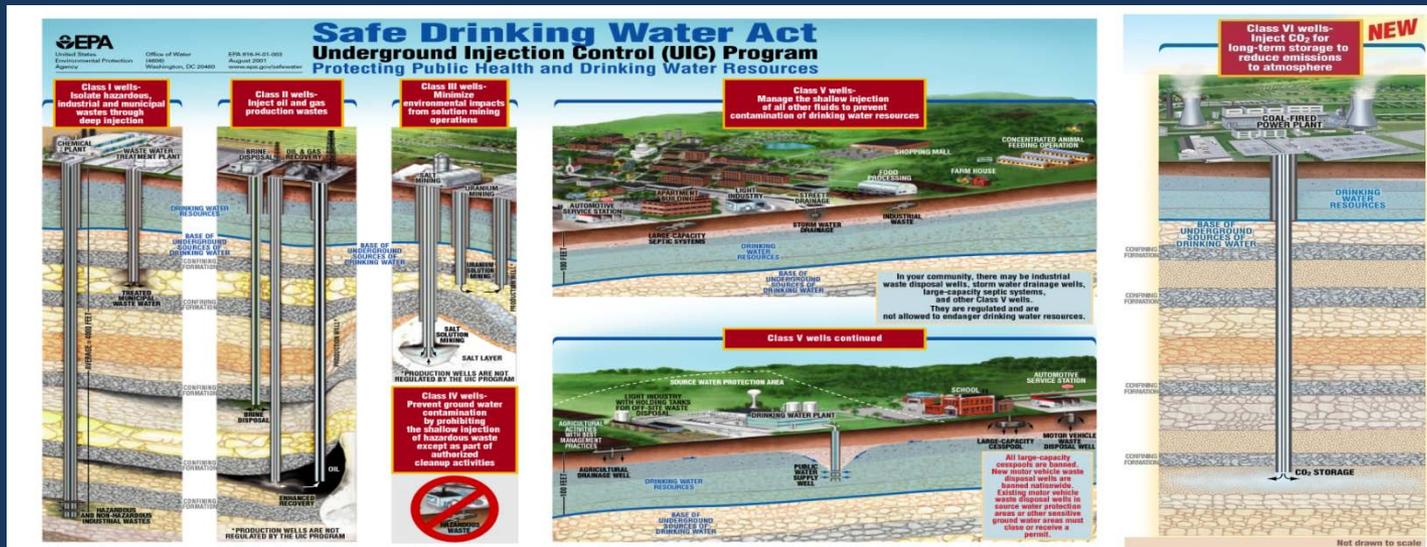
It is an EPA Program administered in Kansas by the state agency.

AKA: Primacy – State UIC Programs have primary enforcement responsibility once their UIC Program has been approved by EPA

3. How many classes of injection wells are regulated under the UIC Program?

ANSWER:

Six.



4. What risks does a Class I industrial waste disposal well pose?

ANSWER:

If the regulations, permit, and requirements of the KDHE UIC Program are complied with, the risk posed by these wells is minimal. If not followed, the public health and the environment are endangered. But, these are the minimum requirements and enhancements should always be considered to increase protection capabilities.

5. What is purpose of the UIC Permit?

ANSWER:

It is a control document and agreement between KDHE and the facility for the operation of the well. It lists the essential requirements.

6. Explain why your facility needs a Class I disposal well (s). What would happen to this facility if it cannot use its Class I disposal well?

ANSWER:

(This is unique to the facility)

Facility operations potentially shut down or more complex, expensive disposal alternatives may need to be implemented.

B. CONSTRUCTION SECTION:

1. How many layers of environmental protection are present in the standard Class I disposal well design?

ANSWER:

- Surface casing & cement = 2
- Longstring casing & cement = 2
- Injection tubing & annular fluid = 2
- **TOTAL = 6**

Many wells have more than 6 to account for special conditions such as the presence of the salt formation

2. List the three potential leak locations in a Class I disposal well.

ANSWER:

- Casing
- Tubing
- Packer

Also can be a combination of two or more of these.

3. Does a Class I well inject wastewater above or below the lower most usable water zone?

ANSWER:

Injects below the lower most usable water zone.

C. MONITORING SECTION:

1. Describe the purpose of the annulus monitoring system.

ANSWER:

Provides continuous leak detection for the well. This is the primary early warning system for detecting leakage in the well components. A loss of annulus pressure and/or annulus liquid of these parameters indicates potential leakage.

2. Why is measuring and monitoring the injection tubing pressure important?

ANSWER:

The permit and the KDHE regulations limit injection to gravity flow only. This is to protect the well components, prevent undesirable pressure buildup in the disposal zone, and minimizes the impact to the environment should a release occur.

3. Describe why measuring injection fluid volume is important.

ANSWER:

The permit limits the daily injection volume. This encourages waste minimization, limits the area of influence of the injection well and limits undesirable pressure build-up in the disposal formation.

4. Why is monitoring the injection fluid rate important?

ANSWER:

Provides information on the performance of the well

5. Why is it important to sample, analyze and report the results for the injection fluid?

ANSWER:

- Characterizes the waste.
- All parties need to know what is going into the subsurface.
- Detect characteristics that could damage the well components.

6. Can the office cleaning crew sign the monthly monitoring report submitted to KDHE?

ANSWER:

No, must be signed by someone of responsibility with the knowledge to attest to the correctness of the report such as a plant manager.

D. RESPONSE TO PROBLEMS SECTION:

What are the appropriate and/or required actions to take to in response to the following problems:

- The seal pot is losing liquid overtime at an increasing rate.

ANSWER:

- Notify KDHE as soon as becoming aware of the situation.
- Note this situation on the monthly monitoring report, including any additions of liquid as required.
- Schedule a workover to repair the well. If the annulus can be maintained liquid filled and the annulus pressure maintained, KDHE will allow the well to remain in operation under close monitoring until the workover is initiated. If these cannot be maintained, then the well has failed mechanical integrity and must be shut-in until repaired and properly tested demonstrating the well has mechanical integrity.

- The annulus pressure gauge has stopped working.

ANSWER:

- Fix or replace the gauge as soon as possible.
- Keep a replacement calibrated gauge on hands for quick replacement.
- Note the repair or replacement on the monthly monitoring report.
- Keep a spare gauge for quick replacement.

- Junk, boards and metal pieces are on the ground near the well and the well is lacking good paint. Describe the proper course of action and why this action is important.

ANSWER:

- Do not allow this situation to occur. Routinely police the area around the wellhead.
- Clean up the area and paint the well. The junk and material near the well are a safety hazard. Lack of paint can lead to corrosion and damage to the well components.
- Such a situation gives a negative perception of the well operation and the appearance that the well is not a priority at the facility.

- Wastewater is flowing from a valve on the wastewater line at the wellhead.

ANSWER:

- Shut down the flow to the well immediately and properly manage the wastewater to prevent any additional spillage.
- Contain the spill to minimize impact to the environment.
- Once secured, notify KDHE within 2 hours of discovery. The Spill Number is 785-296-1679.
- Initiate cleanup and remediation of the impacted area in accordance with KDHE requirements.
- Make necessary repairs, notify KDHE the repairs are complete and commence operation upon approval of KDHE.

E. CONCLUSION:

How can KDHE improve this training?