IMPROVE PERMITTING EFFICIENCY
SECOND ANNUAL UIC CLASS

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Underground Injection Control Program Supervisor
Colorado Oil and Gas Conservation Commission

Second Annual UIC Class
June 26, 2013

Agenda

- Overview of UIC program
- Applicable regulations
- Underground Injection Control (UIC) application process
- Seismic issues
- Hydrologic consultation
- Operator's timeline
- Proposed hydrofracturing with diesel regulations

Federal Regulations Basis and Defining UIC

- 40 CFR 144 – Underground Injection Control Program
- 40 CFR 145 – State UIC Program Requirements
- 40 CFR 146 – Underground Injection Control Program: Criteria and Standards
- 40 CFR 147 – State, Tribal, and EPA-Administered Underground Injection Control Programs
  - Subpart G - Colorado

Classes of Injection Wells

- All underground injection wells are regulated by the Safe Drinking Water Act
  - Class I: wells used to inject hazardous waste or industrial waste below a USDW
  - Class II: wells used to dispose of oil or gas production fluids or wells used for enhanced recovery
  - Class III: wells used for solution mining
  - Class IV: wells used to inject hazardous waste or industrial waste above a USDW (banned except for those which are part of an EPA or state approved CERCLA or RCRA project)
  - Class V: all others or wells used to inject nonhazardous fluid into a USDW
  - Class VI: wells used to inject carbon dioxide into the ground for sequestration

Applicable Regulations 40 CFR 144 through 147

- UIC program is part of the Safe Drinking Water Act administered by the Environmental Protection Agency (EPA)
- Colorado was given primacy for Class II injection wells in 1984
- Injection wells within Indian reservation boundaries in Colorado are regulated by EPA

State Primacy

- The EPA often delegates regulation of UIC wells to individual states (primacy)
- The EPA delegates regulation of other classes of wells to individual states (e.g., Wyoming has primacy over other classes of wells)
- Colorado has primacy over Class II wells since April 2, 1984
- EPA does not engage with the routine operations of state operation

Definition of Class II Waste

Resource Conservation and Recovery Act (RCRA) Subpart C Exempt Waste

Because the RCRA exempt status of an oilfield waste is based on the relationship of the waste to exploration and production (E&P) operations, and not on the chemical nature of the waste, it is possible for an exempt waste and a non-exempt hazardous waste to be chemically very similar.

Allowable Injection Fluids

What comes out of a well

- Produced water
- Drilling fluids
- *Spent* well treatment or stimulation fluids
- Pigging wastes
- Gas plant wastes
  - Amine
  - Cooling tower blowdown
  - Tank bottoms

Non-allowable Fluids

What did not go into a well

- Unused fracturing fluids or acids
- Painting wastes
- Refinery wastes
- Lubricating oils
- Sanitary wastes
- Radioactive tracer wastes

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Applicable Regulations

- Rule 324b addresses aquifer exemptions
- Rule 325 addresses underground disposal of water
- 400 Series Rules address enhanced recovery operations because fluids are injected

Applicable Regulations
Aquifer Exemptions

- Rule 324b addresses aquifer exemptions
  - Testing of water quality of disposal formation is required. If total dissolved solids (TDS) < 10,000 ppm, an aquifer exemption is required.
  - Aquifer exemptions are granted when:
    - The formation is hydrocarbon producing
    - The formation is too deep to be economically produced as a source of drinking water under current practices
    - The water is so contaminated it would be economically impractical to treat it for human consumption
  - Notice of the aquifer exemption request is published in the local newspaper for a 30-day comment period
  - The notice is also forwarded to the EPA and Colorado Department of Public Health and Environment for their review

Applicable Regulations Underground Disposal

- Rule 325 addresses underground disposal of water
  - Notice to surface owners and mineral owners within ¼ mile – this is not the same thing as "mineral rights"; owner's permission is required
  - Publication of disposal well notice in local newspaper announcing a 30-day comment period
  - Various well bore construction information
  - Testing for water quality of disposal formation. If TDS < 10,000 ppm, an aquifer exemption is required.
- For enhanced recovery operations, these steps are done over the entire unit area

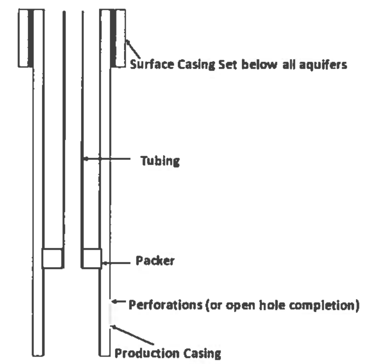
Applicable Regulations Enhanced Recovery

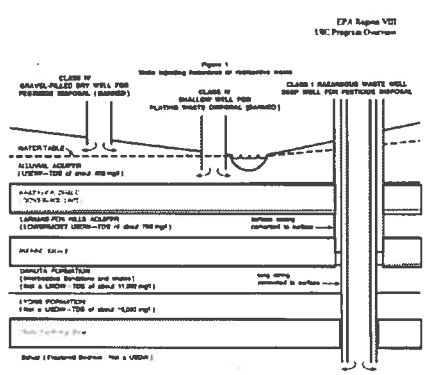
- 400 Series Regulations
  - Prohibits enhanced recovery operations, cycling or recycling operations including the extraction and separation of liquid hydrocarbons from natural gas in connection therewith, or operations for the storage of gaseous or liquid hydrocarbons, nor carrying on any other method of unit or cooperative development or operation of a fieldd or a part of either, without having first obtained written authorization from the Commission to perform the aforementioned activities or operations.

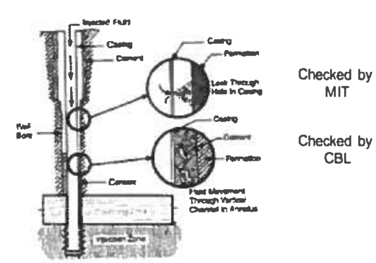
Enhanced Recovery

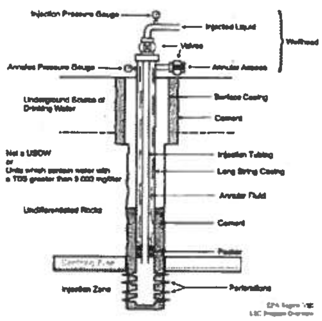
- Injection into the same formation production is taking place is enhanced recovery or water cycling.
- Unitization of field is necessary in order to protect correlative rights.

TYPICAL INJECTION WELL









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UIC Application Process (Rule 325)

- COGCC Rule 325 outlines the application process for underground injection.
- Injection Permit Application: Form 31 – contains details of the type of injection, fluid type, geology formation, injection rate and pressure.
- Injection Well Permit Application: Form 33 – describes the downhole geometry and perforations.
- Source of Produced Water for Disposal: Form 26 – provides a list of where the E&P waste is sourced.

Forms to Submit

- Form 2 – Permit to Drill (submitted online)
- Form 2A – Oil and Gas Location Assessment (submitted online)
- Form 4 – Sundry Notice (submitted online)
- Form 31 – Injection Permit Application
- Form 33 – Injection Well Permit Application
- Form 26 – Source of Produced Water

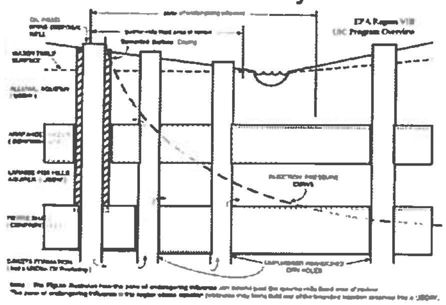
Forms to Submit

- Form 21 – Mechanical Integrity Test
- Form 42 – Notice of Notification (Notice of Hydraulic Fracturing et al.) submitted online
- Form 5 – Drilling Completion Report (submitted online)
- Form 5A – Completed Interval Report (submitted online)

Form 31 Support Information

- Proposed injection program
- Surface owner agreement must specify salt water disposal or BLM sundry
- Notice to surface and mineral owners – a letter sent certified or registered mail or hand delivered to all surface and mineral owners within a ¼-mile area of review
- Remedial correction plan for wells – all wells within the ¼-mile area of review must have cement coverage to prevent water migrating vertically to another zone

Remedial Plans for Adjacent Wells



Form 31 Support Information (cont.)

- Maps and lists
  - Map of all wells (oil and gas and water) within ¼ mile of injection well
  - Map of all producing wells within ½ mile of injection well
  - Maps and lists of all surface and mineral owners within ¼ mile of injection well
  - Unit area plat (required for enhanced recovery)
- Surface facility plan view
- If commercial facility, description of operations and area served

Form 31 Support Information (cont.)

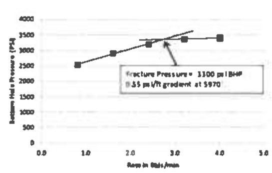
- Resistivity or induction log
- Cement bond log (can be uploaded with Form 5)
- Water analysis for injection zone (total dissolved solids) – must be from intended injection well or nearby well (same section) and same injection formation
- Contact person should be who to call with questions about well completion who is best able to answer questions – not necessarily the consultant who prepared the application

Step rate tests

- A step rate test may be performed by the operator to determine the fracture gradient of the injection formation.
- Step rate tests must be performed on new wells, once injection has begun the pore pressure increases and makes this data invalid.
- Default fracture gradient is 0.6 psi/ft.

Step rate tests (cont.)

- Submit data to COGCC for analysis
  - Data logger data is not necessary
  - Submit pairs of flow rate vs. pressure reading
  - Indicate if pressures are bottom hole or surface

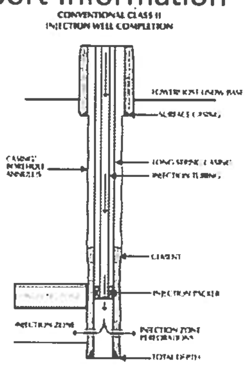


Injection Rate BPM	Surface Pressure PSI	Hydrostatic Pressure PSI	Friction Loss PSI	Calculated BHP PSI
0.8	0	2587	41	2546
1.6	420	2587	88	2919
2.4	800	2587	182	3205
3.2	1090	2587	305	3372
4	1320	2587	505	3402

Allowable injection pressure = (0.55 psi/ft – 0.433 psi/ft) x 5,970' = 716 psi surface injection pressure

Form 33 Support Information

- Current wellbore diagram
- Proposed wellbore diagram
- Injection must take place at least 2000 feet below ground



Form 26 Support Information

- Source wells producing water to be injected
- Chemical analysis of fluids
- If more than six source wells, attach a table

UIC Application Process

Pre-drilling

- Forms 31, 33, 26, and, if applicable, Forms 2, 2A, and 4 are submitted at once – Forms 2, 2A, and 4 are submitted online
- Missing attachments to Forms 31, 33, and 26 may be added later if not immediately available
- Public notice will be posted once surface use agreement or BLM sundry as well as water analysis are received
- A memo is sent by COGCC to the Colorado Division of Water Resources for evaluation of groundwater protection
- An internal review is done for seismic evaluation

UIC Application Process

Post drilling

- Well is completed or re-completed by operator and Forms 5 and 5A submitted online, if applicable
- MIT is performed
  - Witnessed by state inspector
  - Submit Form 42, have 2 copies of Form 21 filled out for inspector's signature
  - Test must be performed to maximum requested injection pressure
- Maximum injection volume is calculated using neutron density and density porosity logs and geometry of ¼ mile radius cylinder of sandstone injection formation

Tricks to Make Things Faster!

- Contact the county government early – some have lengthy processes
- Do not start your project without including a geologist on your team
- Fill well 24 hours before MIT– this allows equilibrium of temperature and eliminates false pressure fluctuations
- Address all correspondence concerning injection wells to Denise Onyskiw

Approval Letter

- All approved injection permits have:
  - A maximum allowable injection pressure. This pressure is set to be below formation fracturing pressure.
  - A maximum allowable injection volume
  - Monitoring and reporting of amount of water injected and samples of water injected with a Form 4
  - Casing and cementing to prevent movement of fluid into or between USDWs. We sometimes require that special logs be run periodically.
  - An instruction to check Bradenhead pressure regularly. Do not bury the Bradenhead valve!

UIC Inspections

- All UIC wells are inspected yearly
  - Injection pressure is checked
  - Annular pressure is checked
- All UIC wells are pressure tested for casing integrity every five years. Mechanical integrity failures must be shut-in.
- All UIC wells are equipped with a packer and tubing and the tubing casing annulus is inspected for leaks. Packer must be set within 100 ft of top perf.
- Any well showing abnormal pressure on the tubing annulus is required to cease injection and be repaired or plugged within six months.

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COGCC/Colorado Geological Survey Seismic Review

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Matt Morgan
Senior Mapping Geologist
Colorado Geological Survey
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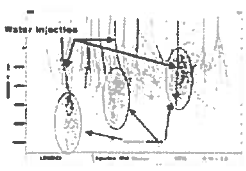
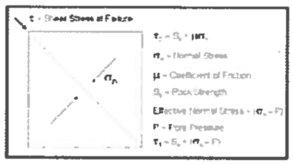
Induced Seismicity - Primer

- Human activity that causes seismic events (energy release) beyond 'historical' baseline level.
- Elevated pore pressure causing shear failure – potential scenario associated with fluid injection into existing fault.



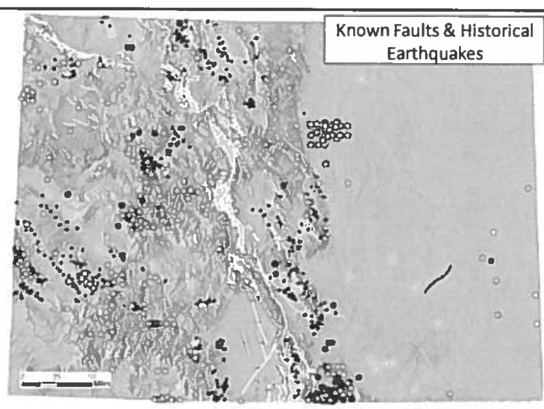
Concept of Effective Stress



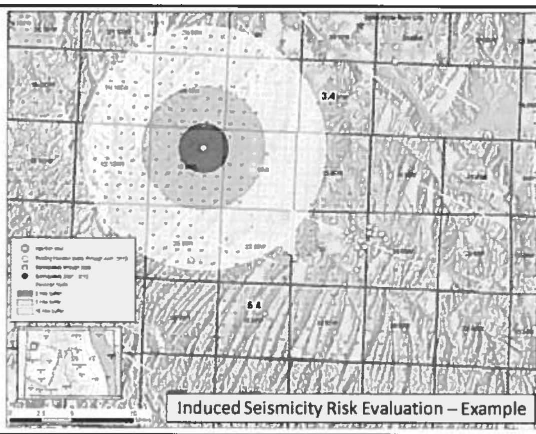
Source: DOE, LBNL
http://esd.lbl.gov/research/projects/induced_seismicity/

Induced Seismicity Risk Evaluation

1) Confirmed prior instance of induced seismicity in immediate area/formation
2) Any recognized Neogene (< 25 mya) faults in the area?
3) Linear elements in surface topography suggesting possible unmapped faults?
4) Any historic earthquakes recorded in the area?
5) Fault character relative to depth of proposed injection and stratigraphy
6) Peak ground acceleration (PGA)
7) Existing injection wells and historical volumes



- CGS Late Cenozoic Fault, Fold & Earthquake Database http://geosurvey.state.co.us/hazards/Earthquakes/Pages/Maps.aspx
- USGS Quaternary Fault & Fold Database http://earthquake.usgs.gov/hazards/qfaults/



Induced Seismicity Risk Evaluation – Example

Seismic Risk – Recommendations

- Seismic monitoring might be prudent if earthquake triggering is deemed possible.
- Mitigation strategies might be considered prior to injection.
- If significant changes in baseline seismic activity are recorded at any point after an injection program begins, a more detailed seismicity investigation may be warranted.

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Division of Water Resources Hydrologic Consultation

Hydrogeological Services

Matt Sares – Manager
Ralf Topper- Senior Hydrogeologist
Elizabeth Pottorff - Hydrogeologist

What we look at:

- Surface casing depth
- Other casing depths
- Principal sources of fresh ground water
- Registered water wells within ½ mile
- Distance to surface water or ditch
- Depth and formation of injection interval
- Intervening formation lithology
- Outcrop of injection formation

Produced Water Rules

- For Oil & Gas wells most formations and locations were determined as tributary or non-tributary to surface water
- No direct relationship to UIC approval
- Nontributary formation and area is better
- Glover model is also the standard to determine if an injection well would impact surface water

Our Recommendations

- "Based on the information provided, it does not appear that there is any potential for injury to known or potential sources of fresh water in the area from a properly constructed injection well."
- Plug the borehole back to the base of the injection interval.
- "A plan to prevent runoff of surface spills would protect surface water."

CDWR Public Information

- http://water.state.co.us/
- Data & Maps
  - AquaMap
  - Imaged Documents
- http://cdss.state.co.us/onlineTools/Pages/AquiferDeterminationTools.aspx
  - Denver Basin Aquifer Evaluation Tool

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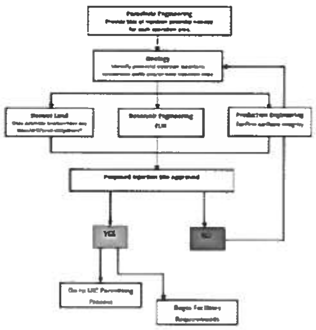
Operator Timeline: Pre-Permitting Process



Operator Timeline - Released to Permit

#1 – PREPARE TIMELINE

GIS - Prepares folder for proposed injection well	FORM
• List wells within 1/4 mile of BHL	31
• List oil/gas wells within 1/2 mile	31
• Water well within 1/4 mile of surface and BHL	31
• List surface owner within 1/4 mile	31
• List mineral owner within 1/4 mile	31
• Surface ownership maps	31
• Mineral ownership maps	31
• Surface facility diagram	31

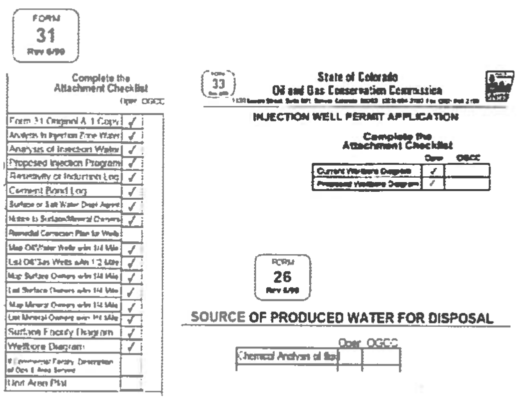
•

Operator Timeline - Released to Permit

Land Dept	FORM
• Notification to Surface and Mineral Owner	31
• Surface or SWD agreement;	
• If Federal surface Regulatory Dept submits sundry notice to BLM	31
Production Engineering	
• Remedial Correction Plan	31
• Write conversion/recompletion procedure	31
• Current Wellbore Diagram	31/33
• Proposed Wellbore Diagram	31/33
Geology	
• Formation Resistivity/Porosity	31
• Cement Bond Logs	31
• Seismicity Report	31

Operator Timeline - Released to Permit

	FORM
Water Mgmt	
▪ Representative Formation WQ (INJ zone)	31
▪ Review Source Water Samples (INJ water)	31/26
Regulatory	
▪ Injection Program Narrative	31
▪ Prepare Form 31, 33, and 26	
Facilities Dept - concurrently planning pipelines/facilities	
Regulatory – concurrently preparing BLM requirements if Federal	
10-Day Notification MIT	42
Results MIT	21



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Hydrofracturing with Diesel

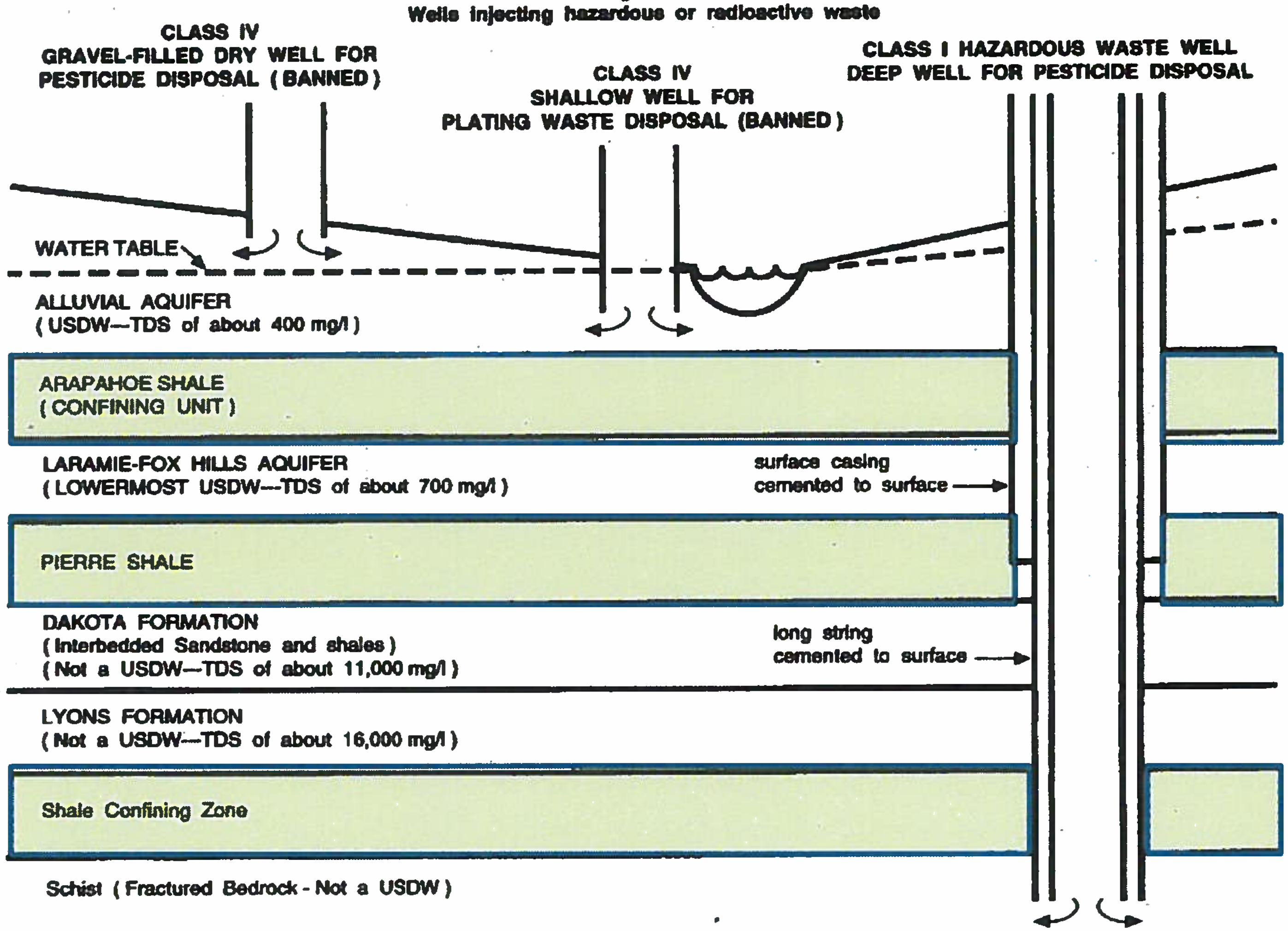
- The Energy Policy Act of 2005 exempted hydrofracturing (as well as gas storage) from the UIC regulations unless diesel fuel is used as the hydrofracturing material.
- Thus, owners or operators who inject diesel fuels during HF related to oil, gas, or geothermal operations must obtain a UIC permit before injection begins.

EPA Definition of "Diesel"

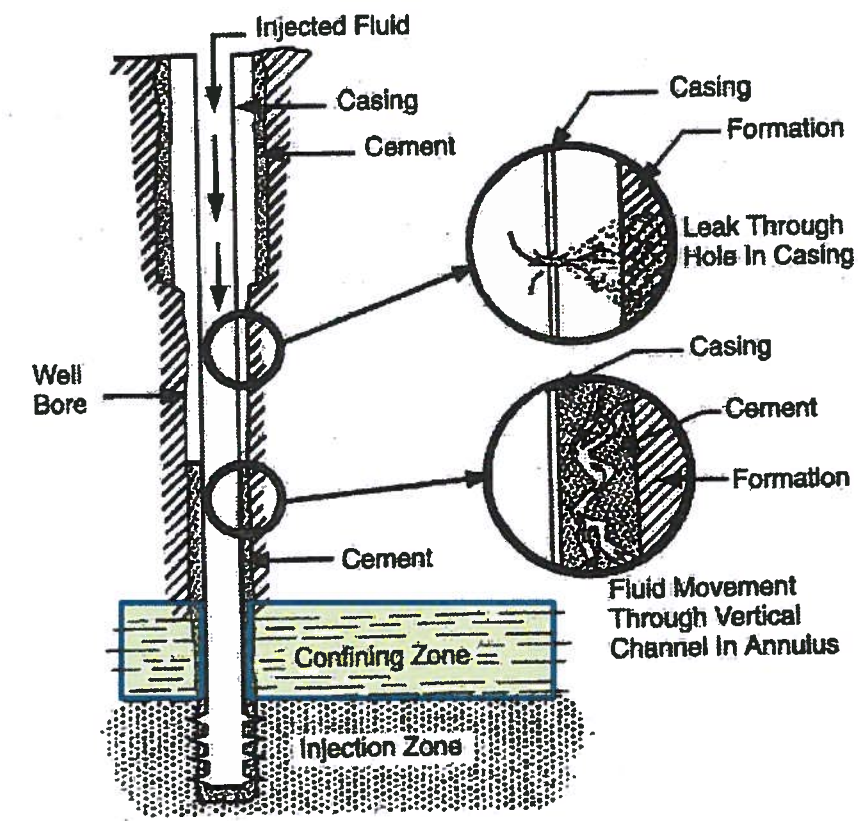
- Any portion of the injectate has one of six listed CASRNs:
  - 68334-30-5
  - 68476-34-6
  - 68479-30-2
  - 68476-31-3
  - 8008-20-6
  - 68410-00-4
- Or, is referred to as "diesel fuel" in its primary name or common synonyms.

Denise M. Onyskiw, P.E.
Colorado Oil and Gas Conservation Commission
303-894-2100 ext. 5145
Denise.onyskiw@state.co.us

Figure 1
Wells injecting hazardous or radioactive waste

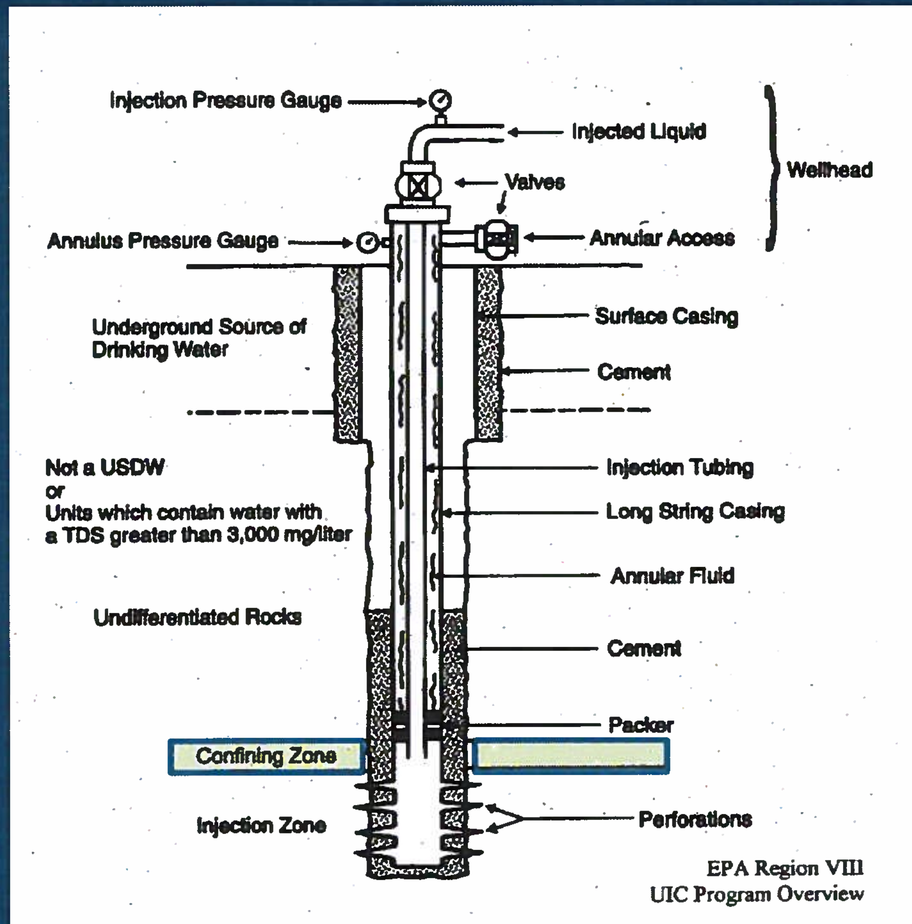


EPA Region VIII
UIC Program Overview

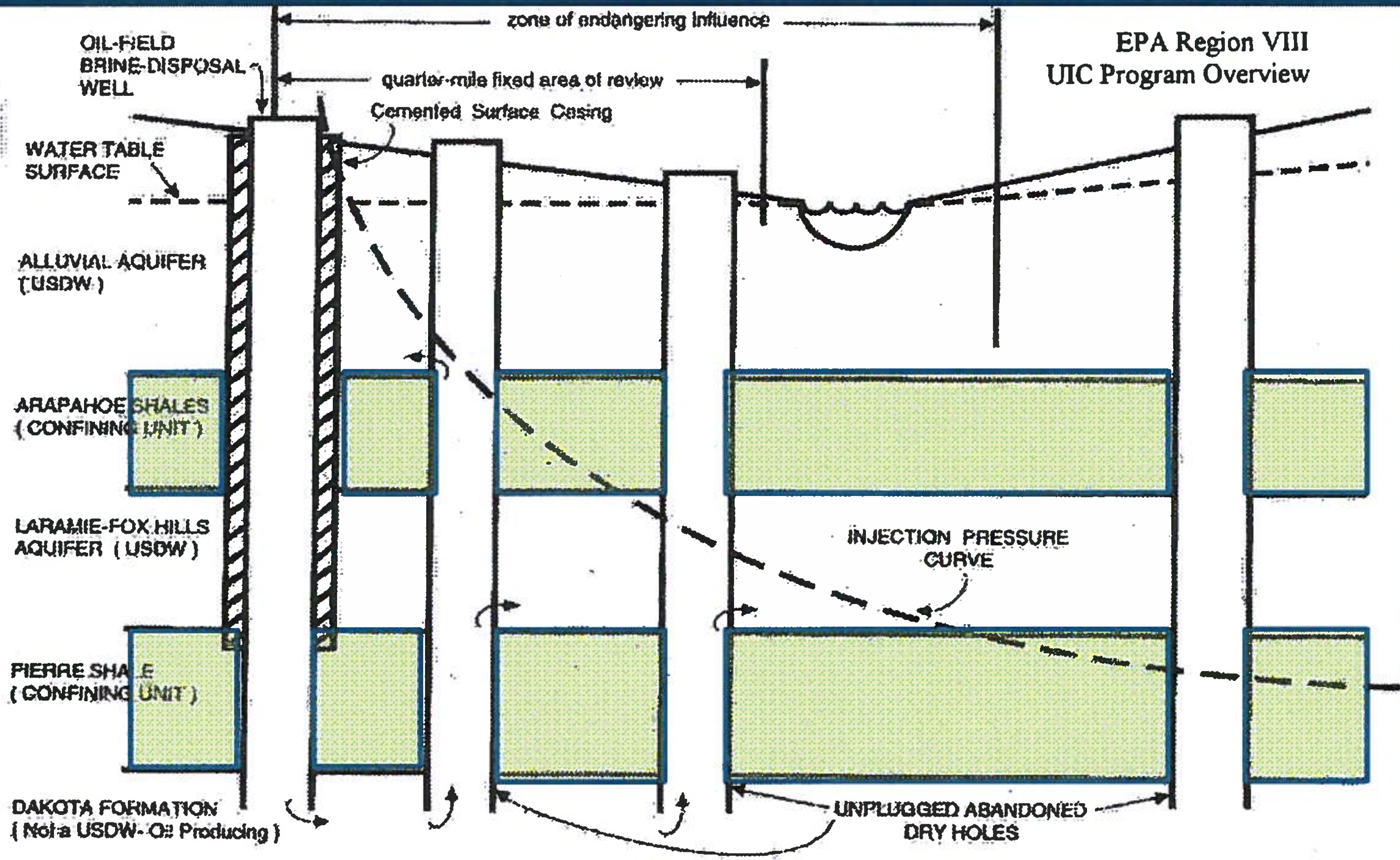


Checked by MIT

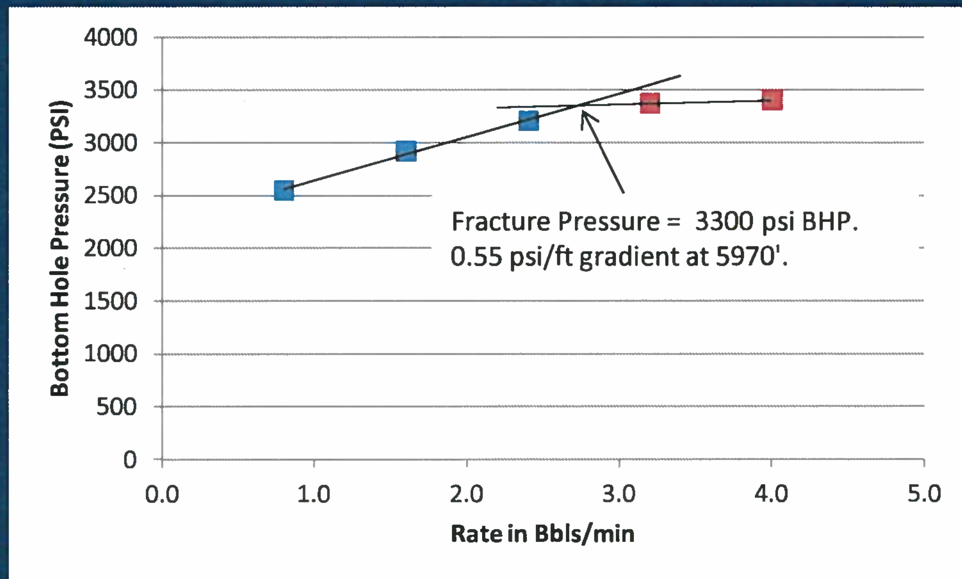
Checked by CBL


Injection Pressure Gauge
Injected Liquid
Valves
Wellhead
Annulus Pressure Gauge
Annular Access
Underground Source of Drinking Water
Surface Casing
Cement
Not a USDW
or
Units which contain water with
a TDS greater than 3,000 mg/liter
Injection Tubing
Long String Casing
Annular Fluid
Undifferentiated Rocks
Cement
Packer
Confining Zone
Injection Zone
Perforations
EPA Region VIII
UIC Program Overview

Remedial Plans for Adjacent Wells



Note: The Figure illustrates how the zone of endangering influence can extend past the quarter-mile fixed area of review.
The zone of endangering influence is the region where injection pressures may force fluid out of the intended injection reservoir into a USDW.



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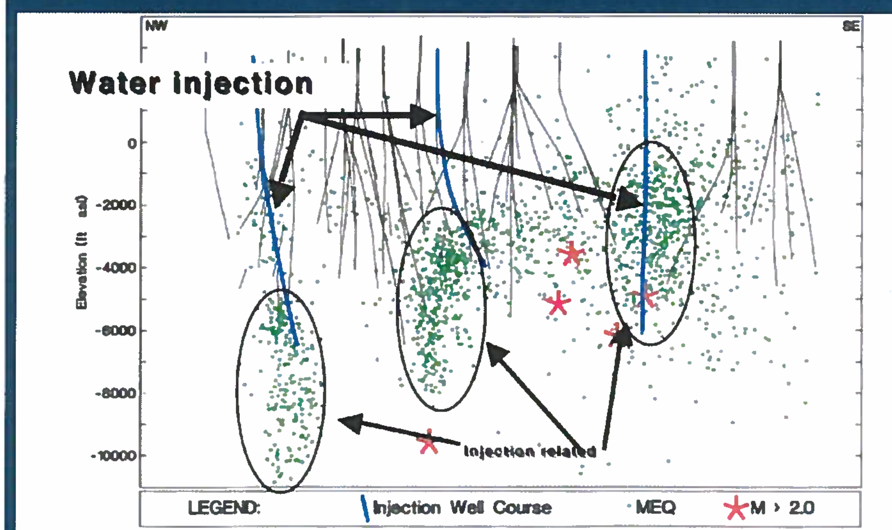
Allowable injection pressure = (0.55 psi/ft – 0.433 psi/ft) x 5,970' = 716 psi surface injection pressure

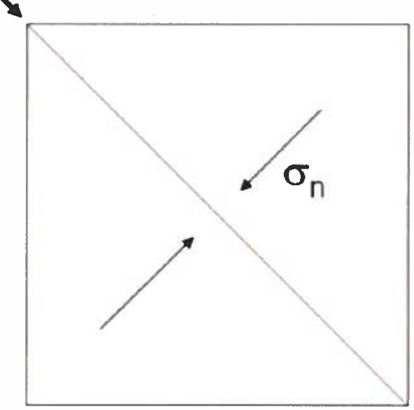
Induced Seismicity - Primer

- Human activity that causes seismic events (energy release) beyond 'historical' baseline level.
- Elevated pore pressure causing shear failure – potential scenario associated with fluid injection into existing fault.



Concept of Effective Stress

τ = Shear Stress at Failure



$\tau_D = S_o + \mu\sigma_n$

σ_n = Normal Stress

μ = Coefficient of Friction

S_o = Rock Strength

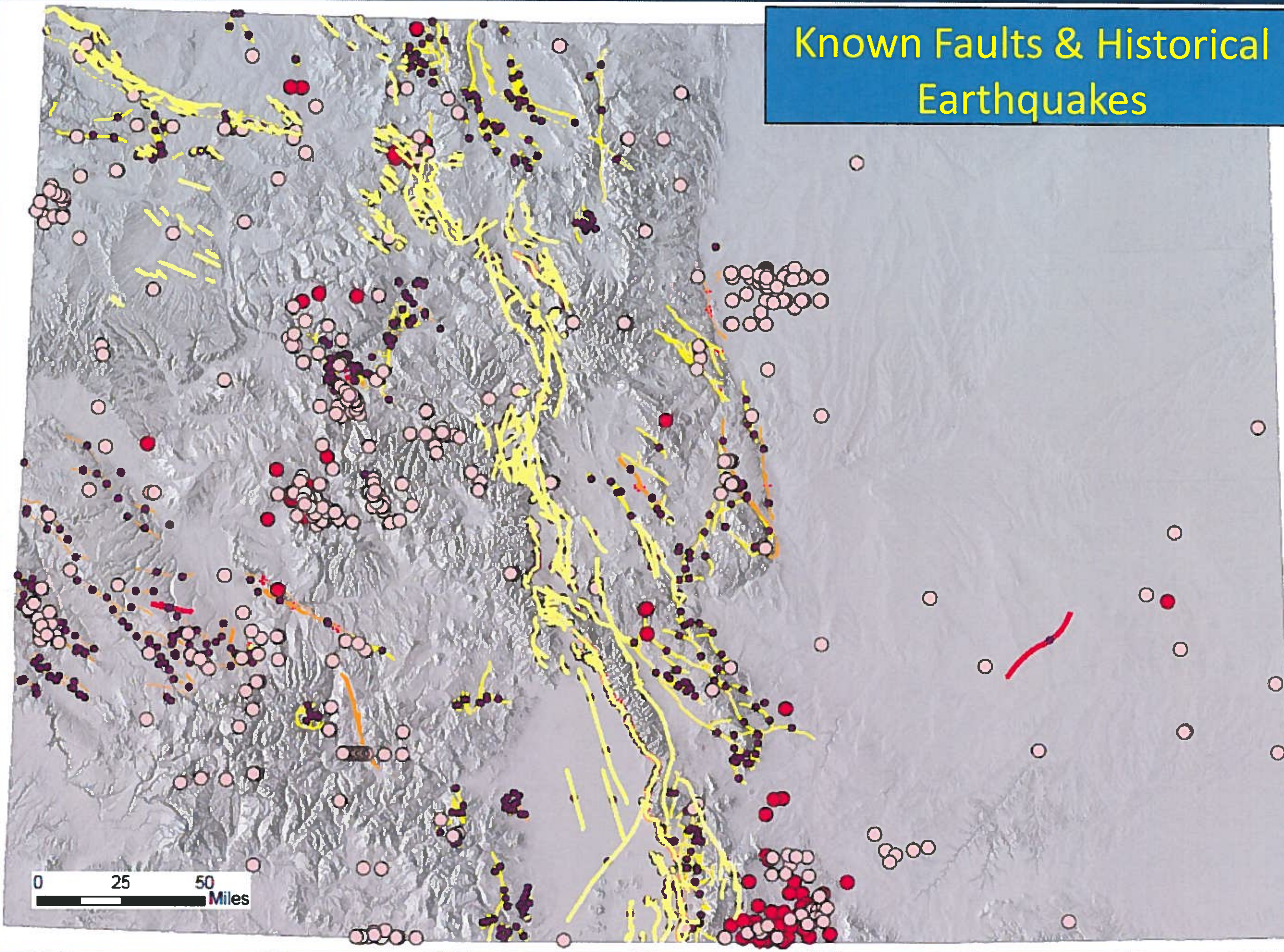
Effective Normal Stress = $(\sigma_n - P)$

P = Pore Pressure

$\tau_f = S_o + (\sigma_n - P)$

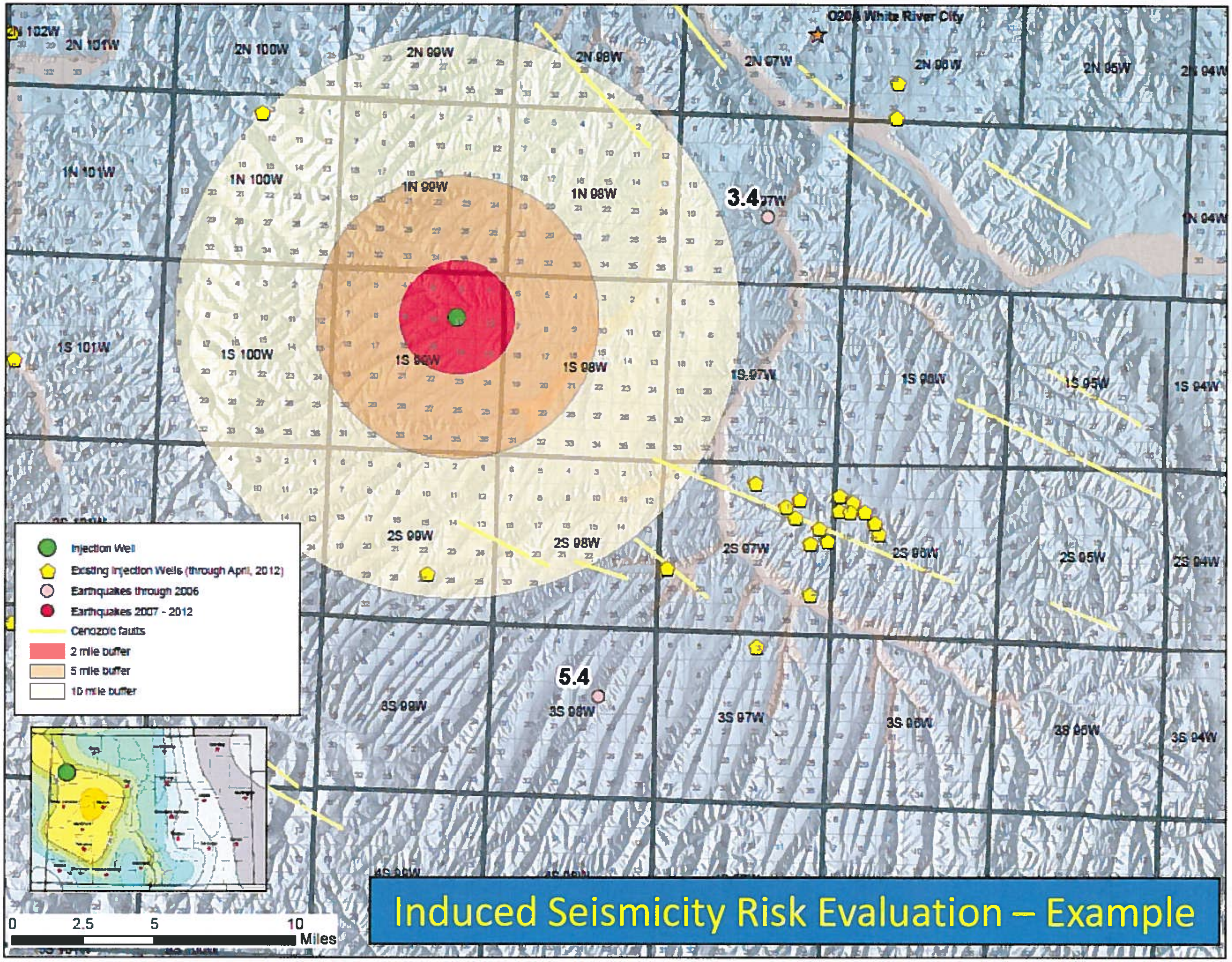
Source: DOE, LBNL
http://esd.lbl.gov/research/projects/induced_seismicity/

Known Faults & Historical Earthquakes

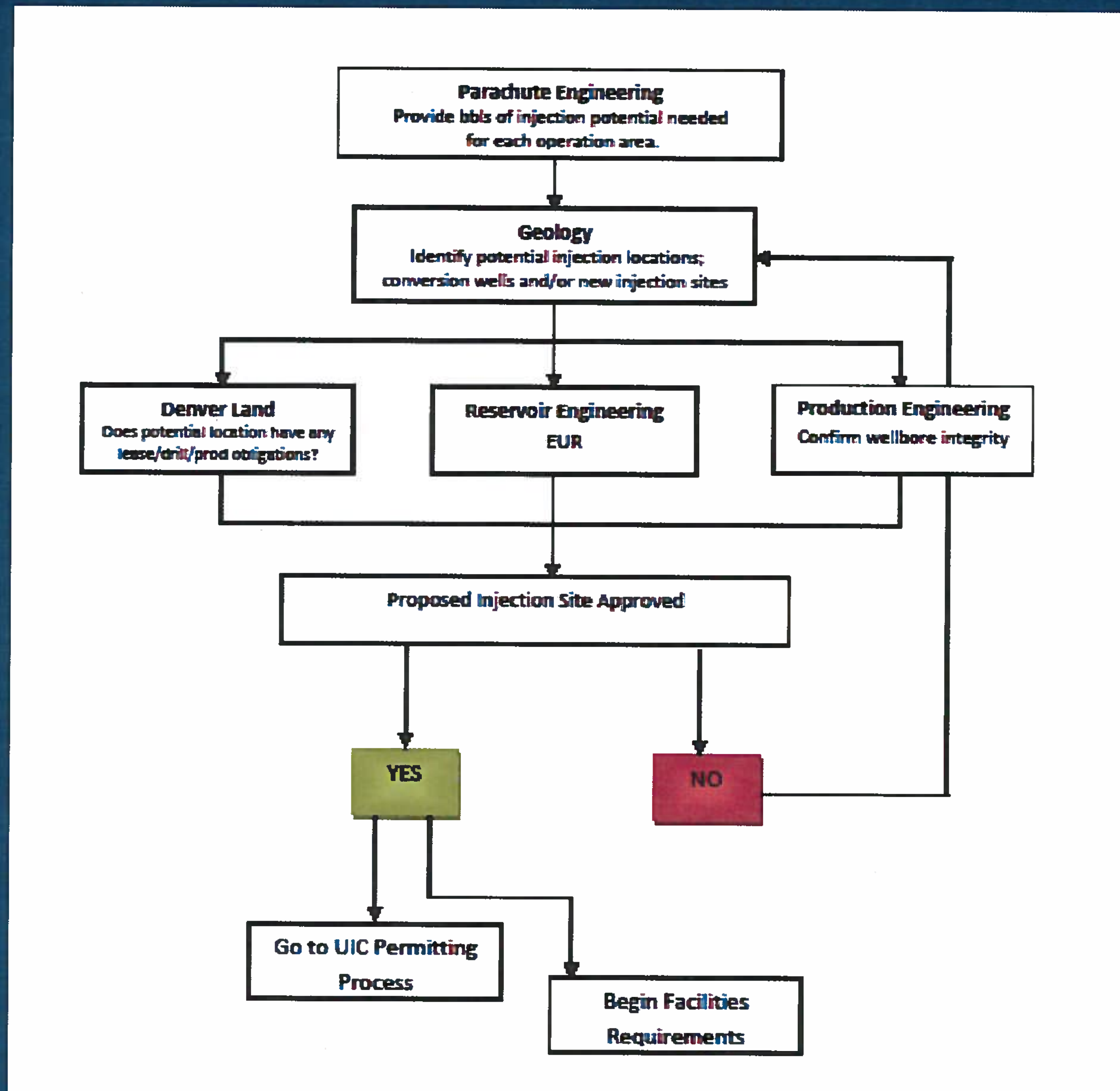


- **CGS Late Cenozoic Fault, Fold & Earthquake Database**
  http://geosurvey.state.co.us/hazards/Earthquakes/Pages/Maps.aspx
- **USGS Quaternary Fault & Fold Database**
  http://earthquake.usgs.gov/hazards/qfaults/

Induced Seismicity Risk Evaluation – Example



Operator Timeline: Pre-Permitting Process



FORM
31
Rev 6/99

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109

FOR OGCC USE ONLY

UNDERGROUND INJECTION FORMATION PERMIT APPLICATION

1. Submit original and one copy of this form.
2. If data on this form is estimated, indicate as such.
3. Attachments – see checklist and explanation of attachments.
4. Aquifer exemption is required for all injection formations with water quality <10,000 TDS (Rule 322B). Immediately contact the Commission for further requirements if the total dissolved solids (TDS) as determined by water analysis for the injection zone is less than 10,000 ppm.
5. Attach a copy of the certified receipt to each notice to surface and mineral owner(s) or submit a sample copy of the notice and an affidavit of mailing or delivery with names and addresses of those notified. Each person notified shall be specified as either a surface or mineral owner as defined by C.R.S. 34-60-103(7).

Complete the Attachment Checklist

	Oper	OGCC
Form 31 Original & 1 Copy		
Analysis fo Injection Zone Water		
Analysis of Injection Water		
Proposed Injection Program		
Resistivity or Induction Log		
Cement Bond Log		
Surface or Salt Water Displ Agmt		
Notice to Surface/Mineral Owners		
Remedial Correction Plan for Wells		
Map Oil/Water Wells w/in 1/4 Mile		
List Oil/Gas Wells w/in 1/2 Mile		
Map Surface Owners w/in 1/4 Mile		
List Surface Owners w/in 1/4 Mile		
Map Mineral Owners w/in 1/4 Mile		
List Mineral Owners w/in 1/4 Mile		
Surface Facility Diagram		
Wellbore Diagram		
If Commercial Facility, Description of Ops & Area Served		
Unit Area Plat		

Project Name: ______________________ Project Location: ______________________

Project Type: ☐ Enhanced Recovery ☐ Disposal ☐ Simultaneous Disposal

Single or Multiple Well Facility? ☐ Single ☐ Multiple

IF UNIT OPERATIONS, ATTACH PLAT SHOWING UNIT AREA

County: ______________________ Field Name and Number: ______________________

OGCC Operator Number: ______________________

Name of Operator: ______________________

Address: ______________________

City: ______________________ State: _____ Zip: __________

Contact Name and Telephone:

____

No: ______________________

Fax: ______________________

Injection Fluid Type: ☐ Produced Water ☐ Natural Gas ☐ CO_2 ☐ Drilling Fluids

☐ Exempt Gas Plant Waste ☐ Used Workover Fluids ☐ Other Fluids (describe): ______________________

Commercial Facility? ☐ Yes ☐ No

If Yes, describe area of operation and types of fluids to be injected at this facility:

PROPOSED INJECTION FORMATIONS

FORMATION A (Name): ______________________ Porosity: __________

Formation TDS: __________ Frac Gradient: __________psi/ft Permeability: __________

Proposed Stimulation Program: ☐ Acid ☐ Frac Treatment ☐ None

FORMATION B (Name): ______________________ Porosity: __________

Formation TDS: __________ Frac Gradient: __________psi/ft Permeability: __________

Proposed Stimulation Program: ☐ Acid ☐ Frac Treatment ☐ None

Anticipated Project Operating Conditions

Under normal operating conditions, estimated fluid injection rates and pressures:

FOR WATER: A minimum of _______ bbls/day @ ______ psi to a maximum of _______ bbls/day @ _______ psi.

FOR GAS: A minimum of _______ mcf/day @ ______ psi to a maximum of _______ bbls/day @ _______ psi.

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: ______________________ Signed: ______________________

Title: ______________________ Date: __________

OGCC Approved: ______________________ Title: ______________________ Date: __________

Order No: ______________________

UIC FACILITY NO:

CONDITIONS OF APPROVAL, IF ANY:

FORM
33
Rev 6/99

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303) 894-2100 Fax: (303) 894-2109

FOR OGCC USE ONLY

INJECTION WELL PERMIT APPLICATION

Submit a completed Form 33 with or after approval obtained on Form 31 (Underground Injection Permit Application) or you must have a previously approved Injection Well Permit.
1. Operator may not commence injection into this well until this form is approved.
2. Each individual injection well must be approved by this form.

Well Name and Number: ____________ **API No:** ____________
UIC Facility No: ____________ (as assigned on an approved Form 31)
Project Name: ____________ Operator Name: ____________
Field Name and Number: ____________ County: ____________
QtrQtr: ______ Sec: ______ Twp: ______ Range: ______ Meridian: ______

Complete the Attachment Checklist

	Oper	OGCC
Current Wellbore Diagram		
Proposed Wellbore Diagram		

CURRENT WELLBORE INFORMATION

	SIZE	DEPTH	NO. SACKS	CEMENT TOP	Cement Top Determined By: CBL	CIRCULATED	CALCULATED
Surface Casing					☐	☐	☐
Intermediate Casing (if any)					☐	☐	☐
Production Casing					☐	☐	☐

Plug Back Total Depth: ______ Tubing Depth: ______ Packer Depth: ______

______ Formation Gross Perforation Interval: ______ to ______
______ Formation Gross Perforation Interval: ______ to ______
______ Formation Open Hole Interval (if any): ______ to ______

List below all Plugs, Bridge Plugs, Stage Cementing or Squeeze Work performed on this wellbore: (if more space needed, continue on reverse side of this form.)
1.
2.
3.
4.

Describe below any changes to the wellbore which will be made upon conversion. (This includes but not limited to changes of tubing and packer setting depths, any additional squeeze work for aquifer protection or casing leaks, setting of bridge plugs to isolate non-Injection formations.)
1.
2.
3.
4.

Comments:

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.
Print Name: ____________
Signed: ____________ Title: ____________ Date: ____________

OGCC Approved: ____________ Title: ____________ Date: ____________
MAX. SURFACE INJECTION PRESSURE: ______ **If Disposal Well, MAX. INJECTION VOL. LIMIT:** ______
CONDITIONS OF APPROVAL, IF ANY:

FORM
26
Rev 6/99

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109

FOR OGCC USE ONLY

SOURCE OF PRODUCED WATER FOR DISPOSAL

This form must be completed for any new disposal site and for any change in sources of produced water for an existing disposal site.

Complete the Attachment Checklist

	Oper	OGCC
Chemical Analysis of fluid		

OGCC Operator Number: ____________
Name of Operator: ____________
Address: ____________
City: ____________ State: ____ Zip: ________

Contact Name and Telephone:
____
No: ____________
Fax: ____________

OGCC Disposal Facility Number: ____________
Operator's Disposal Facility Name: ____________ Operator's Disposal Facility Number: ______
Location (QtrQtr, Sec, Twp, Rng, Meridian): ____________
Address: ____________
City: ____________ State: _____ Zip: ________ County: ____________

If more space is required, attach additional sheet.

Add Source: ☐ OGCC Lease No: ________ API No: ________ Well Name & No: ________
Operator Name: ________ Operator No: ________
Delete Source: ☐ Location: QtrQtr: ______ Section: ______ Township: ______ Range: ______ Producing Formation: ________
Analysis Attached? ☐Yes ☐No Transported to disposal site via: ☐Pipeline ☐Truck TDS: ________

Add Source: ☐ OGCC Lease No: ________ API No: ________ Well Name & No: ________
Operator Name: ________ Operator No: ________
Delete Source: ☐ Location: QtrQtr: ______ Section: ______ Township: ______ Range: ______ Producing Formation: ________
Analysis Attached? ☐Yes ☐No Transported to disposal site via: ☐Pipeline ☐Truck TDS: ________

Add Source: ☐ OGCC Lease No: ________ API No: ________ Well Name & No: ________
Operator Name: ________ Operator No: ________
Delete Source: ☐ Location: QtrQtr: ______ Section: ______ Township: ______ Range: ______ Producing Formation: ________
Analysis Attached? ☐Yes ☐No Transported to disposal site via: ☐Pipeline ☐Truck TDS: ________

Add Source: ☐ OGCC Lease No: ________ API No: ________ Well Name & No: ________
Operator Name: ________ Operator No: ________
Delete Source: ☐ Location: QtrQtr: ______ Section: ______ Township: ______ Range: ______ Producing Formation: ________
Analysis Attached? ☐Yes ☐No Transported to disposal site via: ☐Pipeline ☐Truck TDS: ________

Add Source: ☐ OGCC Lease No: ________ API No: ________ Well Name & No: ________
Operator Name: ________ Operator No: ________
Delete Source: ☐ Location: QtrQtr: ______ Section: ______ Township: ______ Range: ______ Producing Formation: ________
Analysis Attached? ☐Yes ☐No Transported to disposal site via: ☐Pipeline ☐Truck TDS: ________

Add Source: ☐ OGCC Lease No: ________ API No: ________ Well Name & No: ________
Operator Name: ________ Operator No: ________
Delete Source: ☐ Location: QtrQtr: ______ Section: ______ Township: ______ Range: ______ Producing Formation: ________
Analysis Attached? ☐Yes ☐No Transported to disposal site via: ☐Pipeline ☐Truck TDS: ________

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.
Print Name: ____________ Signed: ____________
Title: ____________ Date: ____________

OGCC Approved: ____________ Title: ____________ Date: ________

CONDITIONS OF APPROVAL, IF ANY:

Click here to reset the form

FORM 21 Rev 3/13

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)-894-2100 Fax: (303)-894-2109

FOR OGCC USE ONLY

MECHANICAL INTEGRITY TEST

Fill out Part II of this form if well tested is a permitted or pending injection well. Send original plus one copy.

1. Duration of the pressure test must be a minimum of 15 minutes.
2. A pressure chart must accompany this report if this test was not witnessed by a OGCC representative.
3. For production wells, test pressures must be a at minimum of 300 psig.
4. Injection well tests must be witnessed by an OGCC representative.
5. New injection wells must be tested to maximum requested injection pressure.
6. For injection wells, test pressurees must be at least 300 psig or average injection pressure, whichever is greater.
7. A minimum 300 psi differential pressure must be maintained between the tubing and tubing/casing annulus pressure.
8. Do not use this form if submitting under provisions of Rule 326.a.(1) B. or C.
9. OGCC notification must be provided 10 days prior to the test via Form 42.
10. Packers or bridge plugs, etc., must be set within 100 feet of the perforated interval to be considered a valid test.

Complete the Attachment Checklist

	Oper	OGCC
Pressure Chart		
Cement Bond Log		
Tracer Survey		
Temperature Survey		
Other Report 1		
Other Report 2		

OGCC Operator Number: ____________ Contact Name and Telephone

Name of Operator: ____________

Address: ____________ No: ____________

City: ____________ State: ______ Zip: ______ Email: ____________

API Number: ____________ Field Name: ____________ Field Number: ____________

Well Name: ____________ Number: ____________

Location (QtrQtr, Sec, Twp, Rng, Meridian): ____________

☐ **SHUT-IN PRODUCTION WELL** ☐ **INJECTION WELL** **Facility No.:** ____________

Part I. Pressure Test

☐ 5-Year UIC Test ☐ Test to Maintain SI/TA Status ☐ Reset Packer

☐ Verification of Repairs ☐ Tubing/Packer Leak ☐ Casing Leak ☐ Other (Describe): ____________

Describe Repairs: ____________

NA - Not Applicable	**Wellbore Data at Time of Test**	
Injection/Producing Zones(s)	Perforated Interval: ☐ NA	Open Hole Interval: ☐ NA

Casing Test ☐ NA

Use when perforations or open hole is isolated by bridge plug or cement plug

Bridge Plug or Cement Plug Depth

Tubing Casing/Annulus Test ☐ NA

Tubing Size:	Tubing Depth:	Top Packer Depth:	Multiple Packers? ☐ Yes ☐ No

Test Data

Test Date	Well Status During Test	Date of Last Approved MIT	Casing Pressure Before Test	Initial Tubing Pressure	Final Tubing Pressure

Starting Casing Test Pressure	Casing Pressure - 5 Min.	Casing Pressure - 10 Min.	Final Casing Pressure	Pressure Loss or Gain During Test

Test Witnessed by State Representative? ☐ Yes ☐ No

OGCC Field Representative (Print Name): ____________

Part II. Wellbore Channel Test Complete only if well is or will be an injection well.

Indicate method used for cement integrity test, attach appropriate records, charts, or logs unless previously submitted.

☐ Tracer Survey Run Date: ____________ ☐ CBL or Equivalent Run Date: ____________ ☐ Temperature Survey Run Date: ____________

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: ____________

Signed: ____________ Title: ____________ Date: ____________

OGCC Approval: ____________ Title: ____________ Date: ____________

Conditions of Approval, if any:

FORM 42
Rev 03/12

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 Phone: (303) 894-2100 Fax: (303) 894-2109

NOTICE OF NOTIFICATION

OGCC RECEPTION
Receive Date:
Document Number:

Entity Information

OGCC Operator Number: ______ Contact Person: ______
Company Name: ______ Phone: ( ) ______
Address: ______ Fax: ( ) ______
City: ______ State: ______ Zip: ______ Email: ______

API #: 05 - ___ - ___ - ___ Facility ID: ______ Location ID: ______
Sec: ______ Twp: ______ Range: ______ QtrQtr: ______ Lat: ______ Long: ______

NOTICE OF HYDRAULIC FRACTURING TREATMENT – 48-hour notice required

Date of Treatment: ______ Time: ______ (HH:MM)

NOTICE OF SPUD – 48-hour notice required Surface Hole Spud ONLY

Spud Date: ______ Time: ______ (HH:MM)
Rig Name: ______

NOTICE OF CONSTRUCTION OF A NEW LOCATION OR MAJOR CHANGE – 48-hour notice required

Start Date: ______

NOTICE TO RUN AND CEMENT CASING – 24-hour notice

Start Date: ______ Time: ______ (HH:MM) String: ______

FORMATION INTEGRITY TEST – 24-hour notice

Test Date: ______ Time: ______ (HH:MM)

MECHANICAL INTEGRITY TEST – 10-DAY NOTICE

Test Date: ______ Time: ______ (HH:MM) Underground Injection Control(UIC) Well? ☐

BRADENHEAD TEST – 48-hour Notice

Test Date: ______ Time: ______ (HH:MM)

BLOW OUT PREVENTER TEST – 24-Hour notice

Test Date: ______ Time: ______ (HH:MM)

SITE READY FOR INSPECTION ______

PIT LINER INSTALLATION – 48-hour notice

Install Date: ______

SIGNIFICANT LOST CIRCULATION – Notify within 24 hours, report mud losses in excess of 100 barrels which require shutdown of operations for an hour or longer to pump lost circulation material and rebuild pit volume

Date of Lost Circulation: ______ Time: ______ (HH:MM)
Measure Depth: ______ (feet) Mud Volume Lost: ______ (bbl)
Significant Kick Ensued? ______

A Form 23 (Well Control Report) is required for Significant Kicks within 15 days. A significant kick shall be defined as one that is managed by shutting in the well to circulate out the kick or that is managed by going on choke and requiring an increase in mud weight exceeding 3/10ths of one pound per gallon to control.

NOTICE OF HIGH BRADENHEAD PRESSURE DURING STIMULATION – Notify within 24 hours when bradenhead pressure increases more than 200 psig during stimulation. This satisfies Rule 341 verbal notification requirements. Submit a follow-up Form 4 within 15 days.

Date and time of High Bradenhead Pressure: ______________ Time: ________ (HH:MM)

OTHER – AS SPECIFIED BY PERMIT CONDITION add (2/2A)

Describe Permit Condition: ____

Date: ______________ Time: ________ (HH:MM)

This form must be signed by an authorized agent of the entity making assertion.

I certify under penalty of perjury that this report has been examined by me and to the best of my knowledge is true, correct and complete.

Print Name: ______________________ Email: ______________________

Signature: ______________________ Title: ______________________ Date: ______________

United States
Environmental Protection
Agency

Exemption of Oil and Gas Exploration and Production Wastes from Federal Hazardous Waste Regulations

Introduction

This publication provides an understanding of the exemption of certain oil and gas exploration and production (E&P) wastes from regulation as hazardous wastes under Subtitle C of the Resource Conservation and Recovery Act (RCRA).

The information contained in this booklet is intended to furnish the reader with:

- A basic background on the E&P exemption.
- Basic rules for determining the exempt or non-exempt status of wastes.
- Examples of exempt and non-exempt wastes.
- Status of E&P waste mixtures.
- Clarifications of several misunderstandings about the exemption.

- Answers to frequently asked questions.
- Recommendations for sensible waste management.
- Additional sources of information.

The American Petroleum Institute (API) estimated that 149 million barrels of drilling wastes, 17.9 billion barrels of produced water and 20.6 million barrels of other associated wastes were generated in 1995 from exploration and production (E&P) operations.

Once generated, managing these wastes in a manner that protects human health and the environment is essential for limiting operators' legal and financial liabilities and also makes good business sense. Operators must also determine if the waste is subject to hazardous waste regulations. At times this determination is misunderstood and can lead to improper waste management decisions.

Drilling waste volumes are directly related to the level of drilling activity. API data show that the total footage drilled for all oil and gas wells dropped from 315.4 million feet in 1985 to 118 million feet in 1995, a decrease of 60 percent. A corresponding drop in the volume of drilling waste, from 361 million barrels in 1985, to 149 million barrels in 1995, was estimated.

On the other hand, as hydrocarbons from producing wells deplete, produced water volumes typically increase. API has estimated that the average volume of produced water increased from 6 barrels of water per barrel of oil in 1985, to 7.5 barrels of water per barrel of oil in 1995.

Prudent waste management decisions, even for nonhazardous wastes, should be based on the inherent nature of the waste. Not all waste management options are appropriate for every waste. Operators also should be familiar with state and federal regulations governing the management of hazardous and nonhazardous wastes.

The preferred option for preventing pollution is to avoid generating wastes whenever possible (source reduction). Examples include process modifications to reduce waste volumes and materials substitution to reduce toxicity.

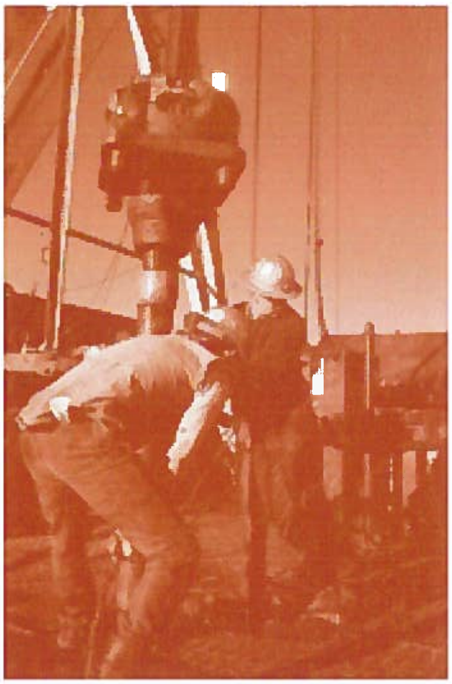
Understanding the procedures for determining the exempt or nonexempt status of a waste is a valuable tool, especially for operators who choose to develop voluntary waste management plans. When these procedures are used in conjunction with a knowledge of the nature of the waste, the operator will be better prepared to develop site-specific waste management plans and to manage E&P wastes in a manner that protects human health and the environment.

Scope of the Exemption

In December 1978, EPA proposed hazardous waste management standards that included reduced requirements for several types of large volume wastes. Generally, EPA believed these large volume "special wastes" are lower in toxicity than other wastes being regulated as hazardous waste under RCRA. Subsequently, Congress exempted these wastes from the RCRA Subtitle C hazardous waste regulations pending a study and regulatory determination by EPA. In 1988, EPA issued a regulatory determination stating that control of E&P wastes under RCRA Subtitle C regulations is not warranted. Hence, E&P wastes have remained exempt from Subtitle C regulations. The RCRA Subtitle C exemption, however, did not preclude these wastes from control under state regulations, under the less stringent RCRA Subtitle D solid waste regulations, or under other federal regulations. In addition, although they are relieved from regulation as hazardous wastes, the exemption does not mean these wastes could not present a hazard to human health and the environment if improperly managed.

Among the wastes covered by the 1978 proposal were "gas and oil drilling muds and oil production brines." The oil and gas exemption was expanded in the 1980 legislative amendments to RCRA to include "drilling fluids, produced water, and other wastes associated with the exploration, development, or production of crude oil or natural gas. . . ." (Geothermal energy wastes were also exempted but are not addressed by this publication.)

According to the legislative history, the term "other wastes associated" specifically includes waste materials intrinsically derived from primary field operations associated with the exploration, development, or production of crude oil and natural gas. The phrase "intrinsically derived from the primary field operations" is intended to distinguish exploration, development, and production operations from transportation and manufacturing operations.



With respect to crude oil, primary field operations include activities occurring at or near the wellhead and before the point where the oil is transferred from an individual field facility or a centrally located facility to a carrier for transport to a refinery or a refiner.

With respect to natural gas, primary field operations are those activities occurring at or near the wellhead or at the gas plant, but before the point where the gas is transferred from an individual field facility, a centrally located facility, or a gas plant to a carrier for transport to market. Examples of carriers include trucks, interstate pipelines, and some intrastate pipelines.

Primary field operations include exploration, development, and the primary, secondary, and tertiary production of oil or gas. Crude oil processing, such as water separation, de-emulsifying, degassing, and storage at tank batteries associated with a specific well or wells, are examples of primary field operations. Furthermore, because natural gas often requires processing to remove water and other impurities prior to entering the sales line, gas plants are considered to be part of production operations regardless of their location with respect to the wellhead.

In general, the exempt status of an E&P waste depends on how the material was used or generated as waste, not necessarily whether the material is hazardous or toxic. For example, some exempt E&P wastes might be harmful to human health and the environment, and many non-exempt wastes might not be as harmful. The following simple rule of thumb can be used to determine if an E&P waste is exempt or non-exempt from RCRA Subtitle C regulations:

- Has the waste come from down-hole, i.e., was it brought to the surface during oil and gas E&P operations?
- Has the waste otherwise been generated by contact with the oil and gas production stream during the removal of produced water or other contaminants from the product?

If the answer to either question is yes, then the waste is likely considered exempt from RCRA Subtitle C regulations. It is important to remember that *all* E&P wastes require proper management to ensure protection of human health and the environment.

Exempt and Non-Exempt Wastes

In its 1988 regulatory determination, EPA published the following lists of wastes that were determined to be either exempt or non-exempt. These lists are provided as examples of wastes regarded as exempt and non-exempt and should not be considered to be comprehensive. The exempt waste list applies only to those wastes generated by E&P operations. Similar wastes generated by activities other than E&P operations are not covered by the exemption.

Exempt E&P Wastes

- Produced water
- Drilling fluids
- Drill cuttings
- Rigwash
- Drilling fluids and cuttings from offshore operations disposed of onshore
- Geothermal production fluids
- Hydrogen sulfide abatement wastes from geothermal energy production
- Well completion, treatment, and stimulation fluids
- Basic sediment, water, and other tank bottoms from storage facilities that hold product and exempt waste
- Accumulated materials such as hydrocarbons, solids, sands, and emulsion from production separators, fluid treating vessels, and production impoundments
- Pit sludges and contaminated bottoms from storage or disposal of exempt wastes
- Gas plant dehydration wastes, including glycol-based compounds, glycol filters, and filter media, backwash, and molecular sieves
- Workover wastes
- Cooling tower blowdown
- Gas plant sweetening wastes for sulfur removal, including amines, amine filters, amine filter media, backwash, precipitated amine sludge, iron sponge, and hydrogen sulfide scrubber liquid and sludge
- Spent filters, filter media, and backwash (assuming the filter itself is not hazardous and the residue in it is from an exempt waste stream)
- Pipe scale, hydrocarbon solids, hydrates, and other deposits removed from piping and equipment prior to transportation
- Produced sand
- Packing fluids
- Hydrocarbon-bearing soil
- Pigging wastes from gathering lines
- Wastes from subsurface gas storage and retrieval, except for the non-exempt wastes listed on page 11
- Constituents removed from produced water before it is injected or otherwise disposed of
- Liquid hydrocarbons removed from the production stream but not from oil refining

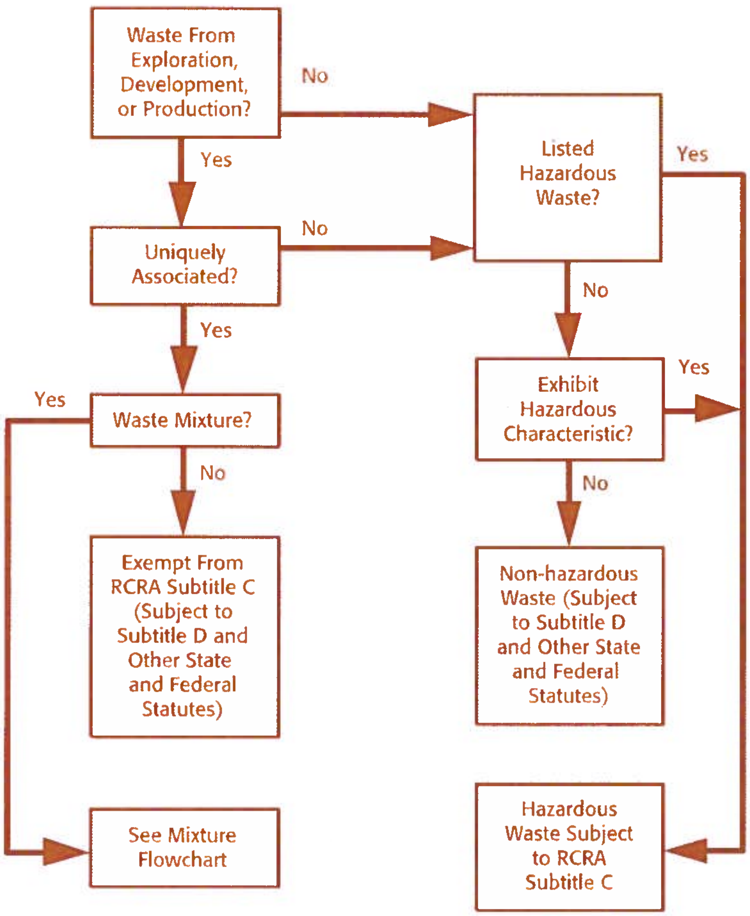
- Gases from the production stream, such as hydrogen sulfide and carbon dioxide, and volatilized hydrocarbons
- Materials ejected from a producing well during blowdown
- Waste crude oil from primary field operations
- Light organics volatilized from exempt wastes in reserve pits, impoundments, or production equipment

Non-Exempt Wastes

- Unused fracturing fluids or acids
- Gas plant cooling tower cleaning wastes
- Painting wastes
- Waste solvents
- Oil and gas service company wastes such as empty drums, drum rinsate, sandblast media, painting wastes, spent solvents, spilled chemicals, and waste acids
- Vacuum truck and drum rinsate from trucks and drums transporting or containing non-exempt waste
- Refinery wastes
- Liquid and solid wastes generated by crude oil and tank bottom reclaimers[1]
- Used equipment lubricating oils
- Waste compressor oil, filters, and blowdown
- Used hydraulic fluids
- Waste in transportation pipeline related pits
- Caustic or acid cleaners
- Boiler cleaning wastes
- Boiler refractory bricks
- Boiler scrubber fluids, sludges, and ash
- Incinerator ash
- Laboratory wastes
- Sanitary wastes
- Pesticide wastes
- Radioactive tracer wastes
- Drums, insulation, and miscellaneous solids

[1] Although non-E&P wastes generated from crude oil and tank bottom reclamation operations (e.g., waste equipment cleaning solvent) are non-exempt, residuals derived from exempt wastes (e.g., produced water separated from tank bottoms) are exempt. For a further discussion, see the Federal Register notice, Clarification of the Regulatory Determination for Waste from the Exploration, Development, and Production of Crude Oil, Natural Gas and Geothermal Energy, March 22, 1993, Federal Register Volume 58, Pages 15284 to 15287.

Exempt/Non-Exempt Wastes



Mixing Wastes

Mixing wastes, particularly exempt and non-exempt wastes, creates additional considerations. Determining whether a mixture is an exempt or non-exempt waste requires an understanding of the nature of the wastes prior to mixing and, in some instances, might require a chemical analysis of the mixture. Whenever possible, avoid mixing non-exempt wastes with exempt wastes. If the non-exempt waste is a listed or characteristic hazardous waste, the resulting mixture might become a non-exempt waste and require management under RCRA Subtitle C regulation. Furthermore, mixing a characteristic hazardous waste with a non-hazardous or exempt waste for the purpose of rendering the hazardous waste non-hazardous or less hazardous might be considered a treatment process subject to appropriate RCRA Subtitle C hazardous waste regulation and permitting requirements.

NOTE: In a policy letter dated September 25, 1997, EPA clarified that a mixture is exempt if it contains exempt oil and gas exploration and production (E&P) waste mixed with non-hazardous, non-exempt waste. Mixing exempt E&P waste with non-exempt characteristic hazardous waste, however, for the purpose of rendering the mixture non-hazardous or less hazardous, could be considered hazardous waste treatment or impermissible dilution.

Below are some basic guidelines for determining if a mixture is an exempt or non-exempt waste under the present mixture rule.

- **A mixture of an exempt waste with another exempt waste remains exempt.**

  Example: A mixture of stimulation fluid that returns from a well with produced water results in an exempt waste.

- **Mixing a non-hazardous waste (exempt or non-exempt) with an exempt waste results in a mixture that is also exempt.**

  Example: If non-hazardous wash water from rinsing road dirt off equipment or vehicles is mixed with the contents of a reserve pit containing only exempt drilling waste, the wastes in the pit remain exempt regardless of the characteristics of the waste mixture in the pit.

- **If, after mixing a non-exempt characteristic hazardous waste with an exempt waste, the resulting mixture exhibits any of the same hazardous characteristics as the hazardous waste (ignitability, corrosivity, reactivity, or toxicity), the mixture is a non-exempt hazardous waste.**

  Example: If, after mixing non-exempt caustic soda (NaOH) that exhibits the hazardous characteristic of corrosivity in a pit containing exempt waste, the mixture also exhibits the hazardous characteristic of corrosivity as determined from pH or steel corrosion tests, then the entire mixture becomes a non-exempt hazardous waste.

  Example: If, after mixing a non-exempt solvent containing benzene with an exempt waste also containing benzene, the mixture exhibits the hazardous characteristic for benzene, then the entire mixture becomes a non-exempt hazardous waste.

- **If, after mixing a non-exempt characteristic hazardous waste with an exempt waste, the resulting mixture does not exhibit any of the same characteristics as the hazardous waste, the mixture is exempt. Even if the mixture exhibits some other characteristic of a hazardous waste, it is still exempt.**

  Example: If, after mixing non-exempt hydrochloric acid (HCl) that only exhibits the corrosive characteristic with an exempt waste, the mixture does not exhibit the hazardous characteristic of corrosivity but does exhibit some other hazardous characteristic such as toxicity, then the mixture is exempt.

  Example: If, after mixing a non-exempt waste exhibiting the hazardous characteristic for lead with an exempt waste exhibiting the characteristic for benzene, the mixture exhibits the characteristic for benzene but not for lead, then the mixture is exempt.

- **Generally, if a listed hazardous waste[2] is mixed with an exempt waste, regardless of the proportions, the mixture is a non-exempt hazardous waste.**

  Example: If any amount of leaded tank bottoms from the petroleum refining industry (listed as waste code K052) is mixed with an exempt tank bottom waste, the mixture is considered a hazardous waste and is therefore non-exempt.

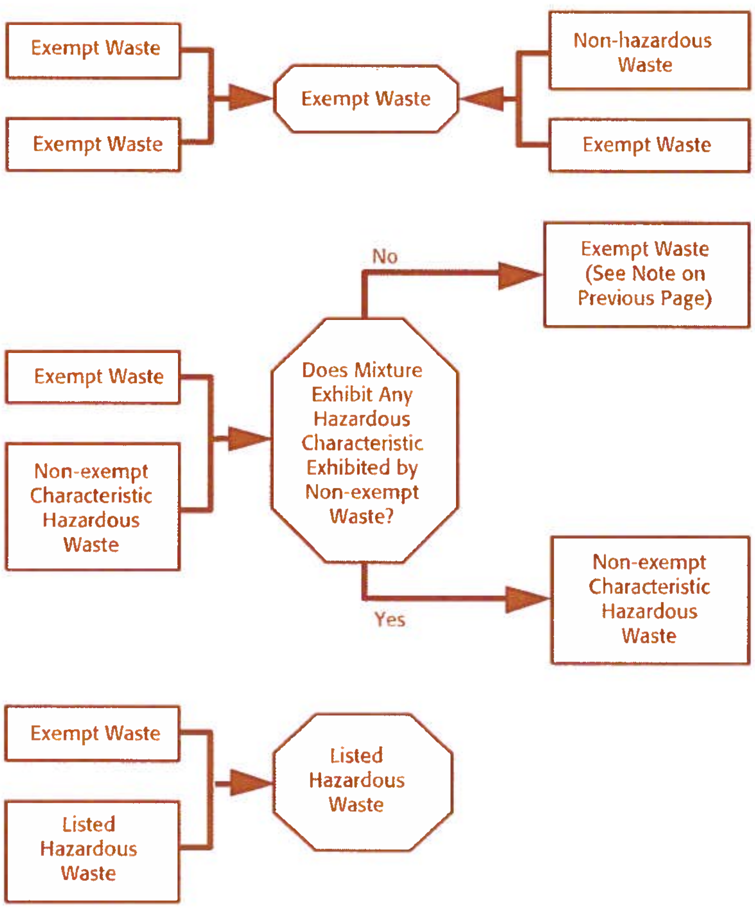
2 Listed hazardous wastes are those wastes listed as hazardous in the Code of Federal Regulations under Subpart D of 40 CFR Part 261.

It is also important to emphasize that a mixture of an exempt waste with a listed hazardous waste generally becomes a non-exempt hazardous waste regardless of the relative volumes or concentrations of the wastes. However, if the listed hazardous waste was listed solely for one or more of the characteristics of ignitability, corrosivity, or reactivity, then a mixture of this waste with an exempt waste would only become non-exempt if the mixture exhibits the characteristic for which the hazardous waste was listed (i.e., if the mixture is ignitable, corrosive, or reactive).

Similarly, if a mixture of an exempt waste with a non-exempt characteristic hazardous waste exhibits any of the same hazardous waste characteristics as the hazardous waste, or if it exhibits a characteristic that would not have been exhibited by the exempt waste alone, the mixture becomes a non-exempt hazardous waste regardless of the relative volumes or concentrations of the wastes. In other words, for any of these scenarios, the wastes could become non-exempt even if only one barrel of hazardous waste were mixed with 10,000 barrels of exempt waste.

NOTE: The act of mixing a hazardous waste with an exempt waste may be subject to RCRA regulations affecting hazardous waste treatment, including the need for a permit (unless the unit or process is otherwise exempt). Moreover, the waste may still be subject to the 40 CFR 268 Land Disposal Restrictions (LDR) regulations (as applicable), including the prohibition of dilution as a substitute for adequate treatment.

Possible Waste Mixtures and Their Exempt and Non-Exempt Status



Common Misunderstandings

An incomplete understanding of the hazardous waste regulations can result in misinterpretations of the regulatory status of various wastes. The following are common misunderstandings that arise with the RCRA Subtitle C exemption and hazardous waste determinations.

Misunderstanding: All wastes located at E&P sites are exempt.

Fact: All wastes located at E&P sites are not necessarily exempt. To be considered an exempt waste, the waste must have been generated from a material or process uniquely associated with the exploration, development, and production of crude oil and natural gas. For example, a solvent used to clean surface equipment or machinery is not exempt because it is not uniquely associated with exploration, development, or production operations. Conversely, if the same solvent were used in a well, it would be exempt because it was generated through a procedure that is uniquely associated with production operations.

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Misunderstanding: All service company wastes are exempt.

Fact: Not all service company wastes are exempt. As with all oilfield wastes, only those wastes generated from a material or process uniquely associated with the exploration and production of oil and gas are considered exempt. The previous example of solvents used for cleaning equipment and machinery would also apply in this case—the solvent is not an exempt waste.

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Misunderstanding: Unused products are exempt.

Fact: Unused products, if disposed of, are not exempt, regardless of their intended use, because they have not been used and therefore are not uniquely associated with the exploration or production of oil and gas. When unused products become waste (e.g., they are disposed of), they are subject to RCRA Subtitle C hazardous waste regulations if they are listed or exhibit a hazardous characteristic.

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Misunderstanding: All exempt wastes are harmless to human health and the environment.

Fact: Certain exempt wastes, while excluded from RCRA Subtitle C hazardous wastes control, might still be harmful to human health and the environment if not properly managed. The exemption relieves wastes that are uniquely associated with the exploration and production of oil and gas from regulation as hazardous wastes under RCRA Subtitle C but does not indicate the hazard potential of the exempt waste. Additionally, some of these wastes might still be subject to state hazardous or non-hazardous waste regulations or other federal regulations (e.g., hazardous materials transportation regulations and National Pollutants Discharge Elimination System (NPDES) or state discharge regulations) unless specifically excluded from regulation under those laws.

Misunderstanding: Any mixture of a non-exempt hazardous waste with an exempt waste becomes an exempt waste.

Fact: Not all mixtures of a non-exempt hazardous waste with an exempt waste become exempt wastes. Generally, a mixture of a listed hazardous waste with an exempt waste becomes a non-exempt hazardous waste.

Also, a mixture of a hazardous waste that exhibits one of the characteristics of a hazardous waste (ignitability, corrosivity, reactivity, or toxicity) with an exempt waste, becomes a non-exempt characteristic hazardous waste if the mixture exhibits one of the same hazardous characteristics as the original hazardous waste. Conversely, if the mixture does not exhibit one of the same hazardous characteristics of the hazardous waste, the mixture becomes a non-hazardous exempt waste. Remember, mixing a non-exempt hazardous waste with an exempt waste for the purpose of rendering the hazardous waste non-hazardous or less hazardous may be considered a treatment process and must be conducted in accordance with applicable RCRA Subtitle C regulations.

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Misunderstanding: A waste exempt from RCRA Subtitle C regulation is also exempt from state and other federal waste management regulations.

Fact: The exemption applies only to the federal requirements of RCRA Subtitle C. A waste that is exempt from RCRA Subtitle C regulation might be subject to more stringent or broader state hazardous and non-hazardous waste regulations and other state and federal program regulations. For example, oil and gas exploration and production wastes are subject to regulation under the Clean Air Act (CAA), Clean Water Act (CWA), Safe Drinking Water Act (SDWA), and Oil Pollution Act of 1990 (OPA).

Frequently Asked Questions

EPA receives calls on a regular basis requesting answers to questions related to the E&P exemption. The most common questions and answers are listed below.

Q: Are RCRA-exempt wastes also exempt under other federal laws?

A: Not necessarily. Unless specifically excluded from regulation under other federal laws, RCRA-exempt wastes might still be subject to regulation under authorities other than RCRA.

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Q: What is the benefit of the RCRA exemption if the operator is still liable for cleanups under RCRA?

A: Although the operator might still be liable for cleanup actions under RCRA for wastes that pose an imminent and substantial endangerment to human health and the environment, the RCRA exemption does allow the operator to choose a waste management and disposal option that is less stringent and possibly less costly than those required under RCRA Subtitle C. The operator, however, should make every effort to choose the proper management and disposal procedures for a particular waste to avoid the need for later cleanup action.

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Q: When is a waste considered "uniquely associated with" exploration and production operations?

A: A waste is "uniquely associated with" exploration and production operations if it is generated from a material or procedure that is necessary to locate and produce crude oil or natural gas. Also, a waste is "uniquely associated with" exploration and production operations if it is generated from a material or procedure that only occurs during the exploration and production of crude oil or natural gas. A simple rule of thumb for identifying "uniquely associated wastes" is whether the waste came from downhole or otherwise was generated in contact with the oil or gas production stream for the purpose of removing water or other contaminants from the well or the product.

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Q: Are wastes generated from a transportation pipeline considered exempt wastes under RCRA Subtitle C?

A: No. The RCRA Subtitle C exemption only applies to wastes generated from the exploration, development, and production (i.e., primary field operations) of crude oil or natural gas. Hence, wastes generated from the transportation of crude oil or natural gas are not RCRA-exempt.

Q: Do exempt wastes lose their exempt status if they undergo custody transfer and are transported offsite for disposal?

A: No. Custody transfer is used to define the endpoint of production operations for crude oil and applies only to the change in ownership of the product (e.g., crude oil). Exempt wastes maintain their exempt status even if they undergo custody transfer and are transported off-site for disposal or treatment.

Q: Are all wastes generated at facilities that treat or reclaim exempt wastes also exempt?

A: No. The exemption applies only to those wastes derived from exempt wastes, not to additional wastes generated by the treatment or reclamation of exempt wastes. For example, if a treatment facility uses an acid in the treatment of an exempt waste, any waste derived from the exempt waste being treated is also exempt but the spent acid is not.

Q: When does transportation begin?

A: For crude oil, transportation begins at the point of custody transfer of the oil or, in the absence of custody transfer, after the endpoint of production separation and dehydration. Storage of crude oil in stock tanks at production facilities is considered part of the production separation process, not transportation, and is included in the exemption. For natural gas, transportation begins at the point where the gas leaves the facility after production separation and dehydration at the gas plant. Natural gas pipelines between the gas well and the gas plant are considered to be part of the production process, rather than transportation, and wastes that are uniquely associated with production that are generated along such a pipeline are exempt.

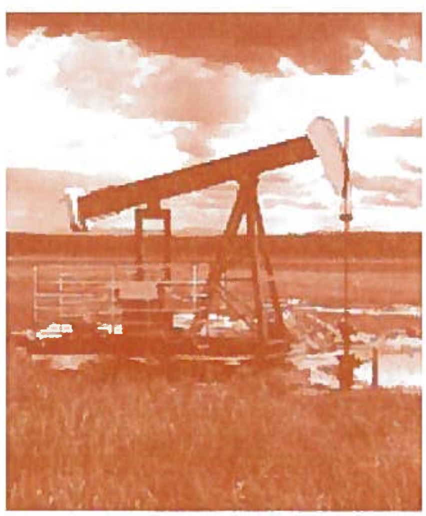
EPA periodically issues interpretive letters regarding the oil and gas exemption. One such letter was in response to a request for clarification of the exempt or non-exempt status of wastes generated at natural gas compressor stations. In some regions, such as the Appalachian states, natural gas might not require sweetening or extensive dehydration. Therefore, the gas generally does not go to a gas plant but is carried from the wellhead to a main transmission line and, in some cases, directly to the customer. Compressor stations are located as needed along the pipelines that run between the wellhead and the main transmission line or the customer to maintain pressure in the lines. The Agency has taken the position that these compressor stations (in the absence of gas plants, and handling only local production) should be treated the same as gas plants, and that wastes generated by these compressor stations are exempt. On the other hand, compressor stations located along main gas transmission lines are considered to be part of the transportation process, and any wastes generated by these compressor stations are non-exempt.

Sensible Waste Management

Sensible waste management begins with "good housekeeping." Prudent operators design E&P facilities and processes to minimize potential environmental threats and legal liabilities. EPA promotes sensible waste management practices through a number of joint efforts with organizations such as API, individual states, and the Interstate Oil and Gas Compact Commission (IOGCC). The following waste management suggestions have been compiled from publications produced by these organizations as well as from literature available from industry trade associations, trade journals, and EPA.

Suggested E&P Waste Management Practices

- Size reserve pits properly to avoid overflows.
- Use closed loop mud systems when practical, particularly with oil-based muds.
- Review material safety data sheets (MSDSs) of materials used, and select less toxic alternatives when possible.
- Minimize waste generation, such as by designing systems with the smallest volumes possible (e.g., drilling mud systems).
- Reduce the amount of excess fluids entering reserve and production pits.
- Keep non-exempt wastes out of reserve or production pits.
- Design the drilling pad to contain stormwater and rig-wash.
- Recycle and reuse oil-based muds and high density brines when practical.
- Perform routine equipment inspections and maintenance to prevent leaks or emissions.
- Reclaim oily debris and tank bottoms when practical.
- Minimize the volume of materials stored at facilities.
- Construct adequate berms around materials and waste storage areas to contain spills.
- Perform routine inspections of materials and waste storage areas to locate damaged or leaking containers.
- Train personnel to use sensible waste management practices.



Sources of Information

Resource Conservation and Recovery Act (RCRA)

RCRA regulates hazardous waste generators, hazardous waste transporters, and hazardous waste treatment, storage, and disposal facilities (TSDFs). RCRA encourages environmentally sound methods for managing commercial and industrial waste, as well as household and municipal waste.

RCRA Resources:

- 40 CFR Parts 260 to 279
- RCRA Call Center: 800 424-9346 or Washington, DC Area Local 703 412-9810 or TDD 800 553-7672 or TDD Washington, DC Area Local 703 412-3323 Fax: 703 308-8686
- Internet access: <www.epa.gov/epaoswer/other/oil/index.htm>

Clean Water Act (CWA)

The Water Pollution Control Act, commonly known as the Clean Water Act (CWA), is the Federal program designed to restore and maintain the integrity of the nation's surface waters. CWA controls direct discharges to surface waters (e.g., through a pipe) from industrial processes or stormwater systems associated with an industrial activity. It also regulates indirect discharges, or discharges to publicly owned treatment works (POTWs) through a public sewer system, by requiring industrial facilities to pretreat their waste before discharging to a public sewer.

CWA Resources:

- 40 CFR Parts 100-129 and 400-503
- EPA Office of Water: 202 260-5700
- State water authority, regional EPA office, and local POTW
- Internet access: <www.epa.gov/ow/>

Oil Pollution Prevention (Spill Prevention, Control and Countermeasures Regulations)

Spill prevention, control and countermeasures (SPCC) regulations promulgated pursuant to the CWA are designed to protect our nation's waters from oil pollution caused by oil spills that could reach the navigable waters of the United States or adjoining shorelines. The regulations apply to non-transportation-related facilities with a specific aboveground or underground oil storage capacity that, due to its location, can be reasonably expected to discharge oil into the navigable waters of the United States.

SPCC Regulations Resources:

- 40 CFR Part 112
- RCRA Call Center: 800 424-9346
- Internet Access: <www.epa.gov/oilspill/index.htm>

Discharge of Oil

The section of the CWA regulations commonly known as the "sheen rule" provides the framework for determining whether a facility or vessel responsible for an oil spill must report the spill to the federal government. These rules require oil spills that may be "harmful to the public health or welfare" to be reported to the National Response Center. Usually, oil spills that cause a sheen or discoloration on the surface of a body of water, violate applicable water quality standards, and cause a sludge or emulsion to be deposited beneath the surface of the water or on adjoining shorelines, must be reported.

Discharge of Oil Regulations Resources:

- 40 CFR Part 110
- RCRA Call Center: 800 424-9346
- Internet Access: <www.epa.gov/oilspill/index.htm>
- Reporting discharges to the National Response Center: 800 424-8802.

Oil Pollution Act (OPA)

OPA of 1990 amended the CWA, and provided new requirements for contingency planning by government and industry under the National Oil and

Hazardous Substances Pollution Contingency Plan. OPA also increased penalties for regulatory noncompliance, broadened the response and enforcement authorities of the federal government, and preserved state authority to establish laws governing oil spill prevention and response.

OPA Resources:

- Internet Access: <www.epa.gov/oilspill/index.htm>

Safe Drinking Water Act (SDWA)

SDWA mandates that EPA establish regulations to protect human health from contaminants present in drinking water. Under the authority of the SDWA, EPA developed national drinking water standards and created a joint federal/state system to ensure compliance with these standards. EPA also regulates underground injection of liquid wastes through the Underground Injection Control (UIC) program under the SDWA. The UIC program regulates five classes of injection wells to protect underground sources of drinking water.

SDWA Resources:

- 40 CFR Parts 141-143 (SDWA); 40 CFR Parts 144-148 (UIC)
- SDWA Hotline: 800 426-4791
- State oil and gas regulatory authority.
- Internet Access: <www.epa.gov/ogwdw>

Clean Air Act (CAA)

CAA regulates air pollution. It includes national emission standards for new stationary sources within particular industrial categories. It also includes the National Emission Standards for Hazardous Air Pollutants (NESHAPs), which are designated to control the emissions of particular hazardous air pollutants (HAPS). NESHAPs specific to oil and gas production were promulgated in 1999.

The CAA includes a Risk Management Program. This program requires stationary sources with more than a threshold quantity of a regulated substance (designated in the regulations) to develop and implement a risk management program (RMP). The RMP must include a hazard assessment, a prevention program, and an emergency response program.

CAA Resources:

- 40 CFR Parts 50-99
- Control Technology Center, Office of Air Quality, Planning and Standards (OAQPS), EPA, General Information: 919 541-0800; Publications: 919 541-2777
- RCRA Call Center (CAA §112(r) questions): 800 424-9346
- Internet Access: <www.epa.gov/oar/oaq_caa.html>
- Oil and Gas Production NESHAPs Rule: <www.epa.gov/ttn/uatw/oilgas/oilgaspg.html>

The Emergency Planning and Community Right-to-Know Act (EPCRA)

EPCRA was designed to improve community access to information about potential chemical hazards and to facilitate the development of chemical emergency response plans by State and local governments. EPCRA regulations establish four types of reporting obligations for facilities that store or manage certain chemicals above specified quantities.

EPCRA Resources:

- 40 CFR Parts 350-372
- RCRA Call Center: 800 424-9346
- Internet Access: <www.epa.gov/opptintr/tri/> and <www.epa.gov/swercepp>

Comprehensive Environmental Response Compensation, and Liability Act (CERCLA or Superfund)

Superfund authorizes EPA to respond to releases, or threatened releases, of hazardous substances that might endanger public health, welfare, or the environment. It also grants EPA the authority to force parties responsible for environmental contamination to clean it up or to reimburse response costs incurred by EPA. CERCLA also contains hazardous substance release reporting regulations that require facilities to report to the National Response Center (NRC) any release of a hazardous substance that exceeds the specified quantity for that substance.

CERCLA Resources:

- 40 CFR Parts 300-399
- RCRA Call Center: 800 424-9346

- Internet Access: <www.epa.gov/superfund>

Toxic Substances Control Act (TSCA)

TSCA allows EPA to collect data on chemicals to evaluate, assess, mitigate, and control risks that might be posed by their manufacture, processing, and use. Facilities are required to report information as necessary to allow EPA to develop and maintain this inventory.

TSCA Resources:

- 40 CFR Parts 702-799
- TSCA Hotline: 202 554-1404
- Internet Access: <www.epa.gov/internet/opptsfrs/home/opptsim.htm>

Other EPA Information Resources

Office of Solid Waste
Industrial and Extractive Wastes Branch
1200 Pennsylvania Avenue, NW.
Mail Code 5306W
Washington, DC 20460

RCRA Call Center: 800 424-9346 or
Washington, DC Area Local 703 412-9810 or
TDD 800 553-7672 or TDD Washington, DC
Area Local 703 412-3323 Fax: 703 308-8686
Internet access: <www.epa.gov/epaoswer/hotline>

The RCRA Call Center is a publicly accessible service that provides up-to-date information on several EPA programs. Please note that the Center cannot provide regulatory interpretations. It also processes requests for relevant publications and information resources.

Office of Emergency and Remedial Response, Oil Spill Program
1200 Pennsylvania Avenue, NW.
Washington, DC 20460
Oil Spill Program Information Line: 800 424-9346
Internet access: <www.epa.gov/oilspill/>

The Office of Emergency and Remedial Response (OERR) manages the Superfund and Oil Spill programs.

National Response Team

c/o U.S. EPA
1200 Pennsylvania Avenue, NW.
Washington, DC 20460
Telephone: 800 424-8802
Fax: 202 260-0154
Internet access: <www.nrt.org>

The National Response Team and the Regional Response Teams are the federal component of the National Response System (NRS), the federal government's coordinated mechanism for emergency response to discharges of oil and releases of chemicals. The NRT is chaired by the U.S. EPA with the United States Coast Guard serving as Vice Chair. The National Response Center (800 424-8802) is the sole federal point of contact for reporting oil and chemical spills.

Other Federal Agencies

U.S. Department of Interior

U.S. Bureau of Land Management
Fluid Minerals Group
1849 C Street, Room 406-LS
Washington, DC 20240
Telephone: 202 452-5125
Fax: 202 452-5124
Internet access: <www.blm.gov/nhp/300/wo310/>

The Bureau of Land Management's (BLM's) management of fluid minerals includes overseeing the production and conservation of oil and gas, geothermal energy, and helium. BLM is responsible for leasing oil and gas resources on all federally owned lands, including those lands managed by other federal agencies. This includes about 564 million acres of federal minerals estate, or about 28 percent of all lands within the United States. Additionally, BLM is responsible for the review and approval of all permits and licenses to explore, develop, and produce oil and gas and geothermal resources on both Federal and Indian lands.

U.S. Fish and Wildlife Service
Division of Environmental Quality
4401 North Fairfax Drive, Suite 322
Arlington, VA 22203
Telephone: 703 358-2148
Internet access: <contaminants.fws.gov>

The U.S. Fish and Wildlife Service is the main federal agency dedicated to protecting wildlife and their habitat from pollution's harmful effects. Specialists in the Environmental Contaminants Program focus on detecting toxic chemicals; addressing their effects; preventing harm to fish, wildlife and their habitats; and removing toxic chemicals and restoring habitat when prevention is not possible. These specialists are experts on oil and chemical spills, pesticides, water quality, hazardous materials disposal and other aspects of pollution biology.

U.S. Department of Energy

Office of Natural Gas & Petroleum Technology,
Office of Fossil Energy
1000 Independence Ave. SW. - Forrestal Building
Washington, DC 20585
Telephone: 202 586-6503
Fax: 202 586-5145
Internet access: <www.fe.doe.gov/programs_oilgas.html>

The Department of Energy's (DOE's) Office of Natural Gas and Petroleum Technology is responsible for the gas and oil exploration and production program, natural gas storage and delivery, downstream petroleum processing, and environmental and regulatory analysis programs for oil and natural gas operations, and natural gas import/export authorizations.

Other Information Resources

American Petroleum Institute

1220 L Street, NW.
Washington, DC 20005
Telephone: 202 682-8000
Internet access: <www.api.org>

The American Petroleum Institute (API) is the national trade association representing over 400 companies involved in oil and gas exploration, production, transportation, refining, and marketing. API represents its members in addressing public policy and regulatory issues. API also sponsors research, collects statistics, conducts workshops, and develops standards and recommended practices for industry equipment and operations.

Interstate Oil and Gas Compact Commission

P.O. Box 53127
Oklahoma City, OK 73152-3127
Telephone: 405 525-3556
Fax: 405 525-3592
E-mail: iogcc@iogcc.state.ok.us
Internet access: <www.iogcc.state.ok.us>

Founded by six states in 1935, the Interstate Oil and Gas Compact Commission (IOGCC) was established to control unregulated petroleum overproduction and resulting waste. "Since that time, states have established effective regulation of the oil and natural gas industry through a variety of IOGCC programs designed to gather and share information, technologies and regulatory methods."

Ground Water Protection Council

13208 N. MacArthur
Oklahoma City, OK 73142
Telephone: 405 516-4972
Fax: 405 516-4973
Internet access: <www.gwpc.org>

The Ground Water Protection Council is an organization whose members consist of state and federal ground water agencies, industry representatives, environmentalists, and concerned citizens. Since it includes state Underground Injection Control (UIC) program directors, it is the best source of data on Class II well injection issues.

National Governors' Association

Emergency Management and Oil Spill Prevention and
Response Project
Hall of States
444 North Capitol Street, NW.
Washington, DC 20001-1512
Telephone: 202 624-5300
Internet access: <www.nga.org>

The National Governors' Association's project on oil spill prevention, preparedness, and response offers states an opportunity to share their experiences and coordinate with the federal agencies involved in oil spill prevention and response. This program facilitates the exchange of information on successful state programs among state and federal emergency managers. NGA works with U.S. EPA to coordinate and promote state oil spill prevention programs by holding workshops, summarizing successful state oil programs, and establishing ongoing workgroups to discuss oil spill topics.

Publications

Title: "Report to Congress: Management of Wastes from the Exploration, Development, and Production of Crude Oil, Natural Gas, and Geothermal Energy," U.S. EPA, December 1987, NTIS Publication No. PB 88-146212.

Available from: National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, 703 487-4650.

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Title: "Regulatory Determination for Oil and Gas and Geothermal Exploration, Development, and Production Wastes," July 6, 1988, Federal Register Volume 53, Pages 25446 to 25459.

Available from: RCRA Call Center, Washington, DC, 800 424-9346

Internet access: <www.epa.gov/epaoswer/other/oil/index.htm>

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Title: "Clarification of the Regulatory Determination for Wastes from the Exploration, Development, and Production of Crude Oil, Natural Gas and Geothermal Energy," March 22, 1993, Federal Register Volume 58, Pages 15284 to 15287.

Available from: RCRA Call Center, Washington, DC, 800 424-9346

Internet access: <www.epa.gov/epaoswer/other/oil/index.htm>

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Title: Associated Wastes Reports: "Crude Oil Tank Bottoms and Oily Debris," "Completion and Workover Wastes," "Dehydration and Sweetening Wastes."

Available from: EPA Office of Solid Waste

Internet access: <www.epa.gov/epaoswer/other/oil/execrep.htm>

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Title: "Profile of the Oil and Gas Extraction Industry"

Available from: EPA Office of Enforcement and Compliance Assurance

Internet access: <es.epa.gov/oeca/sector/index.html#oilgasex>

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Title: "Environmental Guidance Document: Waste Management in Exploration and Production Operations," API Bulletin E5, Second Edition, February 1997.

Available from: American Petroleum Institute, c/o Global Engineering Documents, 15 Inverness Way E., Englewood, CO 80112, 800 854-7179

Internet access: <www.api.org/cat>

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Title: "Guidelines for Commercial Exploration and Production Waste Management Facilities," (Order Number G0004), March 2001.

Available from: American Petroleum Institute, c/o Global Engineering Documents, 15 Inverness Way E., Englewood, CO 80112, 800 854-7179

Internet access: <www.api.org/ehs/CommFac>

Title: "Environmental Engineering for Exploration and Production Activities," Monograph Volume 18.

Available from: Society of Petroleum Engineers, P.O. Box 833836, Richardson, TX 75083-3836, 972 952-9393

E-mail: books@spe.org

Internet access: <www.spe.org>

Title: "Suggested Procedure for Development of Spill Prevention Control and Countermeasure Plans," API Bulletin D16, Second Edition, August 1, 1989.

Available from: American Petroleum Institute, c/o Global Engineering Documents, 15 Inverness Way E., Englewood, CO 80112, 800 854-7179

Internet access: <www.api.org/cat>

Title: "Onshore Oil and Gas Production Practices for Protection of the Environment," API Recommended Practice 51, Third Edition, February 2001.

Available from: American Petroleum Institute, c/o Global Engineering Documents, 15 Inverness Way E., Englewood, CO 80112, 800 854-7179

Internet access: <www.api.org/cat>

Title: "Revised Guidelines for Waste Minimization in Oil and Gas Exploration and Production."

Available from: Interstate Oil and Gas Compact Commission, P.O. Box 53127, Oklahoma City, OK 73152-3127, 405 525-3556

Internet access: <www.iogcc.state.ok.us>

EPA

United States
Environmental Protection Agency
Office of Solid Waste (5305W)
Washington, DC 20460

Official Business
Penalty for Private Use $300
EPA530-K-01-004
October 2002
www.epa.gov/osw