Regulated by Oklahoma Corporation Commission

Approximately 500,000 wells drilled

More than 25 years ago, the Commission established ability to request/require reports and records on hydraulic fracturing/chemical treatment on any well

Cross references to rules regarding hydraulic fracturing (2010)

24 hours advance notice of hydraulic fracturing required to the Conservation Division District Office or field inspector (2011) Modified to 48 hours (March 12)

Horizontal wells hydraulically fractured on or after January 1, 2013 and other wells hydraulically fractured on or after January, 2014 required to be filed with FracFocus Registry (2012)
Active wells (2012):

- 65,500 Natural gas
- 117,000 Oil
- 10,800 Injection/disposal

Total active wells: 193,300

- ~350,000 plugged and abandoned wells
- ~500,000 wells drilled in Oklahoma history
- ~3,050 active operators of oil and gas wells (04/2013)
- ~41,000 miles of gathering/transmission pipelines
- ~58 Field Inspectors to cover 76 counties
Oklahoma Corporation Commission
Horizontal Wells 01/01/10-05/31/13
All Active Injection Wells Permitted at Greater Than 30,000 Bls/day

Legend
- Arbuckle UIC Wells greater 30,000 Bls
- UIC Wells Greater 30,000 Bls
DISPOSAL WELL APPLICATIONS (2012)

- Non-Commercial 1015 Applications: 390
  Permits or orders issued: 305

- Commercial 1015 Applications: 90
  Permits or orders issued: 56

- Injection Enhanced Recovery 1015 Applications: 312
  Permits or orders issued: 228
Non-Commercial Disposal Wells

OEIAF 06/13/13
Water Usage in Perspective

Water Usage (x 1,000 gallons)

- Woodford Shale Well: 7,518
- Corn Circle Avg (126-ac)*: 57,480
- OKC Daily Avg**: 90,000
- Earlywine G.C. (2011)***: 143,705

* Agricultural Issues & Recommendations, OWRB, June 2011, p. 6
** www.okc.gov/utilities
*** http://www.okgazette.com/oklahoma/article-13296-water-hogs.html
Flow back water pits > 50,000 Bbls and new Form 1014F OAC 165:10-7-16 et seq. (Also allows temporary use by another operator)

Disposal wells and Form 1015 OAC 165:10-5-5

Notice

Non-commercial – <5,000 Bbls/day to each operator of producing unit or well within ½ mile radius; >5,000 Bbls 1 mile radius

Commercial – to each operator of a producing unit or well within 1 mile radius and to each surface owner or surface lessee adjacent and contiguous to the site. Additional surety requirements based upon proposed or existing facilities.

Land application (soil farming) OAC 165:10-7-10, et seq. $50,000 surety
Water Volumes Injected in Commercial Disposal Wells

Out of State Water 3rd Qtr. FY2013

- Barrels of Water
  - Arkansas
  - Texas
  - Kansas
  - New Mexico
  - Colorado

Total Volume: 1,133,072 bbls

OEIAF 06/13/13
OCC OIL AND GAS REGULATION

- Prevent waste and safeguard mineral rights
- Protect the environment
- Ensure public safety (H$_2$S)
### Monthly Injection Volumes

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MIT screen

**Well Information**

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- **Rework Before Test?**
  - Explain:

  - **Surf Casing Press, Before Test**: 0
  - **Annulus Press Before**: 0
  - **Max. Press Per OCC Order**: 1000
  - **Actual Packer Depth**: 7000
  - **Starting Test Press**: 300

- **Positive Annulus Pressure Monitoring?**
  - Annauls Tested: Yes

- **WELL SHUT DOWN?**
  - Reason:

- **Alternative Testing Procedure Authorized by OCC Order No.**
  - Tracer Survey Passed?
  - Tubing Pressure Passed?
  - Casing Patched?
  - Fluid Level Passed?
  - Fluid Depression Passed?

- **Comment**: STEVE CHUNICKY

**Things that are captured for a MIT.**
H2S Inspection Screen

Find

Well Information

Add comments here.

Add Copy

Last modified by

Last modified on

- Wind Socks?
- Leaking Pipes?
- Corroding Pipes?
- Venting > 100ppm?

- Last test Results
- Contingency Plan?
- Specialized Equipment
- Site Security?
- Warning Signs?

Comment
### Well Information

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#### Cement

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- **Cement Operator**: DUNKIN JERRY WELL SERVICE, INC
- **Treatable Water Depth**: 1100
- **New Casing Pull**: 0
- **Last Mod. User**: OCCDOMAIN\g09
- **Last Mod. Date**: 3/1/2013 9:54:00 AM

#### Cement Class

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- **Plug KB Depth**: 1350
- **Meas Top Plug**: 1100
- **Calc Top Plug**: 1100
- **Description**: FRESH WATER
- **Last Mod. User**: OCCDOMAIN\g09
- **Last Mod. Date**: 3/1/2013 9:54:00 AM
REGULATORY ELEMENTS

- Rules
- Registrations, permits, and approvals
- Complaint procedures
- Inspections and investigations
- Enforcement
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FOCUS OF RECENT RULEMAKING

- Guide to hydraulic fracturing rules
- Drilling and completion of horizontal wells
- Storage and recycling of flow-back water
GUIDE TO HYDRAULIC FRACTURING RULES

- 165:10-3-10
  + (a) Longstanding prohibition on pollution by fracturing or acidizing operations
  + (b) New rule reference guide on hydraulic fracturing

- Used STRONGER guidelines in development of (b)
CASING AND CEMENTING

- Surface casing
  - BTW maps
  - Depth specified on ITD
  - Notice to field inspector
  - Completion report

BTW = base of treatable water
ITD = intent to drill
WATER AND WASTE MANAGEMENT

- Multi-stage hydraulic fracturing of horizontal wells
- Increasing demand on water resources
- New rules to facilitate recycling of flow-back water
PITS FOR STORING FLOW-BACK WATER

- Pits in Oklahoma fall into three categories with different permitting procedures:
  - On-site pits (Form 1000)
  - Off-site pits (Form 1014)
  - Commercial pits (Commission order)
ON-SITE PITS

- Reserve pits are authorized on the permit to drill (Form 1000)
- Small frac jobs can be handled by designing reserve pits to handle flow-back water
Off-site pits used to store water for hydraulic fracturing are permitted on Form 1014.

- Pits are typically used for more than one well.
- Size of pits have grown in recent years to over 100,000 bbl.
NEW RULE (165:10-7-16(F))

- Flow-back water pits in excess of 50,000 bbl
- Rule covers the permitting, construction, operation, and closure requirements for any pit used for temporary storage of flow-back water that is to be reused for hydraulic fracturing of wells
CONSTRUCTION REQUIREMENTS

- Earthwork compacted to achieve 90% standard proctor density
- Slope of berm may not be steeper than 3:1 on the inside and 2.5:1 on the outside
- Liner must have minimum thickness of 30 mil
- UV protection for intended life of pit
- Maximum fluid level 3 ft below top of berm
- Width of crown must be minimum of 8 ft
CONSTRUCTION REQUIREMENTS (CONT.)

- Additional requirements for Hydrologically Sensitive Areas (HSA)
  - Minimum 60 mil liner, OR 30 mil liner with a leachate collection system
  - Monitor wells required
OPERATION AND MAINTENANCE

- Vegetative cover must be established on all areas of earth fill on outside slopes
- Pit must be enclosed by a fence
- Site must be secured by a locked gate
CLOSURE

- Topsoil must be stockpiled for cover
- Bond or other financial security to cover closure cost
Creek County LiDAR Map for 26-17N-R8E
## Operator Well Inventory

**Oklahoma Corporation Commission**

### Oil and Gas Info

**Entity Information**

- **Company Name:** WHITE OPERATING COMPANY, LLOYD R WHITE
- **Operator #:** 8891
- **Status:** OPEN
- **Parent Entity:** N/A

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Thanks to our Partners

Demo’s of RBDMS Oklahoma upon request