Water Use in the Oil & Gas Industry

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Environmental Permits and Support
Goal for Texas Waters

It is the goal of Texas Railroad Commission to maintain and protect the quality of surface and groundwater in the State. Policies shall be consistent with public health and welfare, and facilitate oil and gas industries, taking into consideration the economic development of the state.
Topics for Discussion

- Water Uses in the Industry
- Regulation of Surface Water
- Regulation of Ground Water
- Responsibility of Texas Railroad Commission
- Management of Produced Water and Other Waste Streams
- Best Management Practices (BMP’s)
Water Use in the Industry

- Enhanced Oil Recovery (EOR) water flooding
- Drilling and Completion
- Workover
- Cavern Creation
- Gas Plant Cooling
- Hydrostatic Test Water

Where does all this water come from?
Regulation of Surface Water

Surface waters in Texas are owned and managed by the State. Texas Commission on Environmental Quality (TCEQ) regulates surface waters through Texas Water Code, Chapter 11, relating to Water Rights

- Temporary Water Rights
- Water Rights Permitting

In Texas groundwater is regulated by local Groundwater Conservation Districts (GCDs)

- **Texas Water Code, Chapter 36**
  - Conserve, preserve, protect, recharge, and prevent waste of groundwater resources within their boundaries

- **Texas Water Development Board must approve groundwater management plans.**

http://www.twdb.state.tx.us/groundwater/index.asp

http://www.tgpc.state.tx.us/
RRC Responsibility

• Water Protection (Statewide Rule 8)

• No person subject to RRC may cause or allow pollution of surface or subsurface water

• No person may dispose of (or recycle) oil and gas waste except as authorized or permitted by RRC
Management of Produced Water and Other Waste Streams

- Recycling
  - Authorized
  - Permitted
- Land Apply (irrigation)
- Discharges
  - Recycling Opportunities
- Stormwater
  - Best management practices
Authorized Fluid Recycling

Non-commercial fluid recycling (NFCR) 8(d)(7)(B)

- Treatment and reuse of fluid produced from an oil or gas well
- By the operator or a contractor
- On an RRC lease
- Fluids may be accepted from other leases or operators
- Recycled fluids may be stored on-site in authorized pits.

Reuse of the fluid is authorized

- For makeup water for frac fluids or another type of oil-field fluid used in the wellbore of an oil, gas, geothermal or service well
- For any use except discharge to surface waters
Authorized Fluid Recycling Pits

Containment options include:

Pit Design

- Sufficiently large and have adequate freeboard
- Designed to prevent stormwater from entering the pit
- Constructed with dikes that are structurally sound and do not seep
- Lined with a liner that has a hydraulic conductivity $1.0 \times 10^{-7}$ cm/s or less
- Constructed and operated outside of the 100-year flood plain

Above Ground Storage Tanks

- Open top
- Enclosed
Authorized Fluid Recycling

District Registration: Operator must provide written notification prior to construction or prior to use of an existing pit for non-commercial fluid recycling, including:

- Location of the pit with lease name and number or drilling permit number, and latitude and longitude
- Dimensions of the pit and maximum capacity of the pit; or
- A signed statement that the operator has permission from the surface owner for construction and use of the pit.

http://www.rrc.state.tx.us/oil-gas/applications-and-permits/environmental-permit-types-information/swr8-summary/
Fluid Recycling Expansion

Red markers only represent number of pits in the county, not exact location. Currently 79 registered pits.
Authorized Fluid Recycling Pits

If your fluid recycling does not meet this criteria then you must obtain a permit. All commercial recycling must be permitted in accordance with Chapter 4, Subchapter B.
Permitted Fluid Recycling

• Division 5
  • Off Lease Commercial
  • Limited to a location for 2 years

• Division 6
  • Off Lease/ On lease Commercial
  • Limited to location for 5 years

Complete water analysis may be required
Fluid Recycling Permit Standards

- Water quality standards will be evaluated dependent on requested reuse

- No minimum water quality standards if used in an oil or gas wellbore

http://www.rrc.state.tx.us/oil-gas/applications-and-permits/environmental-permit-types-information/recycling/
Land Apply Produced Water

Beneficial for wildlife or agricultural uses

- Associated pits
- Irrigation
- Reverse osmosis (gas plants)

- Soil and complete water analyses required
- Prevent runoff

Land Apply Permit Standards

• Water quality standards will be evaluated for application rates

• Composite soil sampling and analyses required quarterly

http://www.rrc.state.tx.us/oil-gas/applications-and-permits/environmental-permit-types-information/recycling/
Discharges to Surface Waters

Must be permitted by both EPA (NPDES) and RRC

- Produced Water (Inland & Offshore)
- Hydrostatic Test Water (HT)
- Gas Plant Effluent (GPE)

- Complete water analysis required

http://www.rrc.state.tx.us/oil-gas/applications-and-permits/environmental-permit-types-information/discharges/
Discharge Permit Standards

• May not cause a violation of the Texas Surface Water Quality Standards

• Each discharge has required effluent testing and limitations specific to location

• Additional testing parameters and limitations may be added based on results of water analysis or chemicals added to discharge

http://www.rrc.state.tx.us/oil-gas/applications-and-permits/environmental-permit-types-information/recycling/
Recycling Opportunities

Reuse for HT Discharge Water (New Pipelines Only)

- Storage and transportation
- Dedicated pits
- Commercial?
- Water testing required?

Recycling Opportunities

Reuse for Gas Plant Effluent

• Dedicated pits
• Cuts cost for disposal
• Dust suppression
• Irrigation
• Commercial?
• Water Testing required

http://www.rrc.state.tx.us/oil-gas/applications-and-permits/environmental-permit-types-information/discharges/gasplanteffluent/
Storm Water Discharges

Permits will distinguish between contact storm water and non-contact storm water

- Non-contaminated storm water may be discharged without a permit from RRC. A permit from EPA may be required.
- Storm water detention ponds (permitted as pits)
- Discharge of contact storm water is prohibited.
- Best Management Practices (BMPs) should be followed when managing non-contact storm water.
Best Management Practices

These apply to all RRC authorized and permitted facilities

- Use of berms, grading or curbing to prevent runoff of contaminated fluids
- Secondary containment requirements for storage tanks, frac tanks or other vessels containing wastes
  - 120% capacity is recommended, however a minimum capacity consistent with the U.S. Environmental Protection Agency’s rules governing Spill Prevention, Control, and Countermeasure Plans (40 CFR Part 112), is acceptable that will capture 100% and the 25 year/24-hour rainfall event.
- Good Housekeeping and Inspections
Contact Information

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