

An Overview of USEPA's Produced Water Regulations and Permitting

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The Clean Water Act

- Established the National Pollutant Discharge Elimination System (NPDES) permitting program
- Requires that all discharges of pollutants to surface waters are authorized by NPDES permits

NPDES permits require two types of limits

- Technology based limits are required in all permits
- Water Quality based limits are also required when necessary to protect water quality

Technology Based Limits

- BPT, BCT, NSPS, BAT
- Best Available Technology economically achievable required after March, 1989
 - Best professional judgment in absence of national regulations
 - Established on a case by case basis when permits are issued
 - Effluent Limitations Guidelines have been established for produced water
 - Established as a National Rulemaking
 - (40 CFR 435)

Technology Based Limits

40 CFR 435

National Effluent Limitations Guidelines for the Oil and Gas Extraction Point Source Category

(based on economically achievable technology – dependent on location)

Subcategories:

- Subpart A - Offshore – open ocean
 - Territorial Seas and Outer Continental Shelf
- Subpart C - Onshore – wellhead on land
- Subpart D - Coastal – inland/wellhead in water
- Subpart E - Agriculture and Wildlife Use
 - onshore west of the 98th meridian
- Subpart F - Stripper – produces less than 10 bbl/day of oil

Subcategories



Subpart C - Onshore

Subpart D - Coastal

Subpart A - Offshore

- Territorial Seas
(0 -3 miles)

- Outer Continental Shelf
(> 3 miles)

Produced Water Technology Based Limits

- Subpart A - Offshore Subcategory

Territorial Seas and Outer Continental Shelf

(same limits apply to Coastal Subcategory wells in Cook Inlet, AK)

- Produced Water Discharge Allowed

- Oil and Grease limited based on dissolved gas floatation technology

- 29 mg/l monthly average
- 42 mg/l daily maximum

Produced Water Technology Based Limits

- **Subpart C - Onshore Subcategory**
 - No Discharge of Produced Water
- **Subpart D - Coastal Subcategory**
 - No Discharge of Produced Water
 - Except Cook Inlet, AK

Produced Water Technology Based Limits

- **Subpart E – Agriculture and Wildlife Use**
 - Applies West of 98th Meridian
 - Discharge of Produced Water allowed if discharge quality allows for livestock or wildlife watering use
 - Oil and Grease (35 mg/l maximum)
- **Subpart F - Stripper Subcategory**
 - Discharge of Produced Water allowed
 - Effluent Guidelines did not establish limits
 - Limits established for some Texas discharges under the Coastal general permit
 - Oil and Grease (25/35 mg/l)
 - Total Dissolved Solids (TDS) < 3,000 ppm

Water Quality Based Limits

- Based on Mixing in the Receiving Water
 - Often a percentage of the stream flow or area
 - Gulf of Mexico
 - 100 Meter Mixing Zone in Federal Waters
 - Mixing Zone size defined by State Water Quality Standards for discharges to State waters (i.e.: territorial seas and coastal waters)
 - Texas – 200 feet
 - Whole Effluent Toxicity
 - Numeric Water Quality Standards
 - Narrative Standards

40 CFR 435 Permits in Region 6

(EPA R6 is the Permitting Authority for TX O&G Activities under TX Railroad Commission and for discharges in the Outer Continental Shelf)

- Outer Continental Shelf General Permit
 - GMG290000 – EPA R6 Permit
 - 11,573 permit authorizations
- Territorial Seas General Permits
 - TXG260000 – EPA R6 Permit
 - 8 permit authorizations
 - LAG260000 – EPA R6 Permit
 - 118 permit authorizations
 - Proposed LDEQ Permit anticipates approximately 150 potential permit authorizations
- Coastal General Permits
 - TXG330000 – EPA R6 Permit
 - 42 permit authorizations
 - LAG330000 – LDEQ Permit Issued
 - 712 permit authorizations

Coastal Produced Water

- Texas (TXG330000)
- Current permit issued May 31, 2007
- Permit Expires July 6, 2012
- Produced water discharges prohibited except from some stripper wells
- Stripper wells (<10 bbl/day oil produced)
 - Oil and Grease: 25/35 mg/l
 - TDS: <3,000 mg/l
 - Monitoring now required for TDS once per year

Coastal Produced Water

- Louisiana (LAG330000)
- Current permit issued September 27, 2005
- Permit Expires November 30, 2012
- Produced water discharges prohibited

Territorial Seas Produced Water

- Texas (TXG260000)
 - Current Permit Issued September 6, 2005
 - Permit Expires November 4, 2010
 - Oil and Grease 29/42 mg/l
 - Toxicity
 - 7-day Chronic limit based on 100 meter mixing zone
 - 24-hr. Acute limit - 100% effluent
 - Texas Water Quality Standards Requirement
 - Permit allows pre-dilution

Territorial Seas Produced Water

- Louisiana (LAG260000)
 - Current Permit Issued November 4, 1997
 - Permit Expired December 3, 2002
 - Chronic Toxicity
 - 100 meter mixing zone
 - Limits based on State Standards
 - Benzene, Lead, Thallium, Phenol
 - LDEQ Permit Reissuance
 - Public Notice on December 31, 2008

Outer Continental Shelf (OCS) Produced Water

- GMG290000 – EPA Issued Permit
- 1998 Permit Expired 11/03
- Re-issued 10/6/04 for a 3 year term
 - Short term so effects to hypoxia could be examined
- Offshore Subcategory Technology Based Limits
 - No changes
 - Oil & Grease (dissolved gas floatation technology)
 - 29 mg/l Monthly Average
 - 42 mg/l Daily Maximum

OCS Water Quality Based Limits

- Based on Ocean Discharge Criteria
Clean Water Act section 403(c)
- Whole Effluent Toxicity Limit
- New Monitoring Requirements for
Discharges in the Hypoxic Zone

Hypoxia Study

- Produced water monitoring completed and study submitted to EPA August, 2005
- Analysis of produced water data conducted using three existing hypoxia models
- Calculated impact to hypoxia to be very small and within the margin of uncertainty of the models and the margin of error of the ambient monitoring

Latest OCS Permit Re-Issuance

- Permit proposed December 21, 2006
- Permit issued May 31, 2007
- Permit effective October 1, 2007

Latest OCS Permit Re-Issuance

- Whole effluent toxicity limit changed to include sub-lethal effects
 - 2 year compliance schedule
 - Some operators planning to add diffusers
 - Permit allows increased dilution to meet limit
 - Vertically aligned multiple discharges ports
 - Diffuser designed using CORMIX dispersion model
 - Addition of seawater

Other Produced Water Issues

- Texas Agriculture and Wildlife Use Subcategory
 - Received some applications for discharges from wells in west Texas
 - Issue individual permits in 2008

Coal Bed Methane

- EPA Headquarters studying need for Effluent Guidelines
- Big issue in Powder River Basin
 - Thick coal beds / large volume discharges / fresh water
- Colorado San Juan and Raton Basins
 - Discharges in Raton Basin currently permitted by CO
 - Northern San Juan Basin discharges may be authorized
- Region 6 production in NM, OK, and TX
 - No discharge - re-injection has proven viable
 - Probably won't meet State Water Quality Standards

Other EPA Regions

- Region 4 – Atlanta
 - Issued Eastern GOM OCS general permit 12/9/04
 - >200 meters off Florida and Alabama
 - More extensive notification requirements
 - Bottom surveys
 - Some Coastal Zone based requirements

Other EPA Regions

- Region 9 – San Francisco
 - OCS permit issued 9/15/04
 - Monitoring of produced water to determine reasonable potential to exceed CA Water Quality Standards

Other EPA Regions

- Region 10 – Seattle
 - North Slope general permit issued 11/20/03
 - No discharge of produced water
 - Arctic general permit issued 5/16/06
 - No discharge of produced water
 - Cook Inlet general permit proposed 2/28/06
 - Discharge of produced water is authorized
 - Water Quality Standards based limits for metals, hydrocarbons, and toxicity calculated using 10 to 5,000 meter mixing zones
 - Issued May, 2007
 - Challenges by both industry and citizens groups are pending

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