

CWA Discharges Offshore - Oil and Gas E&P and Class II Perspectives

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Offshore Oil and Gas Production in Brief (AGI, 2018)

- U.S. offshore oil production in 2017: 602 million barrels (18% of U.S. total). Globally, offshore oil production in 2015: ~ 10 billion barrels (~ 29% of global production)
- U.S. offshore natural gas production in 2016: 1.7 trillion cubic feet (5.2% of U.S. total)
- Federal revenues from offshore oil and gas (2017): \$ 3.8 billion
- Largest offshore producers: Saudi Arabia, Brazil, Mexico, Norway, U.S.
- Largest producers in deep water (> 125 m, roughly 400 ft) and ultra-deep water (>1500 m, roughly 5000 feet): Brazil, Angola, Norway, U.S.
- U.S. offshore oil and gas production is focused in the central and western Gulf of Mexico, with some production off the coast of Southern California and in the Cook Inlet and Beaufort Sea of Alaska. Challenges in drilling in the Arctic offshore (shallow water depths but severe weather hazards) differ substantially from those in other offshore regions

Offshore Oil and Gas Exploration and Production Wastes - US Perspective

- Bulk of wastes generated during offshore E&P activities are formation water (produced water) and drilling muds and cuttings. Majority of produced water is re-injected for waterflood/EOR purposes. Also, majority of drill cuttings/muds are re-injected (slurry fracture injection)/annular injection
- Additional materials generated include small quantities of treated and sanitary waste, deck drainage, once-through fire water, non-contact cooling water, bilge water, ballast water, produced sands, waste oil, excess cement, chemical products and trash and debris
- In the US - offshore, all of these waste streams are regulated by the U.S.EPA or states through discharge permits (NPDES) and are either released after treatment or returned to shore for disposal
- EPA prohibits ocean discharge of some wastes: oil and synthetic based drilling muds and cuttings, produced sands, waste oil, chemical products, trash and debris. Wastes that do not meet state and federal regulatory requirements must be properly disposed or recycled onshore

Offshore Oil and Gas E&P Discharges - Regulatory Perspective - USA and North Sea

- Individual states control waters from the coast outward to 3 to 9 nautical miles, depending on the state. Federal regulation covers the Outer Continental Shelf (OCS) - the area beyond state waters out to 200 nautical miles offshore, or to the border with another country's exclusive economic zone (e.g., in the Gulf of Mexico).
- The U.S. Bureau of Ocean Energy Management (BOEM), issues leases for oil, gas, and wind energy development and evaluates and approves each plan prior to start of drilling or production activities. The U.S. Bureau of Safety and Environmental Management (BSEE), regulates energy activities including conducting inspections of offshore facilities to ensure permit compliance.
- NPDES permits contain effluent limitations (developed pursuant to the CWA including sections - 301, 302, 306, 307 and 403) and operating conditions which depend on the permit region
- Operators must apply to the EPA for permit coverage to discharge drilling and production wastes to the OCS before the Bureau of Ocean Energy Management (BOEM) authorizes activities. BOEM shares in regulating offshore discharges and may require operators to further regulate effluent discharges by imposing “mitigating measures” on certain operations
- Both drilling muds and produced water must meet toxicity testing and set discharge rate/volume requirements prior to discharge. Discharges of oil-based drilling fluids or muds (OBF or OBM), cuttings wetted with OBM, and synthetic-based drilling fluids or muds (SBF or SBM) are prohibited.
- Similar regulations are in place for E&P discharges offshore in the North Sea/Norway/UK

Offshore Discharges - Class II and CWA Implications from 9th Circuit Ruling - Maui, Hawaii

- Maui County's Lahaina Waste Reclamation Facility treats ~ 4 million gallons/day of sewage and is discharged to groundwater via 4 injection wells, located within a ¼ mile of the WWTP. The effluent (enriched in nitrogen and phosphorus) promotes algal bloom and oxygen depletion, causing ecological harm once it reaches ocean waters (hydrologically connected to the groundwater)
- This indirect discharge case (ground water and then eventually into offshore waters) highlights the important distinction between point source and non-point source discharges. For the former, the CWA mandates permits that require use of best available technologies as well as compliance with water quality standards. For the latter, the CWA leaves decisions to State Agencies, that may have chosen to do little or nothing.
- For a Class II injection and/or disposal well (injecting produced water, E&P fluids, drill cuttings etc.) operating offshore, UIC permits are generally issued by either the State Agency with jurisdiction (e.g. Texas RRC, Alaska AOGCC etc.) or by the appropriate Federal Agency (BOEM) for federal waters. The 9th Circuit ruling may result in NPDES permits also being required for each offshore injection/Class II well (with the Injection well permit the primary permit and the NPDES permit being a secondary permit - as is the case in Cook Inlet)

Topics of Discussion/Relevance

- Is SDWA/UIC even applicable to offshore injection wells?
- If injection is into a zone that is a USDW or is not a USDW - does it matter? Also, consider the presence of a seawater depth of 100s to 1000s of feet to seafloor.
- Dual regulatory jurisdiction if surface location is onshore and bottom hole location is offshore (e.g. Northstar - Alaska, EPA and BOEM)
- Also, consider that in Alaska (under the Class II program run by AOGCC), annular injection of drill cuttings/solids etc. is not covered under the UIC MOA between EPA and AOGCC when the state was granted primacy of the Class II UIC program.
- The Maui Ruling appears to be not applicable to injection wells that are operating completely offshore, but may apply to some onshore wells injecting into injection zones that are hydraulically connected with eventual surface discharge to the ocean. But if such a potential hydraulic connection were to be known or identified based on a geologic/hydrogeologic and engineering assessment during the permit application process, then such a permit should/will be denied by the regulatory agency with jurisdiction from a well integrity and loss of containment of injection fluids within the permitted injection zone basis.
- Well control and well integrity are controlling parameters and not SDWA for offshore injection, but with NPDES applicable for offshore surface discharge.