Public Meeting
EPA Oil and Gas Extraction Study
Effluent Guidelines Program

October 9, 2018
Washington, DC

Meeting Agenda

- EPA Presentation (10:30 – 11:30)
  - Background on the NPDES program and effluent guidelines
  - Reasons for, goals and scope of EPA's produced water study
  - Stakeholder engagement activities
  - Summary of feedback received from stakeholders
  - Next steps
- Break (11:30 – 12:30)
- Participant input (12:30 – 4:00 PM)

NPDES Program Background

- The National Pollutant Discharge Elimination System (NPDES) was created in 1972 by the Clean Water Act (CWA)
- Addresses water pollution by regulating point source discharges of pollutants to waters of the United States
- Applies to industrial sources as well as discharges from municipal wastewater treatment plants
- The goal of the CWA is zero discharge of pollutants

NPDES Permits

- Any discharge of pollutants to surface waters must obtain authorization to discharge (i.e., a permit)
- NPDES permits contain both technology-based effluent limitations as well as water quality-based effluent limitations
  - Technology-based limitations are based on the performance of best available treatment technologies, while considering factors such as economic achievability to the industry
  - Water quality-based effluent imitations are protective of the water quality of the receiving water; water quality goals for water bodies are defined by state water quality standards

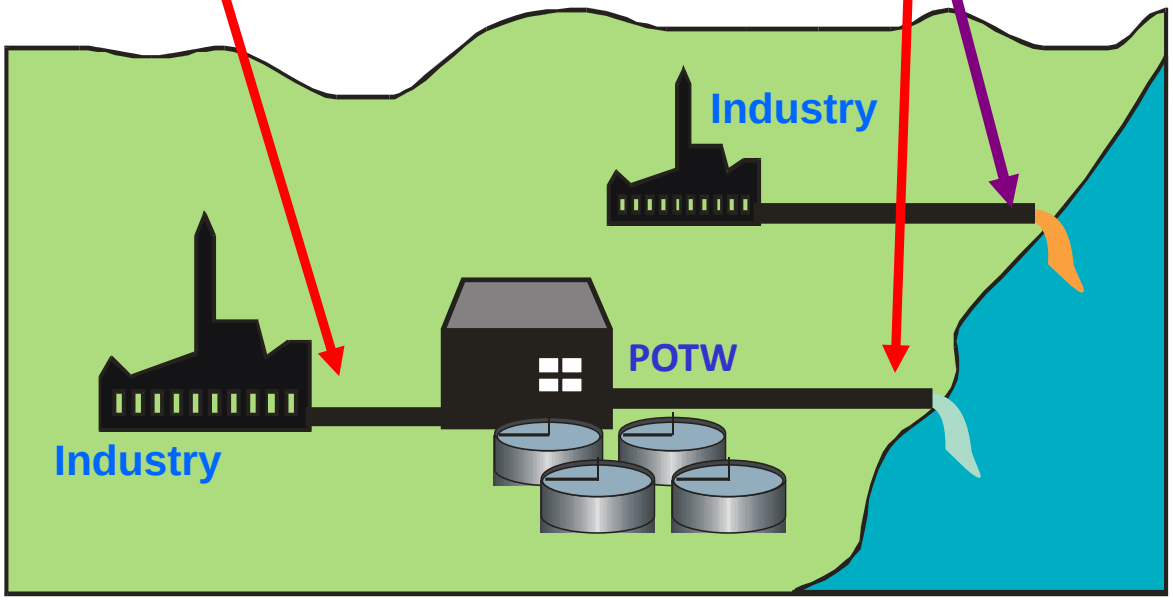
Technology-Based Limits
- - What are their objective?

- Intended to define the minimum level of pollution control for industrial wastewater
  - Determined by assessing the pollution reduction capability of technologies
    - Statute designed to increasingly elevate the technology floor for all discharges in and industrial sector to match the performance of the best plants in the industry
    - "Technology" includes in plant or end of pipe treatment, process changes, pollution prevention, wastewater minimization, best management practices and alternative wastewater management techniques
    - Limits based on the performance of specified technologies; facilities are not required to use those technologies and may instead use alternative approaches to comply
- Provide equity among dischargers with an industry sector
  - Industry-specific (e.g., paper mills, oil & gas activities, steel mills)
  - Apply to all facilities throughout the country within the industry sector
- *Not* based on the water quality of individual receiving waters

Programs to Control Industrial Discharges

- **National Pretreatment Program**
  - Controls for industrial & commercial facilities that discharge wastewater to sewage treatment plants (indirect dischargers)
  - Controls interference and pass-through of pollutants

- **National Pollutant Discharge Elimination System (NPDES) discharge permits**
  - Permits for industrial & commercial facilities that discharge directly to surface waters (“direct dischargers”)
  - Permits for sewage treatment plants



POTW = Publicly Owned Treatment Works

Effluent Guidelines Affecting Oil and Gas Extraction

- EPA has two nationally applicable, technology-based regulations that affect discharge of oil and gas extraction wastewaters:
  - Oil and gas extraction effluent guidelines
    - 40 CFR part 435
  - Centralized waste treatment effluent guidelines
    - 40 CFR part 437

Oil and Gas Extraction Guidelines

- For onshore facilities, the oil and gas extraction guidelines generally prohibit discharge of pollutants in wastewaters from both conventional and unconventional wells directly to surface waters (zero discharge)
- Exceptions are:
  - Discharge for beneficial reuse west of the 98th meridian (Subpart E)
  - Stripper wells (Subpart F- Reserved)
  - Coal bed methane (CBM) (Subpart H - Reserved)
- Also, discharge of pollutants from unconventional extraction activities (shale or tight formations) to POTWs is prohibited

Centralized Waste Treatment (CWT) Guidelines

- CWT facilities accept wastewater from off-site for treatment or reuse
- CWT facilities can accept oil and gas extraction wastewater and can discharge both directly and indirectly
- CWT rules were not developed specifically for wastes from oil and gas extraction, so the technology basis and the effluent limitations may not adequately control those wastewaters (see May, 2018 CWT study)

Practices Not Subject to CWA

- Practices to manage wastewater that do not involve discharge to surface waters
  - Reuse of oil and gas extraction wastewater within the oilfield
  - Disposal of wastewater in Class II UIC disposal wells (SDWA)
  - Discharges of oil and gas extraction wastewater to land
  - Application to roads for deicing or dust suppression
  - Evaporation/seepage ponds
  - Use for irrigation of crops where the water is not first discharged to a surface water

Why We Are Doing an Oil and Gas Study

- Large volumes of wastewater – or produced water - are generated in the oil and gas industry, and projections show these volumes will increase
- Produced water is primarily managed by disposing of it using a practice known as underground injection via Class II Underground Injection Control (UIC) disposal wells
- New approaches to managing produced water are emerging
- Some states and stakeholders, particularly in water scarce areas of the country, are asking what steps would be necessary to treat and renew this water for other purposes

Oil and Gas Study – Goals and Scope

- Goal is to look at how EPA, states, tribes and stakeholders regulate and manage wastewater from the oil and gas industry
- To understand if support exists for potential regulations that may allow for broader discharge of oil and gas extraction wastewater to surface waters under NPDES
- Scope is on-shore activities, both conventional and unconventional (but not CBM)
- Key component is to solicit information from individual perspectives on topics surrounding produced water management

Engagement Activities

- In-person meetings with stakeholders
  - Washington DC, New Mexico, Colorado, Wyoming, Texas, California, Oklahoma, and Pennsylvania
- Conference calls
  - Academia
  - Industry
  - NGOs
  - Public
  - States (Utah, North Dakota, and Louisiana) and state-affiliated organizations
  - Tribes
  - Vendors

Discussion Topics

- Produced water management - pros/cons with the status quo
- Produced water management alternative options - technologies, availability, drivers, etc.
- Current or future produced water management barriers to alternatives
- Concerns related to federal regulations that allow for the discharge of treated produced water to surface waters and/or to POTWs. Challenges to permitting facilities that treat and discharge produced waters
- Appropriate level of treatment required for produced waters that will be discharged to surface waters POTWs
- Existing state regulations/requirements that conflict with different federal approaches to produced water management (e.g., water rights)

Summary of Feedback – States and Affiliated Orgs.

- Some states are supportive of additional discharge options for treated produced water
  - Add water to hydrologic cycle and can help meet downstream water allocations/water compacts
  - Additional discharge increases available water which can reduce demand for freshwater for exploration and production (E&P) activities
  - Could reduce wastewater management costs to industry in some cases
  - Could help alleviate disposal well capacity issues

Summary of Feedback – States and Affiliated Orgs.

- Some states are not supportive of additional discharge options for treated produced water
  - See existing management options as being sufficient
  - See potential problems with discharge such as impacts to water quality and residuals management
- Better data on produced water generation, reuse and injection well utilization could help manage disposal well capacity concerns
- Some states report lacking technical expertise in permitting discharges – would look to EPA for this expertise
- Some concerns over how to do water quality-based permitting since standards and criteria do not exist for many constituents in produced water

Summary of Feedback - States and Affiliated Orgs.

- Some development is in areas where there are not surface waters or other users of water, so opportunities for downstream uses may be limited
- Converting produced water from a material requiring disposal to a resource could generate additional revenue for states
- Concern that there is lack of knowledge about the chemical composition of produced water
- Concern about incomplete disclosures about chemicals used in operations

Summary of Feedback - Industry

- Where practical, industry is committed to the reuse of produced water in their operations to offset fresh water needs
- Options for produced water management should be maximized
- Produced water management should include a discharge option, which is consistent with options available for other industries
- Technology has improved, making treatment and discharge cost-competitive with other options in certain cases
- Discharge can be done in a way that is protective of the environment
- The timeline to obtain NPDES permits may be an impediment to discharge

Summary of Feedback - Industry

- Many producers support additional flexibility for produced water management, including options to discharge
  - Current and future availability of disposal wells
  - Changing state requirements for seepage/evaporation ponds
  - Reduced ability to recycle/reuse produced water in some basins as drilling and completion activities decline
  - Benefits for addressing water scarcity
  - Potential revenue source from selling water and from recovering co-products (salts, lithium)
  - Limited options for management can affect the economics of extracting resources in some areas -- potential for stranded resources

Summary of Feedback - Industry

- Some basins (e.g., Permian) are currently constrained due to insufficient injection well capacity -- producers would utilize treatment and discharge currently if option was more broadly available. Projected growth will make problem worse
- Sharing of produced water for reuse within the oil field occurs in many areas, but not in others. Reasons include perceived liability, state regulatory barriers, and business competition
- Some producers would utilize commercial (e.g., CWT) facilities if costs were comparable to other options
- Believe that EPA knows what technologies are necessary to treat produced water to be suitable for discharge
- Were EPA to change federal regulations to allow broader discharge, there are barriers at the state level
- Would like to have the option to send their wastewater to POTWs

Summary of Feedback - Tribes

- Questions about what surface waters would be affected by discharge of treated produced water
- Concern with discharges to surface waters that have important tribal uses such as fishing, ceremonial practices
- One Tribe indicated that they would like to use treated produced water for beneficial reuse (Subpart E, west of 98th meridian)
- Concern over toxicity and human health and ecological implications of discharges

Summary of Feedback - NGOs

- Concern over toxicity and human health and ecological implications of discharges due to a number of factors:
  - Large number of chemical compounds used in exploration and production – little data on toxicity; much data proprietary
  - Chemistry is constantly changing as new chemical formulations enter the market
  - Unknown transformation of chemical constituents into other chemical compounds
  - Analytical methods do not exist for many compounds
  - Limited treatment technology performance data for many compounds
  - Water quality criteria do not exist for many constituents
  - Discharges to intermittent and ephemeral streams – no safety factor provided by dilution

Summary of Feedback - Academia

- Knowledge gaps
  - Chemical composition, particularly produced water characterization, including possible downhole transformations
  - Analytical methods for detection and monitoring of constituents
- Challenges
  - How to determine treatment approaches and effectiveness without knowing what's in the wastewater
  - Similarly difficult to determine possible environmental impacts as a result of knowledge gaps
  - Produced water variability in and between oil/gas fields complicates assessment

Summary of Feedback - Others

- Generally, POTWs do not want to accept produced water because the treatment technology they employ will not treat produced waters
- At least one POTW would like to build plants specifically designed to treat produced water for discharge
- Additional work to develop analytical methods and toxicity measures for produced waters is needed
- The cost of treatment that includes desalination is much higher than the cost to reuse in the oil field or to inject into disposal wells – possibility to offset treatment costs by recovering marketable by-products
- At least one CWT says it is not easy to treat produced water, and recovering and selling co-products is necessary to offset treatment costs and be profitable; may be difficult to recover these co-products with mobile treatment systems

For More Information

www.epa.gov/eg/study-oil-and-gas-extraction-wastewater-management