

PFAS

**The Roaring 20's of Environmental
Management**

MWCC Conference

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Texas Molecular

- Commercial hazardous and non-hazardous wastewater management facility located in Deer Park, TX. In operation for over 40 years.
- Inject 90 to 100 million gallons each year.
- Provide utility-like service to a variety of industries
- State of Texas and USEPA permits including a Federal EPA No Migration Petition (NMP) for 3 Injection Wells at Deer Park, TX.
- TCEQ Compliance Rating of 0, “High” Performance
- Active member of Deer Park Citizens Advisory Council and Deer Park Local Emergency Planning Committee
- Managed and injected over 80,000,000 gallons of hazardous and non-hazardous waters contaminated with PFAS in the past 4.5 years.
- One additional No Migration Petition well in Corpus Christi, TX

PFAS, The Roaring 20's of Environmental Management

- **PFAS – What is all the fuss?**
- **What is Driving the Interest?**
- **EPA Programs and Regulatory Drivers**
- **Non-Regulatory Drivers**
- **Environmental Justice**
- **Opportunities**
- **Summary**
- **References and Information Sources**
- **Questions**

PFAS – What is All the Fuss?

- There have been numerous environmental challenges which have been a focus of attention and resources in the past. Some would include the Safe Drinking Water Act, the Clean Air Act, RCRA Land Bans, and specific chemicals like PCBs and Dioxins.
- PFAS management is likely to be a challenge which may take decades and contribute significantly to the “Roaring Twenties” of Environmental Management.
- Some of the contributing factors include:
 - » Thousands of PFAS compounds
 - » Use in multiple industries for decades
 - » Household and industry use.
 - » Significant current and legacy contamination
 - » All media are impacted, i.e. drinking water, wastewater, groundwater, air, and waste treatment and disposal

PFAS – What is All the Fuss?

- PFAS. What a great discovery. They have been used for over 70 years.
 - » PFAS chemicals have been used to improve our lives. Some uses:
 - Non-stick frying pans
 - Water and stain barrier in clothing, carpeting, outdoor equipment, and leather
 - Oil barrier for paper (french fries) and cardboard (pizza boxes)
 - Personal care products (lipstick, mascara, sunscreen, lotions, etc.)
 - High temperature oils and gaskets
 - Firefighting foams
 - Medical equipment
- PFAS chemicals have some potential problems
 - PFAS does not easily degrade. They bioaccumulate in animals and humans.
 - Almost everyone on earth has PFAS in their blood
 - PFAS has been found in the blood of polar bears
 - Some PFAS chemicals have been linked to a wide variety of cancers and other medical conditions
 - 2 PFAS compounds, PFOA and PFOS, were banned from production
 - Other PFAS compounds are coming under increased scrutiny

What is Driving the Interest?

- Public health concerns
 - » Drinking water
 - » Food supply
 - » Legacy groundwater contamination
 - » Air contamination
- Broad geographic reach
 - » Ubiquitous nature of PFAS
 - » Multiple industries
 - » In most parts of U.S.
- EPA Priority
 - » Address the public health concerns
 - » Prioritize industries and PFAS chemicals for regulation
 - » Establish “safe” levels for water, air, groundwater, and waste.

EPA Programs and Regulatory Drivers

- **PFAS future regulation is becoming more certain**
- **General direction of PFAS regulations can be ascertained by the totality of recent EPA programs and proposals.**
 - » EPA Response to New Mexico Petition on listing as a hazardous waste, 10/26/21.
 - » EPA Roadmap for PFAS Regulation, 10/18/21
 - » Preliminary Effluent Guidelines Program Plan 15, 9/21
 - » EPA Multi-Industry PFAS 2021 Preliminary Report , 9/16/21.
 - » TSCA. Proposed PFAS Reporting. 6/21/21.
 - » EPA Interim Guidance on PFAS Disposal and Destruction, 12/18/2020.
 - » TRI. Currently 176 PFAS constituents
 - » **Health Advisory (HA). EPA issued revised HA for PFOA (.004 ppt), PFOS (.02 ppt), and established new HA for PFBS (2000 ppt) and Gen X (10 ppt). Note HA for PFOA and PFOS are below detection limits (parts per quadrillion). 6/15/22.**
- **Incineration Issues**
 - » 2 States (NY and IL) have banned incineration of PFAS and AFFF
 - » DOD has suspended shipments of PFAS and AFFF to all incinerators
 - » EPA is working on incineration combustion conditions, products of incomplete combustion, as well as air transport issues.

EPA Programs and Regulatory Drivers

Preliminary Effluent Guidelines Program Plan 15

- Issued September 2021
- PFAS management and rulemaking are included
- **Covers direct (NPDES) and indirect discharge (POTW)**
- Focus on Point Source Categories (PSC) with highest discharges, e.g. **top 5 and top 25%.**
- PFAS Focus: **Organic Chemicals, Plastics, Synthetic Fibers, Pulp and Paper, Chrome Plating, and Commercial Airports. Detailed studies on landfills and textile mills are planned.**
- Excluded: **Cosmetics, Pesticides, Food Additives, Drugs & Devices**

EPA Programs and Regulatory Drivers

EPA Interim Guidance on PFAS

- EPA issued an Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Perfluoroalkyl Substances on December 18, 2020. It should be updated in 2023.
- What was the reason for report?
 - » Meet requirements of FY 2020 NDAA
 - » Provides information on current commercially available technologies to manage PFAS materials.
- What PFAS Materials does it cover?
 - » Aqueous Film Forming Foam (AFFF)
 - » Soil and Biosolids
 - » Textiles
 - » Spent water treatment materials like filters, granular activated carbon, ion exchange resins.
 - » Landfill Leachate
 - » Waste streams from facilities that use PFAS.

EPA Programs and Regulatory Drivers

EPA Interim Guidance on PFAS, continued

- What the guidance does not do
 - » Set treatment or discharge standards
 - » Does not specify or limit what technology to use. Guidance only.
- Includes additional research for new technologies.
- Includes consideration of potential vulnerable populations at TSDFs accepting PFAS wastes
 - » Releases
 - » Identify vulnerable populations
 - » Health effects
 - » Participation of vulnerable populations in permitting
 - » Vulnerability as part of risk assessment
 - » Community engagement
- Ranks available technologies in terms of levels of uncertainty concerning environmental and health risk.
- Interim Guidance to be updated in 2023.

Disposal and Destruction Options In Order of “Lowest Uncertainty”

- Storage
- Class 1 Hazardous Underground Injection
- Class 1 Non-Hazardous Underground Injection
- Hazardous Waste Landfill, Subtitle C
- Non-Hazardous Waste Landfill, Subtitle D
- Hazardous Waste Incineration
- Other Thermal Treatment
- Reverse Osmosis & Ion Exchange

Challenges of PFAS Wastewater Management Opportunities

- **On-site and off-site work**
- **Consulting, legal assistance, remediation, projects, and on-going work (including re-evaluating other remediation that was proposed before PFAS contamination became an issue)**
- **Wastewaters, leachates, firefighting water, and groundwater**
- **Industries with PFAS**
 - » Chemical companies
 - » Leather tanning
 - » Specialty paper
 - » Chrome plating (legacy fume suppressants)
 - » Landfills (leachates, biosolids, gas recovery)
 - » US Military and airlines (firefighting foam and water)
 - » Oil refineries (firefighting foam and water)
 - » Storage terminals (firefighting foam and water)
 - » Others including cosmetics, lubricants, fabrics, etc.
- **National, with special emphasis in NE and Midwest**
- **We are still in the early stages of PFAS waste management. Very large potential for management of PFAS.**

Specific Opportunities

- State and Federal Regulatory Agencies
 - » EPA, DOD, State and Local Environmental and Water Authorities
 - » Develop regulations
 - » Study toxicity
- Industry
 - » Manage PFAS
 - » Evaluate replacements
- Environmental Engineers – site evaluation and advise clients
- Environmental Attorneys – advise clients
- Environmental Remediation Companies
- Colleges and Universities – work on new treatment technologies and support State and National PFAS programs
- Analytical laboratories. Increase the scope of PFAS compounds and reduce the detection limits.
- Waste treatment (landfills, incineration, underground injection)
- On-site technologies (membrane, carbon, ion exchange, etc.)

References and Information Resources, PFAS

- EPA Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances, December 18, 2020. <https://www.texasmolecular.com/wp-content/uploads/2020/12/EPA-Interim-Guidance-on-Disposal-and-Destruction-of-PFAS-12-18-20.pdf>
- TSCA Section 8(a)(7) Reporting and Recordkeeping Requirements for Perfluoroalkyl and Polyfluoroalkyl Substances, Federal Register, Volume 86 FR 33926, June 28, 2021. [federalregister.gov/citation/86-FR-33926](https://www.federalregister.gov/citation/86-FR-33926).
- EPA Preliminary Effluent Guidelines Program Plan 15, September 2021. EPA-821-R-21-003. [epa.gov/eg/preliminary-effluent-guidelines-program-plan](https://www.epa.gov/eg/preliminary-effluent-guidelines-program-plan)
- EPA Strategic Roadmap: EPA's Commitment to Action 2021 -2024. October 18, 2021, https://epa.gov/system/files/documents/2021-10/pfsas-roadmap_final-508.pdf.
- EPA Multi-industry PFAS 2021 Preliminary Report, EPA 821-R-21-004, September 16, 2021
- EPA Response to New Mexico Petition, October 26, 2021. https://www.epa.gov/system/files/documents/2021-10/oct_2021_response_to_nm_governor_pfas_petition_corrected.pdf
- PFAS Action Plan of 2021, H.R.2467. <https://www.congress.gov/bill/117th-congress/house-bill/2467>.
- Environmental Justice Screening and Mapping Tool. www.epa.gov/ejscreen

PFAS – The Roaring 20s Summary

- Comprehensive Federal regulations are not yet in force. The amount and type of new initiatives makes it is clear that regulations and opportunities are here and increasing with each passing month..
- There are numerous project and career opportunities for managing PFAS in the “Roaring 20s.”
- Opportunities are available in the public and private sector. Opportunities range from academic and research activities to legal and consulting to management and remediation.
- There is something for almost everyone who wants to be part of the solution of this environmental challenge.

Questions?

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