Emerging Contaminants & Landfill Leachate

SWANA Palmetto
2019 Annual Meeting
Pawleys Island

Jessie J. O. King
Presentation Overview

1. Background on PFAS
2. Federal Actions and Laws
3. State Actions and Laws
4. Targets for Regulatory Oversight: SW Landfills
5. Crystal Ball
What are Emerging Contaminants?

> Chemicals not previously detected (or previously far less) in the water supply.

> Also referred to as “contaminants of emerging concern”

> Risks to human health and the environment not yet fully understood.

> Introduced into water sources by way of agricultural runoff, foams, personal care pollutants, industrial

> Source: Municipal waste?
Emerging Contaminants

- Industrial chemicals like 1,4-Dioxane,
- PFAS: Per- and Polyfluoroalkyl Substances (PFAS) that include:
  - Perfluoro-octane Sulfonate (PFOS)
  - Perfluorooctanoic Acid (PFOA)
- GenX: technology used to make high performance fluoropolymers (e.g., some nonstick coatings) without the use of perfluorooctanoic acid (PFOA)
States: NC “GENX THE FILM”

- https://www.genxthefilm.org/
- https://youtu.be/OOOR5ab9M7c
PFAS

> Over 4,000 PFAS chemicals used in manufacturing worldwide since 1940s
> U.S. manufactures voluntarily phased out longer chain (more toxic and bio-accumulative)
> BUT: some replacement PFAS are capable of degrading to PFOA and other long-chain PFAS
> Widely distributed in air, soil and land
> Ecological and Human Health Risks
> Not regulated under the Federal Safe Drinking Water Act (yet)
PFAS and PFOA

> **Consumer and Industrial Uses:**
  - Firefighting foam
  - Chemical processing
  - Building and construction
  - Aerospace, electronic, semi-conductor and automotive industries
  - Stain and water-resistant coatings
  - Food packaging
  - Waxes and cleaners
PFAS

> 2000 Started looking into health and ecological risks related to PFAS

> 2006 U.S. companies began to voluntarily phase out of manufacturing and importing products using PFAS compounds
Recent Federal PFAS Actions

> 2012: EPA published third Unregulated Contaminant Monitoring Rule: to find data for 6 PFAS

> 2013-2015: Collected Drinking Water Samples in nearly 5,000 public water systems
  – using results to develop a SDWA regulatory drinking water determination process

> 2016: EPA released lifetime Health Advisories for PFOA & PFOS
  – Non-enforceable, health based drinking water levels
  – 70 parts per trillion (PPT)
  – Gives state agencies technical information on health effects, analytical methods and treatment technologies
What is Parts Per Trillion

1 ppt = 1 second in 31,700 years
1 drop of water in 20 Olympic-sized pools
6 inches in the distance from here to the sun

*NWRA April 2019 Issue Brief: PFAS
Background EPA Actions

> 2015: Proposed a Significant New Use Rulemaking for Long-Chain PFAS
   – Requires manufacturers and importers of PFOA and PFOA-related chemicals to notify EPA at least 90 days before starting or resuming new uses of these chemicals in products

> 2019: EPA Action Plan
   – Uncertainty across the US in how to most appropriately establish risk-based criteria for these compounds
   – Consistency needed
FEB. 2019: EPA Action Plan

> Priority Actions
> Short Term Actions
> Long Term Actions
EPA Priority Actions

> Propose a national drinking water regulatory determination (i.e. MCL) for PFOA and PFOS
> List PFOA and PFOS as CERCLA Hazardous substances
> Develop interim cleanup recommendations to address groundwater contaminated with PFOA and PFOS
> Finalize draft toxicity assessments for GenX Chemicals and PFBs
> Develop additional toxicity values for other PFAS Chemicals
> Use new TSCA Amendments to require reporting and review of new PFAS
1. **Understand and Address PFAS Toxicity and Occurrence**
   - Expand Drinking water Method 537 to include GenX chemicals and additional PFAS
   - Develop a new drinking water method for additional short-chain PFAS not measured by Method 537
   - DEVELOP AND VALIDATE METHODS FOR OTHER WATER MATRICES (WASTEWATER, SURFACE WATER, GW), SOLIDS (SOIL, SEDIMENT, BIOSOLIDS, FISH TISSUED) AND AIR
EPA SHORT TERM ACTIONS

2. Identifying and Addressing PFAS Exposures
3. Risk Communication and Engagements
EPA Long Term Actions

1. Explore listing PFAS Chemicals to EPCRA Toxic Release Inventory reporting
2. Explore developing a CWA ambient water quality criteria for PFAS
   – States would create water quality standards and set permit limits on discharges to waterbodies
3. EXAMINE AVAILABLE INFO AND ASK FOR ADDITIONAL INFO FROM INDUSTRY TO IDENTIFY INDUSTRIAL SOURCES
4. ONCE IDENTIFIED, Explore regulation through controls on discharge and indirect discharge permits
EPA LONG TERM ACTIONS

5. Nationwide drinking water monitoring for PFAS
   – Proposing new methods to detect more PFAS chemicals
   – Utilizing lower minimal reporting levels (MRLs) than previously possible

6. Develop a PFAS data inventory

7. Identify sensitive and susceptible species

8. Incorporate info into the EPA atmospheric models – see if atmospheric fate and transport potential of PFAS
EPA Draft Recommendations

> Intended to provide clear and consistent guidance for federal cleanup programs (CERCLA (“Superfund”))
> Preliminary remediation goals (PRGs) to inform site-specific cleanup levels for PFOA and PFOS contamination of groundwater
PUBLIC COMMENT PERIOD

> EPA seeking comments on all parts of the recommendations
  – Including use of EPA’s Lifetime Drinking Water Health Advisory level of 70 ng/L or parts per trillion as the recommended PRG for groundwater
  – Whether higher or lower values would be supported.
> The 45-day public comment period will close on June 10, 2019.
CURRENT STATE PFAS POLICIES

55 current policies in 19 states
11 adopted policies in 8 states

[Map showing current policies by state]
NC: CURRENT BILLS

> **PFAS H 560 / S 655:** Prohibits the manufacture, sale, and use of firefighting foams containing PFAS. Requires firefighter protective equipment containing PFAS to be labeled as such.

> **PFAS SB 518:** Establishes a PFAS task force responsible for surveying PFAS contamination in North Carolina, including identifying polluters, conducting biomonitoring studies, establishing maximum health limits for PFAS, and providing clean water to contaminated communities.

> **PFAS S99:** State budget included funding for university research to monitor for PFAS in rivers, provisions for alternative water supplies for residents near a factory that has contaminated nearby wells, and funding for studies of downstream impacts. (Adopted in 2018)

> **Toxic Chemicals General SB 744:** Authorizes the Department of Environment and Natural Resources to participate in the Interstate Chemicals Clearinghouse. (Adopted in 2014)
NC Health-Based Levels

> N.C. DHHS used available toxicity information to set a health goal for GenX in drinking water at 140 nanograms per liter (ng/L) or parts per trillion (ppt).

> Health goal is a non-regulatory, non-enforceable level of contamination below which no adverse health effects would be expected over a lifetime of exposure.

> May change as new information becomes available

> EPA looking at 110 ppt
2018 NC Legislature passed SL 2018-5, directing NC Policy Collaboratory to identify expertise, technology and instrumentation to conduct nontargeted analysis for PFAS, including GENX, all public water supply surface water intakes and one public water supply well selected by each municipal water system, to establish a water quality baseline for all sampling sites.
NC 2018 Act Progress Report

> Created a Plan for sampling of 348 sites in NC
> Started contacting waste water treatment plants for sampling
> Developed analytical methods
> Performed private well risk modeling using samples from tributaries to the Cape Fear River, and date of GenW measurements in 769 private drinking water wells
> Performed PFAS Removal Performance Testing
> Performed preliminary air sampling experiments in Chapel Hill, Fayetteville, Greenville and Wilmington
> Took Rain samples
“Dr. Barlaz spoke at a meeting of the…NC SWANA… and at a private meeting with landfill owners on Nov. 8th to discuss data needs and to build support for sampling”

“He met with a local consultant in the wastewater field to identify candidate landfills”

Conducted alligator and fish studies

Performed first doising study on mise

Performed risk communication
TEAM FIVE A:NC PFAS TEAM NETWORK

> Project: to analyze “Novel PFAS Inputs into the Environment (Landfills)

> Goal: To estimate the total quantity of PFAs present in leachate that is subsequently discharged to either POTWs or to surface water after on-site treatment at a landfill
Specific Aims:

- Estimate the mass of PFASs discharged to POTWs by characterizing the PFAS fingerprint of MSW landfill leachate
- Estimate the mass of PFASs entering POTWs via municipal wastewater and assess importance of MSW landfills as a source
- Estimate the release of PFASs to surface water downstream of POTWs using published info on attenuation during treatment
- Estimate the release of PFASs from LFs that receive C&D waste and document locations
FLORIDA. KENTUCKY. MICHIGAN.

> FLORIDA
  – PFAS SB 1330: Requires reporting of discharges of PFOA and PFOS.
  – PFAS SB 998: Requires entities who discharge PFAS to report discharges to the Department of Environmental Protection

> KENTUCKY: SB 104: Prohibits the use of firefighting foam containing PFAS for training purposes.

> MICHIGAN: SB 14: Sets Maximum Contaminant Levels for PFOA and PFOS in drinking water of 5 ppt.
SOURCES of PFAS in WATER

> Effluent from discharges in POTWs, WWTPs, Etc.
  – Manufacturers, MSW Landfills,
  – Contaminated sites, commercial waste
> Biosolids from the above sources
> Rain
> Groundwater Contamination
MSW LANDFILL LEACHATE & PFAS

> STUDIES

– 2017 LANG
– 2018 HAMID
– 2018 MWRA
LANG 2017 STUDY

> 87 samples from 18 landfills

> Findings:

– PFOA and PFOS concentrations in leachate generally decreasing over time

– Greater rates of decline in humid regions (i.e., precipitation greater than 75 cm/year)

– Humid regions (east coast):
  • More/bigger MSW Landfills
  • contain nearly half the annual volume of solid waste disposed in the US
Hamid 2018 STUDY

> Data from 11 literature sources published between 2004 to 2017,

> PFAS leachate concentrations from landfills in:
  – Australia, Canada, China, Denmark, Germany, Norway, Spain, Sweden, and the US

> Dozens of landfills / More than 162 leachate samples
HAMIL 2018 FINDINGS

> PFOA and PFOS concentrations in landfill leachate vary considerably in different regions of the world

> Results affected by Country’s
  – consumer products
  – industrial materials used, produced, & disposed

> Rate of degradation of PFAS materials to PFOA and PFOS affected by:
  – age of waste materials
  – climatic conditions to which landfills are subject
Lang and Hamil Findings

> A wide range of leachate PFOA and PFOS concentrations worldwide

> China’s values are much higher than elsewhere
  – Why?
  – Continued production of consumer goods with PFAS
  – Industrial waste associated with related manufacturing processes

> Chinese products are then distributed throughout the world for purchase, including in the US

> Chinese Consumer products end up in US Landfills
1. Michigan surface water contaminated with PFAS
2. 2018: MDEQ asked LFs & WWTPs to test for PFOS and PFOA
3. MWRA commissioned report of 35 of state’s 45 landfills
4. LF Data compared with overall discharges from WWTPs
5. Report Conclusions:
   – landfills contribute just a small portion of PFAS released into waterways
   – wastewater from other industrial sources likely plays a larger role
Pfoa & pfos concentrations LF Leachate
## PFOA & PFOS Concentrations in LF Leachate

### Table 2.2: Summary of Literature Study - PFOA & PFOS Concentrations in Landfill Leachate

<table>
<thead>
<tr>
<th>Source Cited</th>
<th>Location/Region</th>
<th>Sample Size</th>
<th>PFOA</th>
<th>PFOS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Detection Frequency %</td>
<td>Concentration Range (ng/l)</td>
</tr>
<tr>
<td>1. Huset, et al (2011)</td>
<td>USA</td>
<td>5</td>
<td>100</td>
<td>380 - 1,000</td>
</tr>
<tr>
<td>3. Lang, et al (2017)</td>
<td>USA</td>
<td>87</td>
<td>100</td>
<td>30 - 5,000</td>
</tr>
</tbody>
</table>
Regional Comparison

Figure 2-2
PFOA & PFOS Concentrations in Landfill Leachate (By Region)

United States
PFOA
- Max: 5000
- Median: 712
- Min: 30
PFOS
- Max: 800
- Median: 117
- Min: 3

Europe
PFOA
- Max: 1000
- Median: 253
- Min: 0
PFOS
- Max: 1500
- Median: 211
- Min: 0

Australia
PFOA
- Max: 7500
- Median: 526
- Min: 17
PFOS
- Max: 2700
- Median: 126
- Min: 0

China
PFOA
- Max: 214000
- Median: 2600
- Min: 281
PFOS
- Max: 8020
- Median: 1740
- Min: 1150
MWRA REPORT ON PFAS IN LEACHATE

> 35 Landfills
   – Sent @1 million gallons of leachate to wastewater treatment plants
   – Leachate had concentrations of about 0.01 pounds of PFOA and 0.003 pounds of PFOS

> 34 Wastewater Plants
   – Received @1.4 billion gallons/day of waste “influent” from various sources each day.
   – Included @0.09 pounds of PFOA and 0.15 pounds of PFOS
> 2011 and 2014: Michigan develops surface water standards for PFOS and PFOA

### Table 2-1 – Rule 57 Values

<table>
<thead>
<tr>
<th>Chemicals</th>
<th>HNV (non-drinking water*)</th>
<th>HNV (drinking water**)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFOS</td>
<td>12 ppt</td>
<td>11 ppt</td>
</tr>
<tr>
<td>PFOA</td>
<td>12,000 ppt</td>
<td>420 ppt</td>
</tr>
</tbody>
</table>

HNV: Human Non-cancer Value
## Table 4-2A
Concentrations and Mass of PFOA AND PFOS
Michigan Active Type II Landfills’ Leachate

<table>
<thead>
<tr>
<th>MWRA Participating Landfill Designation</th>
<th>Average Leachate Volume GPD</th>
<th>PFOA (ppt)</th>
<th>PFOS (ppt)</th>
<th>&quot;PFOA Daily Mass (lb/day)&quot;</th>
<th>&quot;PFOS Daily Mass (lb/day)&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arbor Hills Landfill</td>
<td>98,400</td>
<td>3200</td>
<td>220</td>
<td>0.0026</td>
<td>0.00018</td>
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<tr>
<td>Autumn Hills RDF</td>
<td>54,800</td>
<td>1300</td>
<td>380</td>
<td>0.0006</td>
<td>0.00017</td>
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<td>Bront Run Landfill</td>
<td>16,400</td>
<td>540</td>
<td>110</td>
<td>0.0001</td>
<td>0.00002</td>
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<tr>
<td>C&amp;C Expanded Sanitary Landfill</td>
<td>42,000</td>
<td>1300</td>
<td>450</td>
<td>0.0004</td>
<td>0.00015</td>
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<tr>
<td>Carleton Farms Landfill</td>
<td>123,300</td>
<td>1800</td>
<td>250</td>
<td>0.0018</td>
<td>0.00026</td>
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<tr>
<td>Central Sanitary Landfill</td>
<td>30,100</td>
<td>2500</td>
<td>470</td>
<td>0.0006</td>
<td>0.00012</td>
</tr>
<tr>
<td>Citizen’s Disposal Inc</td>
<td>32,900</td>
<td>1100</td>
<td>160</td>
<td>0.0003</td>
<td>0.00005</td>
</tr>
<tr>
<td>Daftar Sanitary Landfill</td>
<td>16,500</td>
<td>670</td>
<td>150</td>
<td>0.0001</td>
<td>0.00002</td>
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<tr>
<td>Eagle Valley RDF</td>
<td>32,900</td>
<td>470</td>
<td>170</td>
<td>0.0001</td>
<td>0.00005</td>
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<tr>
<td>Glenis Sanitary Landfill</td>
<td>3,800</td>
<td>770</td>
<td>210</td>
<td>0.00002</td>
<td>0.00001</td>
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<tr>
<td>Granger Grand River Landfill</td>
<td>64,400</td>
<td>240</td>
<td>160</td>
<td>0.0001</td>
<td>0.00009</td>
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<tr>
<td>Granger Wood Street Landfill</td>
<td>18,200</td>
<td>470</td>
<td>110</td>
<td>0.0001</td>
<td>0.00002</td>
</tr>
<tr>
<td>K&amp;W Landfill</td>
<td>17,500</td>
<td>800</td>
<td>170</td>
<td>0.0001</td>
<td>0.00002</td>
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<tr>
<td>Manistee County Landfill</td>
<td>4,700</td>
<td>420</td>
<td>220</td>
<td>0.000006</td>
<td>0.000009</td>
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<tr>
<td>McGill Road Landfill</td>
<td>13,700</td>
<td>750</td>
<td>170</td>
<td>0.0001</td>
<td>0.00002</td>
</tr>
<tr>
<td>Michigan Environ Inc. (Mecumine)</td>
<td>13,100</td>
<td>1400</td>
<td>100</td>
<td>0.0002</td>
<td>0.00001</td>
</tr>
<tr>
<td>Northern Dunes RDF</td>
<td>12,300</td>
<td>1000</td>
<td>220</td>
<td>0.0001</td>
<td>0.00002</td>
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<tr>
<td>Oakland Heights Development</td>
<td>17,500</td>
<td>750</td>
<td>230</td>
<td>0.0001</td>
<td>0.00003</td>
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<tr>
<td>Orchard Hill Sanitary Landfill</td>
<td>12,500</td>
<td>650</td>
<td>110</td>
<td>0.0001</td>
<td>0.00001</td>
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<tr>
<td>Ottawa County Farms Landfill</td>
<td>82,200</td>
<td>1800</td>
<td>530</td>
<td>0.0012</td>
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<tr>
<td>People’s Landfill</td>
<td>21,900</td>
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<td>710</td>
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<tr>
<td>Pipe Tree Acres RDF</td>
<td>34,000</td>
<td>1800</td>
<td>430</td>
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<td>0.00003</td>
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<tr>
<td>Pittsfield Landfill</td>
<td>17,500</td>
<td>500</td>
<td>400</td>
<td>0.0002</td>
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<td>Sauk Trail Hills Landfill</td>
<td>20,500</td>
<td>2800</td>
<td>610</td>
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<tr>
<td>SC Holdings</td>
<td>16,000</td>
<td>900</td>
<td>410</td>
<td>0.0001</td>
<td>0.00005</td>
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<tr>
<td>Tri-City RDF</td>
<td>9,600</td>
<td>1200</td>
<td>160</td>
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<td>0.00001</td>
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<tr>
<td>Venice Park RDF MH20*</td>
<td>32,900</td>
<td>910</td>
<td>190</td>
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<td>0.0002</td>
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<tr>
<td>Venice Park RDF MH21*</td>
<td>32,900</td>
<td>1800</td>
<td>630</td>
<td>0.0007</td>
<td>0.0002</td>
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<td>Vienna Junction Industrial Park Sanitary Landfill</td>
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<tr>
<td>Waters Landfill</td>
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<td>900</td>
<td>230</td>
<td>NONE</td>
<td>NONE</td>
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<tr>
<td>Westside RDF</td>
<td>60,800</td>
<td>1300</td>
<td>160</td>
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<tr>
<td>Whitefield Landfill</td>
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<td>1700</td>
<td>500</td>
<td>NONE</td>
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<td>Woodland Meadows RDF - Van Buren</td>
<td>54,800</td>
<td>2600</td>
<td>510</td>
<td>0.0009</td>
<td>0.00023</td>
</tr>
</tbody>
</table>

Other Active Type II Landfill Leachate Data (obtained from MDEQ):

<table>
<thead>
<tr>
<th>MWRA Participating Landfill Designation</th>
<th>Average Leachate Volume GPD</th>
<th>PFOA (ppt)</th>
<th>PFOS (ppt)</th>
<th>&quot;PFOA Daily Mass (lb/day)&quot;</th>
<th>&quot;PFOS Daily Mass (lb/day)&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riverview 003*</td>
<td>1900</td>
<td>270</td>
<td>0.0003</td>
<td>0.00004</td>
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<tr>
<td>Riverview 004*</td>
<td>880</td>
<td>140</td>
<td>0.0003</td>
<td>0.00004</td>
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<tr>
<td>Riverview 007*</td>
<td>38</td>
<td>8.5</td>
<td>0.0003</td>
<td>0.00004</td>
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<tr>
<td>South Kent Outfall*</td>
<td>725</td>
<td>960</td>
<td>0.0001</td>
<td>0.00002</td>
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</tr>
<tr>
<td>South Kent Healed*</td>
<td>16</td>
<td>130</td>
<td>0.0001</td>
<td>0.00002</td>
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</tr>
<tr>
<td>Smith’s Creek Landfill*</td>
<td>510</td>
<td>120</td>
<td>0.0001</td>
<td>0.00002</td>
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</table>

Minimum maximum

<table>
<thead>
<tr>
<th>PFOA (ppt)</th>
<th>PFOS (ppt)</th>
<th>&quot;PFOA Daily Mass (lb/day)&quot;</th>
<th>&quot;PFOS Daily Mass (lb/day)&quot;</th>
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</thead>
<tbody>
<tr>
<td>minimum</td>
<td>10</td>
<td>9</td>
<td>0.000006</td>
</tr>
<tr>
<td>maximum</td>
<td>3200</td>
<td>960</td>
<td>0.0003</td>
</tr>
<tr>
<td>median</td>
<td>1000</td>
<td>220</td>
<td>0.0001</td>
</tr>
<tr>
<td>average</td>
<td>1186</td>
<td>297</td>
<td>0.0004</td>
</tr>
</tbody>
</table>
PFOA in Leachate vs Overall Influent

Figure 4-2A
PFOA Mass: Influent Leachate vs. Overall WRRF Influent

- GLWA
- CRARR
- Dowtowne
- Co-Regence
- Grand Rapids
- Holland
- Lansing
- Marenisco
- Port Huron
- Sandusky
- Terve River
- Wyoming
- YCIA

Legend:
- PFOA in WRRF Influent from sources other than leachate (lb/day)
- PFOA leachate (lb/day)
PFOS in Leachate vs Overall Influent

Figure 4-2B
PFOS Mass: Influent Leachate vs. Overall WRRF Influent

[Graph showing comparison of PFOS mass in leachate vs. overall influent for various locations, with bars representing leachate and other sources.]
MWRA REPORT FINDINGS

> In leachate sampled from MWRA member LFs,
  – PFOA ranged from 240 to 3,200 ppt
  – PFOS ranged from 100 to 710 ppt

> In WRRFs that do not accept LF leachate,
  – PFOA range from non-detect to 17.9 ppt
  – PFOS range from non-detect to 499 ppt (next highest value is 128 ppt)

> In WRRFs that accept LF leachate,
  – PFOA range from non-detect to 64.6 ppt
  – PFOS ranges from non-detect to 62.4 ppt
MWRA REPORT FINDINGS

> PFOA levels are well below Michigan’s most conservative surface water criteria (420 ppt) at all WRRFs
> PFOS levels are below Michigan’s most conservative surface water criteria (11 ppt) at approximately two-thirds of the WRRFs
MWRA REPORT FINDINGS

> Leachate provides relatively minor contribution to overall PFOA and PFOS concentration/mass in most influent because of low leachate discharge volumes;

> Non-leachate sources of PFOA and PFOS significantly contribute to WRRF influent and at higher volumes.

> Influent with no LF leachate contribution show a similar concentration range for PFOA and PFOS as influent that has leachate contribution;

> Although reduction of LF leachate concentrations of PFOA and PFOS to the influent could be beneficial to meeting WQS in the WRRF effluent, impact may be minor since leachate contributes a small volume of PFOS/PFOA overall
NC Landfill Leachate Treatment Testing

> February 2019: New Hanover County volunteered to be the first landfill to participate in NC new LF leachate sampling protocol

> Testing their new leachate treatment system (designed by SCS): Reverse Osmosis System

> Results released in April: system is effectively filtering out PFAs before discharging in the river

> System treats the leachate and recirculates the RO reject water back into the landfill

> Tested for 33 PFAS – no detectable levels found
NWRA: April Issue Brief on PFAS

> MSW LFs may contain low levels of PFAS from common household products

> PFAS mass from leachate represents a relatively minor proportion of the influent at most WWTPs

> Products manufactured outside the US continue to contain PFAS and will continue to be landfilled absent import limits

> Main exposure pathways are not LFs but are:
  • Drinking contaminated water
  • Eating contaminated food
  • Food packaging
  • PFAS treated surfaces: carpets
  • Dust
SUMMARY

> EPA is slowly making progress at coming up with a plan to help states:
  
  – What and how to test for PFAS
  – Sources of PFAS in the environment
  – Formulate standards relating to drinking water and non-drinking water surface water bodies
  – Formulate human health exposure levels
  – Keep track of PFAS products being manufactured or imported into the US
summary

> Some states aren’t waiting on EPA
> Standards are appearing in States where PFAS is contaminating drinking water, creeks and rivers at high levels
> Lawsuits are cropping up against manufacturers and will likely spread to other “sources” of PFAS
> The Solid Waste Industry needs regional leadership and a plan to address the landfill leachate issue and control the testing and dissemination of information
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