



PFAS Data in NC - Air Quality update

December 7, 2020

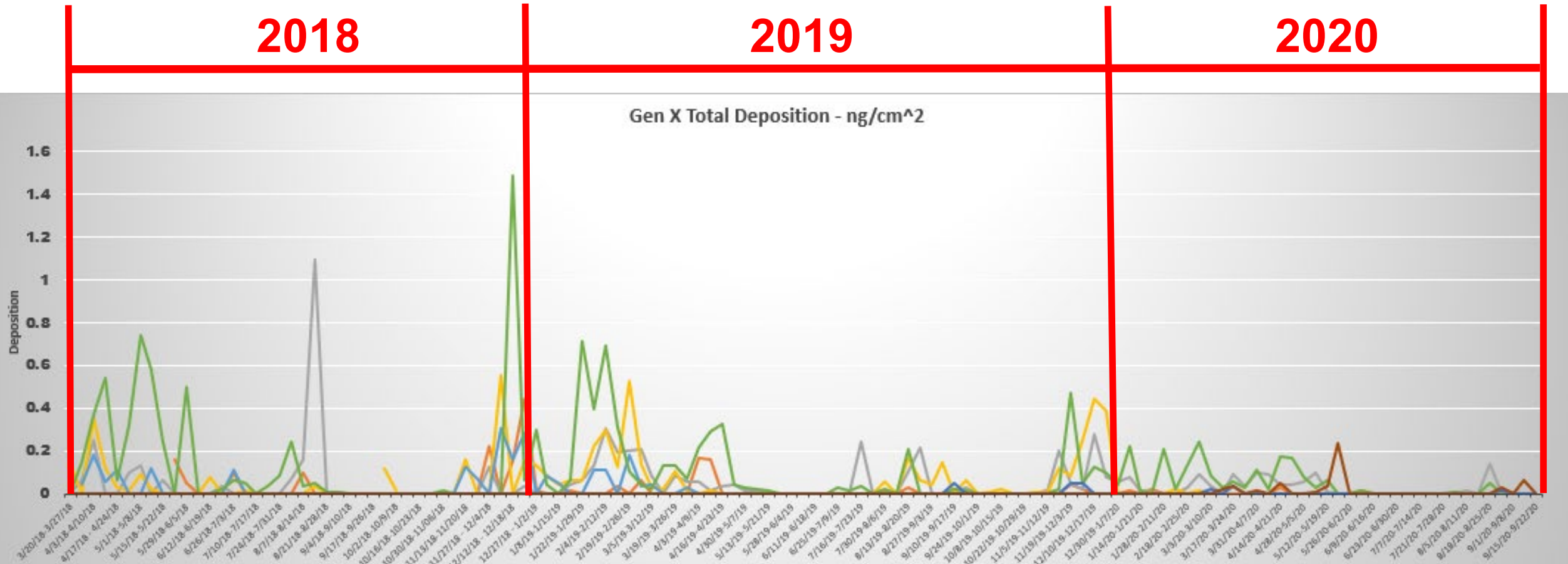
NC Division of Air Quality

Department of Environmental Quality



Near-field Atmospheric Deposition of GenX in North Carolina

5 monitoring sites are 1.0 – 2.1 miles from Chemours



Near-field Atmospheric Deposition of PFAS in North Carolina

5 monitoring sites are 1.0 – 2.1 miles from Chemours

- 1092 near-field wet and dry deposition samples collected for GenX/PFAS analyses from March 2018 thru September 2020.
- 240 samples (~22%) had ONLY GenX detected
- 48 of those samples (~4.3%) were found to contain other PFAS compounds other than Gen X. (**See next slide**)
- 288 samples with GenX and/or PFAS
 - Wet samples 82
 - Dry samples 110
 - Wet/Dry samples 96

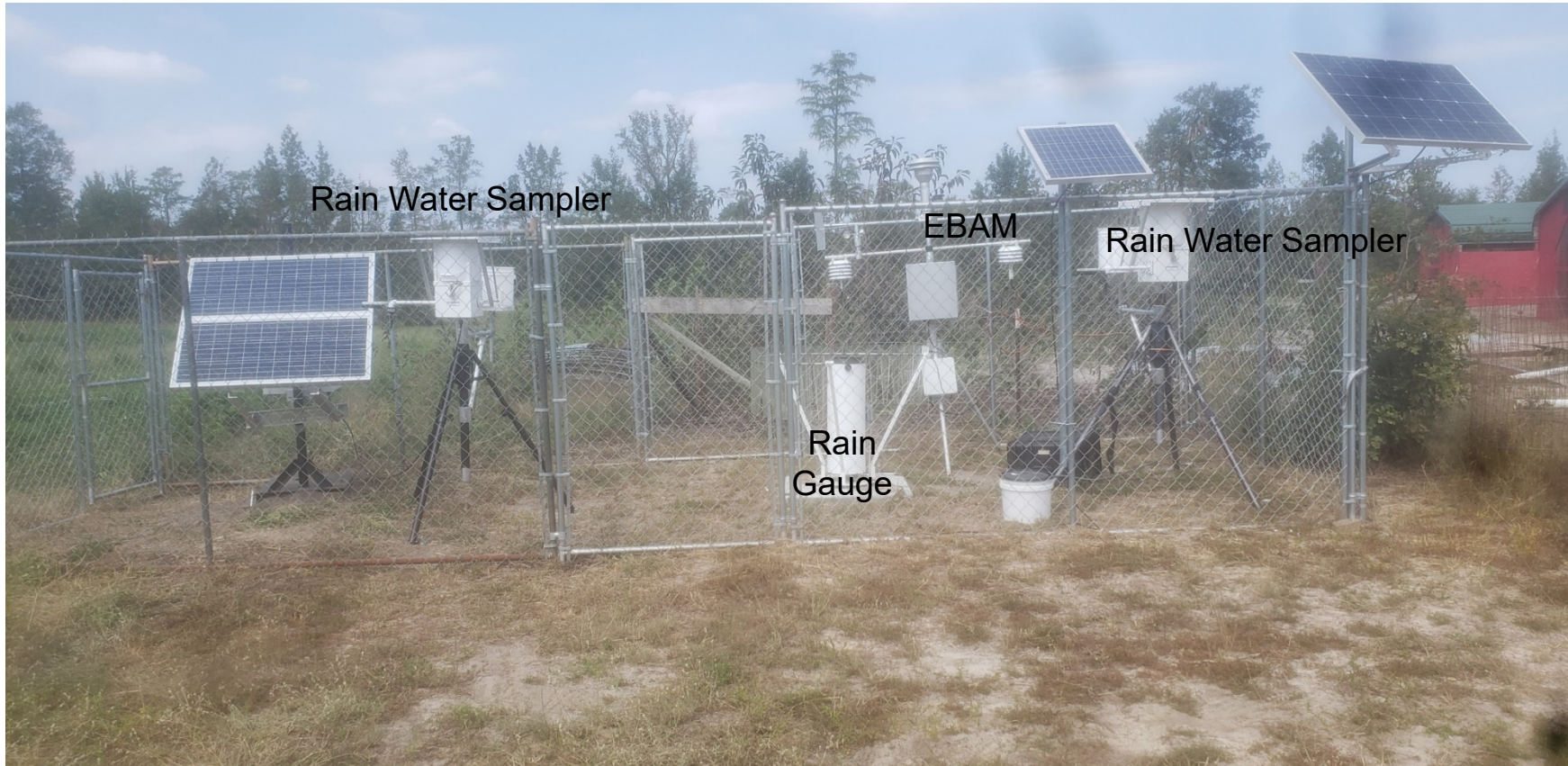


Compound	Abbrv	CAS	# Samples Analyzed for compound	# of Detections
GenX	GenX	13252-13-6	48	35
Perfluoro-n-butanoic acid	PFBA	375-22-4	48	18
Perfluoro-3-methoxypropanoic acid	PFMOPrA	377-73-1	19	18
Perfluoro(3,5-dioxahexanoic) acid	PFO2HxA	39492-88-1	19	15
Perfluoro-4methoxybutanic acid	PFMOBA	863090-89-5	19	12
1H,1H,2H,2H-perfluorooctane sulfonic acid	6:2FTS	27619-97-2	48	9
Perfluoro-n-pentanoic acid	PFPeA	2706-90-3	48	8
Perfluorooctane sulfoic acid	PFOS	1763-23-1	48	7
Perfluoro(3,5,7-trioxoctanoic) acid	PFO3OA	39492-89-2	19	7
Perfluoro-2-methoxyacetic acid	PFMOAA	674-13-5	19	6
Perfluoro-n-octanoic acid	PFOA	335-67-1	48	4
Nafion Byproduct 1	PFESA BP1	29311-67-9	19	2
Perfluoro(3,5,7,9-tetraoxadecanoic) acid	PFO4DA	39492-90-5	19	2
1H,1H,2H,2H-perfluorohexane sulfonic acid	4:2FTS	757124-72-4	48	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid	EtFOSAA	2991-50-6	48	1
Perfluoro-n-decanoic acid	PFDA	335-76-2	48	1
Perfluoro-n-heptanoic acid	PFHpA	375-85-9	48	1
Perfluoro-n-hexanoic acid	PFHxA	307-24-4	48	1
Perfluoro-n-nonanoic acid	PFNA	375-95-1	48	1
Perfluoro-n-undecanoic acid	PFUdA	2058-94-8	48	1
Perfluoro(3,5,7,9,11-pentaoxadodecanoic) acid	PFO5DA	39492-91-6	19	1



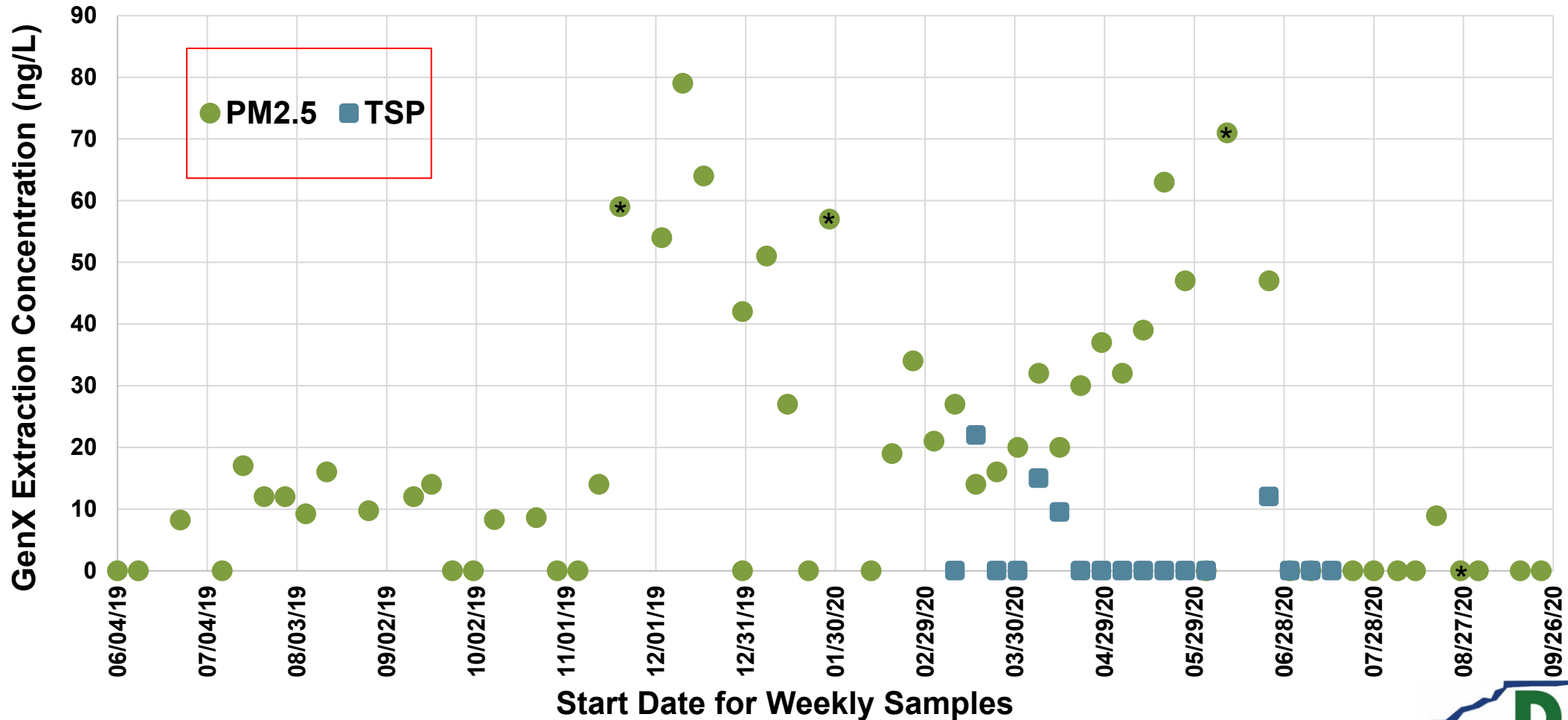
PFAS and Particulate Matter - Summary

- Original question to be addressed:
 - Was GenX/PFAS associated with particulate matter and was it detectable?
- EBAM continuous particulate samplers were used to collect weekly samples on filter tapes, extracted, and analyzed for GenX/PFAS.



PFAS and Particulate Matter - Summary

- Original question to be addressed: Is GenX/PFAS associated with particulate matter and is it detectable? Answer: Yes (Note: Of these samples, two other PFAS compounds were detected, PFBA and PFPeA in 4 samples*)



PFAS and Particulate Matter - Summary

Other questions that are more difficult to answer:

- **Is there a difference in how GenX/PFAS partitions between PM2.5 and Total Suspended Particulate sized particles?**
- **Is it seasonal?**
- **What affects the partitioning and therefore how it's transported?**
- **Is it facility related and/or environmental reintrainment?**

Background Atmospheric Deposition Network

PFAS in North Carolina

- **Network of seven background sites generally oriented near our regional offices**
 - **Asheville – start 11/20/18**
 - **Fayetteville (Candor) – start 10/24/18**
 - **Mooreville – start 3/12/19**
 - **Raleigh – start 4/24/18**
 - **Washington – start 2/12/19**
 - **Wilmington – start 1/8/19**
 - **Winston Salem – start – 3/19/19**

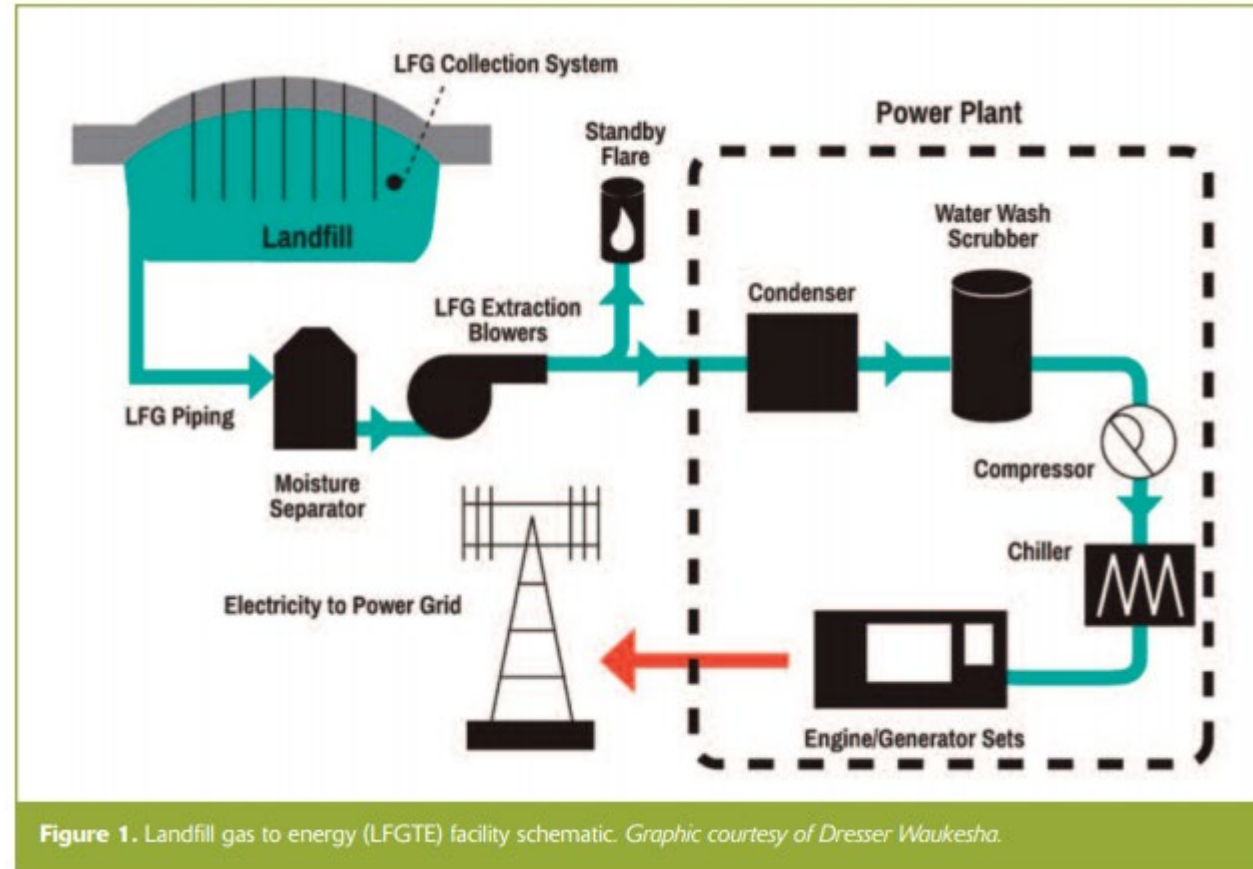
Background Atmospheric Deposition Network PFAS in North Carolina

North Carolina: Background Rainwater PFAS Concentrations
Measured in ppt; ND = Not detected; NS = No sample for the time period



Challenges ahead?

- Landfills
 - Leachate
- Air emissions??
 - Leachate evaporator
 - Flares
 - Reciprocating Internal Combustion Engines (RICE)



Challenges ahead?

- Sewage Sludge Incinerators (SSI)
 - PFAS in sludge?
 - Time, Temperature, Turbulence? Additional removal controls?
 - Sufficient to destroy & capture PFAS?

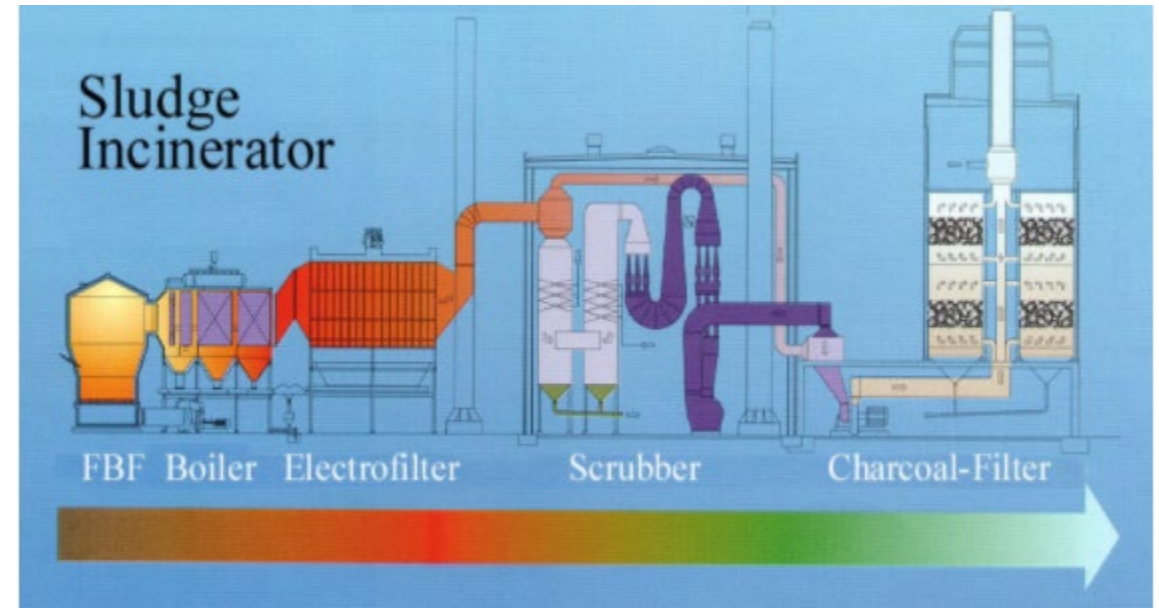


Image courtesy of: <https://biophysics.sbg.ac.at/waste/sewage.htm>

Challenges ahead?

Aqueous film forming foam (AFFF)

- **Primarily a water issue?**
- **Manufacturing/mixing sites**
- **Training sites**
- **Locations where it has been applied**

Challenges ahead?

- **Further analysis and collaborations**
- **Data to drive informed decisions**
- **Source emissions characterization**

Contacts

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