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**The Leachate Crisis: Examining tools to dispose of leachate in an ever evolving industry**

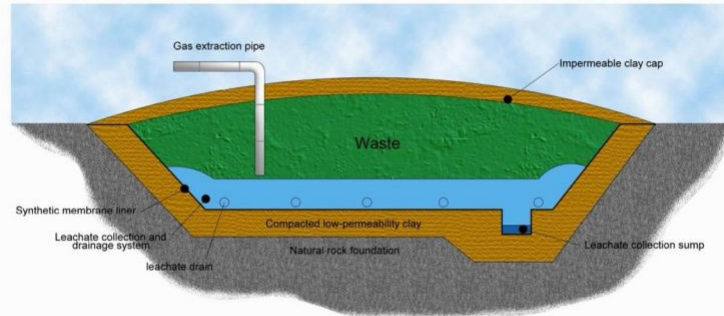
Tori Frew

Mentors: Jon Kitchen, Ivan Cooper, and David Robinson



## What is leachate

### Leachates from landfills



*Cross-section of a modern landfill. The design incorporates a synthetic membrane liner (about 2.5 millimetres thick) on a layer of low-permeability clay (about 1 metre thick). The leachate is drained to a sump by a network of pipes in a permeable drainage layer. Any gas generated is collected by means of a system of pipes. (Not drawn to scale).*

Source: UK Groundwater Forum. Groundwater Our Hidden Asset publication 2016



## Traditional Management

- Haul or pipe offsite untreated
- Partially treat onsite then haul
- Fully treat onsite, discharge to SW or GW
- Evaporate onsite



# What is changing/ Who's it toughest on

- Changing regulations
- Public scrutiny

Due to the elevated PFAS values, Friday, February 24, 2023 the City of Fort Worth Yuma Disposal Site will no longer accept transported leachate from landfills. Discharge of untreated leachate at the Yuma Disposal Site will result in citations to the Liquid Waste Transporter and may result in notification to the Texas Commission on Environmental Quality (TCEQ).

If PFAS levels are reduced at the landfill by pretreatment methods, the City of Fort Worth may allow future discharges of leachate.

## Lowell water treatment plant to stop accepting toxic water from N.H. landfill

By Maria Lovato and David Abel Globe Correspondent and Globe Staff. November 7, 2019, 8:43 p.m.

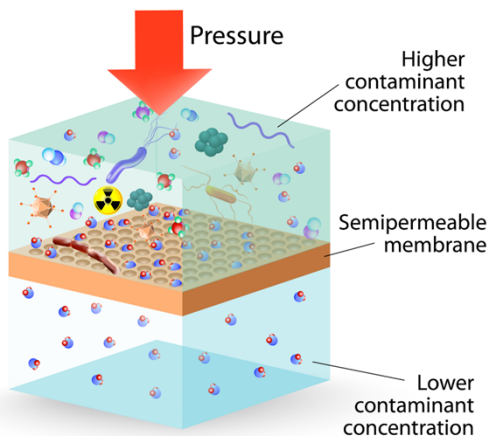


Officials in Lowell said they had suspended a contract with a New Hampshire landfill that sent a large volume of toxic runoff into the Merrimack River. JESSICA RINALDI/GLOBE STAFF/GLOBE STAFF

Under pressure from lawmakers and environmental advocates, officials in Lowell said Thursday that they had suspended a contract with a New Hampshire landfill that sent a large volume of toxic runoff into the Merrimack River, a source of drinking water to more than a half-million people.



## REVERSE OSMOSIS



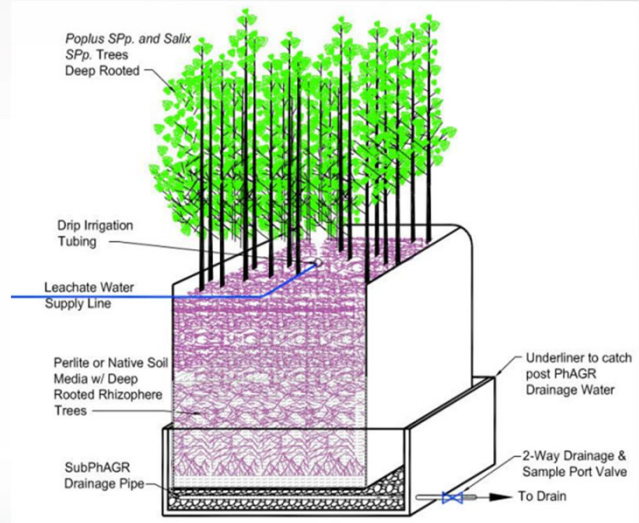
## Reverse Osmosis

- Pressure applied to system
- Adjustable membrane size
- Pros
  - Direct discharge
  - Irrigation use
- Cons
  - High energy requirements = costly
  - Membrane fouling
  - “Leachate brine”



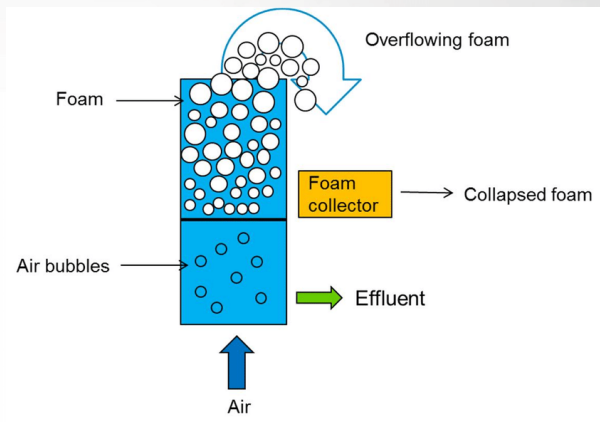
# Phytoremediation

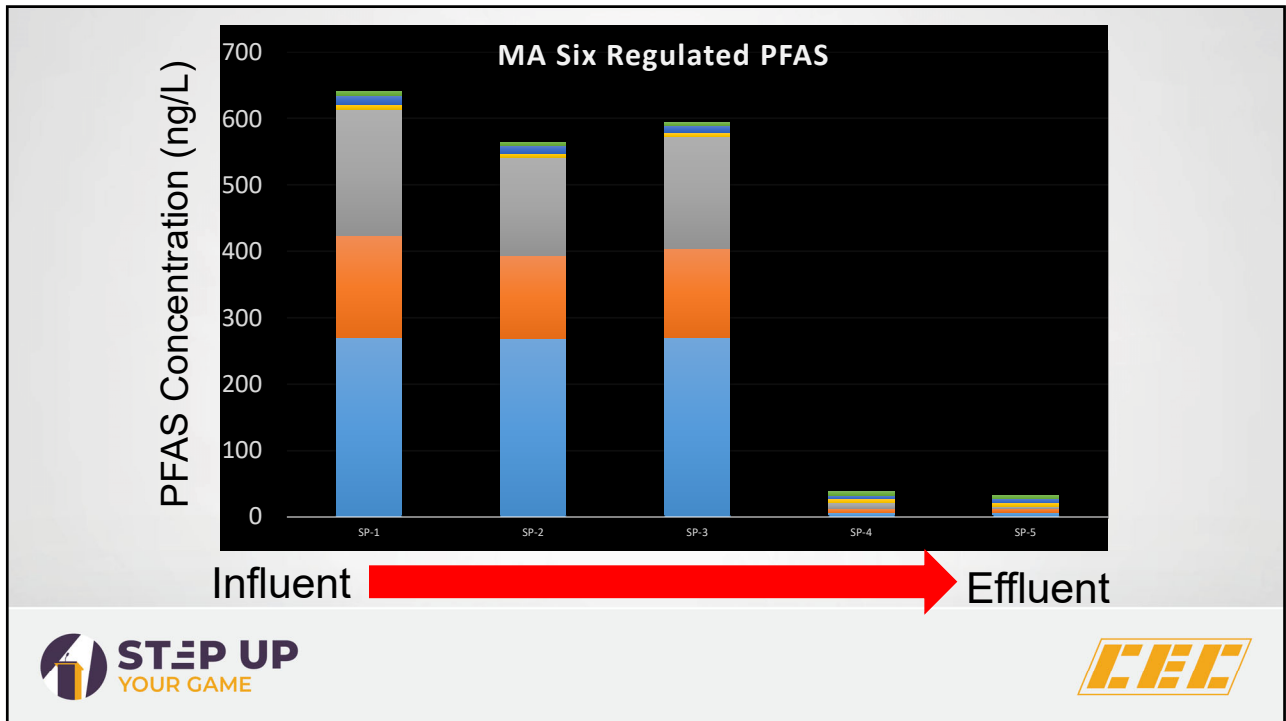
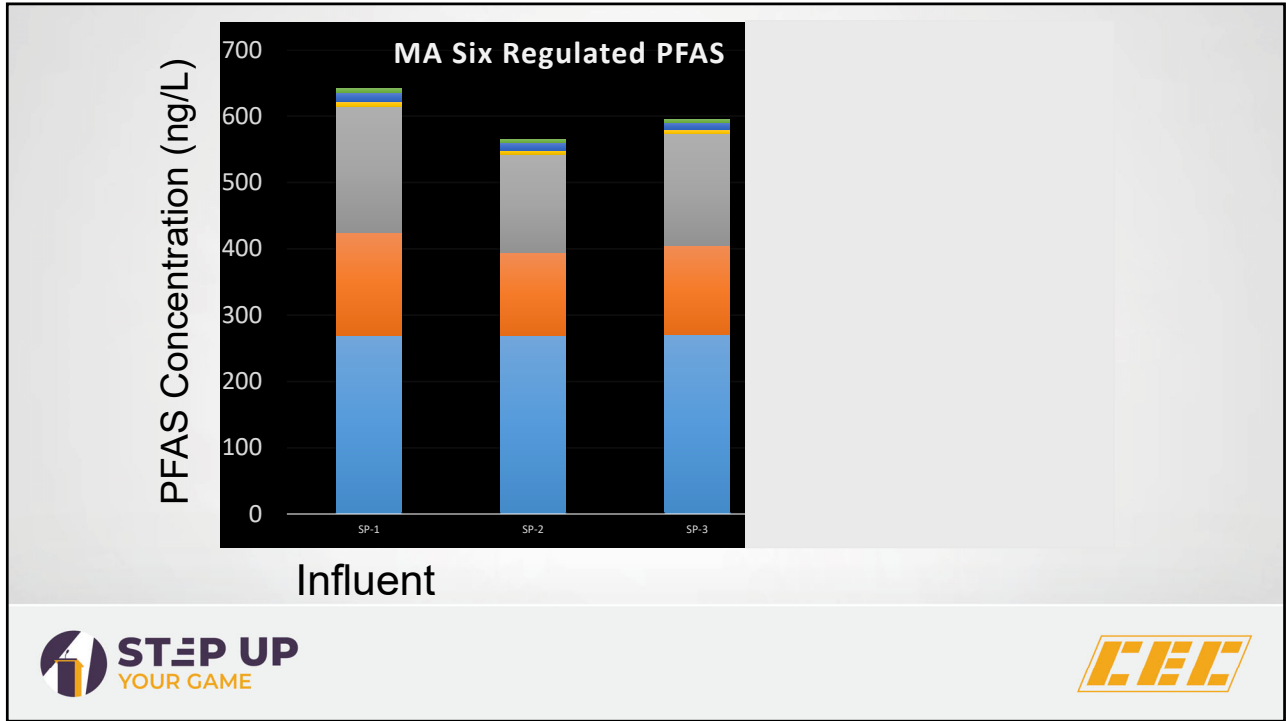
- Utilizing plants to treat contaminated liquid
- Constructed wetlands treat leachate
- Phytoremediation Attached Growth Reactors (PhAGR)



# PFAS Treatment

- Fluoro-Sorb media
- Foam Fractionation





## Current and Future Projects

- Chiquita Canyon Landfill Leachate Study
- Apex Landfill Leachate Evaluation
- Banksia and New Chum Landfills Leachate Evaluation
- Bourne Leachate PFAS Removal Technology Evaluation
- Bridgeton Landfill Leachate Treatment Design and Construction Management
- Evaluation of Oil & Gas Exploration Wastewater Treatment Technologies
- Greenridge Reclamation Landfill Leachate
- Indiana Wetlands and Phytoremediation Treatment Study
- RIRRC Leachate Treatment Process Evaluation and Improvements
- NSA Landfill Condensate and Leachate Evaluation and Treatment Design
- Old Dominion Landfill TTO Leachate Evaluation
- Ontario County (NY) Leachate Study
- Otay Landfill Leachate Management Study
- RIRRC Leachate Pretreatment Evaluation
- Short Creek Landfill Leachate Treatability and Design
- Uwharrie Landfill Ammonia Control in leachate



# QUESTIONS?





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