



Can These Forever Chemicals be Treated?



Montrose Environmental Group

Paul Newman, PG
panewman@ect2.com
407.947.4060

PFAS Symposium

Yes - but there is no “one-size-fits-all” solution

Media to be treated

- Soil
- Groundwater/Surface water
- In-situ vs. ex-situ
- Landfill leachate
- AFFF contact liquids

Treatment goals

- DW screening values (ng/L)
- Individual vs. Total PFAS

Water Quality

- Total PFAS
- Short vs. long-chain PFAS
- Co-contaminants present
- Desired flow rate

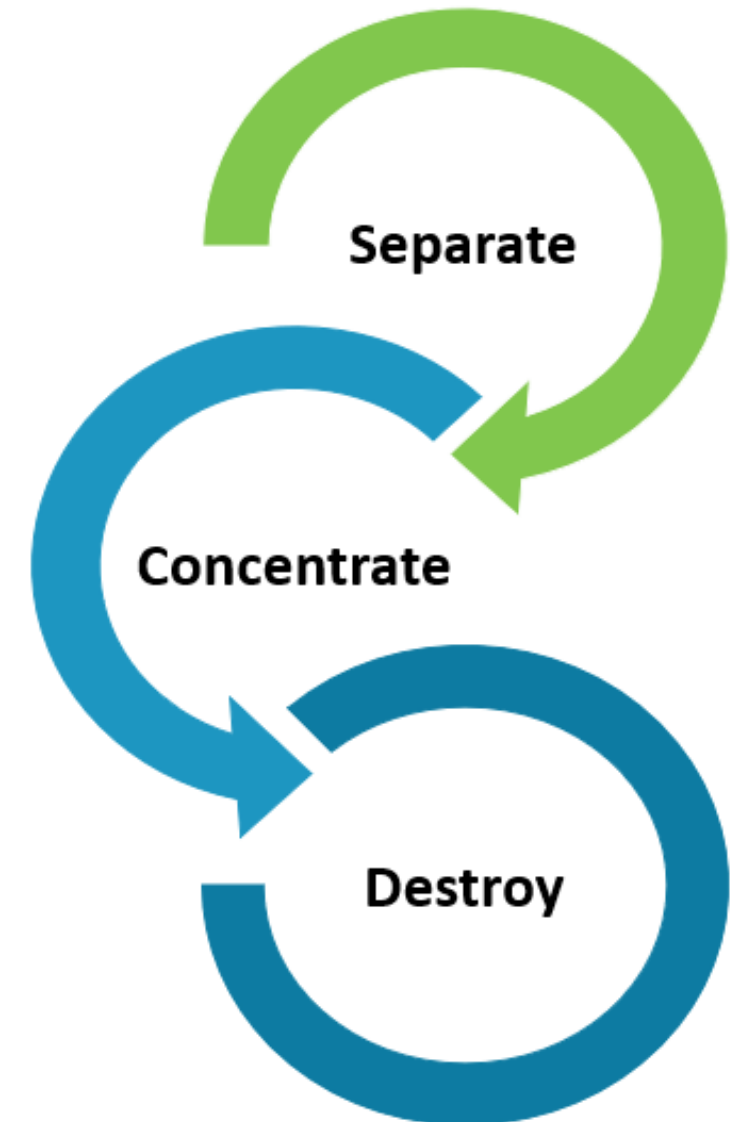
Economics and Sustainability

- Lifecycle Costs vs. Capex



If Destruction is the Goal

- A concentration step is necessary to make destruction cost-effective
- Destruction technologies piloted by ECT2
 - Non-thermal plasma
 - Electrochemical oxidation
 - Supercritical water oxidation
 - Hydrothermal alkaline treatment
- Defense Innovation Unit (DIU) Pilot
 - Concentration and destruction “bake-off”



GAC vs. Ion Exchange for PFAS Water Treatment

	Granular Activated Carbon	Single Use IX	Regenerable IX
Treatment Mechanism	Adsorption	Adsorption and ion exchange	Adsorption and ion exchange
State of Development	Field-Implemented	Field-Implemented	Field-Implemented
Effectiveness	Lower for short-chain PFAS	High	High
Empty Bed Contact Time (EBCT)	10 - 12 min	2 - 3 min	4 - 5 min
System Footprint	Large	Small	Medium
Typical Pretreatment	Sand or Cartridge Filters	Sand or Cartridge Filters with GAC	Sand or Cartridge Filters with GAC
Spent Media	Incinerated or Landfilled Possible Regeneration	Incinerated or Landfill	Regenerated
Waste Quantities Generated	Large	Low	Negligible



Water Treatment Option Considerations

