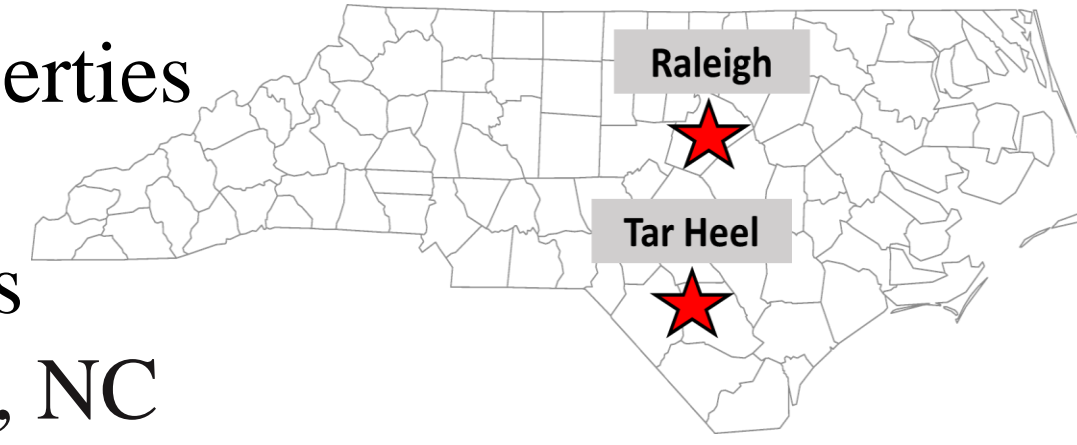


# Removal of PFAS from Municipal Drinking Water

Team 21: Andrew Birkner, Laura Newsom, Teodora Rasuo, Abbie Seidle, Philip Vasto  
Mentor: Dr. Bill Linak

## Motivation

- PFAS are man-made chemicals
  - waterproof and heat resistant properties
  - stable → “forever chemicals”
  - linked to cancer and other diseases
- High PFAS levels exist in Tar Heel, NC
- EPA has new regulated limits of PFAS in drinking water



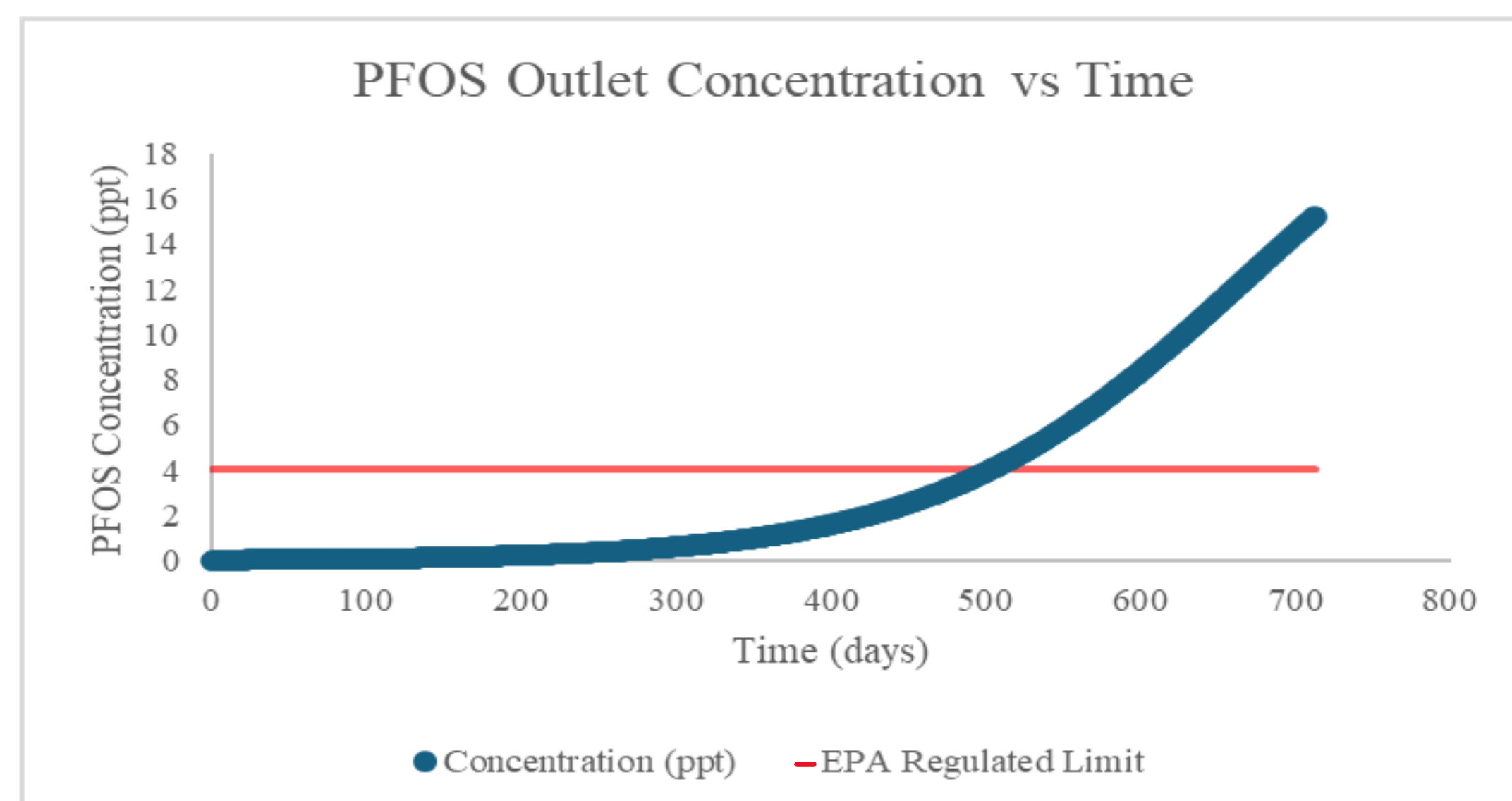
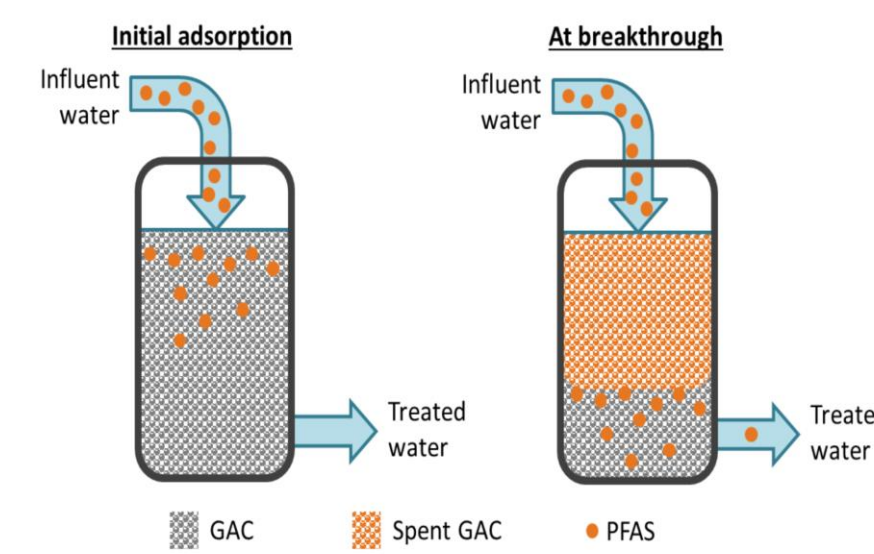
Type of PFAS	New EPA Regulated Limit	Levels @ Bladen Bluffs, NC
Perfluorooctanoic Acid (PFOA)	4.0 parts per trillion (ppt)	8.5 ppt
Perfluorooctane Sulfonate (PFOS)	4.0 ppt	25 ppt
Perfluorohexane Sulfonic Acid (PFHxS)	10.0 ppt	7.7 ppt
Perfluorononanoic Acid (PFNA)	10.0 ppt	Undetected
GenX	10.0 ppt	18.2 ppt
Hazard Limit	1.0	2.59

## Goals

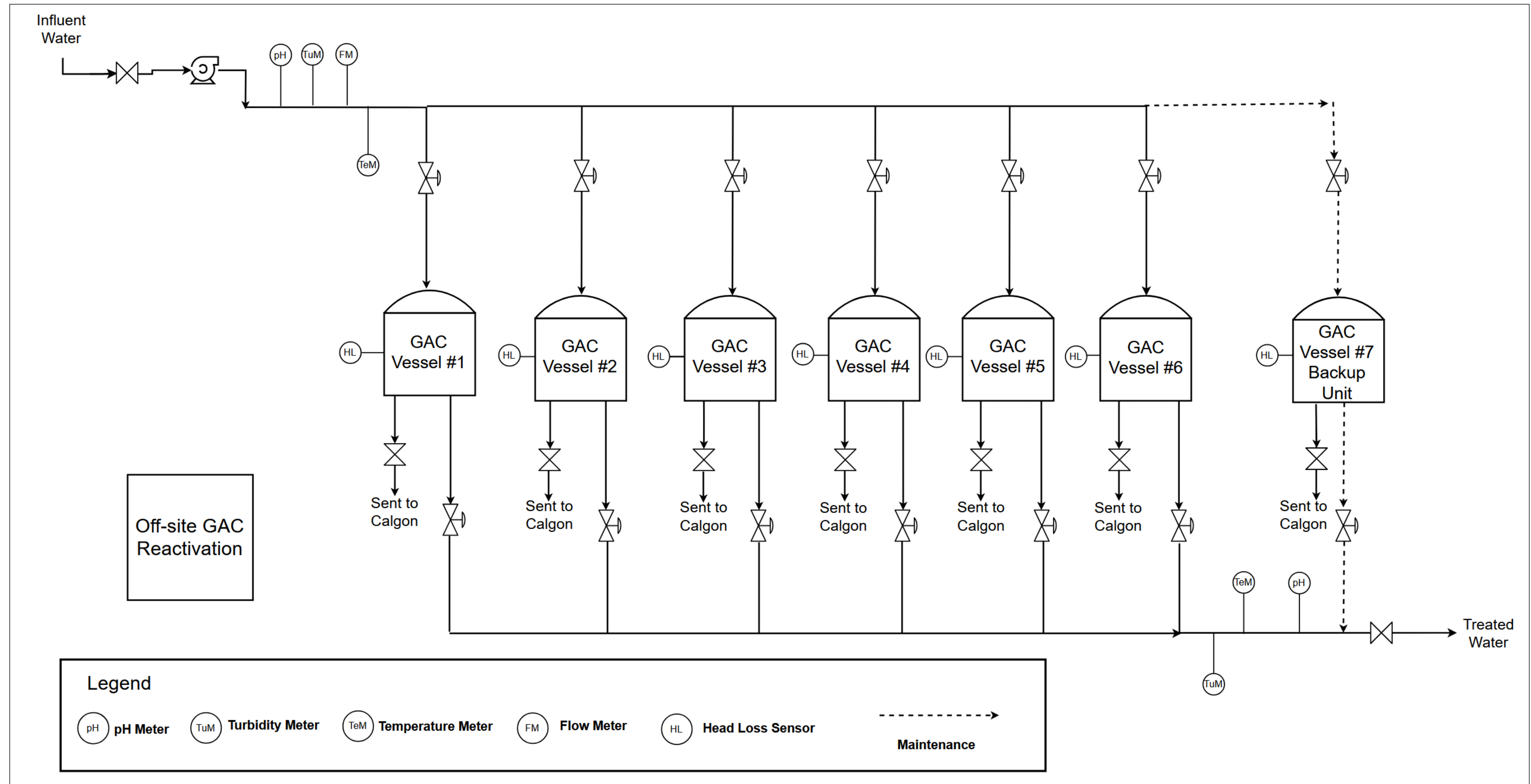
To design and cost a technology, Granular Activated Carbon (GAC), that reduces the level of PFAS in Tar Heel, NC at the Bladen Bluffs facility.

## Sizing

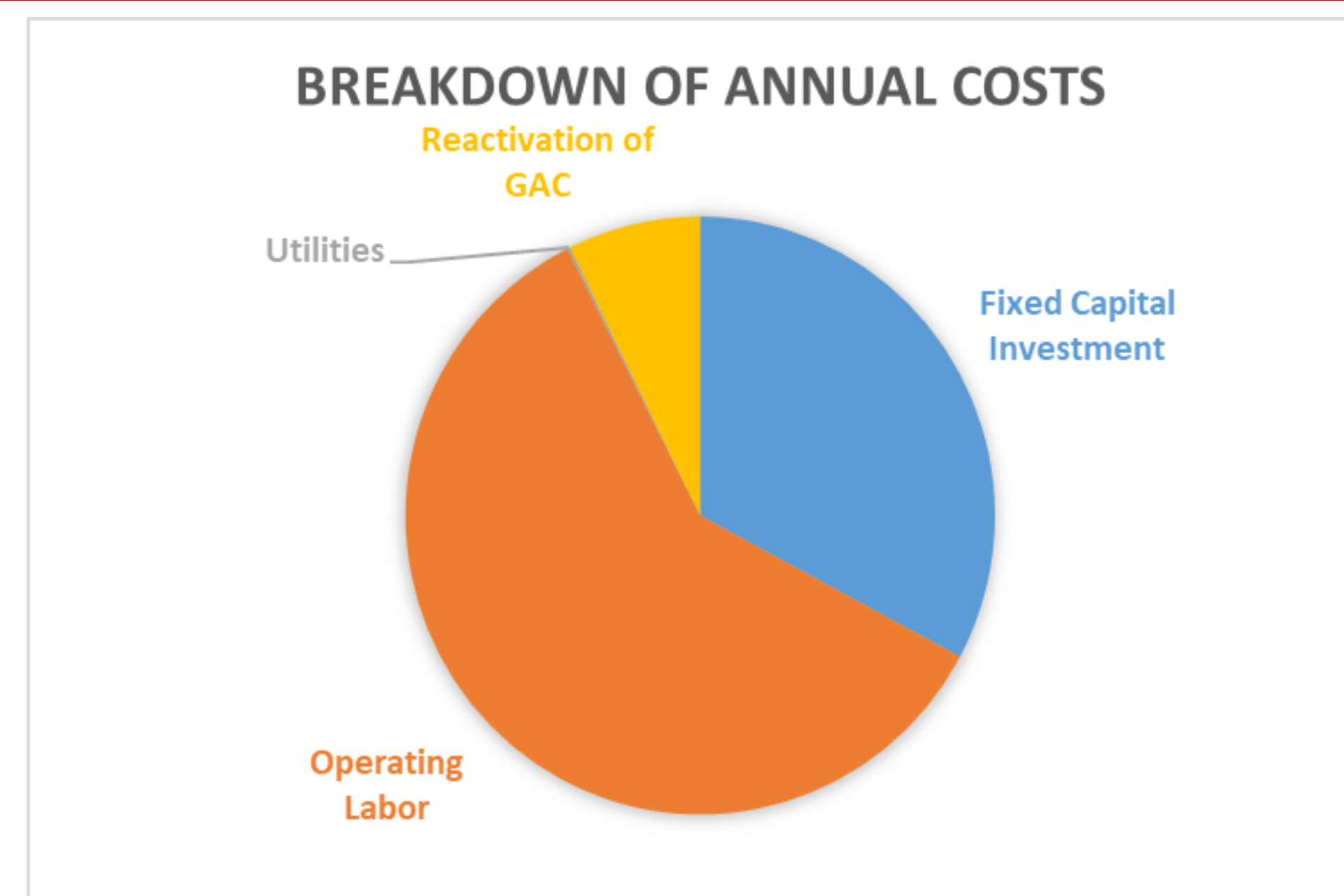
- Throughput is 6 million gallons of raw water per day
- With an Empty Bed Contact Time of 10 minutes, the system needs 89,832 kg of F400 GAC.
- PFOS modeled a breakthrough time of **502 days**.



## Process Flow Diagram



## Costing



- Initial Investment: \$4.93 million
- Cost of virgin GAC: \$300,000
- Cost of GAC Reactivation: \$250,000
- Total Annualized Cost: **\$2.5 million**
- Smithfield Pork Processing facility to take on half the cost alongside community of 4,589 households.

## Findings

- System removes PFAS below EPA regulations for **502 days** before replacement
- Incremental cost to end user is **\$22.57/month**

## Recommendations

It is the recommendation of this group to move forward with pilot testing to confirm long-term reliability before full-scale implementation at Bladen Bluffs.

## References

