Optimizing Biochar Adsorbent Production through Semi-Gasification

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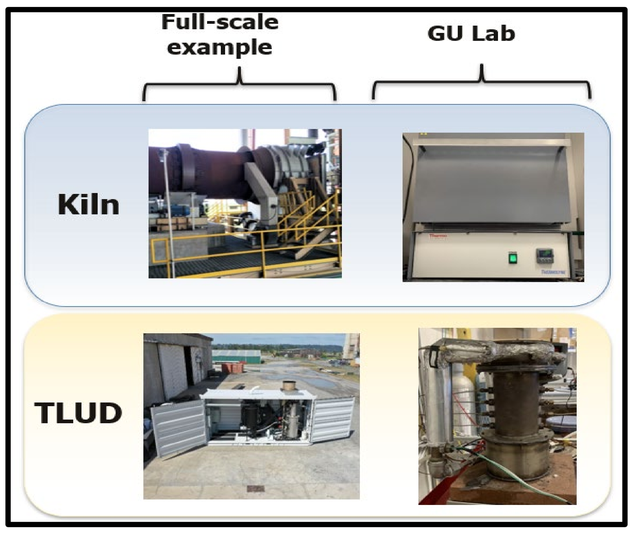
How is Biochar vs Granular Activated Carbon (GAC) Created?

Biochar Production



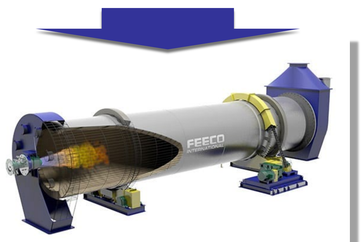
Heated between 500 and 900 °C (Biochar production generates heat)

Biochar

Media stock refined and manufactured

GAC Production

Mined Coal

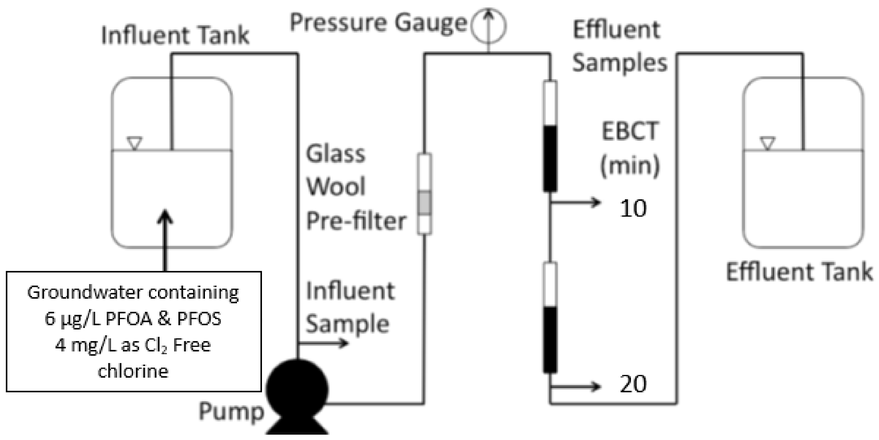


GAC

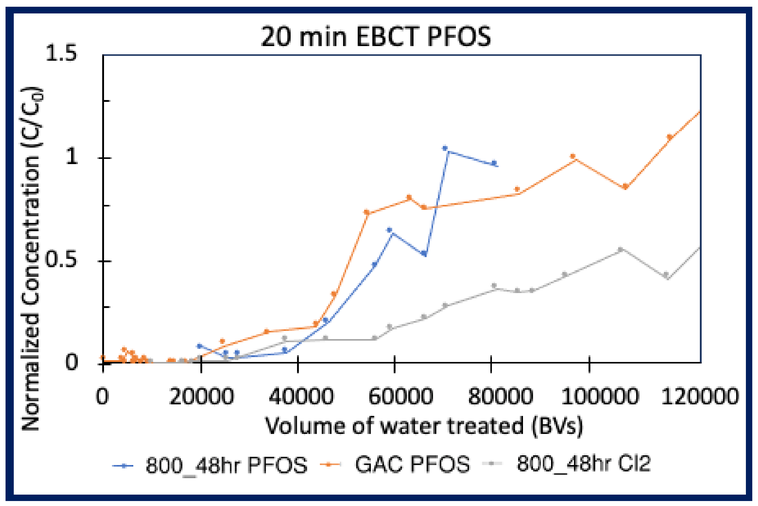
Energy intensive activation is used to increase surface area at high temperature and super critical steam

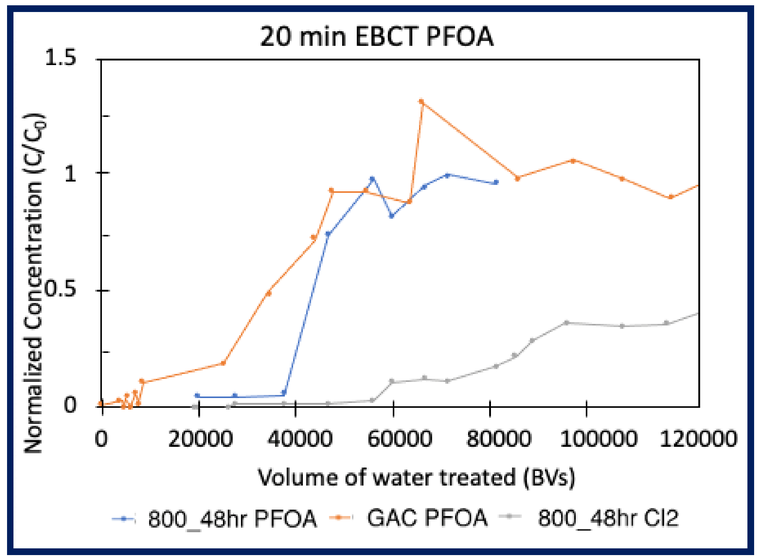
Comparing biochar and GAC filtration

Rapid small-scale column tests determine PFAS removal performance by GAC and biochar.



Results



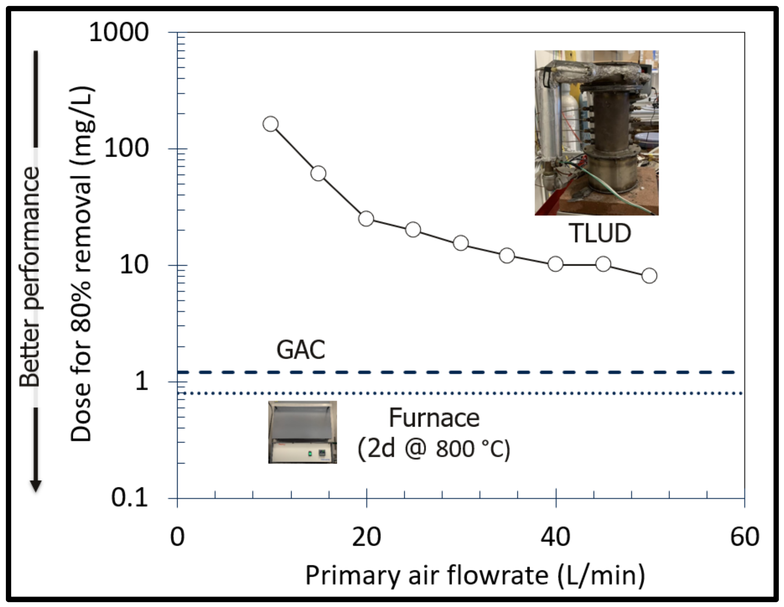


PFOA and PFOS broke through the GAC filter prior to the 48-hour 800-degree kiln biochar. Chlorine broke through later, but likely reduced PFAS adsorption

Conclusion

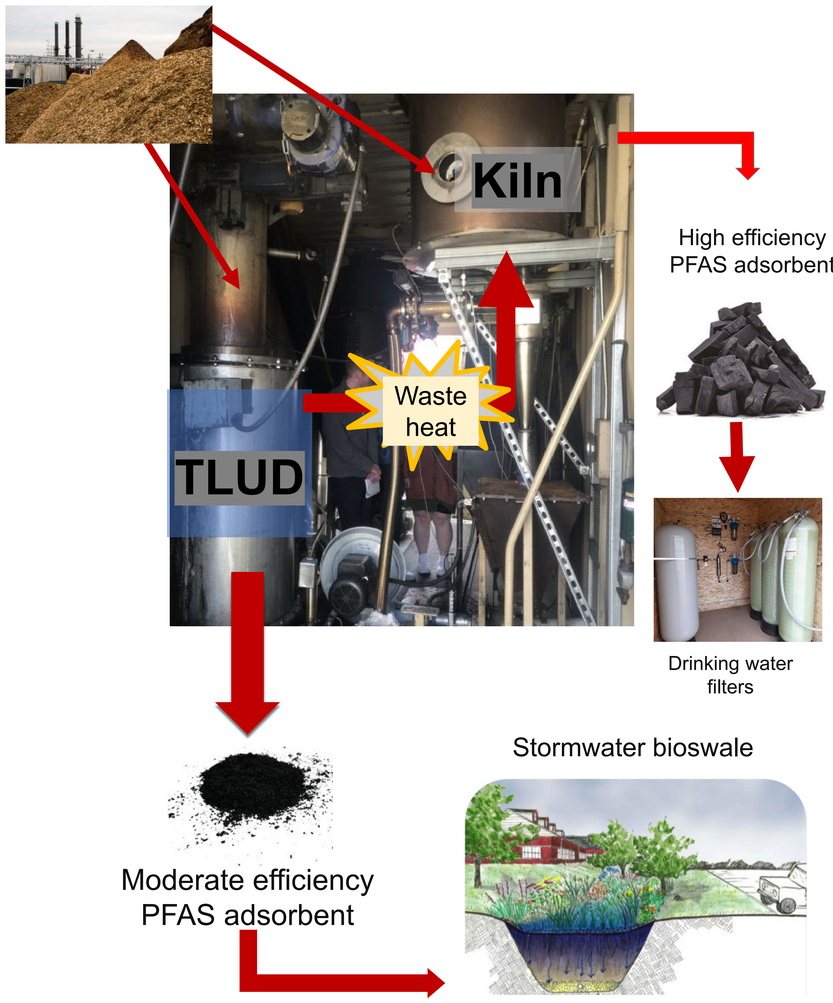
The long duration high temperature **biochar** has a **similar if not better efficiency** compared to the industry standard filter GAC.

TLUD and Furnace Biochar vs GAC Performance in Batch



Biochar created using the furnace performed better than biochar created using the TLUD and GAC.

Conceptual Implementation Process



Producing moderate performing biochar in a TLUD could provide the heat to produce high performing biochar in a kiln. Both biochars could be marketed for different applications (e.g., stormwater or drinking water treatment).