Fluoride

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Introduction

Fluoride contamination of groundwater is a major, well-known health concern, that still does not have any highly effective or sustainable technologies to remedy it. The World Health Organization suggests the Nalgonda method, but this technique has several major flaws including a treatment efficiency that is limited to only 70 percent, and a large dose of aluminum sulfate, which causes sludge disposal problems. Instead, we use Polyaluminum Chloride (PACl) as a coagulant to which the fluoride can both adsorb to and coprecipitate with.The goals of the Fluoride Team is to design and create the optimal system for adsorbing and coprecipitating out fluoride from groundwater.

Goals

The Fall 2015 subteam hopes to find the dosage of PACl required to optimally remove fluoride from groundwater. By quickly redeveloping our physical filtration system and setting up Process Controller, we hope to spend the bulk of our semester experimenting with varying levels of Fluoride and PACl, analyzing our work, and trouble-shooting our system.

The Spring 2016 subteam will be preparing for the EPA P3 competition in April. The primary goals of the semester are to test out the optimal levels of PACl needed to remove fluoride at different in flow concentrations. Additionally, the maximum time that system can be run will be obtained by analyzing data from the pressure sensors.

The Fall 2016 subteam will be fabricating and evaluating new bottom inserts to the filtration system, including one with a reverse jet. Once all tests have been conducted and the most efficient removal system has been determined, the team will evaluate whether or not clay is a necessary component of fluoride removal.

The Spring 2017 subteam will be determining if countercurrent floc blanket reactors should be used instead of a single floc blanket reactor for field testing. Both systems will be tested for a wide range of upflow velocities to optimize red dye #40 removal efficiency. Subsequently, a 0.1 L/s (approximately) reactor will be designed and fabricated for future testing.

More Information

Current Members

Michelle Cheng

Auggie Longo

Briana Vidal

Victoria Zhang

Email Team

Documents

	Challenges	Tasks	Symposium	Final Presentation
Spring 2015			? Unknown Attachment	? Unknown At
Fall 2015				? Unknown At
Spring 2016	? Unknown Attachment	? Unknown Attachment	? Unknown Attachment	? Unknown At ? Unknown At

Fall 2016				
Spring 2017				