

Detailed Task List - Spring 2014

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Literature Reviews

Finish by 2/12/2014 - Assigned to Mingze

- Review papers on Arsenic removal technique focusing on media filtration
- Summarize important findings from each paper
- Integrate findings to design experiments

Learning How to Use GFAAS

Finish by 3/14/2014 - Assigned to Tanapong

- Read the GFAAS manual
- Understand the mechanism of GFAAS
- Meet with William Pennock to learn how to operate GFAAS
- Prepare a calibration curve

Designing Experimental Apparatus

Finish by 3/14/2014 - Assigned to Jason

- Consult with sand column expert on how to create a sand filter
- Find a way to coat the media with coagulant
- Design how to minimize or recycle waste water and materials

Fabrication of Sand Column

Finish by 3/21/2014 - Assigned to Jason and Mingze

- Test the flow rate
- Test backwash mechanism

- Set up recycling/waste system
- Study hazardous waste disposal method and set up all safety measures
- Pre-treat the filter with coagulant

GFAAS Calibration

Finish by 3/21/2014 - Assigned to Tanapong

- Switch out the Arsenic lamp with William Pennock
- Correct the temperature
- Create another calibration curve

Batch Experiment on the Effect of Nitric Acid

Finish by 3/21/2014 - Assigned to Tanapong

- Prepare a neutralized Arsenic sample by adding base
- Test the following cases with varying Arsenic concentration:
 - Control condition: Arsenic with nitric acid
 - Tumbler
 - Stationary

Batch Experiment on Arsenic precipitation mechanism

Finish by 3/28/2014 - Assigned to Tanapong

- Test hypotheses on arsenic precipitation mechanism of co-precipitation versus surface reaction
- Test with the following cases
 - Control condition: No coagulant
 - Coagulant first
 - Arsenic first
 - Simultaneous

Continuous Flow Experiment

Finish by End of Semester

- Experiment on various hypotheses:
 - Types of coagulant
 - Column depths/residence times
 - Amounts of coagulant
 - Levels of pH
 - Concentrations of arsenic
 - Temperatures
 - Reversibility of arsenic precipitation
 - Oxidation states of arsenic

Roles and Responsibilities

Team Coordinator - Tanapong Jiarathanakul

- Coordinated amongst team members, student adviser, faculty, AguaClara leadership team and other subteams
- Facilitated team meetings
- Tracked progress over the course of the semester
- Analyzed results using GFAAS

Material Coordinator - Mingze Niu

- Prepared stock solutions
- Evaluated coagulant mechanism

Data & Material Coordinator - Jason Koutoudis

- Designed experimental apparatus
- Assembled sand filter