Removal of Human Viruses via Membrane Bioreactors (MBR)

REU Student: **Matthew Blair**
Graduate Mentor: **Rabia Chaudhry**
Faculty Mentor: **Dr. Kara Nelson**

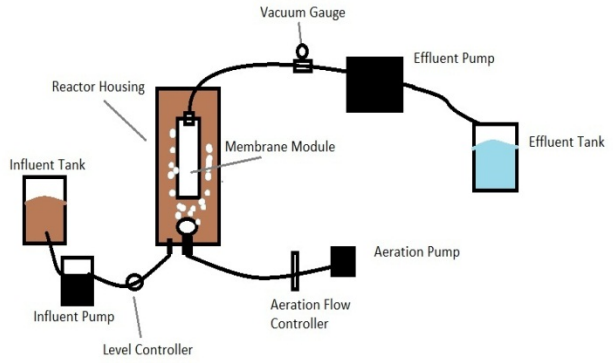
Bench Scale Summer Objectives:

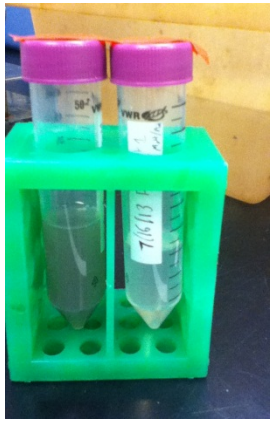
- Build bench scale system that mimics the full-scale MBR facility to better understand virus removal mechanisms.

Progress:

- Scale down operating parameters for the smaller system.
- Design bench scale MBR system, procure and machine required parts.
- Iterate design and parts to ensure membrane module integrity.
- Assemble the bench scale system.
- Test operation using wastewater sludge.

Bench Scale Final Schematic:





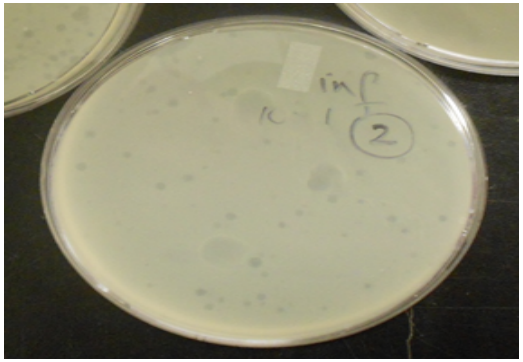
Influent and effluent after filtration though bench MBR.

Close up of effluent

Field Sampling

Objectives:

- Understand pathogenic and indicator virus removal at full scale municipal MBR facility.



Indicator virus (coliphage plaques on a bed of host bacteria).

Particle count data.

Progress:

- Collect and concentrate samples for human virus quantification (using qPCR).
- Process samples for indicator virus quantification (F-specific coliphage by culture-based methods).
- Collect particle size distribution data in MBR permeate to