

Alaska Water Sewer Challenge Phase 3

Monthly Progress Report #3

Reporting Period: September 1st, 2016 – September 30st, 2016

Submission Date: October 10th, 2016

Prepared by

University of Alaska Anchorage

Per the professional services agreement, monthly progress reports will include a one page overview of how the monitoring and testing of the prototype is progressing and how the system is working. All major changes done to the system in the ending month and any changes planned for the following month will be disclosed.

System Overview for September 2016

The system was turned off September 1st as we decided that recycling urine was not able to be achieved without significant treatment reconfiguration. We discontinued recycling urine and attempted regular loading again. In this configuration, we were able to reduce wash water total organic carbon to approximately 2 mg/L, turbidities less than 1 NTU. The water still maintained an odor and we were experiencing notable membrane fouling. We turned off again September 16th, 2016.

The system was restarted on September 27th configured with all water (greywater and kitchen sink, simulated dry toilet) to enter the greywater tank, this tank is treated into the intermediate by the nanofilter and subsequently treated into the wash water tank by a low pressure reverse osmosis membrane. In this configuration we produced wash water we were very accepting of with total organic carbon in of less than 1 mg-C/L when stable. At this point we again identified a membrane fouling issue. Rapidly it was determined that test dust was making its way through the 1 µm nominal cartridge filters.

Considerations for September 2016

We will request a change in test dust based on a literature review that suggests that the NSF 350 dust is much smaller than anticipated in reality. At this point our efforts will shift from assuring water quality to optimizing treatment energy and operational methodology.

General Notice of Data Sharing

All of our data (raw and processed) are being posted publicly as well as all progress reports.

Direct link to website resources: http://reusewaterak.com/?page_id=10

Direct link to photos of water samples: http://www.reusewaterak.com/data_AWSC/daily_photos

Direct link to data: http://www.reusewaterak.com/data_AWSC

End-User Interaction

Members of our team visited Kipnuk September 30th – October 1st. During this trip they held a community meeting, surveyed end-users at their homes about water collection and use as well as sampled rain water catchments and in-home drinking water vessels. We will release a trip report shortly and prepare a blog post about the activity. Briefly, *E.coli* was detected in a statistically significant number of home's rain water catchments and in people in-home drinking water containers.