



Sustainable Northern Communities Sewage Treatment Plant

Award No. 01162

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The project team (CCHRC, Lifewater, and GW Scientific) continued to move the project forward in the 2nd quarter of 2011. Activities included ongoing data monitoring in Anaktuvuk Pass and the CCHRC Research and Test Facility (RTF). The new prototype design continues to undergo testing at the Fairbanks Lifewater facilities, which involves resident water use. The Sustainable Sewage Treatment Plant (SST600) series system is hooked up to resident apartments at Lifewater facilities, providing a more realistic testing approach, while allowing Lifewater staff total access to the new prototype design so testing, validation, and improvements can be made at a faster pace. The controlled “field” test is allowing the project team to learn much more and represents the same environmental conditions as new systems being installed in 2011 in Atqasuk, Alaska

Data from the Anaktuvuk Pass House sewage treatment plant (STP) has been streamed on the web and logged since October 20, 2009. We are using the lessons learned with this prototype design to modify the design and techniques for integration in future new shelter designs to achieve continued performance improvements. During the May site visit, the STP outside–air vent was move to a location further away from the house in response to snow drifts that developed during the 2010/11 winter season. The common air space above the three main chambers in the STP allows the flexible installation of the air vent in different locations to meet local installation needs. Current homes being built in Atqasuk by our project partner, Tagiugmiullu Nunamiullu Housing Authority (TNHA), are using some of the new system design concepts learned during the project (Figure 1). The SST600 series systems are being installed inside the envelope of these homes, which will not only eliminate the need for heat trace, but also makes winter maintenance easier. The project team has been meeting throughout the project to exchange ideas and information that will help improve wastewater treatment systems and their integration into new northern shelter designs. The team is currently working on the final project report and has held several team meetings.

The test system in Anaktuvuk Pass has helped identify important winter maintenance issues for homeowners, and design considerations for incorporating the sewage treatment plants into new housing designs. The real-time reporting system in Anaktuvuk

Pass allows the project team to test data collection methods and standards. This “research-scale” monitoring has helped develop lower-cost remote monitoring systems for commercial applications. Monitoring systems can help local utilities, or housing authorities monitor and perform preventative maintenance on future STP systems.

Figure 1 shows the STP system that is installed outside of the Anaktuvuk House. The effluent is rated for direct surface discharge and is now supporting a small natural wetland during summer months. The underlying soils are mainly sandy gravel and are well drained in the active layer. The management of discharge water is an important design consideration in Arctic climates. Ice rich material, which does not drain away from the house or STP system require design considerations for managing effluent discharge and potential changes in active layer and surface-drainage characteristics.



Figure 1. The STP system at the Anaktuvuk Pass Arctic Prototype House. The effluent from the unit, rated by ADEC for surface discharge, is supporting a small wetland with lush vegetation behind the house. The underlying soils are mainly sandy gravel.