Alaska to Spur Research and Development of Non-Traditional Water and Sewer Systems for Remote Villages

Alaska's Department of Environmental Conservation (DEC) wants to provide more rural Alaska homes with affordable running water and flush toilets. Currently over 6,000 homes lack these basic sanitation facilities and many more depend on aging and deteriorated piped and haul systems.

Residents of homes that lack in-home water and sewer service suffer from higher rates of hospitalizations from severe skin infections and respiratory illnesses. A 2010 study found higher incidence of invasive pneumococcal disease (IPD) among Alaskan children who did not have access to piped water.[1] IPD is a class of diseases that includes very serious infections of the brain, blood, and lungs. Children of Southwest Alaska suffer the highest rates of IPD in the world. Running water provides the ability to wash hands frequently which reduces the incidence of disease.

To correct this public health problem, agencies have funded, designed, and constructed conventional, community-wide piped and truck haul systems. These systems provide running water and sewer to most Alaska homes, but they are expensive to construct in harsh arctic conditions and many small communities cannot afford their high operational costs.

Funding to build new systems and improve existing facilities has declined severely while costs have risen sharply. The deficit between available funds and needs is over $667 million. DEC believes that a different approach to delivering these services is needed.

There are a number of new decentralized water and wastewater treatment, minimization, and re-use technologies that have been developed in different countries and in different climates, and for such diverse purposes as drought and disaster response, recreational vehicles, boats, and the space industry. DEC believes these innovative technologies hold the most promise for use in delivering affordable water and wastewater services to rural Alaska. They have great potential for use in individual homes, multi-family housing, and housing clusters.

Using decentralized water and sewer technology, homeowners would not have to hook into a community-wide utility. Each home would have its own stand-alone system, likely avoiding much of the labor, fuel, heating, and maintenance costs associated with piped and truck haul systems. Similarly, much of the capital cost associated with centralized systems, such as distribution and collection pipes, service lines, utilidors, lift stations, water treatment plants, boardwalks and/or roads, would be avoided.

[1]Wenger JD, Zulz T, et al. Invasive Pneumococcal Disease in Alaskan Children, Impact of the Seven-Valent Pneumococcal Conjugate Vaccine and the Role of Water Supply. *The Pediatric Infectious Disease Journal.* 2010;29.

To spur worldwide interest in developing decentralized systems, DEC will launch a challenge to engineers, water re-use specialists, innovators, and sociologists to research and develop affordable in-home water and sewer systems for homes in remote Alaska villages. The project will begin with an international solicitation, resulting in teams that will compete to create innovative, cost-effective designs for water and sewer technologies that can be constructed and operated on a limited budget and in an arctic climate. The goal of the project is to develop decentralized systems that can deliver the same health benefits as traditional systems at a fraction of the cost.

The Alaska Legislature and DEC are launching this project to improve Alaskans health.

The solicitation will be posted on the State of Alaska Online Public Notice at:http://aws.state.ak.us/OnlinePublicNotices/

To stay informed about this project please visit the project website at: http://dec.alaska.gov/Water/R&D/index.html.

For more information on DEC's Village Safe Water Program, visit: http://dec.alaska.gov/water/vsw/index.htm.