

# Water Main Cured-in-Place Pipeline Lining & Horizontal Directional Drilling Underneath the Alaska Railroad

Presented by James Armstrong



**Abstract:** The Anchorage Water and Wastewater Utility (AWWU) undertook the rehabilitation of 1940's vintage water mains that serves the Alaska Railroad Corporation (ARRC) yard complex, the Port of Anchorage (POA) and surrounding industrial complexes.

In 2012 portions of the water systems in the ARRC yard began to leak near or beneath critical railroad tracks that caused damage ARRC Property. AWWU was prevented from making complete repairs and had to abandon a portion of the water main due to the critical nature of the tracks and contamination near the break. The abandonment of the water main eliminated hydraulic connectivity that negatively impacted the available fire flow and created potential water quality concerns.

Due to the complexity of the project and the ARRC Yard users, the project was split into a north and south phase. The northern portion was designed as an open cut project to move the main away from the tracks and structures, as well as to increase the number of available bidders. The southern portion of the project utilized cured in place pipe (CIPP) lining due to the majority of the main being next to tracks and under buildings. The project evaluated different lining, pipe and gasket materials due to working in an EPA registered RCRA contaminated site. CIPP also allowed the project to move forward and be constructed in winter conditions to satisfy the ARRC Yard user requirements to be less impactful to their business needs.

Successful bidding of the first phase of the project took place in the spring of 2016 and was awarded to a local contractor who then immediately proposed to install most of the pipe utilizing horizontal directional drilling (HDD) and reduce the cost of the project to AWWU. The cost savings were seen through generating less unusable contaminated soil, dewatering equipment with treatment, working around other utilities and remnant building structures. Bidding of the second phase took place in the summer of 2016 and was awarded to the same contractor who was awarded the first phase.

This presentation will walk the listeners through most of the design and construction while highlighting the challenges and rewards of utilizing trenchless technologies to ease impacts, reduce costs, expand the construction season and reduce environmental influences.

**Biography:** James Armstrong, P.E. is a civil engineer at Anchorage Water and Wastewater Utility (AWWU), born and raised in Alaska and returned home after graduating with a BS in civil engineering from Montana State University (MSU – Bozeman) with an emphasis in structural engineering. He has been involved in geotechnical investigations, design of subdivisions, roadways, box store site developments, emulsion and fuel tanks, fuel lines, spill containment, hardstands for military and civilian aircraft, such as the Airbus A380, and many private and public water and sewer projects. A small portion of his career was spent on the construction side doing construction management and installing natural gas lines, ice roads, ice bridges, sewage treatment plants, and other infrastructure on the North Slope out of the village of Nuiqsut. He is currently the editor in charge of the AWWU Design and Construction Practices Manual (DCPM) for the 2011, 2012, and the recently release Draft 2018 versions. Along with editing the DCPM, he undertook a rewrite of the water and sewer divisions of the Municipality of Anchorage (MOA) Standard Specifications (MASS), which were reduced from 20+ sections down to 8 sections. In his spare time he has designed and constructed his own thirty foot long arched concrete pedestrian bridge and two story insulated concrete form (ICF) house with ICF walls and floors.

Friday, April 7th, 2017, 11:45am-12:45pm

UAA College of Engineering, EIB 211