

Inspection technology first for underwater force main in SD

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Thanks to an innovative approach by BC and the use of state-of-the-art inspection technology, the City of San Diego's utility leaders now know the structural condition of a 40-year-old sewer force main located beneath a drinking water reservoir that had never before been cleaned or inspected.

BC's outside-the-box thinking is opening doors to assessing the condition of clients' difficult-to access critical infrastructure, some of which are located under bodies of water and in sensitive environments – aging infrastructure that many BC clients believe is uninspectable.

"Our ears perk up when we hear clients say that their aging infrastructure cannot be inspected," said **Ari Elden** (San Diego), BC technical lead who oversaw field operations for the PS77 force main inspection project. "This motivates us, our project teams and our teaming partners to think creatively, innovate, work together and overcome challenges."

BC proposed the See Snake™ Inline Inspection tool, developed by PICA Inc., for the inspection. The 14-foot long, 800-pound See Snake travelled in the pipelines beneath the body of water in a completely free-swimming, non-operator-controlled mode without the benefit of a cable tether. The tool was propelled forward by raw sewage that was velocity controlled by a temporary jockey pump, traversed multiple 90-degree bends and accommodated numerous interior diameter variations in each pipe during each of its four-hour journeys from the launch to the retrieval sites on opposite shores of the lake.

"With no easy means of retrieving it, BC could not risk getting the See Snake stuck in the force main," said **Gary Skipper** (San Diego), BC Vice President of Infrastructure Monitoring and Assessment and co-leader of BC's Aging Infrastructure Initiative. "San Diego was faced with a challenge that many utilities are grappling with – a

significant gap in the known condition and structural integrity of a high-risk asset. Failure was not an option because of the safety of the community's water."

The See Snake made the deployment successfully because its diameter is significantly smaller than the inner diameter of the pipe to allow for passage by protrusions, lining and scale. The tool employed electromagnetic Remote Field Technology (RFT), also known as Remote Field Eddy Current (RFEC), which works by detecting changes in an electromagnetic field, for measuring metal pipe wall thickness for the entire length and full 360-degree circumference of the pipe.

The project also called for BC to develop a risk management plan that included identifying project specific potential issues and how to lessen risk of problems.

BC contracted with Arrieta Construction of El Cajon, California for piping modifications in valve vaults on either side of Lake Hodges to allow for launch and retrieval of the See Snake tool and with Doyle Precision Services of Gardenia, California for the progressive pigging that cleared debris so the See Snake could make its journey. Other BCers essential to the success of this novel inspection included **Don Gordon** (San Diego) and **Kelly Derr** (Raleigh).