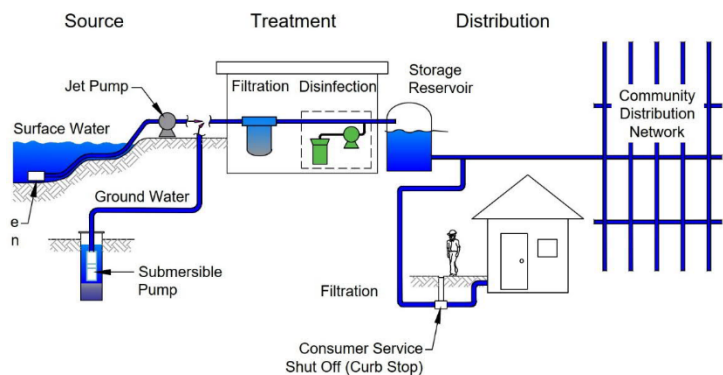**FUNDING DETAILS**

Drinking Water Infrastructure Risk and Vulnerability Study

Alberta Innovates and Alberta Environment and Parks partnered to study the potential climate change risk of extreme streamflow events at 48 small and medium sized municipal drinking water facilities across Alberta. The study was undertaken by Associated Engineering. This study was a high-level assessment which first considered historic vulnerability and then considered increased risks of future extreme streamflow events due to climate change. Vulnerability and risk assessments are a critical stage within an overall adaptive management framework to increase resilience to climate variability and climate change.

The project scope required assessment of the drinking water infrastructure supply, treatment, and distribution), the risks, and the vulnerabilities to severe high and low streamflow events.

RECIPIENT:
Associated Engineering

PARTNERS:
Alberta Environment and Parks

TOTAL BUDGET:
$480,000

AI FUNDING:
$280,000

PROJECT DATES:
MAR 2018 – JAN 2020

PROJECT TRL:
N/A

APPLICATION

Municipal drinking water facilities are by their nature closely linked to climate. Thus, they have the potential to be impacted by climate-induced hydrological changes in terms of physical robustness and ability to access, treat, and convey water to the public and industry. This study is intended to aid municipalities in understanding future risk to drinking water infrastructure associated with climate change, identify facility and local knowledge gaps in need of more detailed assessment, and enable informed decisions prior to investment in new or improved drinking water infrastructure.
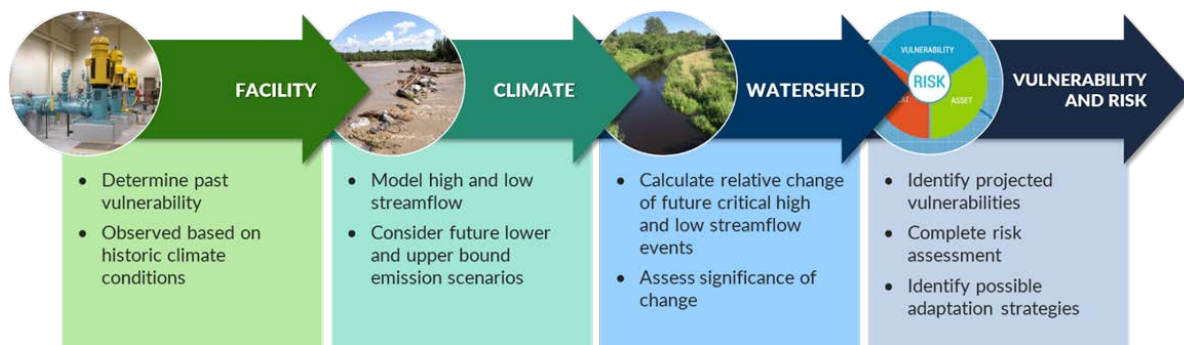
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PROJECT GOALS

- Develop a methodology to complete a high-level assessment of potential climate change impacts to high and low streamflow events that may impact municipal drinking water facilities throughout Alberta.
- Complete a vulnerability and risk assessment of 48 drinking water facilities. Determine potential increasing risks of changing streamflow conditions for two climate emission scenarios in the near future (to 2034) and mid-century (to 2064).
- Consider water supply, treatment and distribution in the assessment.
- Support adaptation strategies by 1) helping to better identify future climate-change-driven risks; 2) assessing whether these changes surpass facility risk thresholds; and 3) suggesting effective, practical measures to reduce risk and make facilities more resilient to potential future change.

BENEFITS TO ALBERTA

- Provides a high-level picture of future climate change risk to Alberta's potable water sources. This information will assist policy makers to understand the issues and where to focus efforts.
- Improves the knowledge base to assist provincial and municipal decision makers in grappling with climate risk uncertainty. This knowledge can then inform decision making and adaptation actions to improve resilience of potable water supply to future extreme open-water streamflow events due to climate change.
- Leverages the SWAT modelling tool calibrated by the University of Alberta Watershed Modelling Laboratory to forecast climate impacts on infrastructure. Associated Engineering collaborated with the Laboratory in utilizing the SWAT tool to generate forecasts under different climate change scenarios.

FACILITY
- Determine past vulnerability
- Observed based on historic climate conditions

CLIMATE
- Model high and low streamflow
- Consider future lower and upper bound emission scenarios

WATERSHED
- Calculate relative change of future critical high and low streamflow events
- Assess significance of change

VULNERABILITY AND RISK
- Identify projected vulnerabilities
- Complete risk assessment
- Identify possible adaptation strategies

1 Student Trained

1 Publication

CURRENT STATUS

MARCH 2020. COMPLETE

Publication of the public Provincial Summary Report by Alberta Innovates is pending. This report will provide guidance to government to understand potential risks and gauge adaptation measures for consideration in ongoing policy development to improve future resiliency of drinking water systems. A specific facility report is being provided to each participating municipality to inform ongoing infrastructure planning by providing high-level insight future climate change considerations that they do not have at this time.