

# Advanced Drinking Water Systems



# Overview

- Water Quality
- Compare Water Treatment Plants (WTPs) vs Advanced Drinking Water Systems (ADWS)
- Advantages of ADWS
- ADWS Systems in Use

# Water Quality and Use

- A portion of NL population use natural springs for drinking water
- Spring Water can contain
  - Bacteria, viruses, cysts
  - Metals, chemicals
  - Turbidity
  - Quality can change frequently and without notice
- Untested, unmonitored, untreated.

# Water Quality and Use

- Guidelines for Canadian Drinking Water Quality:
  - Published by Health Canada
  - Based on research related to health/aesthetic effects and operational considerations
  - Provides limits for pathogens, chemicals, metals, turbidity,

# Water Quality and Use

- Water Use in NL
  - 350 to 500L of water used per person per day
  - Only 5 to 10L (/person/day) is for drinking and cooking
  - Treating this water is expensive

# Water Treatment Options

- Water Treatment Plant (WTP)
- Advanced Drinking Water System (ADWS)

# Water Treatment Plants

- A WTP is a facility that treats all water entering a distribution system at a centralized location through a combination of different water treatment processes providing the consumer with potable water direct from the tap (ENVC)
- Currently 19 WTPs operating in NL
- Average capital cost: \$000s/m<sup>3</sup> supplied
- Average O&M cost: \$00s/m<sup>3</sup> supplied

# ADWS

- An ADWS is a complete water treatment system for small applications
- Scaled down technology
- Used where there are quality concerns with the treated water, or if a community is without water treatment
- Treats only drinking water portion
- Water is drawn from source, treated and stored on site for community members to collect as required





## Functional parts of ADWS

- Pre-filtration and Filtration (Multi-media, carbon,...)
- Ozone and UV disinfection
- Piping, pumps, valves, dispensing
- Storage



# Advantages of ADWS

- Safe drinking water compliant with Federal Guidelines
- Technology accessible for small/rural communities
- Successfully used in 20+ communities
- Non-consumptive uses still met by tap water

# Completed Projects

## 20+ Projects completed across NL

Whiteway, April 2012,	Mary's Harbour, November 2012	Point May, February 2013	Pacquet, March 2015
Leading Ticks, April 2012	Makkovik, January 2015	Seal Cove (FB), June 2013	Jackson's Arm, December 2014
Isle aux Morts, May 2012	Postville, December 2014	Wabana, May 2014	Lushes Bight/Beaumont/ Beaumont North, March 2015
Fox Roost/ Margaree, June 2012	Rigolet, November 2013	Change Islands, December 2014	Lamalaine, December 2015
Lawn, January 2013	Port Saunders, January 2014	Hermitage, December 2014	Port au Choix, February 2016

# Advantages of ADWS

- Bottled water is often quite expensive
- Much lower cost per liter (around 0.005\$/L) vs. bottled
- An ADWS can provide safe, affordable, accessible, drinking water to a community without high cost of water treatment plant and underground infrastructure
- Communities are satisfied with the ADWS units

# Compare ADWS and WTP

ADWS	Conventional WTP
Lower Capital Cost (average: \$400,000)	Higher Capital Cost (millions)
Lower O&M Cost (range: \$3,000 – \$8,000)	Higher O&M Cost (10s of thousands)
Public Collects Water at ADWS site	Water piped to homes
Processes only drinking water portion	Processes all water entering facility
Public Collects Water at ADWS site	Water piped to homes

# Whiteway ADWS



## Key Messages

- Consider an ADWS as a viable option to address drinking water quality issues in small and remote communities in Newfoundland and Labrador
- Apply for an ADWS under the Municipal Capital Works Program

Questions?