

Rural Drinking Water in Newfoundland and Labrador

Exploring Solutions for Sustainable Rural Drinking Water Systems

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Principal Investigator

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Outline

- ◆ Introduction to project
- ◆ Findings thus far with discussion
- ◆ Next steps for the project

About the Project

What are we trying to do and why?



Our Research Project



- 💧 Risks and challenges influencing drinking water quality and availability
- 💧 Emphasis on communities of 1,000 residents or less in NL
- 💧 What is working, factors for success, possible solutions and future research

Major Components of Research



- ◆ Source water quality and quantity
- ◆ Infrastructure and operations
- ◆ Policies and governance
- ◆ Public perception, awareness, and demand

(Annual Report, 2012)

How?

- 💧 Literature Review
- 💧 Legislation and Policy Review (DPSIR)
- 💧 Media Scan
- 💧 Municipal Surveys and Consultations
- 💧 Case Studies

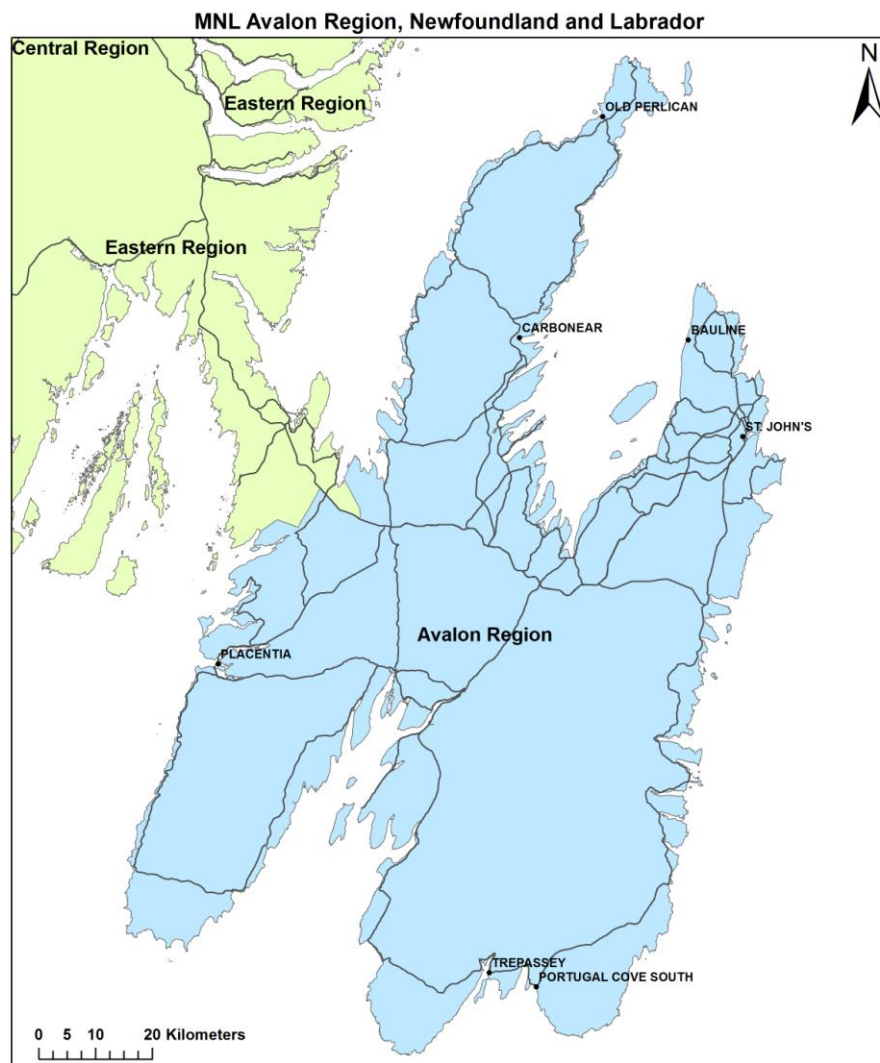


Survey Results and Discussion

Avalon Highlights



MNL Avalon Region



Data Sources:
Government of Newfoundland and Labrador,
Department of Municipal and Intergovernmental Affairs
Geobase National Road Network, Government of Canada,
Natural Resources Canada, Centre for Topographic Information

Prepared by:
Jerry Collins
Research Assistant
Environmental Policy Institute
Grenfell Campus, Memorial University

Respondents - Administrators Survey

- ◆ 46% response rate (municipalities & LSDs)
 - ◆ 37% on the Avalon
 - ◆ 42% of all communities 1000 or less
- ◆ majority (63% on the Avalon) of responding communities 1000 or less

Respondents - Water Operators Survey

- ◆ 84 respondents as of March 15, 2014
- ◆ 21 **Avalon** communities: 19 Municipalities; 2 LSDs

Water Services



Municipal Water Service (Administrators)

Question	1000 or less	1000 +	Avalon Municipalities
Operate a water system for residents?	83%- Yes 18%- No	95%- Yes 5%- No	88%- Yes 12%- No
If no, why not?	60%- Not a priority	64%- Not a priority	100% -Not a priority



Discussion:

Water Services

- ◆ Do you have houses in your municipality that are not hooked up to the municipal system?
 - ◆ Is this a problem?
 - ◆ Why aren't they hooked up?
- ◆ What would it take to increase the percentage of households hooked up to the municipal water supply?

Boil Water Advisories



Boil Water Advisories – DOEC Data

Boil Water Advisories (BWAs)

- July 29, 2013 - **256** BWAs affecting 184 communities in NL (Gov't of NL, 2013c)
- 96%** communities 1,000 or less
- 55%** of BWAs for communities 1,000 or less have been in place for 5+ years



BWA Reasons

Avalon Municipalities/LSDs (Water Operators)

- ◆ 11 respondents from Avalon indicated BWA in last 4 years
- ◆ Reasons included:
 - ◆ Disinfection system is off due to maintenance or mechanical failure
 - ◆ Water distribution system is undergoing maintenance or repairs
 - ◆ No free chlorine residual detected in the water distribution system

Discussion:

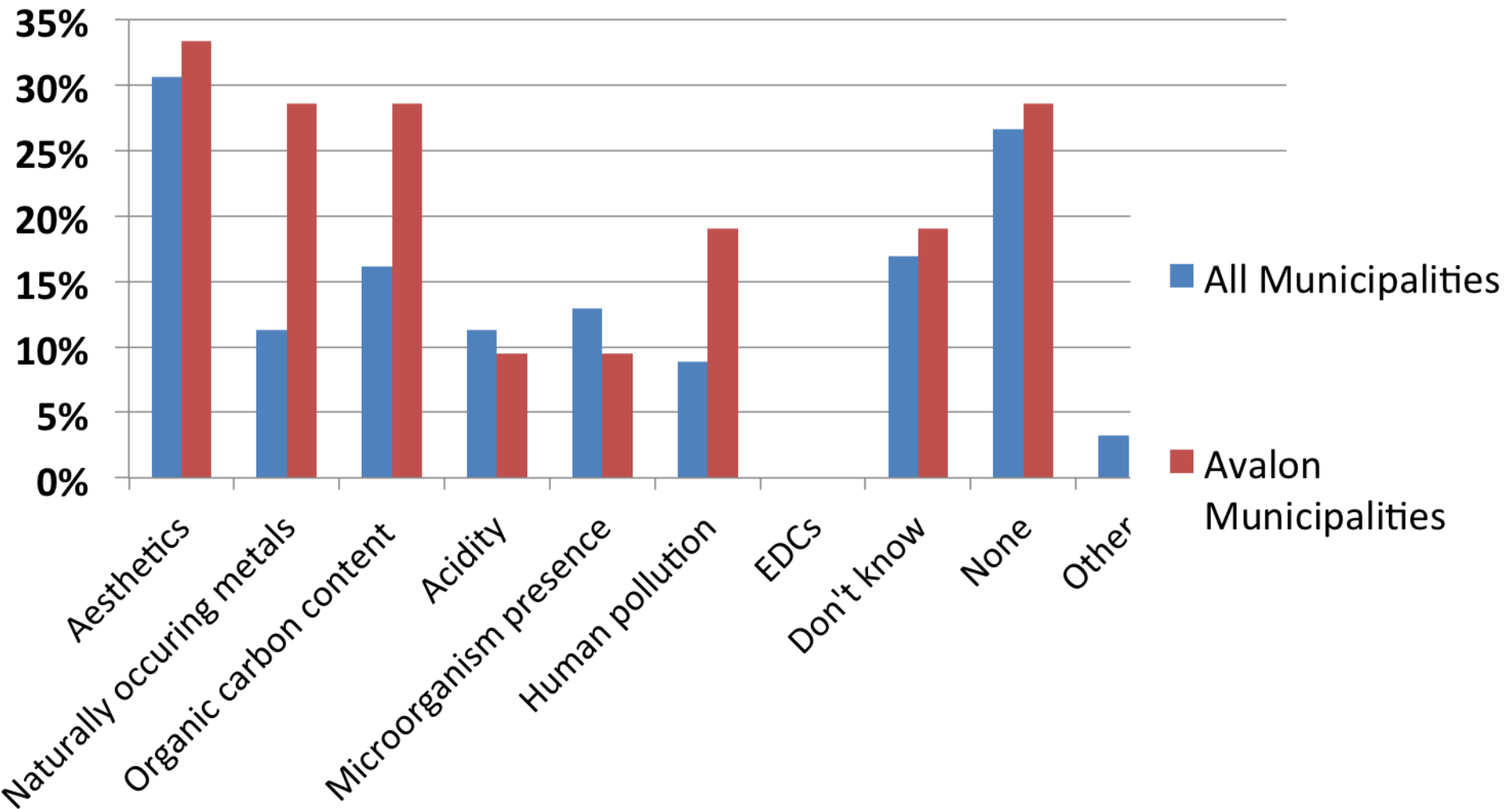
Boil Water Advisories

- ◆ How have BWAs impacted your community?
 - ◆ Safety?
 - ◆ Economically?
 - ◆ Public trust issues?
 - ◆ Other?
- ◆ Once on a BWA what are the barriers to getting off the designation?
- ◆ Do you think the BWA system is working well?

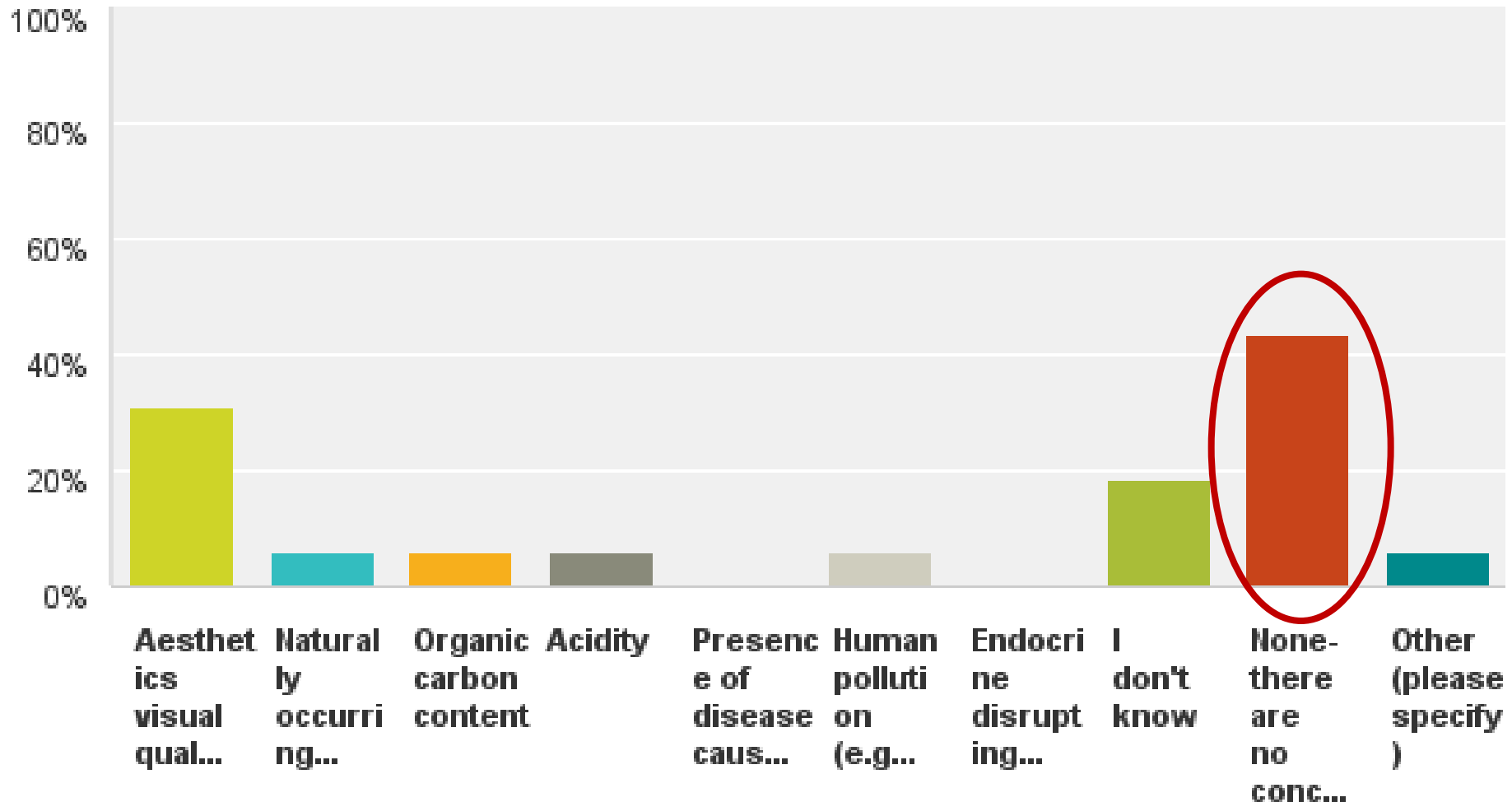
Concerns for Water System



Which of the following are concerns for your municipality's water system? (Administrators)

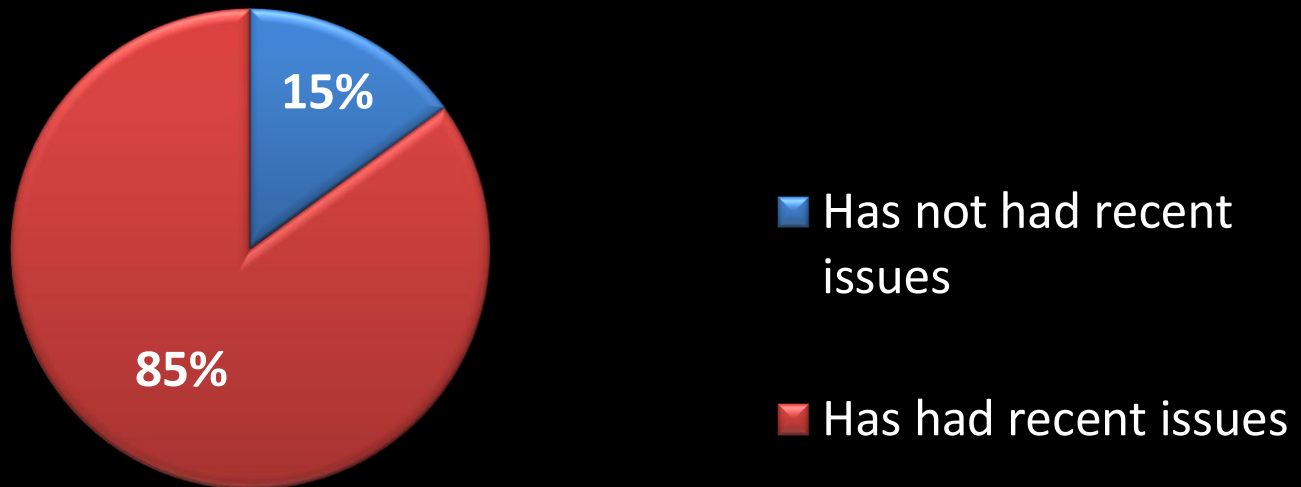


Concerns for your municipality's water system? – Avalon Municipalities/LSDs (Water Operators)



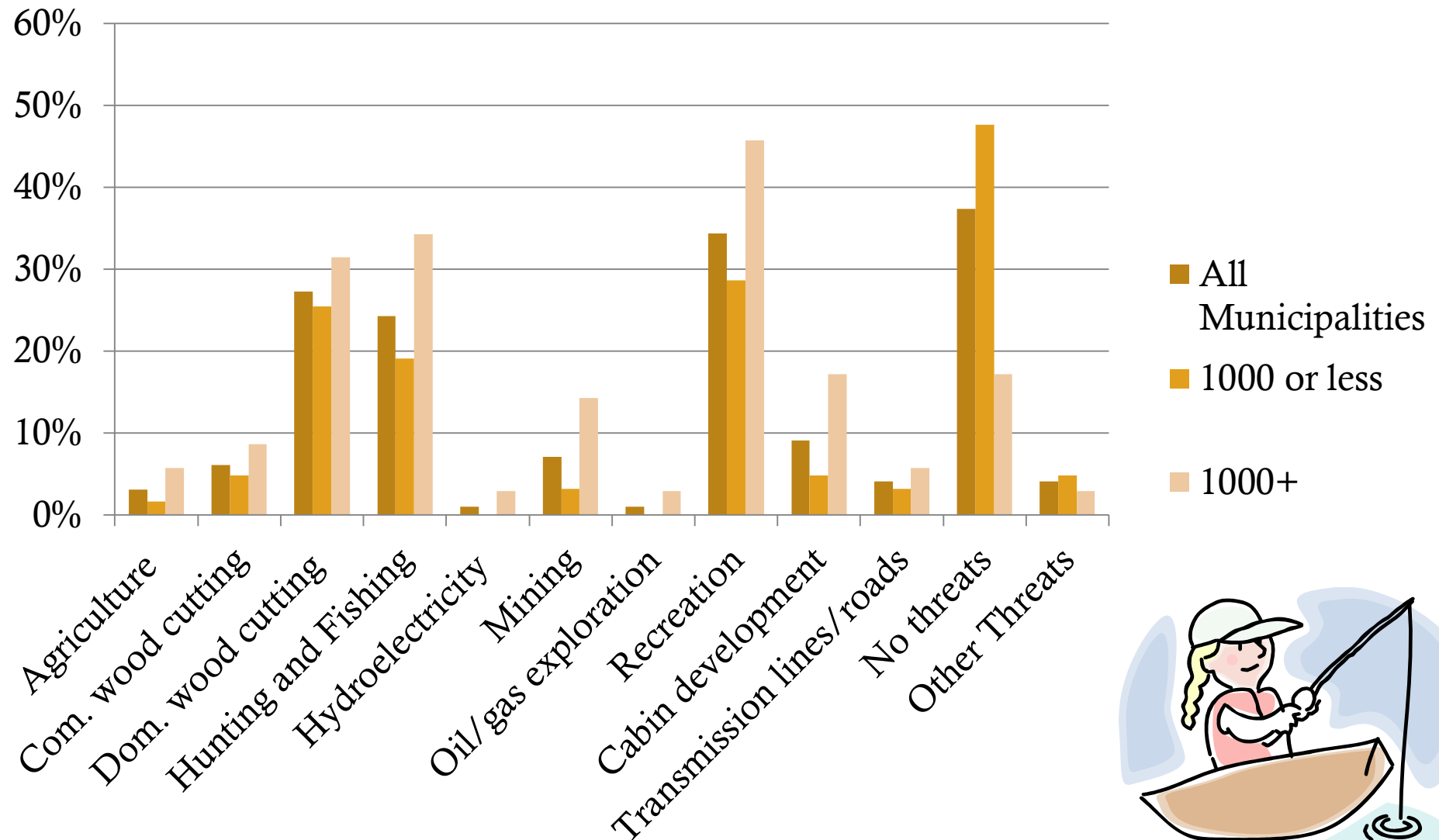
Comparison with DOEC Data

Communities Reporting "No Concerns" Regarding Drinking Water System



Another question asked if they have had HAAs or THMs in the past 4 years
➤ **59%** of those who said NO had exceeded the HAA or THM in the last 4 years

Land Use Activities- All Municipalities (Administrators)



Discussion:

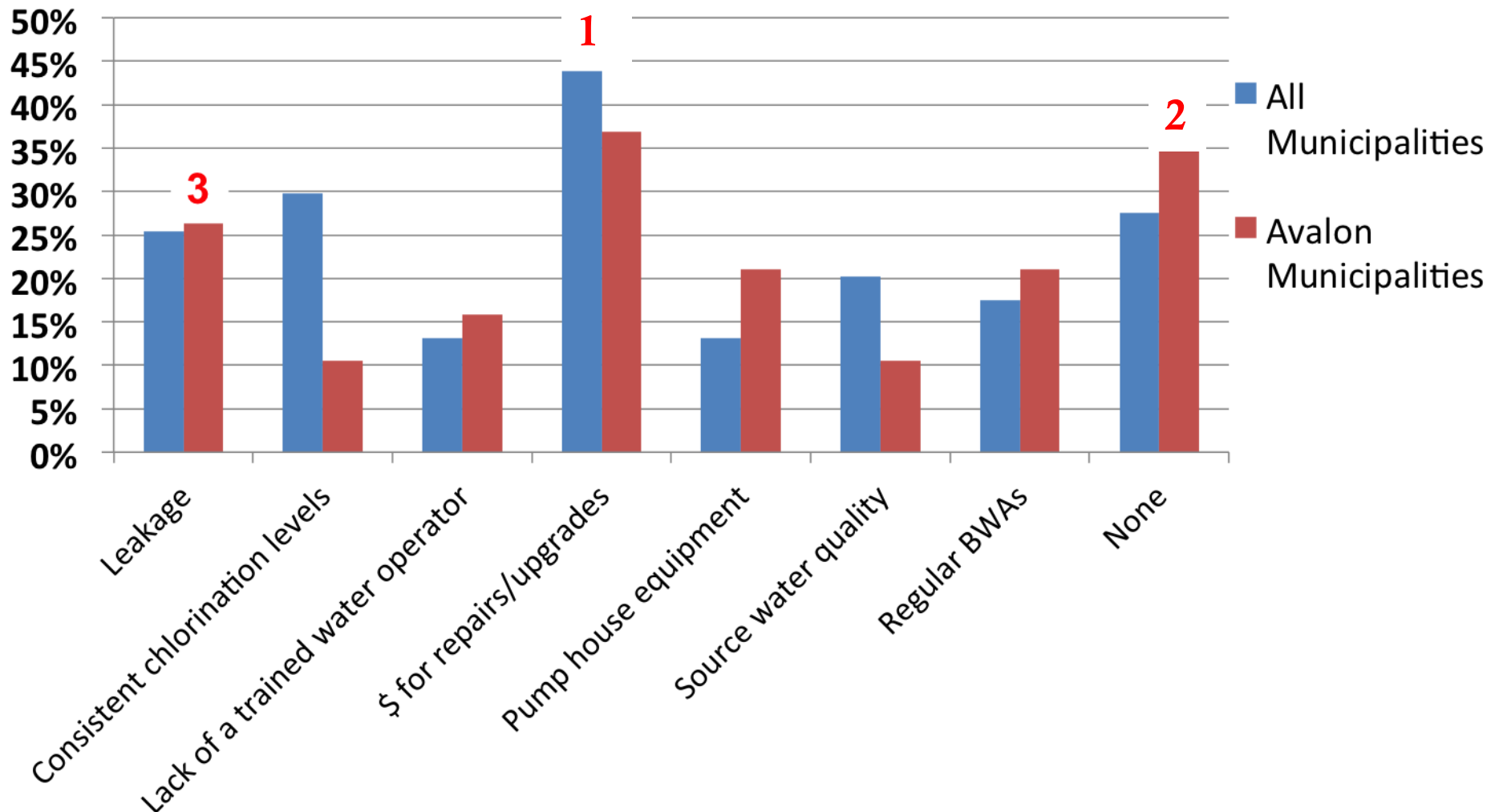
Concerns for Water System

- What kind of concerns (if any) are there for your water system?
 - Any contaminants in your Drinking Water Quality reports?
- Have you done anything to combat aesthetics issues?
 - Taste?
- Have THMs, HAAs or any other disinfectant byproducts been an issue?
 - Have you taken steps to reduce disinfectant byproduct levels?
- Is there something not discussed that is a major concern for your municipality?

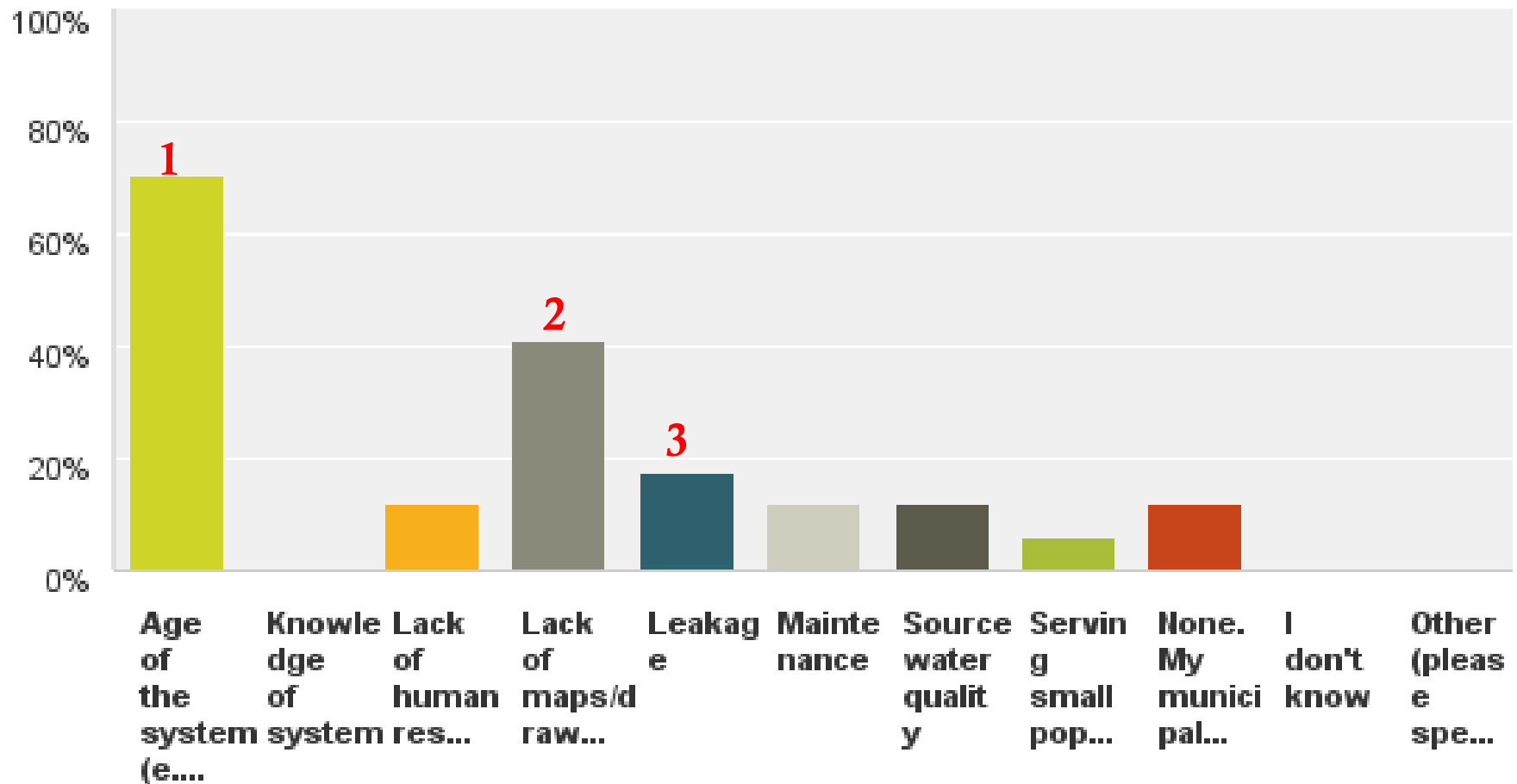
Infrastructure Issues



What challenges does your water system currently face? (Administrators)



Biggest issues other than financial constraints? Avalon Municipalities/ LSDs (Water Operators)



Infrastructure- All Municipalities (Administrators)

- ◆ Aging infrastructure
 - ◆ 19% of all municipalities completed work in the 1970's or earlier
 - ◆ **NONE** of responding Avalon municipalities completed work in 1970's or earlier
- ◆ Need for repairs and upgrades
 - ◆ 68% with 1,000 or less
 - ◆ 79% with 1,000+
- ◆ Financial barriers to upgrades



Source: Paula Dawe, P. Eng
http://www.env.gov.nl.ca/env/waterres/training/adwww/ruralreactions/11_paula_dawe_bmps_for_dbps.pdf

Discussion:

Infrastructure Issues

- ◆ What are the major barriers to repairing water infrastructure?
- ◆ Has your municipality applied for any sort of infrastructure funding for your water system(s)?
 - ◆ If yes, how was your experience?

Water Operator Education, Training and Certification



Municipal Water Operator Training (Administrators)

Question	1000 or less	1000 +	Avalon Municipalities
Position of Water Operator	50% - Paid Full Time	89% - Paid Full Time	63% - Paid Full Time
Operators highest level of training	22% - None	0% - None	9% - None
Is the level of training an issue?	33% - Yes	17% - Yes	5% - Yes
Maps (of all)?	56% - Yes	48% - Yes	57% - Yes

50% of LSDs have a volunteer water operator vs. **4%** for municipalities

Discussion:

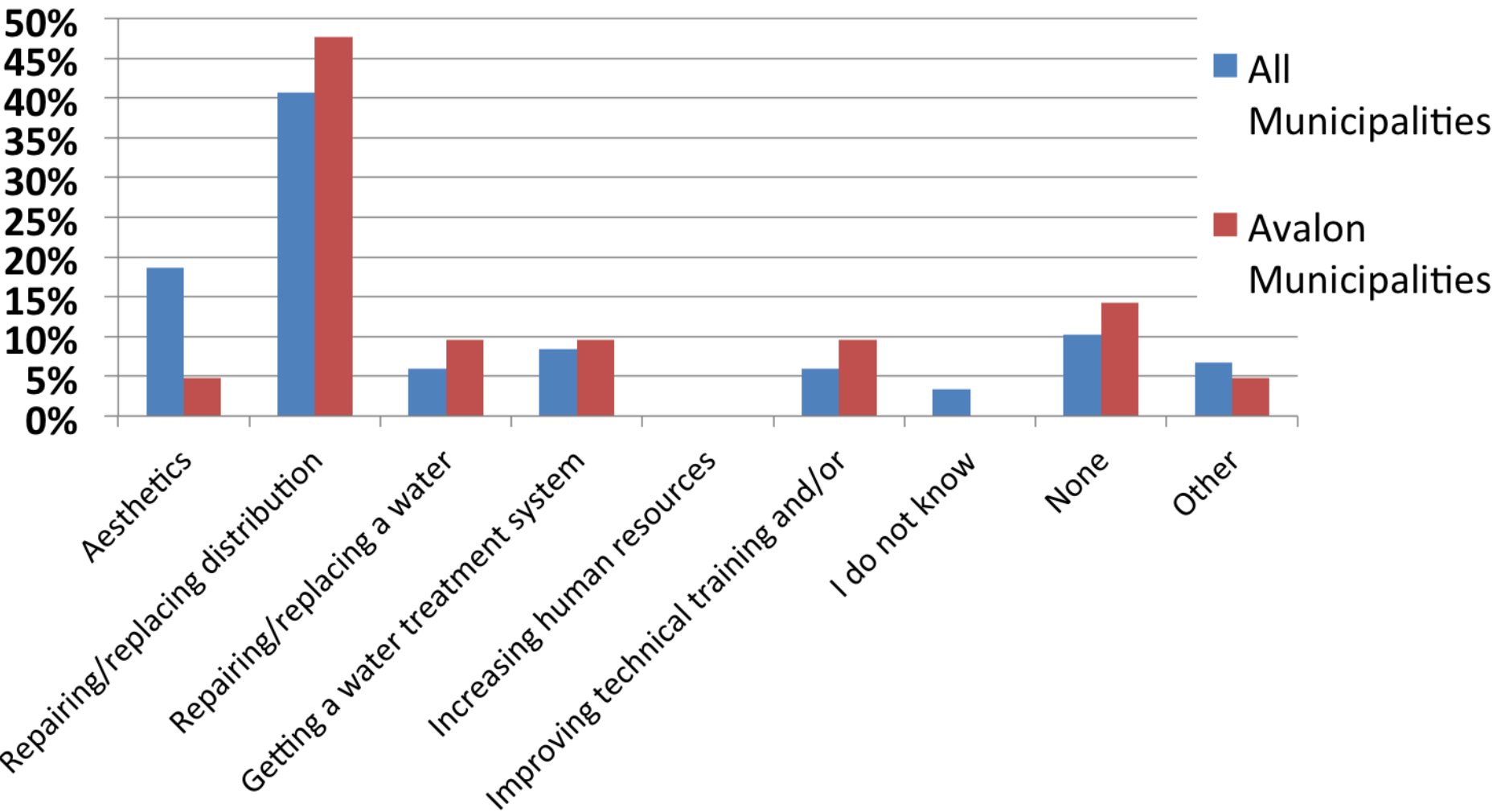
Operator Training

- ◆ What are barriers to operator training in your community?
- ◆ How can the Operator Education, Training and Certification program improve?
- ◆ Is finding a certified water operator difficult in your municipality?
- ◆ Do you have someone who can cover water operations at all times?

Moving Forward



What should be the highest priority for improving drinking water quality in your community? (Administrators)



Solutions Undertaken



- ◆ **Source:** New wells; Dams; Moving intake; Regional approach
- ◆ **Filtration:** Sand screen at inlet in pond; Water filtration gallery
- ◆ **Treatment:** PWDU; MIOX; New/upgraded chlorination/booster systems
- ◆ **Pump upgrades**
- ◆ **Management and Operations:** Proactive leak detection; Automated monitoring systems (e.g. SCADA); Studies

New things that haven't worked...

- ◆ System treatment options too complex for operators to maintain/poor maintenance
- ◆ Poor production from drilled wells
- ◆ New chlorine system didn't work because of mud deposits in the regulator
- ◆ New equipment not working
- ◆ Lack of monitoring to ensure proper installation and testing

Discussion:

Moving Forward

- ◆ What kinds of solutions has your municipality explored?
 - ◆ What's worked?
 - ◆ What hasn't?
 - ◆ Advice?
- ◆ What kind of support is there for you when you are looking for solutions for your water challenges?
 - ◆ What kinds of support do you need?

Next Steps

- 💧 Water Operators Survey analysis
- 💧 Further investigation of key issues and solutions
- 💧 Case study reports
- 💧 Regional approaches focus group - MNL Symposium
- 💧 Reporting back



Profiling regional watershed management on the Northeast Avalon (NEA): Integrating practices for drinking water quality



Atlantic Coastal
Action Program



- ◆ In-depth report on current water systems and their governance in 15 communities in the NE Avalon
- ◆ Series of GIS maps of watersheds
- ◆ *Purpose: study the players, policies and practices conditioning the management of NEA drinking water and watersheds to produce a “State of the Region” report and a series of topical maps developed using the NAACAP GIS platform*
- ◆ Contact j.daniels@mun for more information

Closing Discussion

- ◆ Any questions?
Comments? Concerns?
- ◆ What kind of information
would you like to see
from us?
- ◆ How would you like
information compiled,
displayed and distributed?

Thank you!

And stay in touch!

- Visit our website:
<http://nlwater.ruralresilience.ca>
- Contact Sarah Minnes,
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