

# Rural Drinking Water in Newfoundland and Labrador

## Exploring Solutions for Sustainable Rural Drinking Water Systems

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Principal Investigator



# 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

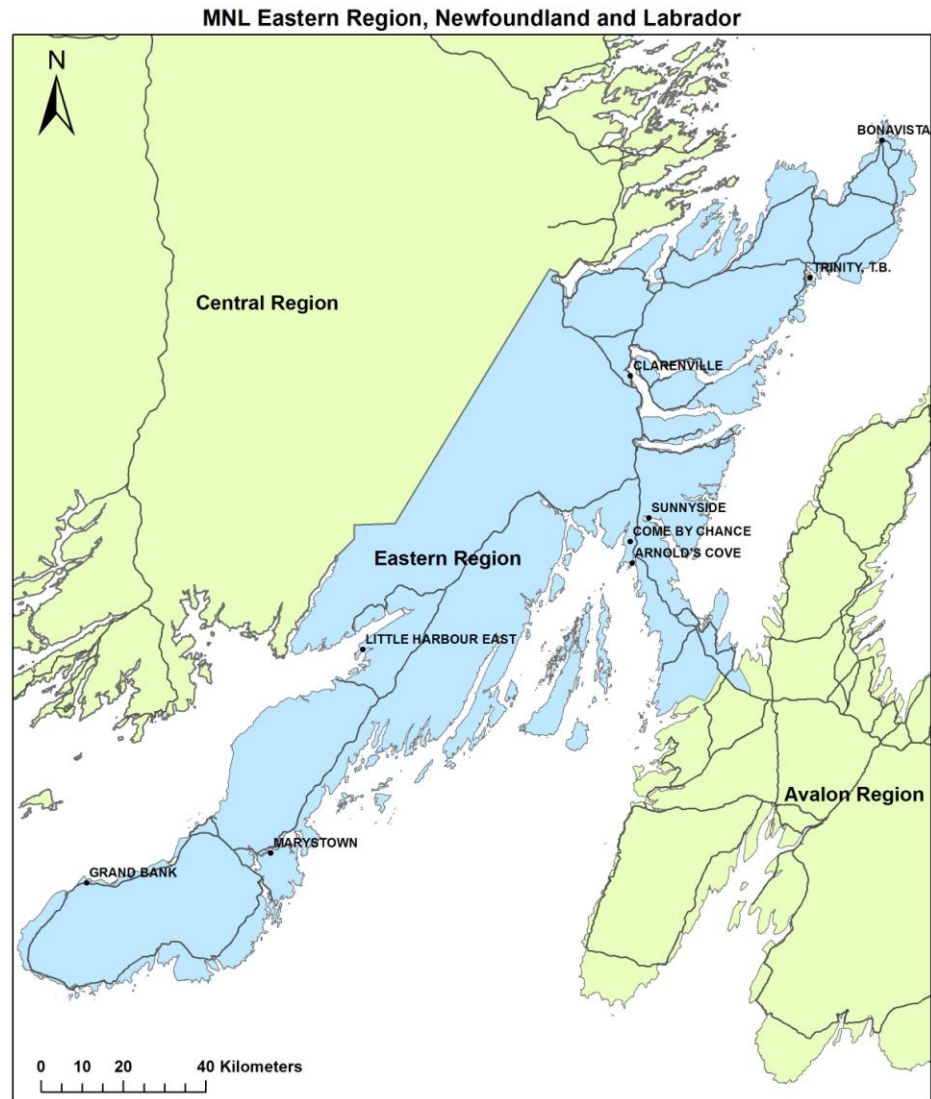


# Survey Results and Discussion

Eastern Highlights



# MNL Eastern 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

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# Respondents- Administrators Survey

- 209 Respondents- **46%** Response Rate
  - 119** - Municipalities
  - 48** - LSDs
  - 42** - anonymous / did not answer question
- 80 municipalities and **42%** of all communities of 1000 or less
- Regional coverage of municipalities:
  - Avalon **17%**
  - Eastern 21%**
  - Central **28%**
  - Western **21%**
  - Northern **8%**
  - Labrador **6%**
- Eastern
  - 41/84** Municipalities/LSDs
  - 22%** under 1,000

# Respondents- Water Operators Survey

- 💧 71 Respondents as of February 3, 2014
  - 💧 53 - Municipalities
  - 💧 15 - LSDs
  - 💧 3 - anonymous / did not specify
- 💧 6 Eastern Municipalities
- 💧 3 Eastern LSDs

# Water Services



# Water Service- All Municipalities (Administrators)

Question	1000 or less	1000 +	Eastern Municipalities
Operate a water system for residents?	83%- Yes 18%- No	95%- Yes 5%- No	83%- Yes 17%- No
If no, why not?	60%- Not a priority	64%- Not a priority	75% - No \$ to maintain system
% of households on water system?	45% -76-99% 37% -100%	45% -76-99% 37% -100%	67% -76-99% 24% -100%





# 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



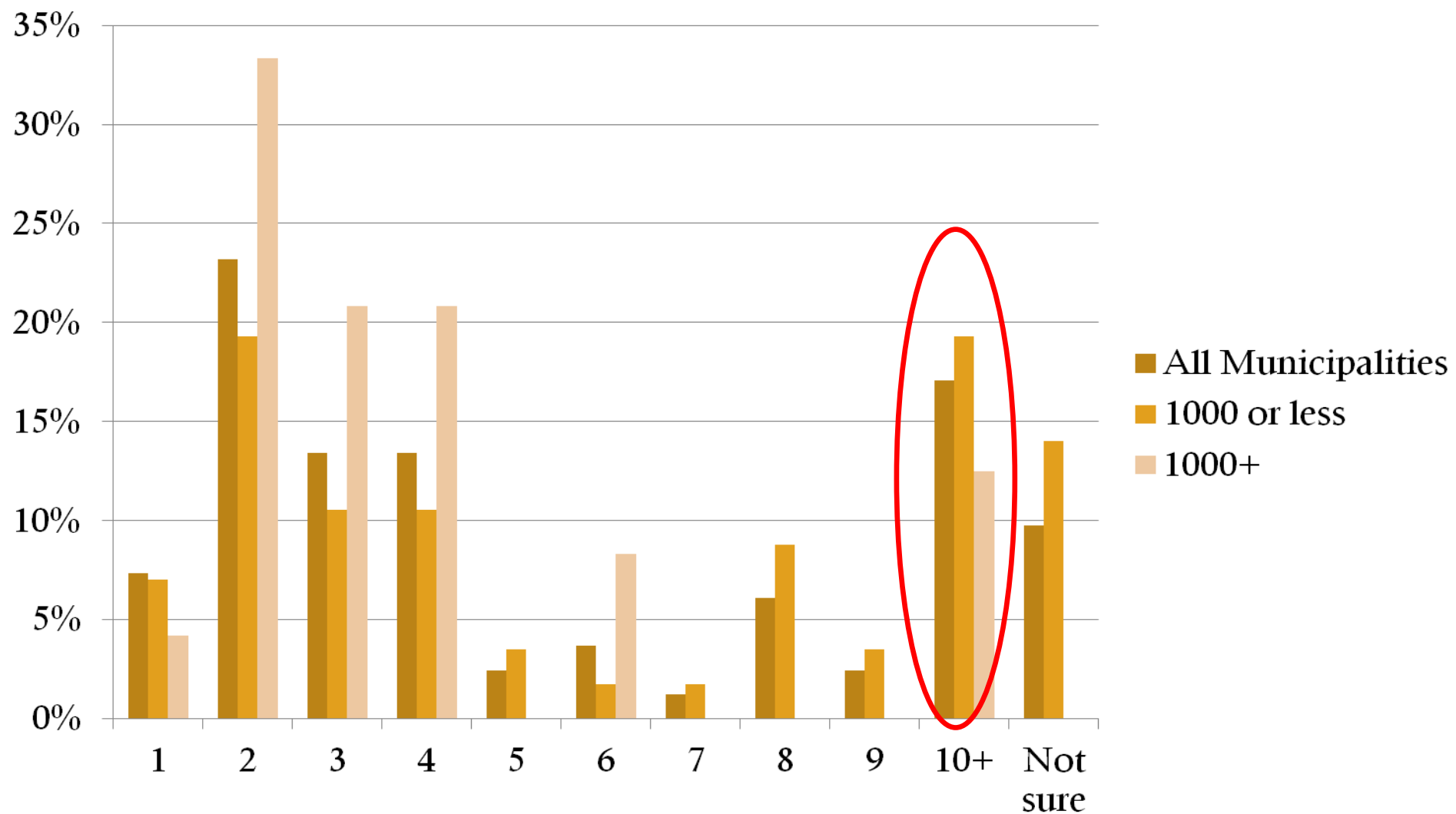
# Boil Water Advisories – DOEC Data

## 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

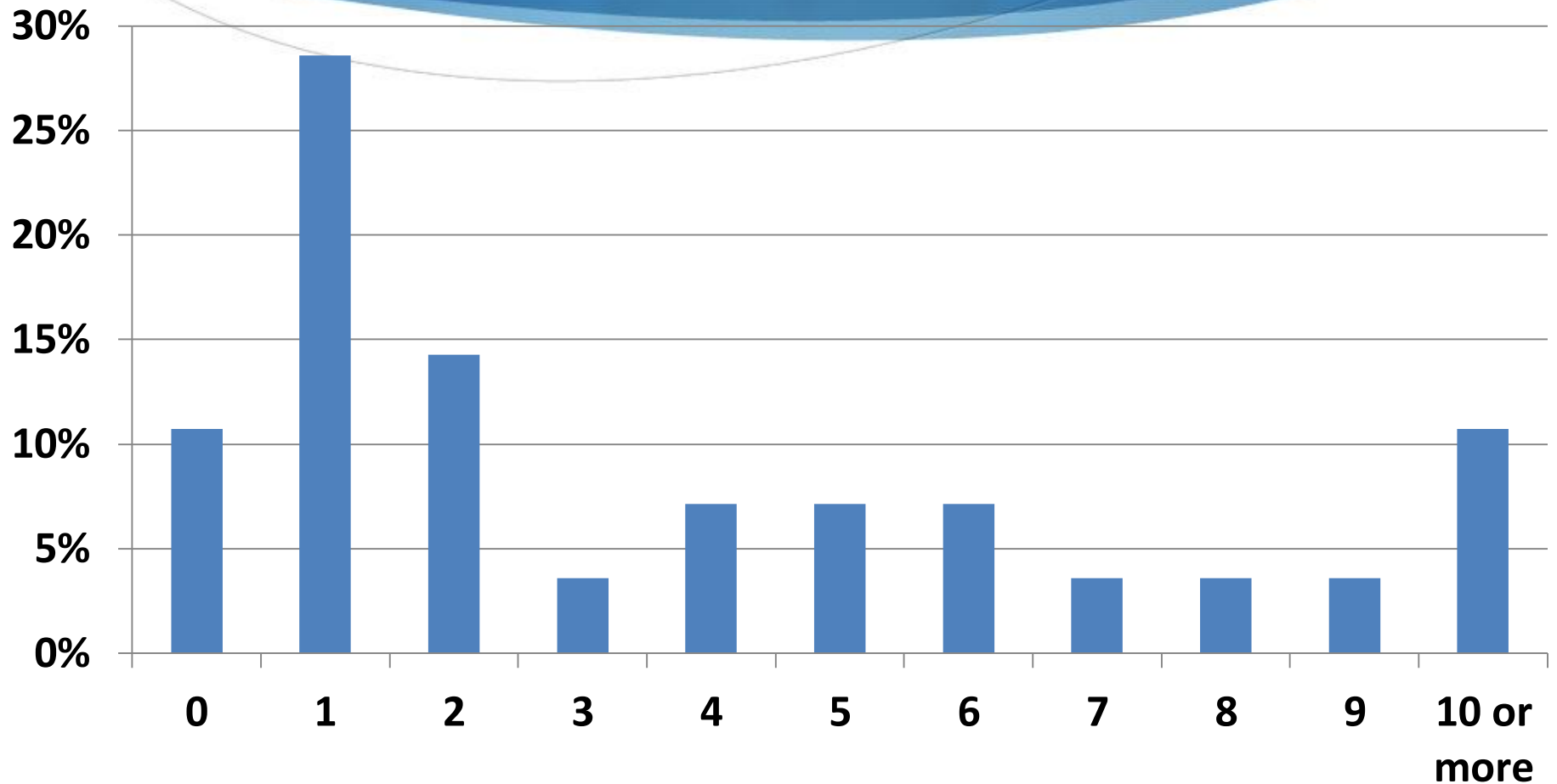


# How many times has your municipality been on a BWA in the last 4 years?- All Municipalities (Administrators)





# How many times has your municipality been on BWA in the last 4 years?- Eastern Municipalities (Administrators)



# BWA Reasons

## Eastern Municipalities/LSDs (Water Operators)

- ◆ 8/9 respondents indicated they have had a BWA in last 4 years
- ◆ 50%- Disinfection system is off due to maintenance or **mechanical failure**
- ◆ Other answers indicated as well as additional reasons in the same communities that they had been on BWA
  - ◆ Undergoing maintenance or repairs
  - ◆ No free chlorine residual

# Discussion:

## Boil Water Advisories

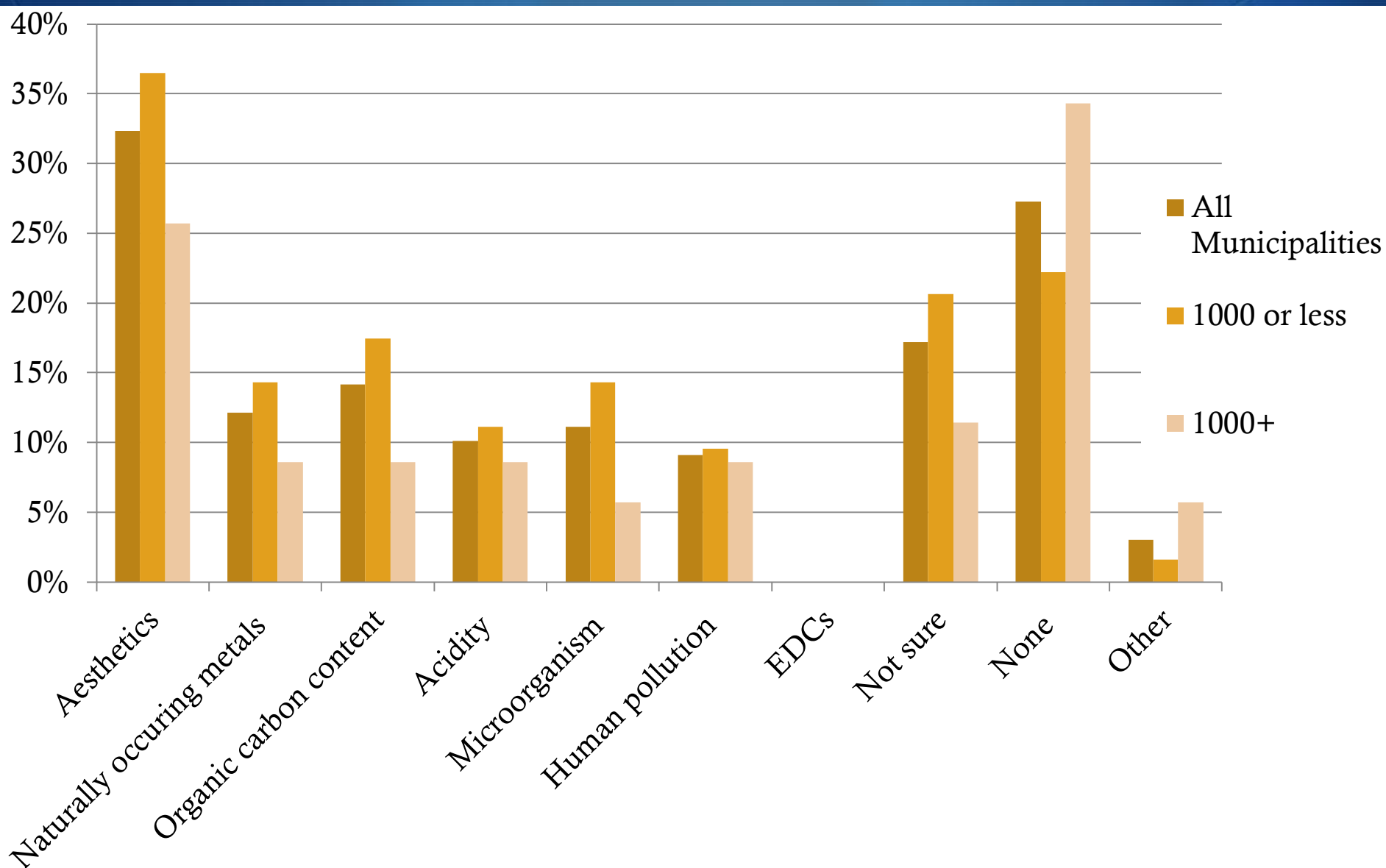
- ◆ Do BWAs impact your community?
  - ◆ Safety?
  - ◆ Economically?
  - ◆ Public trust issues?
  - ◆ Other?
- ◆ Once on a BWA what are the barriers to getting off the designation?
- ◆ Do you think the BWA system is working well?

# Concerns for Water System

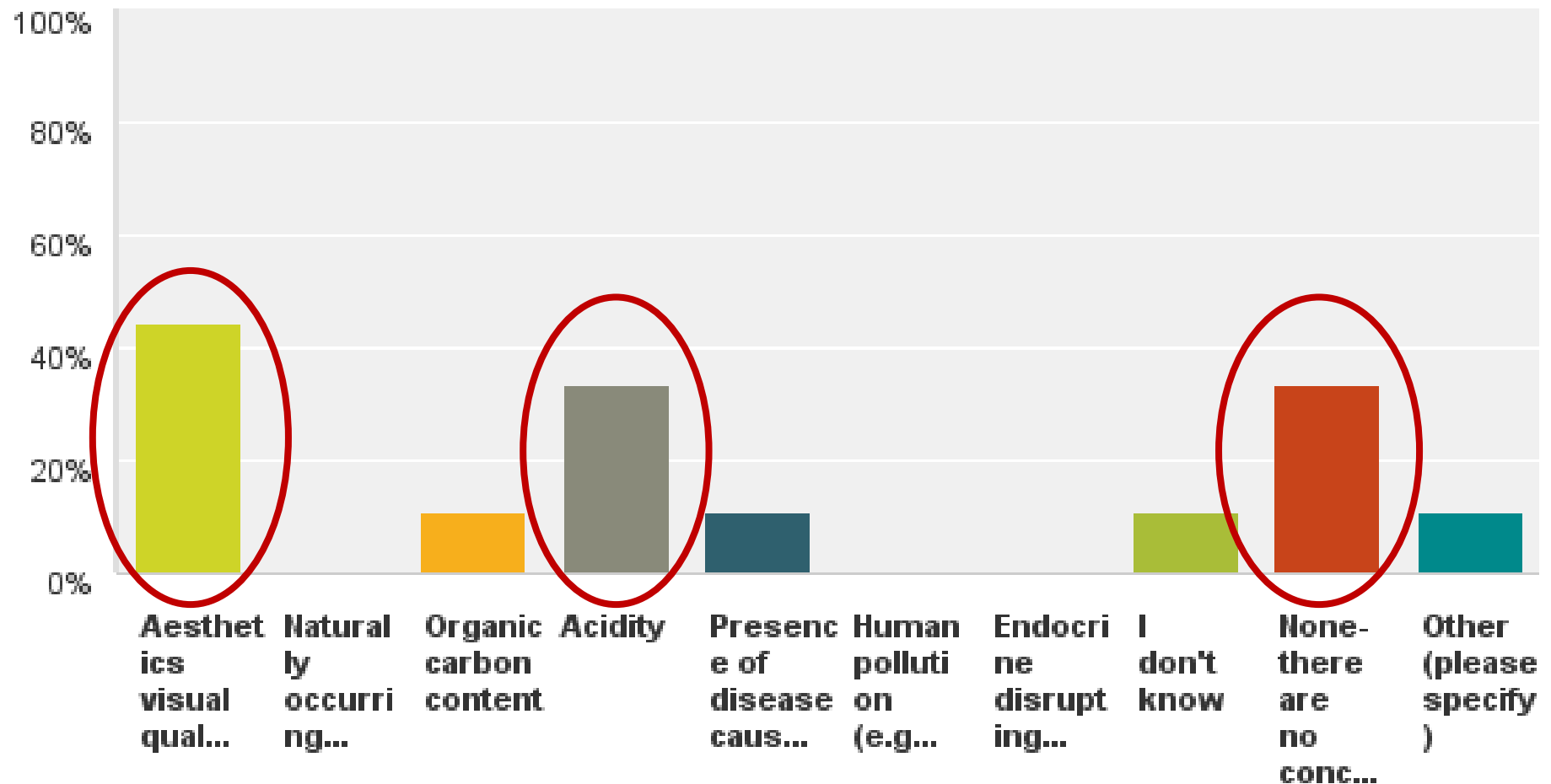




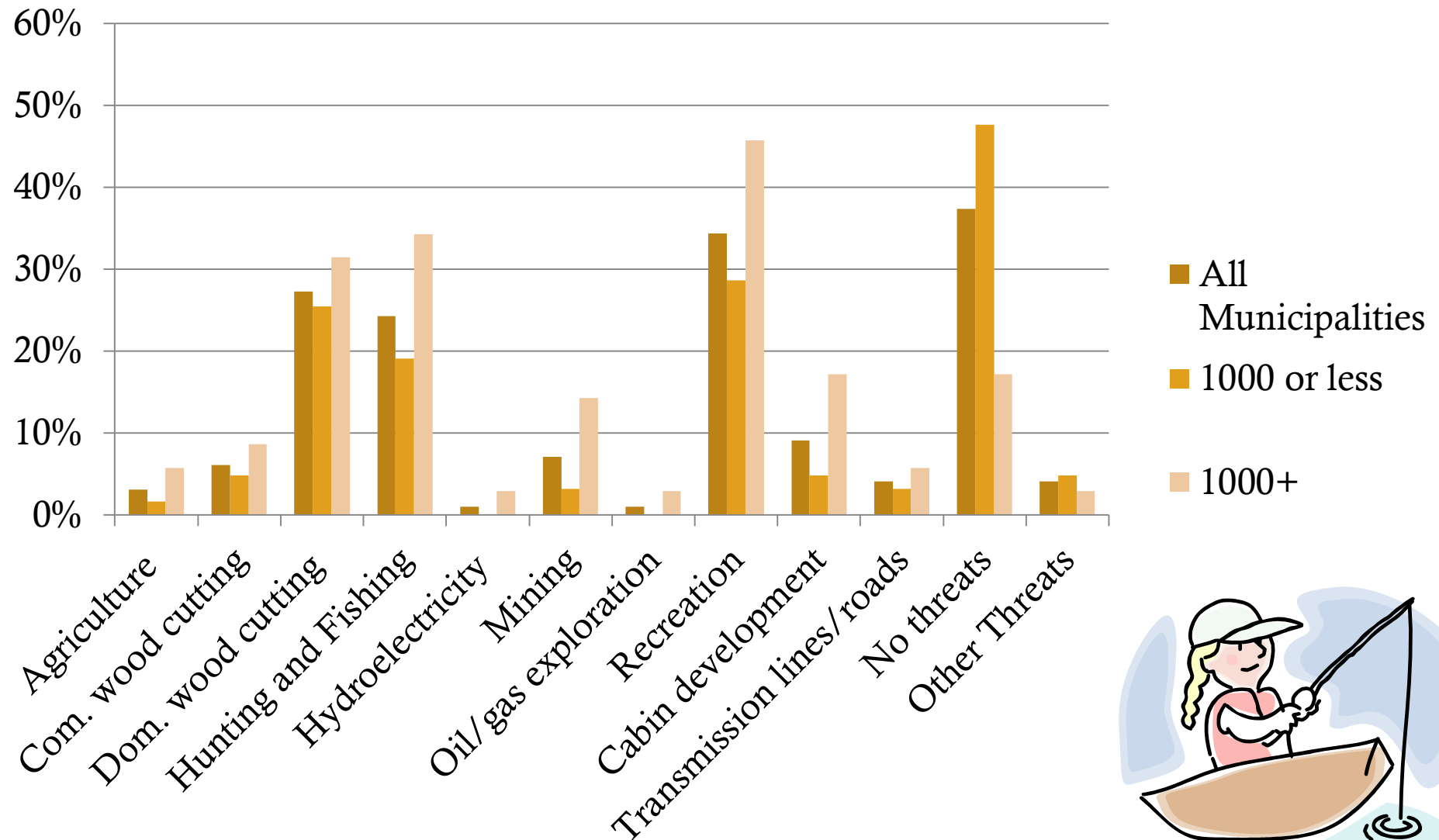
# Which of the following are concerns for your municipality's water system?- All Municipalities (Administrators)



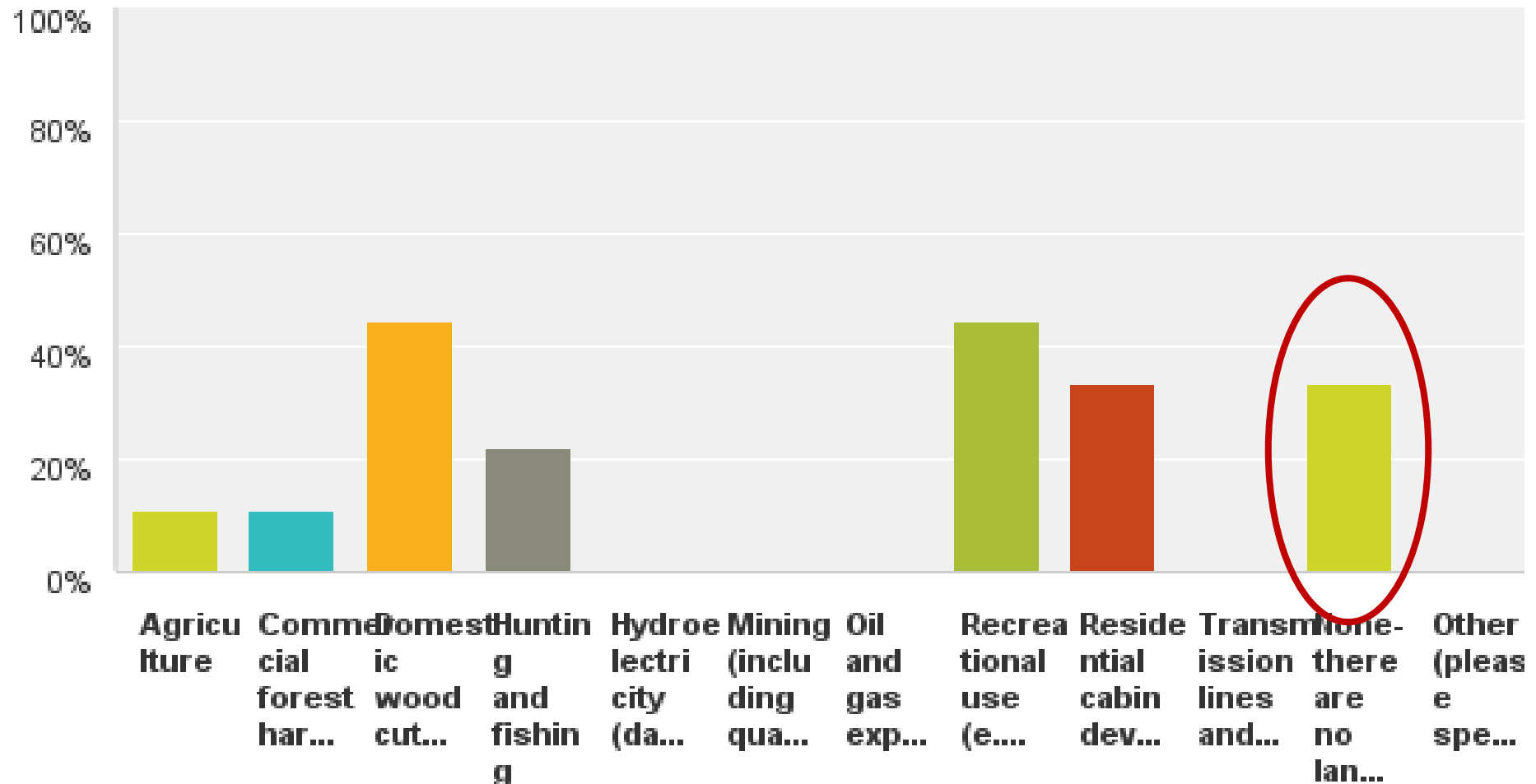
# Concerns for your municipality's water system? - Eastern Municipalities/LSDs (Water Operators)



# Land Use Activities- All Municipalities (Administrators)



# Land Activities – Eastern Municipalities/LSDs (Water Operators)





# Discussion:

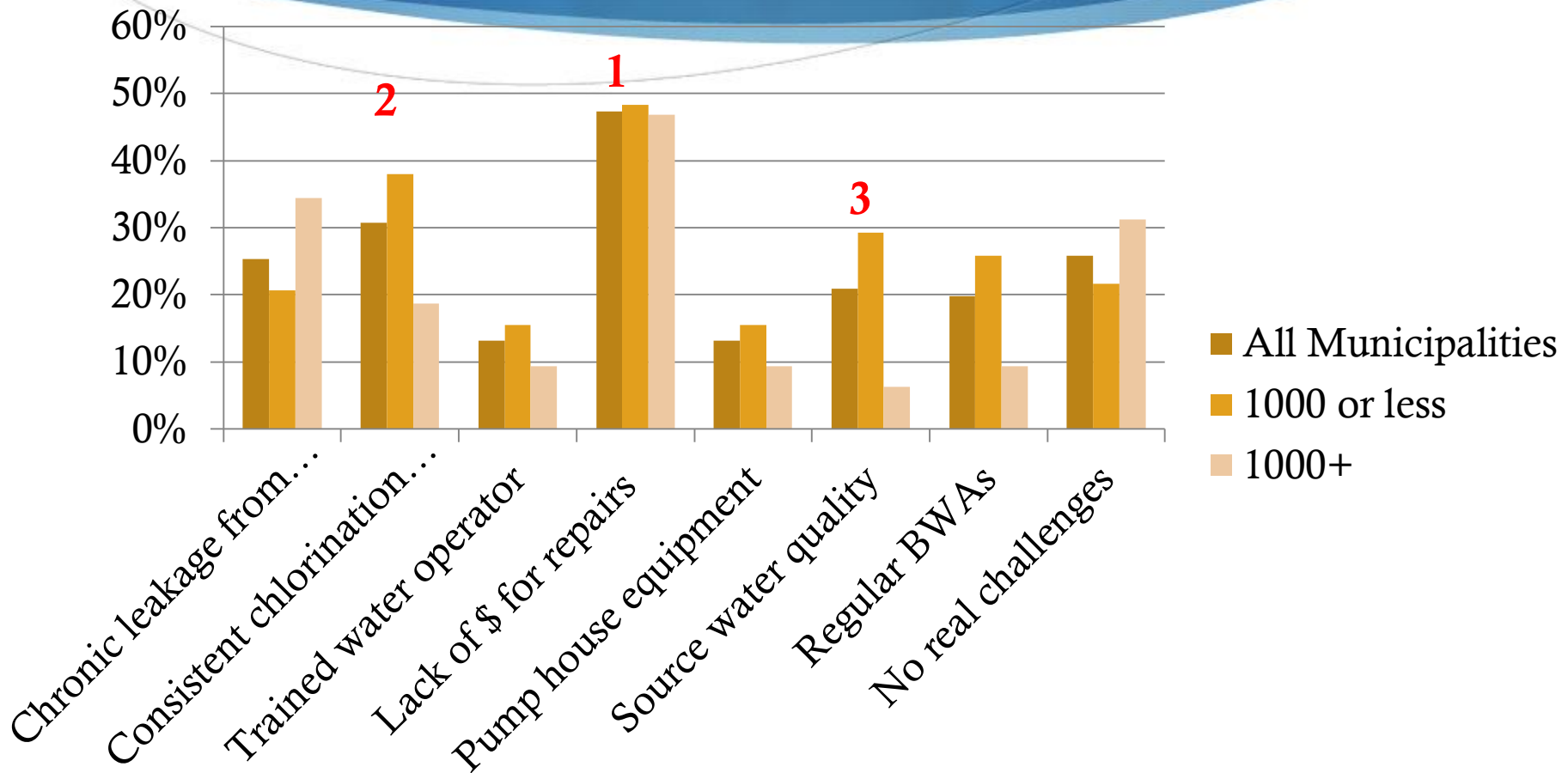
## Concerns for Water System

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

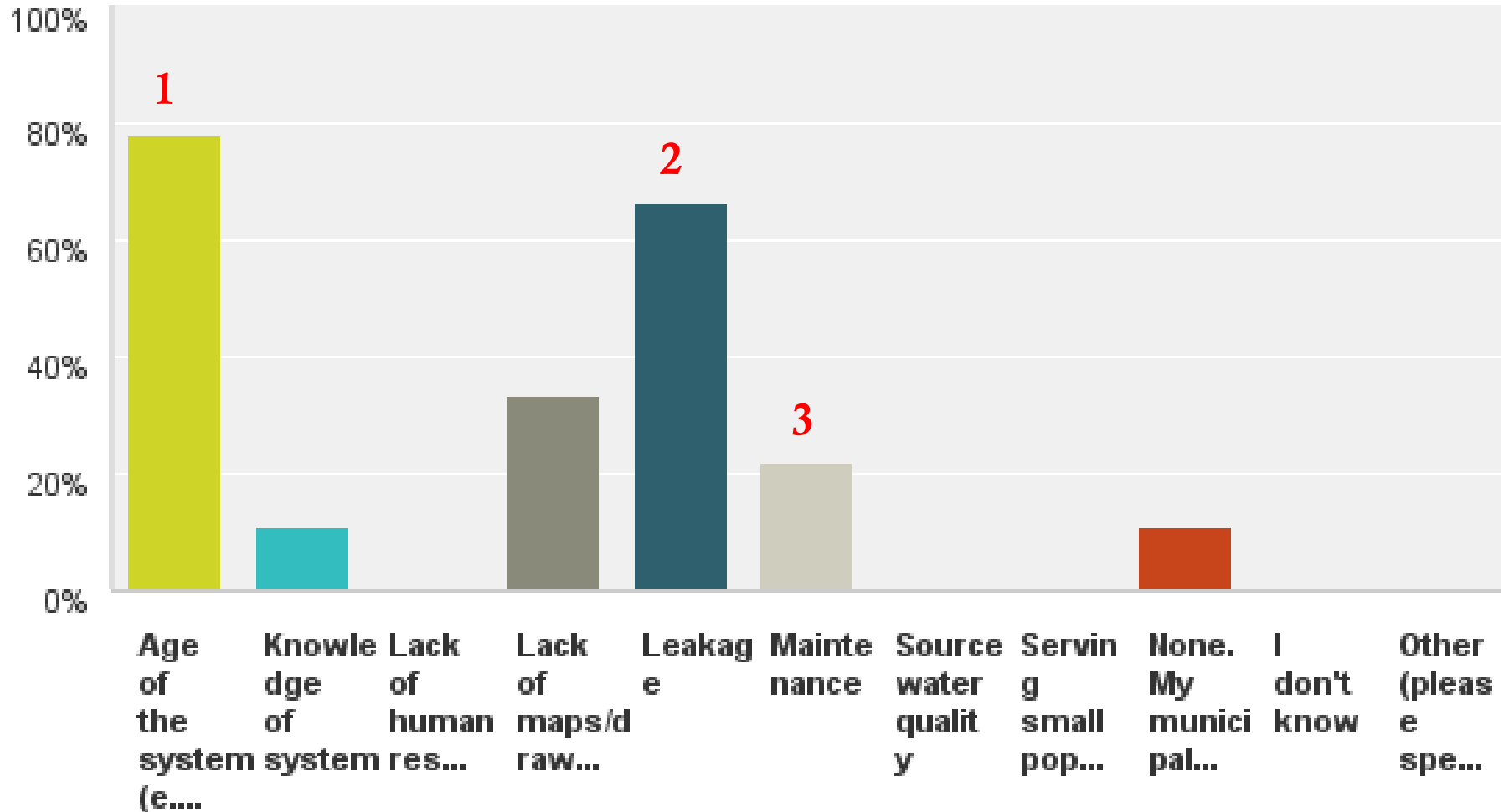
# Infrastructure Issues



# What challenges does your water system currently face? – All Municipalities (Administrators)



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



# Infrastructure- All Municipalities (Administrators)

- ◆ Aging infrastructure
  - ◆ 51% with 1,000 or less- system completed 1970's or earlier
  - ◆ 14% in all Eastern municipalities completed 1970's or earlier
- ◆ Need for repairs and upgrades
  - ◆ 68% with 1,000 or less
  - ◆ 79% with 1,000+
- ◆ Financial barriers to upgrades



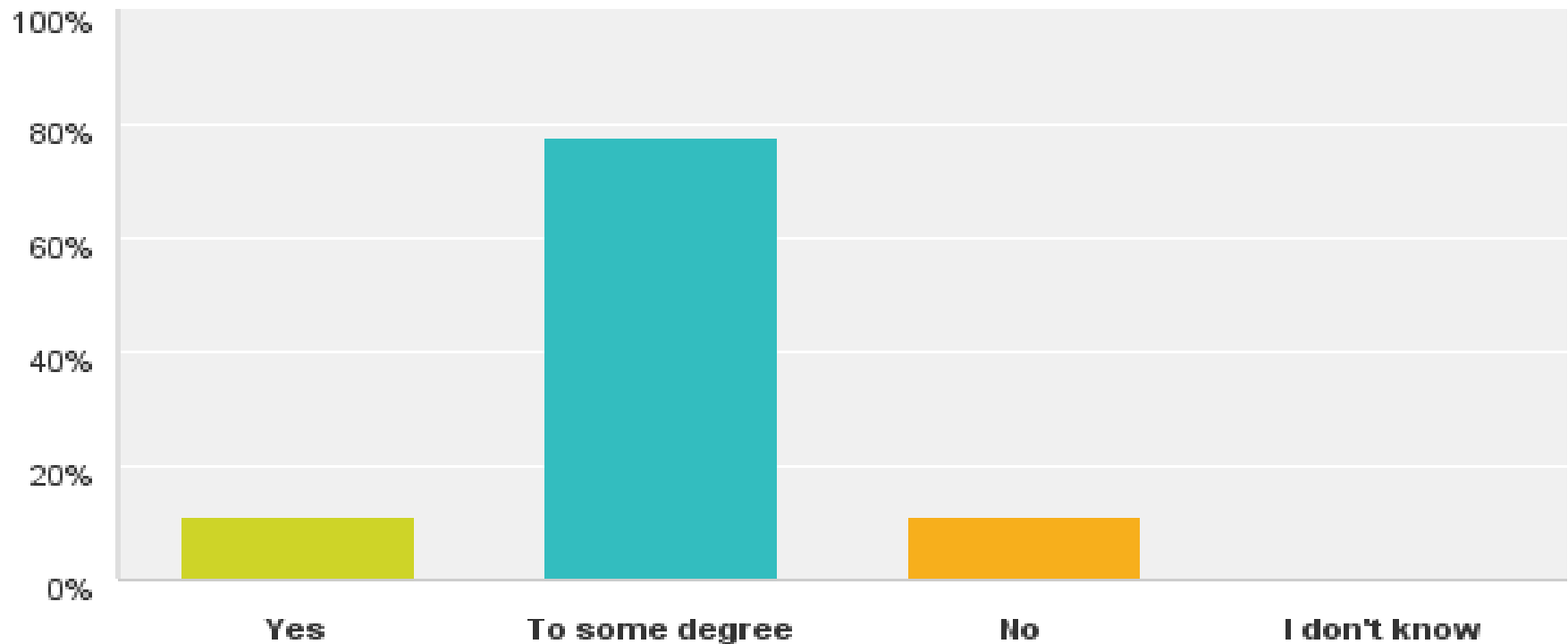
Source: Paula Dawe, P. Eng

[http://www.env.gov.nl.ca/env/waterres/training/adwww/ruralreactions/11\\_paula\\_dawe\\_bmps\\_for\\_dbps.pdf](http://www.env.gov.nl.ca/env/waterres/training/adwww/ruralreactions/11_paula_dawe_bmps_for_dbps.pdf)



Do you think you have sufficient resources (e.g. financial, human or infrastructure resources) to operate the water system in your municipality/LSD effectively?

Water Operators Survey- Eastern Answers



# 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)?
  - ◆ Was the process easy to navigate?
  - ◆ Was it approved?
    - ◆ Why or why not?

# Water Operator Education, Training and Certification

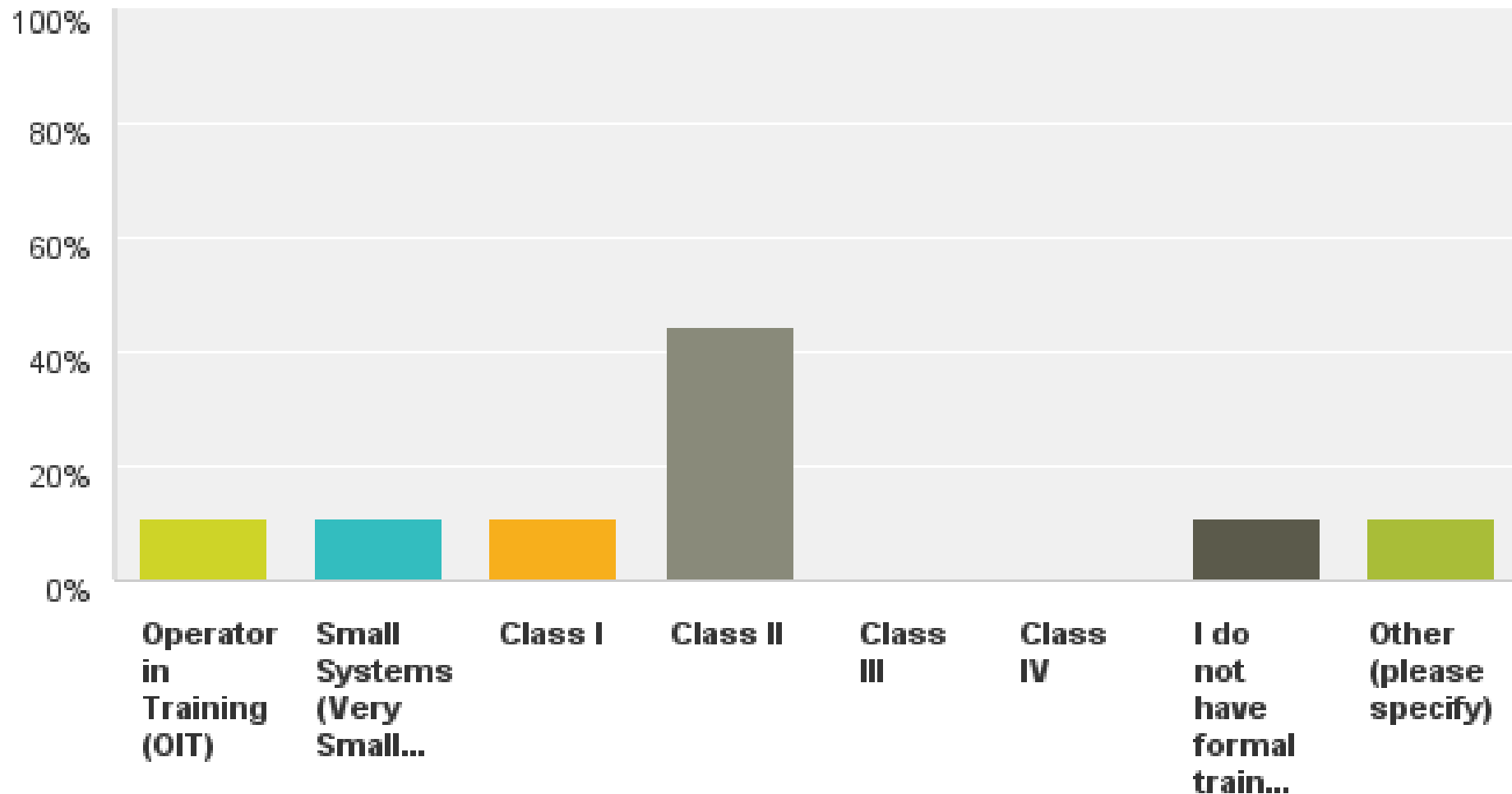


# Water Operator Training – All Municipalities (Administrators)

Question	1000 or less	1000 +
Position of Water Operator	<b>50%-</b> Paid Full Time	<b>89%-</b> Paid Full Time
Operators highest level of training	<b>22%-</b> None <b>13%-</b> OIT <b>18%-</b> Class 1 <b>8%-</b> Class 2	<b>0%-</b> None <b>11%-</b> OIT <b>25%-</b> Class 1 <b>22%-</b> Class 2
Is the level of training an issue?	<b>33%-</b> Yes	<b>17%-</b> Yes
Maps?	<b>56%-</b> Yes of all	<b>48%-</b> Yes of all

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

# Water Operator Training- Eastern Municipalities/LSDs (Water Operators)



# Discussion:

## Operator Training

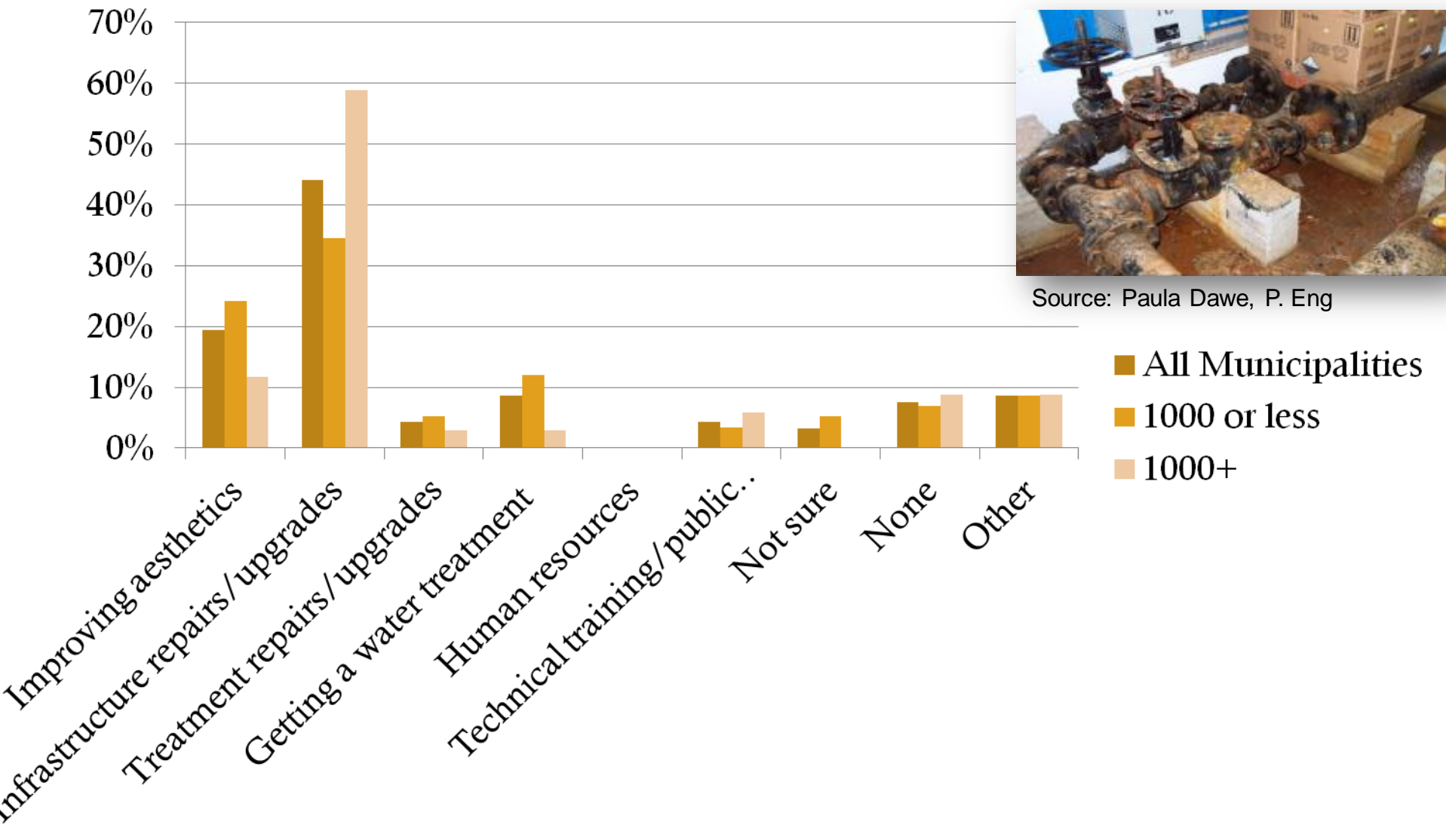
- ◆ What are barriers to operator training in your community?
- ◆ How can the Operator Education, Training and Certification program improve?
- ◆ Is finding a certified water operator difficult in your municipality?
  - ◆ What happens when your water operator goes on vacation?



# Moving Forward



# What should be the highest priority for improving drinking water quality in your community?- All Municipalities (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 worked?
  - ◆ 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?

# Impacts

- ◆ Reduced access to a basic necessity of life
- ◆ Unhealthy communities: Health Canada promotes water as needed daily
- ◆ Potential short and long-term health effects
- ◆ Lack of trust in municipal system
- ◆ Potential liability
- ◆ Stress for municipal leaders
- ◆ Economic development and resident retention



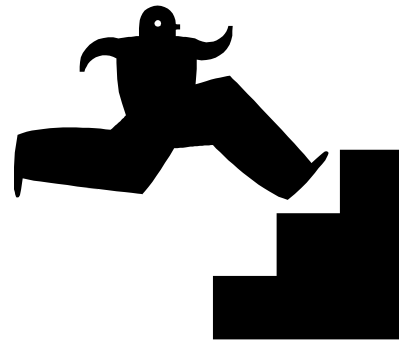


# Closing Discussion

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

# Next Steps

- 💧 Water Operators Survey closing and analysis
- 💧 Further investigation of key issues and solutions
- 💧 Case studies
- 💧 NL/BC comparative project
- 💧 Reporting back



# Thank you!

And stay in touch!

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