

Rural Drinking Water in Newfoundland and Labrador

Exploring Solutions for Sustainable Rural Drinking Water Systems

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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

Western Highlights



MNL Western 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

- Western

- 38/71 Municipalities/LSDs

- 20% of Western respondents
under 1,000

- Regional coverage of
municipalities/LSDs who
answered survey:

- Avalon 18%

- Eastern 21%

- Central 29%

- Western 19%

- Northern 7%

- Labrador 6%

Respondents- Water Operators Survey

- 💧 75 Respondents as of February 18, 2014
 - 💧 57 - Municipalities
 - 💧 15 - LSDs
 - 💧 3 - anonymous / did not specify
- 💧 12 Western Municipalities
- 💧 2 Western LSDs

Water Services



Water Service- All Municipalities (Administrators)

Question	1000 or less	1000 +	Western Municipalities
Operate a water system for residents?	83%- Yes 18%- No	95%- Yes 5%- No	82%- Yes 18%- No
If no, why not?	60%- Not a priority	64%- Not a priority	50% - No \$ to install; No \$ to maintain; Residents unwilling to pay; Water system 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



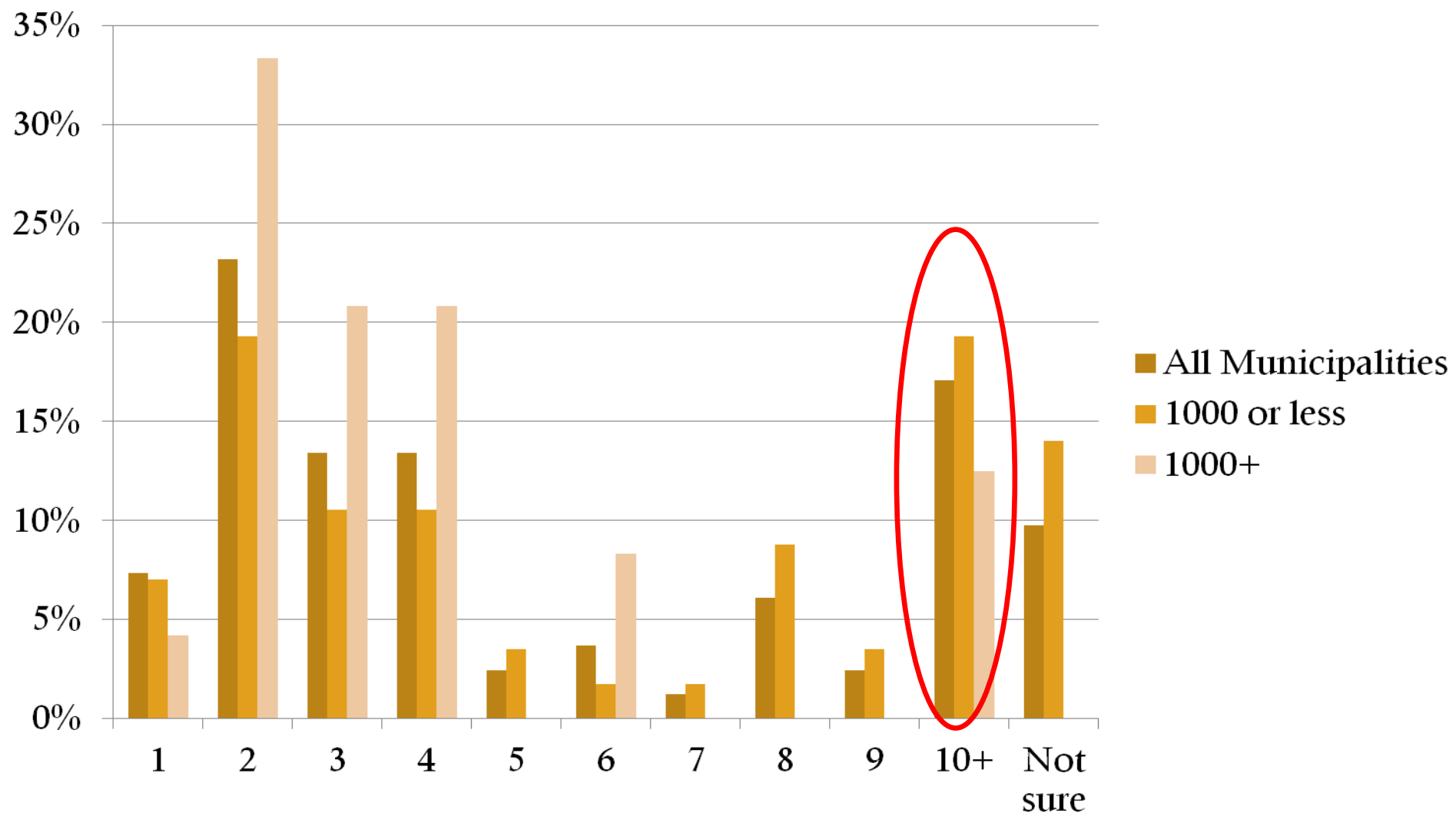
Boil Water Advisories – DOEC Data

Boil Water Advisories (BWAs)

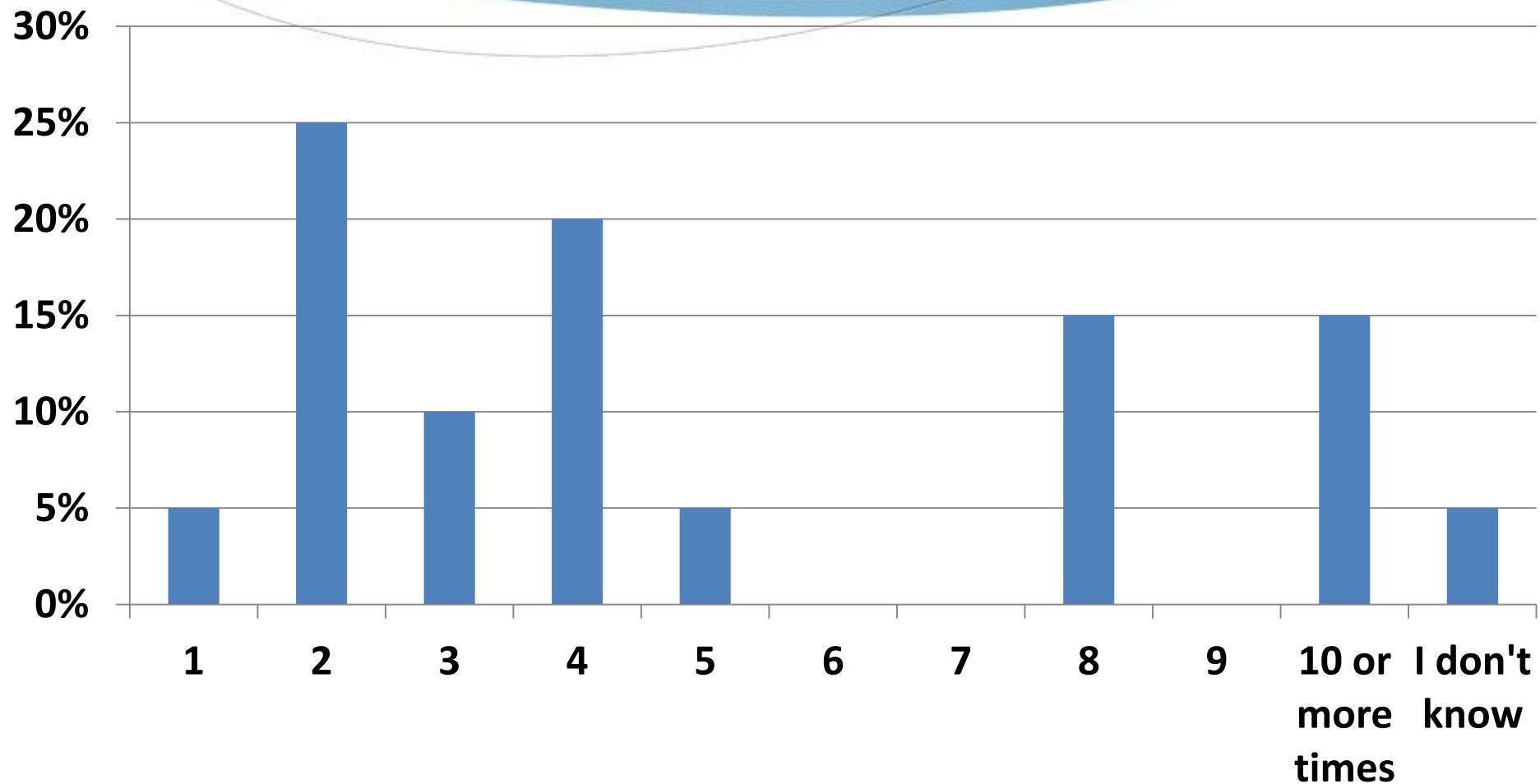
- July 29, 2013 - **256** BWAs affecting 184 communities in NL (Gov't of NL, 2013c)
- 96%** communities 1,000 or less
- 55%** of BWAs for communities 1,000 or less have been in place for 5+ years



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?- Western Municipalities (Administrators)



BWA Reasons

Western Municipalities/LSDs (Water Operators)

- ◆ 100% of respondents indicated they have had a BWA in last 4 years
- ◆ 57%- Water distribution system is undergoing maintenance or repairs
- ◆ 36%- 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
 - ◆ Issues with total coliforms
 - ◆ Water supply system integrity compromised due to disaster
 - ◆ No free chlorine residual
 - ◆ Inadequately treated water was introduced into the system due to fireflows, flushing operations, interconnections, minor power outage or other pressure loss

Discussion:

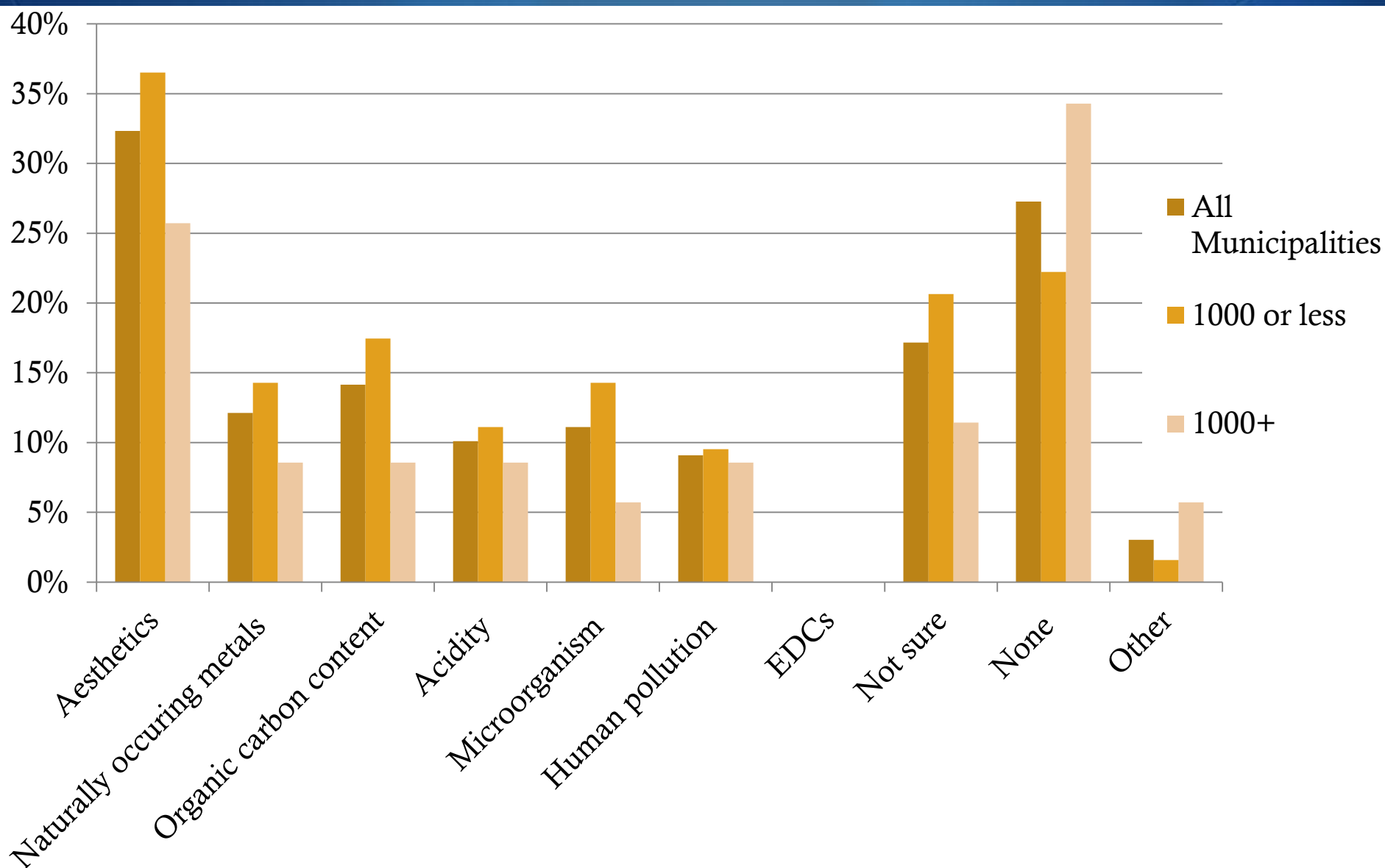
Boil Water Advisories

- ◆ 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?

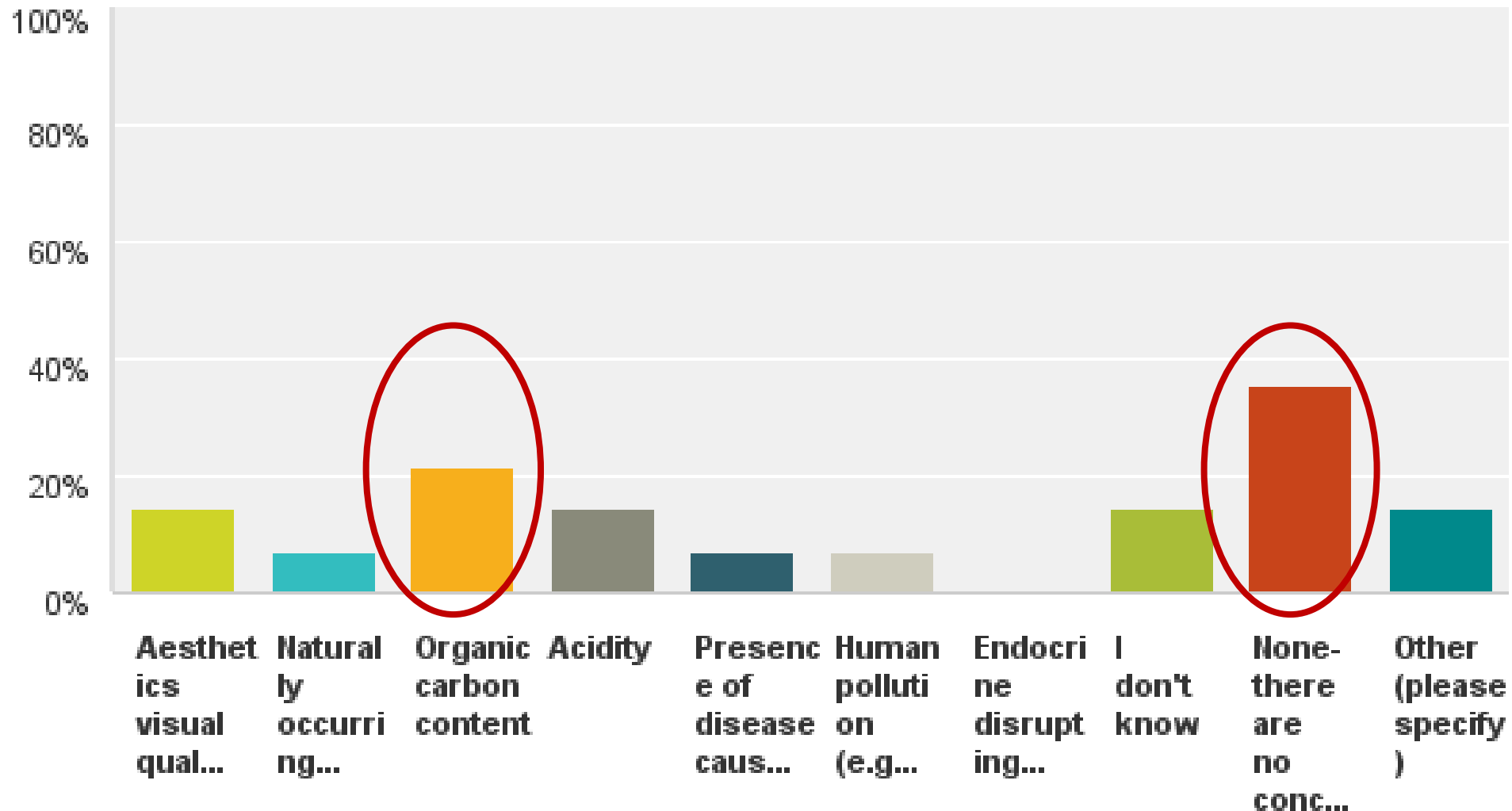
Concerns for Water System



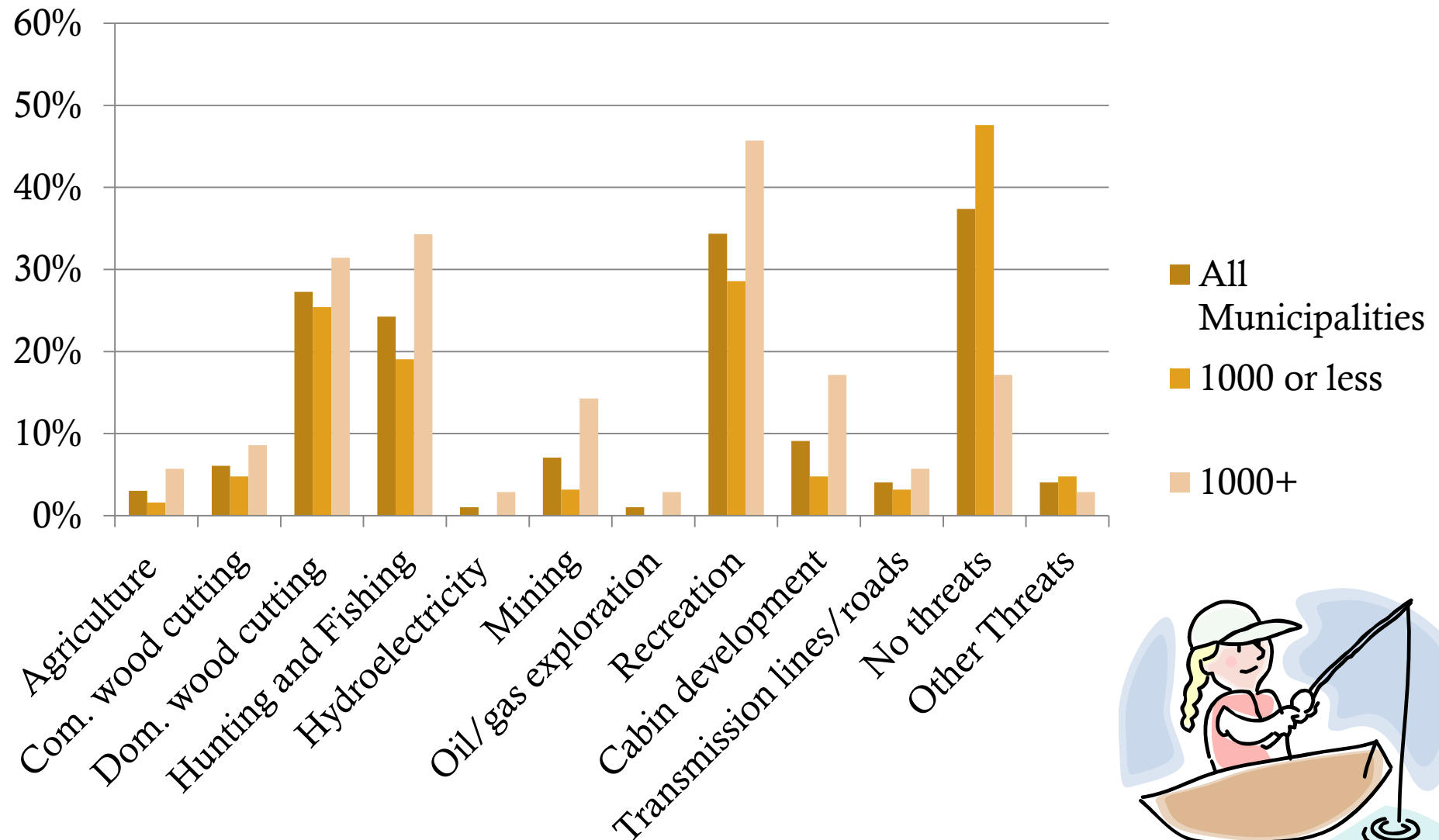
Which of the following are concerns for your municipality's water system?- All Municipalities (Administrators)



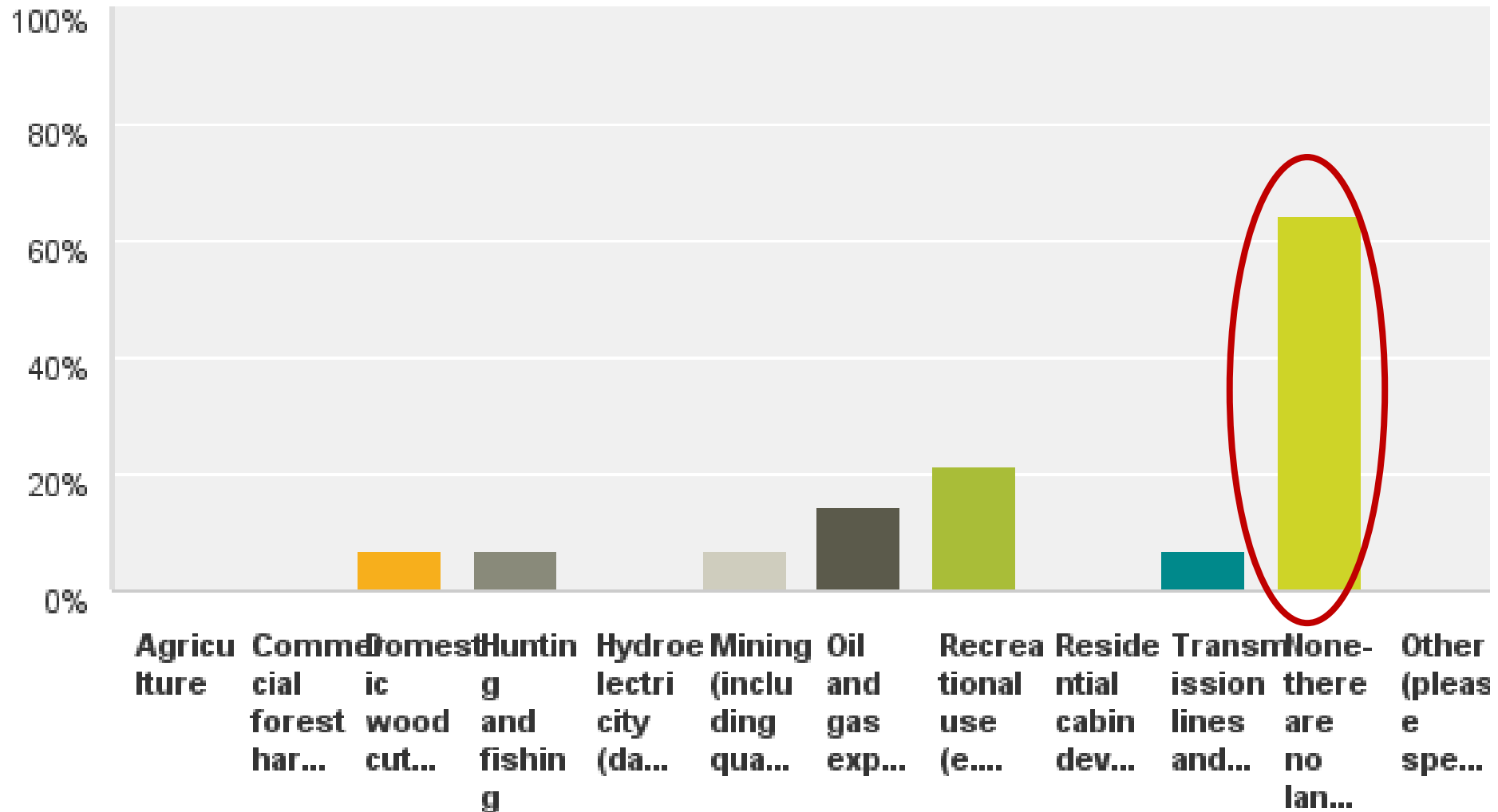
Concerns for your municipality's water system? - Western Municipalities/LSDs (Water Operators)



Land Use Activities- All Municipalities (Administrators)



Land Activities – Western Municipalities/LSDs (Water Operators)



Discussion:

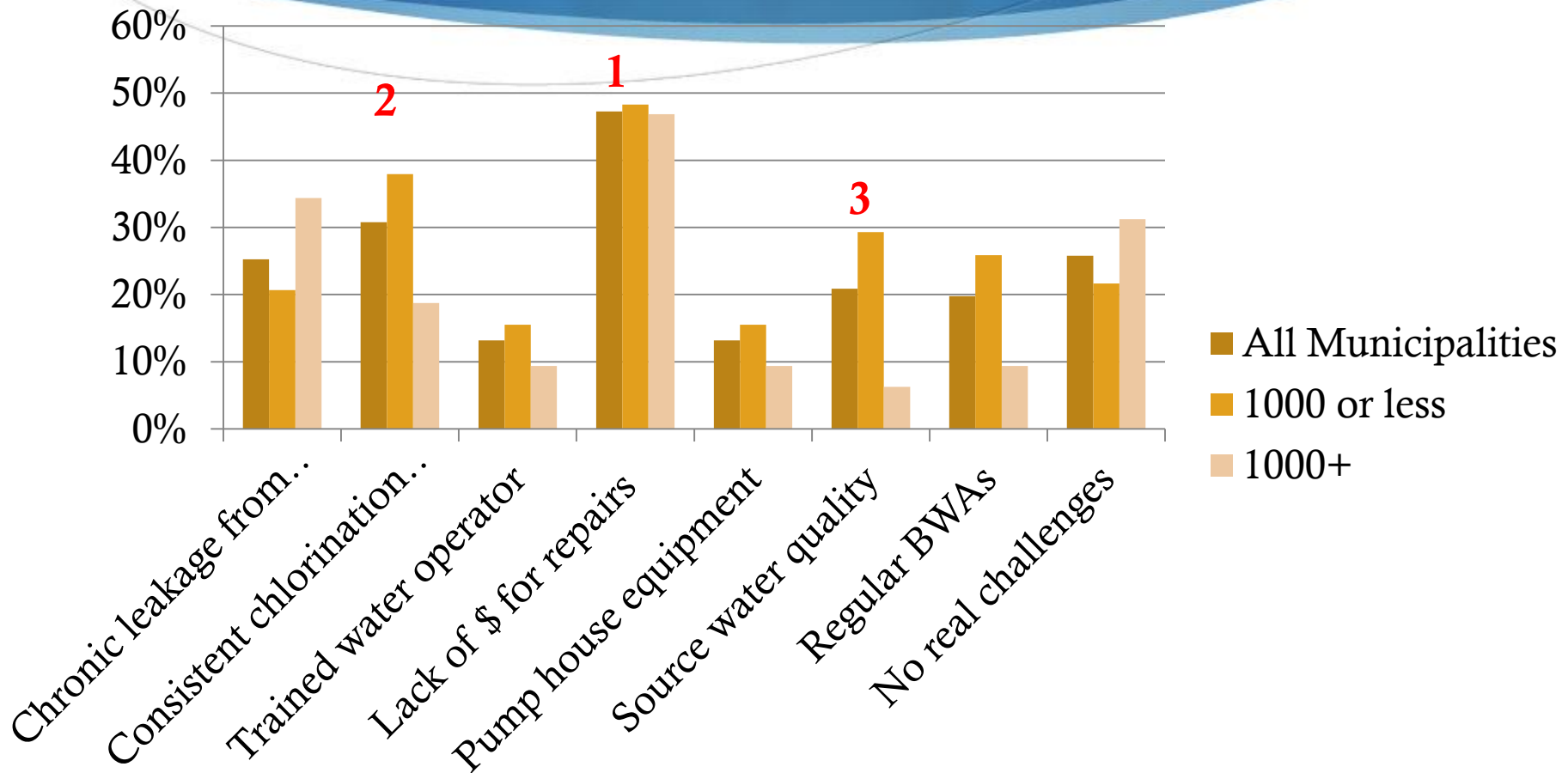
Concerns for Water System

- 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?

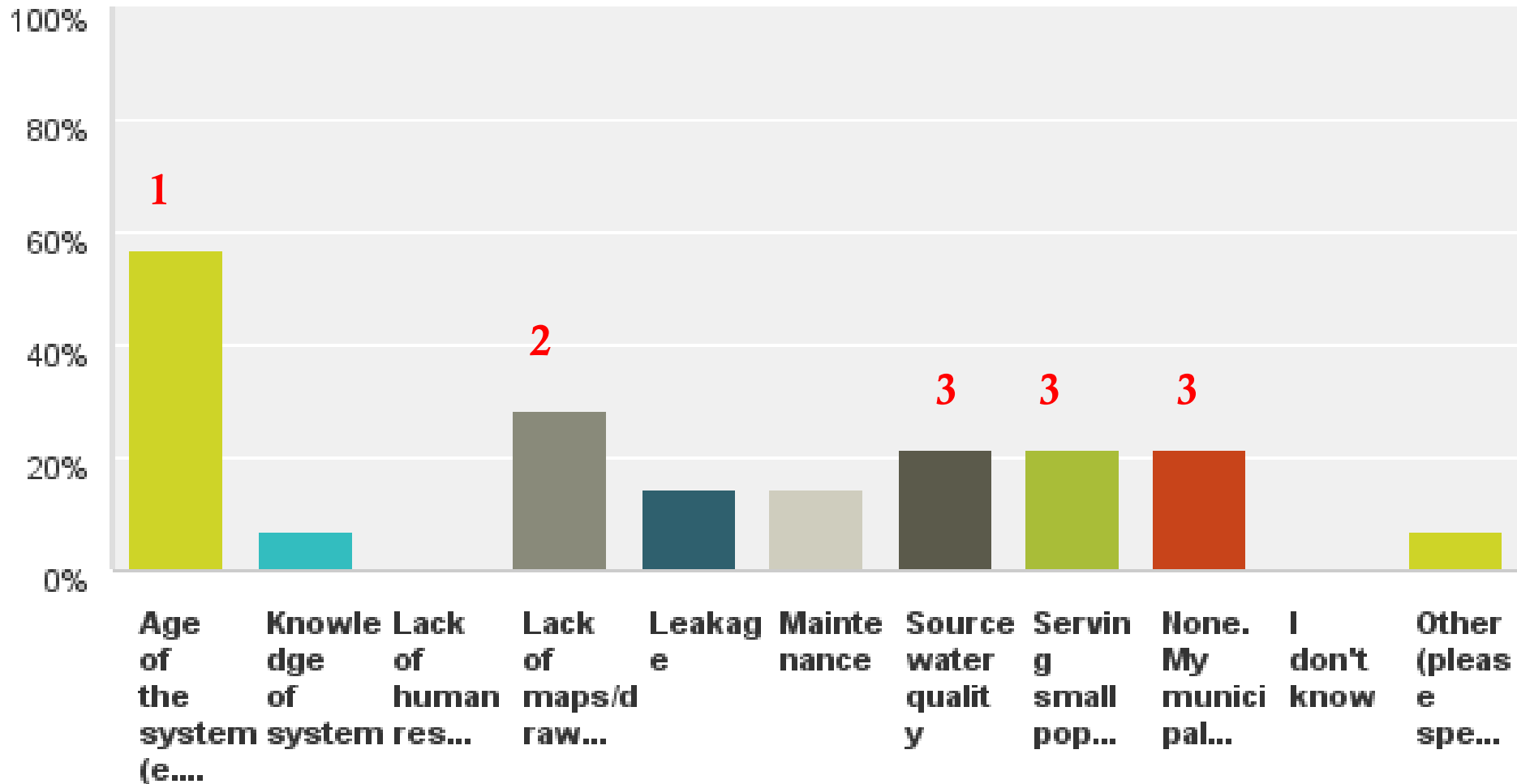
Infrastructure Issues



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



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



Infrastructure- All Municipalities (Administrators)

- ◆ Aging infrastructure
 - ◆ 19% of all municipalities completed work in the 1970's or earlier
 - ◆ 27% of all Western 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

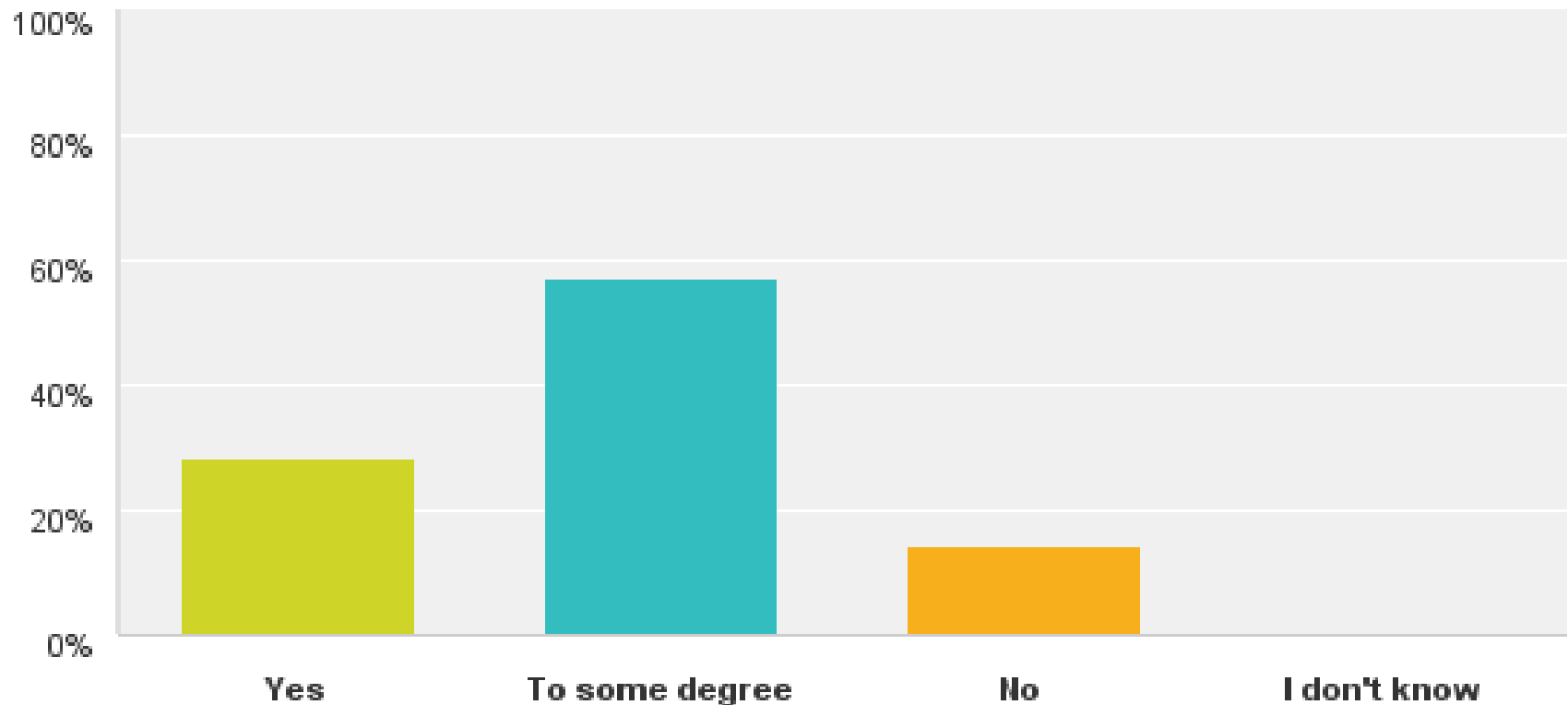


Source: Paula Dawe, P. Eng

http://www.env.gov.nl.ca/env/waterres/training/adwww/ruralreactions/11_paula_dawe_bmps_for_dbps.pdf

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- Western 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

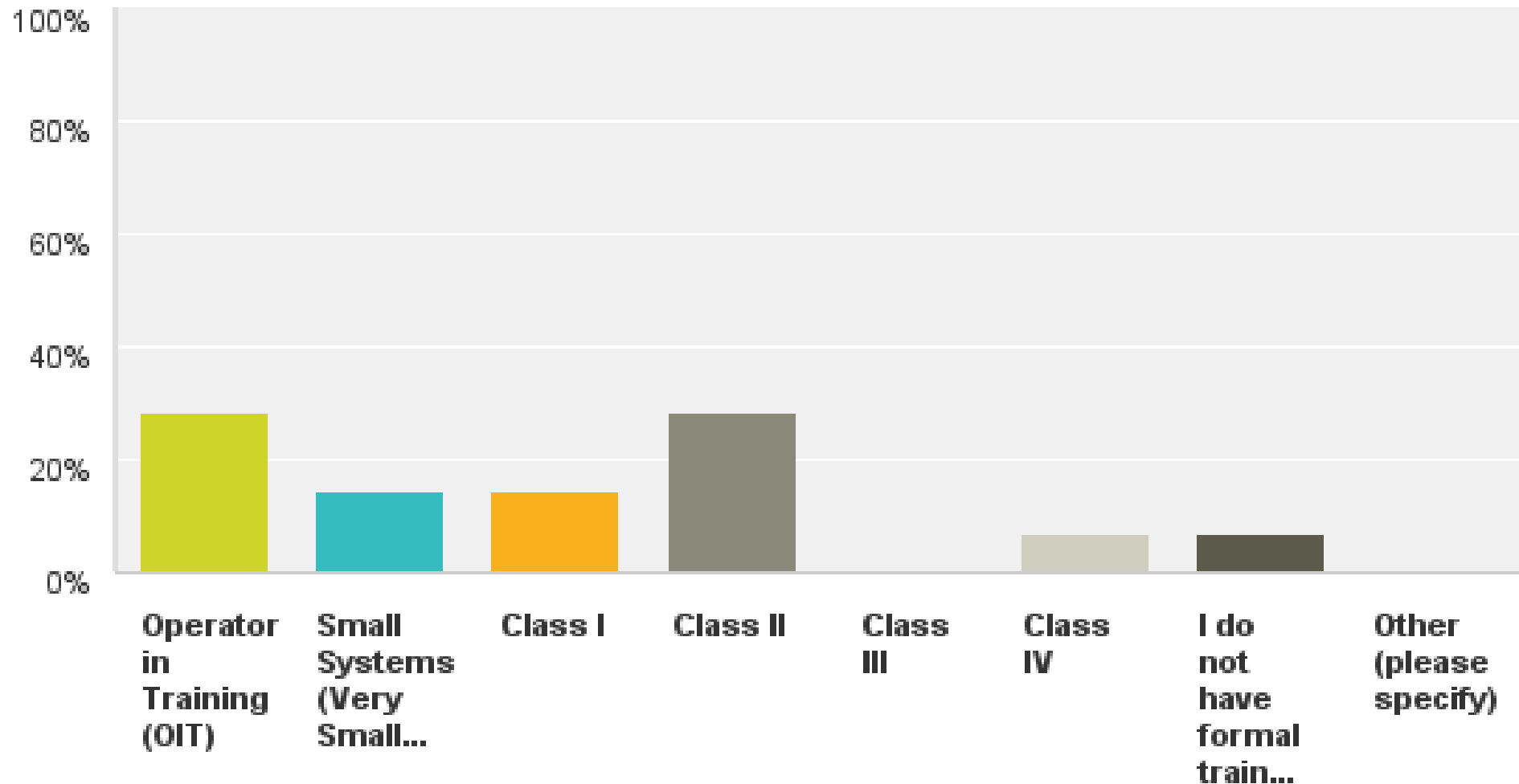


Water Operator Training – All Municipalities (Administrators)

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

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

Water Operator Training- Western Municipalities/LSDs (Water Operators)



Discussion:

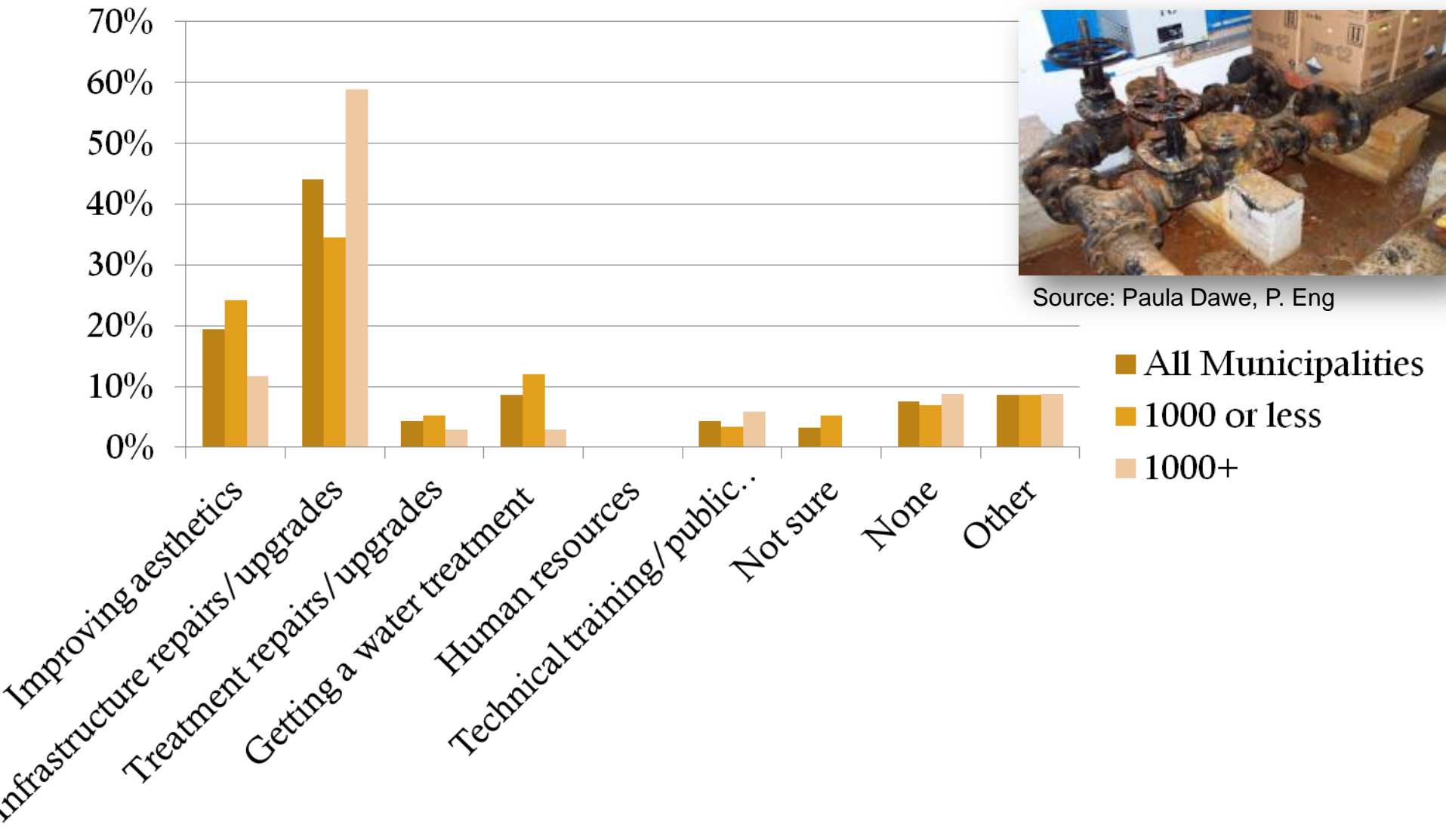
Operator Training

- ◆ 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?

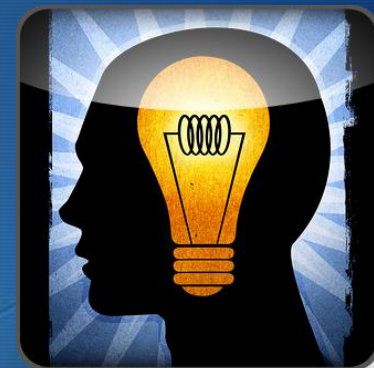
Moving Forward



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 **March 7, 2014** 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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