



Water [and Wastewater] Services A National Perspective

Canadian Water and
Wastewater Association

L'Association canadienne
des eaux potables et usées

Canadian Water and Wastewater Association

- Membership
 - Full - agencies or utilities owning or operating services
 - Subscribing - suppliers, contractors, consultants, universities
 - Associate - Federal or Provincial/Territorial regulatory agencies
 - Member Associations
- Governance
 - Board of 17 provincial and 7 member Association directors
 - Executive Committee

Canadian Water and Wastewater Association

- **Role**
 - National municipal voice on water and wastewater issues
- **Functions**
 - represent municipal interests federally and nationally
 - foster national standards
 - provide a pan-Canadian information flow
 - maintain international linkages

The Public Water and Wastewater Sector

- Services: > 24 Million Canadians
- Revenues > \$3 Billion
- Expenditures > \$4 Billion
- Plants > 5,000 Water/Wastewater
- Mains > 230,000 kms
- Depreciated Capital > \$80 Billion
- Replacement Capital > \$500 Billion
- Staff > 200,000 Employees

Governance of the Municipal water and wastewater sector

Provincial Regulatory Framework

Legislation

- Municipal Acts & Regulations
- Environmental Protection Acts & Regulations
- Fertilizer Acts & Regulations
- Water Resources Acts & Regulations
- Public Health Acts & Regulations
- Natural Resource Acts & Regulations
- Labour Codes

Federal Regulatory Framework

Health Canada

- Health Canada (and F/P Committee on Environmental and Occupational Health + DW Subcommittee)
 - Guidelines for Canadian Drinking Water Quality
 - *Food and Drug and Health Canada Acts*
 - Bottled Water Regulations
 - Common Carrier Regulations
- Potential drinking water materials safety legislation
- First Nation's and Federal Properties
- Health risk evaluation of CEPA Priority Substances

Federal Regulatory Framework (cont)

Environment Canada

- Environment Canada and CCME
 - Environmental and Recreational Water Quality Guidelines (Wastewater Effluents)
 - Air Emissions Guidelines (Digester/Bio Gases)
 - Soil Quality Guidelines (Disposal of Biosolids)
- *Canadian Environmental Protection Act -1999*
 - Environmental risk assessments of Priority Substances
 - Control instruments for the management of Toxic Substances
 - Pollution Prevention and Environmental Emergency Planning Regulations for Toxic Substances

Federal Regulatory Framework (cont)

Environment Canada (cont.)

- *Fisheries Act*
 - Deleterious Substances Regulations
- *Boundary Waters Act*
 - International Joint Commission and Joint Canada-USA Engineering Boards
- *International Rivers Protection Act*
- *Wildlife Conservation Act*
 - endangered species includes aquatic species: affects watersheds and effluent discharge areas

Federal Regulatory Framework (cont)

- NRC - Infrastructure Research / Building Codes
- CMHC - Housing, Land Use Planning, Development and Funding Guidelines and Policies
- CFIA - *Fertilizers Act* and Regulations
- F&OC - *Fisheries Act* (fish habitat protection)
- *Navigable Waters Act* (Canadian Coast Guard)
- I&NAC - First Nations Systems
- DND - Military Base Utility Systems
- Canada Post - *Canada Post Act* - mail services - delivery of water bills

General and Specific Strategic Issues facing the sector.

----- General Issues -----

- F/P downsizing & downloading of responsibilities
- Municipal regionalization and amalgamation
- Public-Private Partnerships - the “in” policy
- Full cost pricing and water demand management
- Constant changes in regulations vs longevity of infrastructure
- Public reporting and monitoring needs
- Public expectations - activities of ENGO’s
- Bottled Water and POU Device sector activities
- Watershed and aquifer protection

----- Health/Environment Issues -----

- Science & Research - outpacing technology
 - detection levels *vs* treatment levels
- Public Perception and Understanding
 - if it tastes bad, it must be bad
 - are chloramines and CDBPs toxic?
- Balancing public health risks
 - DBP's *vs* microbiological risks
- Balancing Public Health and Environmental Risks
 - DBPs *and* aquatic toxicity

----- Health/Environment Issues -----

- Climate Change - Global Warming
 - extreme weather conditions - droughts/storms/floods
 - environmental water quality - new waterborne diseases
- Environmental sustainability - what does this mean?
 - Per capita water use *vs* Total water demand
 - Should we pay for water withdrawn / receive credit for water returned?
 - Chemical and Energy uses - do they reflect sustainability?
- Full cost pricing - can it support sustainability goals
 - What is it? How do you measure it?

----- Operational Issues -----

- How to invest with certainty in infrastructure
 - will today's water quality objectives and standards last as long as the infrastructure?
 - do we have performance benchmarks for infrastructure
- Financial budgeting and planning?
 - 100 year investment planning, 300 year operational funding, and a 3 year political cycle
 - municipal governments have restrictions on their financial management practices.
- Acceptance of innovative technology
- Training standards for operators.

----- Scale Issues -----

Small scale services across the country have trouble:

- meeting water quality objectives
- funding infrastructure needs
- retaining full-time, fully trained employees

----- Benefits of Large Scale -----

Large scale suppliers can more easily absorb core capital and operating costs:

- sophisticated treatment plants exhibit economies of scale; distribution systems generally don't
- on-site laboratory and SCADA systems reduce operating costs
- greater opportunity for on-staff, professional employees

----- Smaller scale systems - What to do? -----

What are the options before them?

- infrastructure subsidy programs - a short term not long term solution
- circuit-rider management systems - shared professional employees
- purchasing water supplies from larger neighbours
- professional management contracts - many choices provincial, private sector, municipal big brother, etc
- water cooperatives - pipeline distribution from a commonly owned central plant

----- Technology Issues -----

- Microfiltration systems are expensive, but they can deal with organics
- UV Disinfection systems can handle most disinfection needs, and chloramines can be used in secondary disinfection
- Ozone generators are now more efficient, and small scale systems are coming on the market
- Dual water supply systems are becoming increasingly common
- On-site recycling and re-use of grey waters can compensate for reduced supply

Conclusions

- Issues being faced are national not just regional
- There are solutions available and examples can be found within Canada and elsewhere
- It will require some innovation in administration, technology and infrastructure.

What is a sustainable community
water and wastewater service?

Sustainability - Energy consumption

- May account for 3 to 6¢ per 1,000 L
- energy input costs vary significantly
 - regional variations in energy costs
 - peak and off-peak energy demand and use
 - need for and use of stand-by power
- energy is required to overcome topography
- energy demand influenced by treatment needs
[In wastewater, co-generation reduces costs, aerobic treatment systems use more energy]

Sustainability - Consumption of chemicals

- May account for 4 to 7¢ per 1,000 L
- Influenced by source water quality
 - removal of organic materials
 - need for disinfection (treatment/distribution)
 - need for pH adjustment/taste and odour control
 - ability to “optimize” plant operations

[For wastewater: treatment level and use of aerobic systems significantly affects chemical use]

Sustainability - Water demand vs environmental supply

- “Sustainability” relates to “not exceeding” supply
 - *c.f.:* NW Coast of BC with Palliser Triangle
- Sustainable use of an abundant resource maybe an inherent economic advantage
- Water demand management may relate more to infrastructure capacity than to supply issues
- Water reclamation and recycling programs can overcome water supply limits

Sustainability - Quality of wastewaters

- Some pollutants cannot be removed
- “Zero” discharge is not attainable
- Prevention of pollution programs needed to:
 - prevent discharges into sewer systems
 - remove some contaminants from societal products and processes
- Expanded inspection and environmental effects monitoring programs will be needed

Sustainability - Quality of wastewaters (cont.)

- Effluent discharges subject to “sustainability”
Acts - Water Resources, Fisheries, CCME guidelines
- Most biosolids are land applied as soil
conditioners - *provincial land application permits,
Fertilizers Act*
- Atmospheric emissions from treatment
processes - *air quality guidelines, co-generation from
biogases (methane).*

Conclusions - Sustainability

- Sustainability needs “definition” in the local circumstance
- Price and other mechanisms will be required to achieve sustainability goals
- Awareness and education programs of all stakeholders will be necessary
- Risk prioritization would be desirable to optimize investment programs

Contact

Canadian Water and Wastewater Association
L'Association canadienne des eaux potables et usées

2nd Fl, Unit 20 / 2^{ième} Étage, N^o 20

5330 rue Canotek Road

Ottawa, ON K1J 9C3

Tel: (613) 747-0524

Fax: (613) 747-0523

E-mail: admin@cwwa.ca

Website: www.cwwa.ca / www.acepu.ca