Enabling Residential Water Reuse

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for

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CMHC Research Goals

To assess the performance of alternate technical approaches to supply and treatment of residential water and will identify barriers to the adoption and use of alternate approaches.
Water Reuse Research

1. Advancing the Light Grey Option
3. Biological Toilets and Greywater Systems
4. CANWELL: the Canadian Water Energy Loop
7. Regulatory Barriers to Onsite Wastewater Reuse
N’Dilo - Yellowknife
Yellowknife Microsystem

- Storage
- Ultra Violet Disinfection
- Ozonation
- 2 Stage Filtration
- Biofilter
- Recirculation Zone
- Primary Treatment

- BACKWASH
- RECIRCULATION
Eagle Lake EcoNomad
“EcoNomad” utilities in a box

- Sewage Treatment Module
- Potable Water Module
- Heat Exchanger Module
- Power & Heat Generation Module
- Power Distribution and Monitoring Module

External Components:
- Effluent Disposal System
- Solar Electric Modules
- Solar Hot Water Heating Modules

Optional External Components:
- Underground Water Storage Cistern
- Wind Generator
- Micro hydro Power System

- Sewage
- Potable
- Hot Water
- Heat & Power
- Remote Panel
Rainwater Harvesting Workshop & Design Charrettes
Minto Roehampton Building
Solution

Single storage with two layers

- **Effect:**
  - Volume of Detention layer is smaller than a single Detention pond would be, because Harvesting layer is used if it not full

- **Design:**
  - Not possible with design storm concept
  - Longterm computer simulation is necessary
Reuse Guidelines in Canada

“Ironically the results of the report indicate that the most significant barrier to the implementation of onsite water reuse may be the lack of regulations and guidance across the country”

– CWWA report to CMHC, November 1997
Water Reuse Standards

Reuse Application and Quality Requirements for:
- Australia (5)
- Canada (2), U.S. (13)
- Cyprus, Spain, Italy
- Israel, Kuwait, Saudi Arabia
- Japan, Korea, China
- WHO
Water Reuse Standards

Municipal and residential water reuse application:
- toilet flushing,
- bathing, showering,
- laundry, washing,
- landscape & garden irrigation

Biological, biochemical, and physical water quality parameters
“Not a lot of technology testing protocols in use internationally”

1. NSF/ANSI Standard 40
2. EPA/NSF Environmental Technology Verification Program
3. Stand-Alone Wastewater Treatment Systems for Isolated Dwellings – BNQ Québec
4. Drinking Water Treatment Technologies Assessment Procedure – Québec Ministère de l’Environnement
Next Steps

• Water Quality/Risk Assessment
• Plumbing/Infrastructure
• Technology Verification/Certification
• Operation & Maintenance – Training/Certification
• Costing
• Partnerships – in Canada and abroad
Next Steps

Water Quality/Risk Assessment

• CHE Secretariat – residential water reuse for toilet application

Draft guideline to CHE – Fall 2006
Public Review – Fall/Winter 2006
Final recommendation to CHE – Spring 2007
Next Steps

Plumbing/Infrastructure

• CSA B128 Technical Committee on Non-potable Water Systems

• Final is published & available

• Intent – specify minimum plumbing requirements for non-potable systems regardless of water origin.
Next Steps

Technology Verification/Certification

• Current discussion with BNQ re: expansion of NQ 3680-910/2000 to include Class VI for reuse.
Next Steps

National Strategy

Reuse Framework

Collaboration – national/international

Research, Policy/Standards, O&M, Training, Education