



# 350 Towns and Cities Can't All Be Wrong! Water and Money Saved with CIPP Rehabilitation

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# Common Misconceptions

- **CIPP works only in sewers**
- **CIPP for water mains is new**
  - Don't want to be the Guiney pig
- **Can't deal with many service connections**
- **CIPP for water is expensive**
- **CIPP liners will impact water quality**



# FACTS About CIPP for Water Mains



- **350 cities can't all be wrong!**
- **Over 400 miles of water mains – it works!**
- **CIPP materials for water mains are safe**
- **Saves water**
- **Saves GHG emissions**
- **Saves Money**



# CIPP for Water Mains

- **14 years of successful rehabilitation**
- **Proven materials and process**
- **Fully structural trenchless solution**
- **Thousands of watertight services**

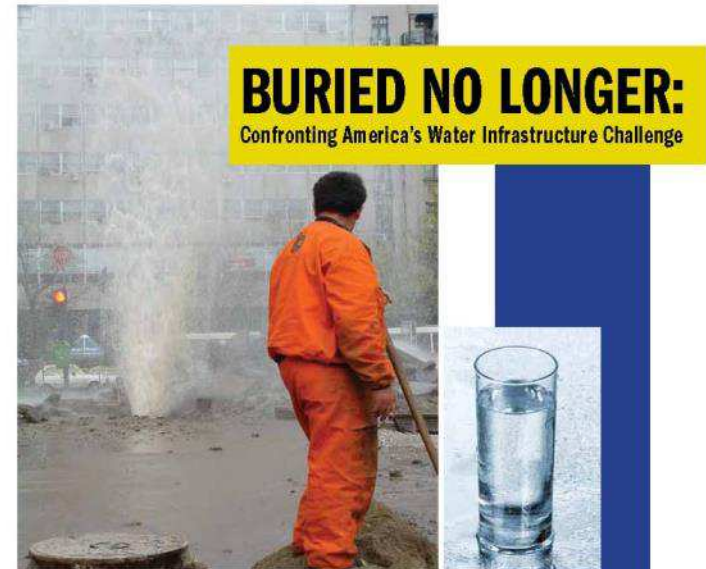


# It's Time !

- **“Buried No Longer”**
  - ✓ One million miles of pipe
  - ✓ One trillion \$

- **Findings**

*“Aging water mains are subject to failures that can threaten public health & safety” (page 13)*



# Manufactured Water

- **Manufactured:** (*man yuh fak cherd*) *v. tr.* *To make or process goods, especially in large quantities, by means of industrial machines.*
- **Raw water + human effort + mechanical effort = added value = drinking water**







# Water Loss at a Critical level

- **2010 EPA Study :**
  - Drinking water losses in systems at a critical level
- **15% of American cities lose more than 20% of manufactured water**
- **Ex.: Post Katrina New Orleans loses 50%**



# The Montreal Case

- Island surrounded by water
- 1.6 M population
- 2,675 miles of water mains
- 37 breaks / mile
- 42% of “manufactured water” is lost during distribution



# Why Did Montreal Do It?

- **Water**
  - Water savings for 2010 & 2011
  - Methodology & results
- **\$\$**
  - 5 consecutive years of water main CIPP
  - Savings of \$ 86 M (28.4 miles)
  - Water saved
  - GHG emissions saved



# How Do You Know?

- **Systematic hydrostatic pressure testing**
  - Before rehabilitation
  - After lining – before opening services
  - After reconnection





**1. Renseignements généraux / General information**

Nom du projet / Project Name : <u>MTL</u>	N° du projet / Project No. : <u>512-107</u>
Chargé de projet / Project Manager : <u>N. Éthier</u>	Opérateur / Operator : <u>Alexandre</u>

**2. Renseignements d'échantillon / Sample information**

Rue(s) / Street(s) : <u>avenue fairmount ouest</u>	Date : <u>21/9/12</u>
Longueur / Length : <u>105</u> m	Type d'essai / Type of test : <u>HYDROSTATIQUE</u>
Section / Section : <u>P88 à P89</u>	Diamètre / Diameter : _____
Norme / Standard : <input checked="" type="checkbox"/> ASTM F1216	<input type="checkbox"/> 001 MEF <input type="checkbox"/> Autres / Other : _____

**3. Renseignements sur les essais / Test information**

Nombre de jours après cuisson : \_\_\_\_\_  
Number of days after curing : \_\_\_\_\_

<u>Heure début</u> Start time	<u>Heure fin</u> End time	<u>Pression / Pressure</u>	<u>Débitmètre / Flow meter</u> Début / Start	<u>Fin / End</u>
<b>Résultats / Results :</b>		Perte permise / Loss permitted : <u>Ø</u>	Perte obtenue / Loss obtained : <u>+ de 2800</u>	

**4. Conditions particulières et observations / Particular conditions and observations**

Alex dufort  
 Nom - Chef d'équipe / Foreman - Sanexen

Renaud Gaudreau  
 Nom - Représentant / Representative - Entreprise / Enterprise

[Signature]  
 Signature - Chef d'équipe / Foreman - Sanexen

[Signature]  
 Signature - Représentant / Representative







	<b>FICHE DES ESSAIS HYDROSTATIQUES</b>	N° FICHE <b>3658</b>
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**1. Renseignements généraux / General information**

Nom du projet : MONTREAL N° du projet / Project No. : ST12-107  
 Chargé de projet : MIKE DAVISON Opérateur / Operator : MARC MAILLETTE-L  
 Project Manager :

**2. Renseignements d'échantillon / Sample information**

Rue(s) / Street(s) : FAIRMOUNT  
 Longueur / Length : 107 m Date : 05-10-2012  
 Type d'essai / Section / Section : RCV 92 à P88  
 Type of test : HYDROSTATIQUE Diamètre / Diameter : 600  
 Norme / Standard :  ASTM F1216  001 MEF  Autres / Other : FINAL

**3. Renseignements sur les essais / Test information**

Nombre de jours après cuisson : \_\_\_\_\_  
 Number of days after curing :

Heure début Start time	Heure fin End time	Pression / Pressure	Débimètre / Flow meter Début / Start	Fin / End
08:55		VILLE → 50 PSI	1520,4	
	09:55	49 PSI		(1522,8) mm <sup>3</sup>
				1521,8
<b>Résultats / Results :</b>	Perte permise / Loss permitted :	—	Perte obtenue / Loss obtained :	1,42/R

**4. Conditions particulières et observations / Particular conditions and observations**

RCV 92 BF91 PT BF90 RCV 89 P88  
  
 ENTRÉE # 6031 SORTIE

MARC MAILLETTE-L  
 Nom - Chef d'équipe / Foreman - Sanexen  
FRANCOIS GELLY  
 Nom - Représentant / Representative - Entreprise / Enterprise

Marc Maillette-L  
 Signature - Chef d'équipe / Foreman - Sanexen  
François Gelly  
 Signature - Représentant / Representative





# Water = Money

	2010	2011
Feet installed	55,760	32,800
Water saved (gal/h)	23,829	12,145
Water gained (gal/yr)	208,738,524	106,385,895
Savings from gained water	\$ 158,119	\$ 80,587







## Lining Water Mains Saves Money

Savings	
Water Main breaks (37 / 100 miles)	\$ 2,800 / mile
Manufactured water savings	\$ 14,221 / mile
Direct construction savings	\$ 3 M / mile
Tons of GHG saved (84 %)	378Tons / mile



# Cleveland, OH

- **Residential area**
- **Many services**
- **Small diameter**
- **Narrow streets**





## Cleveland, OH

- **Why they did it?**
  - Lower cost than open cut;
  - Easy access for residents
  - Low social impact





## Boston, MA

- **Comuter train crossing**
- **Traffic control**
- **Safety issues**
- **Fast turn-around**



# Boston, MA

- **Why use CIPP?**



- **Open trench nearly impossible**
- **Huge cost savings**
- **Fast construction**
- **Uninterrupted service**



# Omaha, NE

- Old Market
- Busy tourist attraction
- Cobblestones & brick pavers
- Old pipe
- Highly commercial





# Omaha, NE

## CIPP chosen because:

- Access maintained
- Traffic maintained



- Low impact on parking
- Safe environment
- \$200,000 direct savings



# New York City, NY

- **Utilities nightmare**
- **Heavy traffic 24/7**
- **Night work**
- **Small footprint**
- **5 hours window to work**



## New York City, NY

- Savings of 50% vs open cut
- Access to shops and restaurants maintained
- Traffic maintained at all times
- No need move other utilities







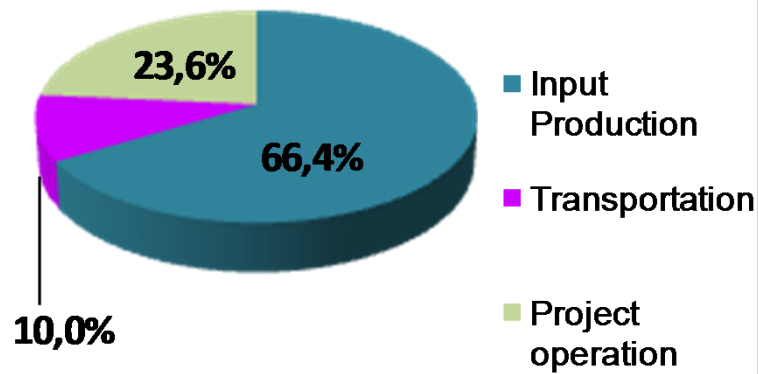
# **CIPP Reduces Green House Gas Emissions**

- **ISO 140645-2**
- **Western Climate Initiative**
- **Verified results and protocols**
- **CIPP saves GHG emissions**

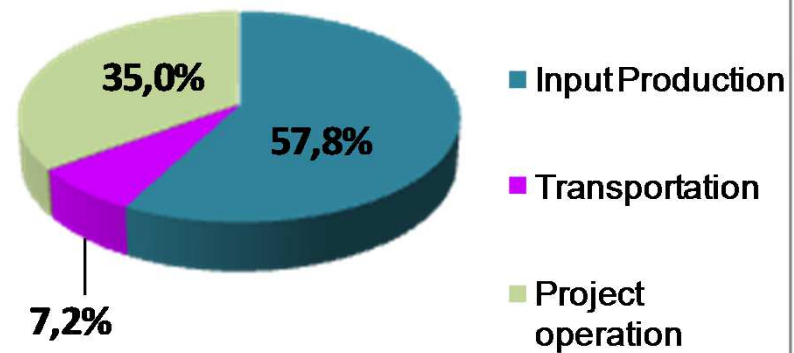


# GHG Emissions

**% CO<sub>2</sub> eq Open Cut**



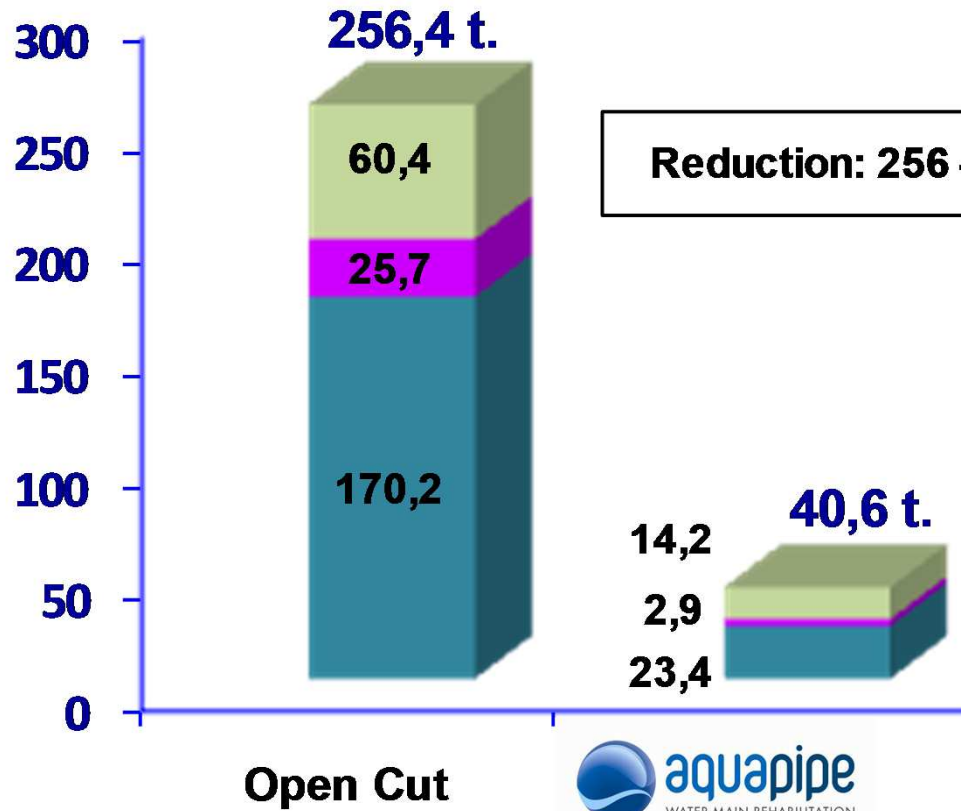
**% CO<sub>2</sub> eq**





# GHG Emissions

t CO<sub>2</sub> eq / km piping



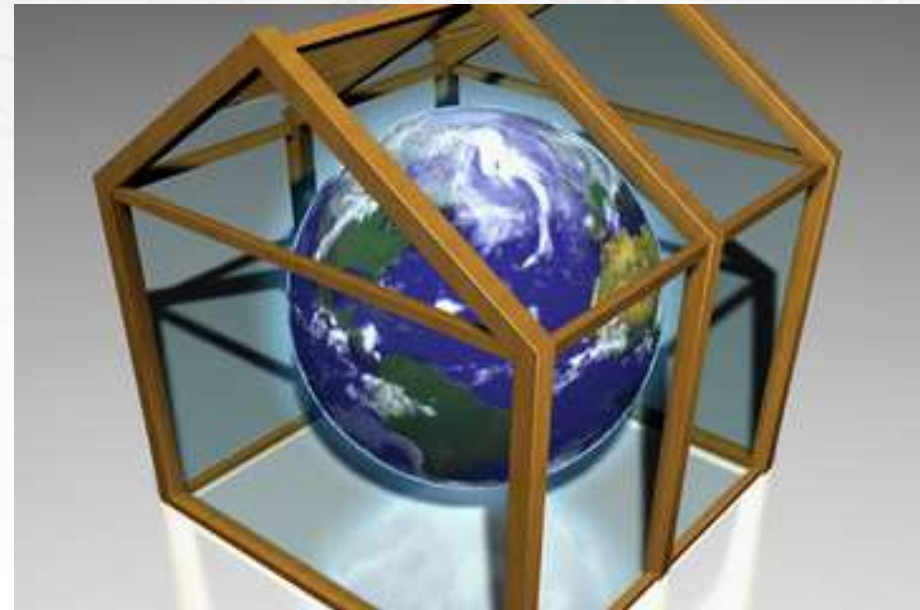
Reduction:  $256 - 41 = 215$  t CO<sub>2</sub> eq/km or 84%

or 378 Tons CO<sub>2</sub> eq/mile

- Project operation
- Transportation
- Input Production

# Sustainable Asset Management

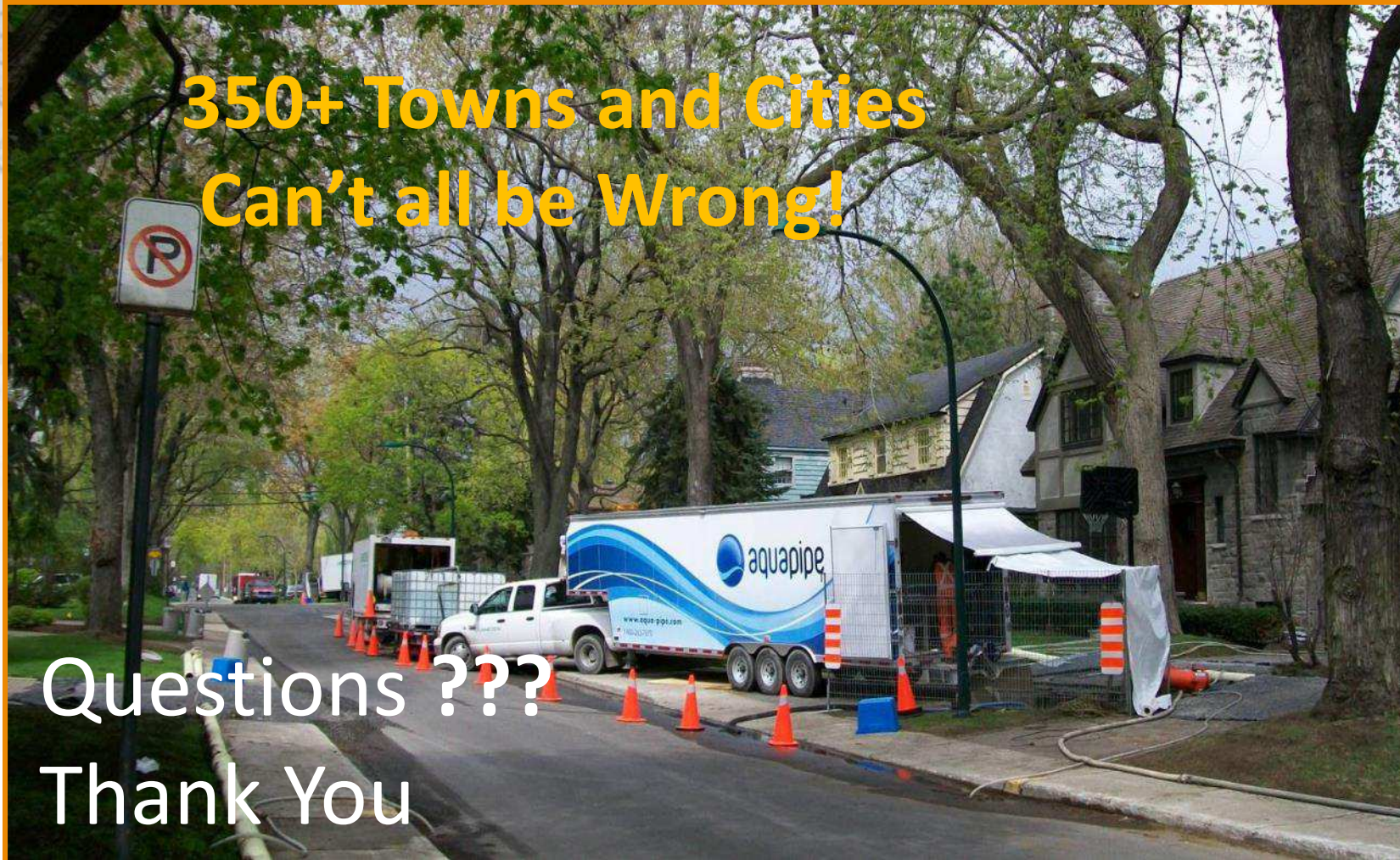
- Low carbon footprint
- 10,500 tons CO<sub>2</sub>
- 2,200 passenger vehicles
- 8,600 acres of forest





350+ Towns and Cities  
Can't all be Wrong!

Questions ???  
Thank You



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