BELL CANADA'S SOLUTIONS TO POLE STORAGE YARD CONTAMINATION

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Abstract

Bell Canada, a telecommunication company, has been conducting a soil and groundwater assessment program at its pole storage facilities since 1993. At the present time, about 30 such facilities are located in Quebec and 60 in Ontario. The pole storage facilities contain between 10 and 400 poles. They are located in work centers and in most cases the bunks are installed on backfill. In Ontario, Bell Canada uses mainly water-base preserved poles (CCA), while in Quebec, oil-base preserved poles are more generally used (PCP).

Samples were taken of groundwater, surface an subsurface soil at 14 sites in Quebec and 14 in Ontario. The chemical parameters analysed were PCP, Phenolics, Mineral Oil and Grease, Cr, Cu, As. Provincial Guidelines criterias were followed to compare results and decide on remediation options.

The results in Ontario show that: surface soil and groundwater samples are exceeding Provincial Criteria Levels on 9 sites; a volume of approximatly 60 metric tons of contaminated soil was calculated; the contaminants are mainly associated with water-based wood preservatives (As, Cr, Cu) and the levels of contamination are between 2 and 10 times greater than the clean-up criteria level. In Quebec: 10 sites show excessive surface soil and groundwater contamination; the volume of contaminated soil is approximatly 500 metric tons; contaminants are mainly associated with oil-based preservatives (PCP, Phenolics, Mineral Oil and Grease) and the levels of contamination vary greatly and can exceed 100 times the clean-up criteria levels.

Because of the volume of contaminated soil, the type of contaminants and the level of contamination, two different approaches were considered. In Ontario, a site specific risk assessment was done at all sites sampled in 1993 and 1994 and on 11 new storage facilities to evaluate the impact on the immediate environment and the potential for the migration of the contaminants beyond property lines. In Quebec, about 200 metric tons of contaminated soil were removed from 2 pole storage facilities and 2 protection systems will be tested : a multi-layer bioactive system and the capture of run-off on impermeable surface.

The sampling program will continue until all the sites are sampled. Results from the protection systems will be evaluated in 1996 for future work.

Outline of Presentation

- Background Information
- Sampling Program
- Results
- Remediation and Protection Actions
- Conclusion

Background Information

- **Services : Telecommunications**
- **Territory : - Québec**
  - Ontario
- **Number of Pole Storage Facilities at present time**
  - Québec : 30
  - Ontario : 60

Sampling Program

- **Sites sampled in 1993-94 :** → Québec : 14
  → Ontario : 14

- **Sampling method :** - Surface soil sampling
  - Subsurface soil sampling
  - Groundwater

- **Chemical Parameters Analysed :**
  PCP - Phenolics - Oil and Grease - Cr, Cu, As.

- **Provincial Guidelines :**
  → Québec : "Politique de réhabilitation des terrains contaminés"
  → Ontario : "Proposed Guideline for the Cleanup of Contaminated Sites in Ontario"

Remediation and Protection Actions

- **Ontario :**
  - → Site specific risk assessment
  - → No protection or remediation actions taken at this time
- **Québec :**
  - → In 1995 : → Remediation on 2 sites
  - → MOE approvals
  - → 2 different approaches will be tested for protection of sites :
    - : Run-off Capture on Impermeable Surface
    - : Multi Layer Bioactive System

Conclusion

- **Sampling program will continue until all sites are sampled**

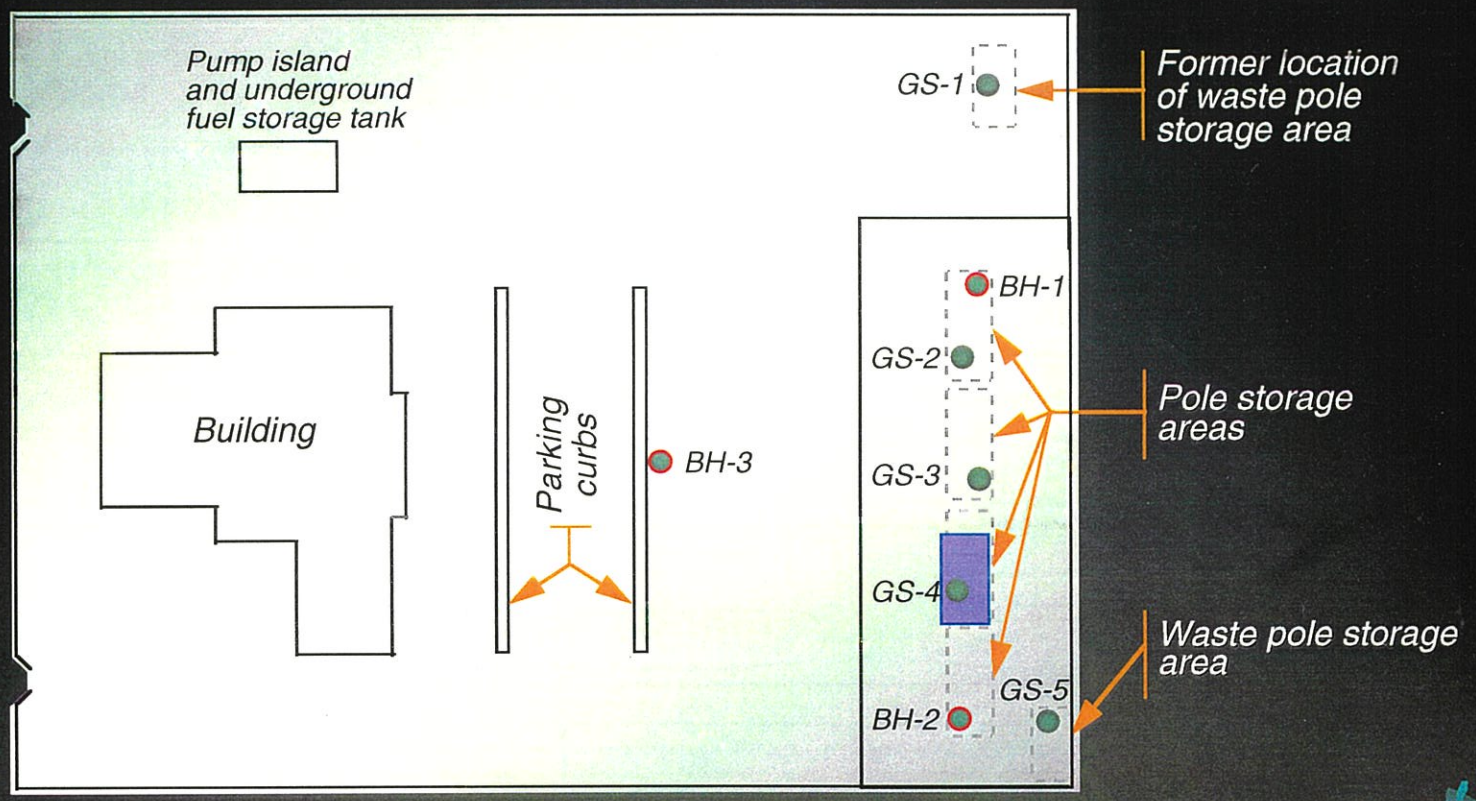
- **Remediation actions :**

  Québec : Active
  - removal of contaminated soil
  - protection of sites

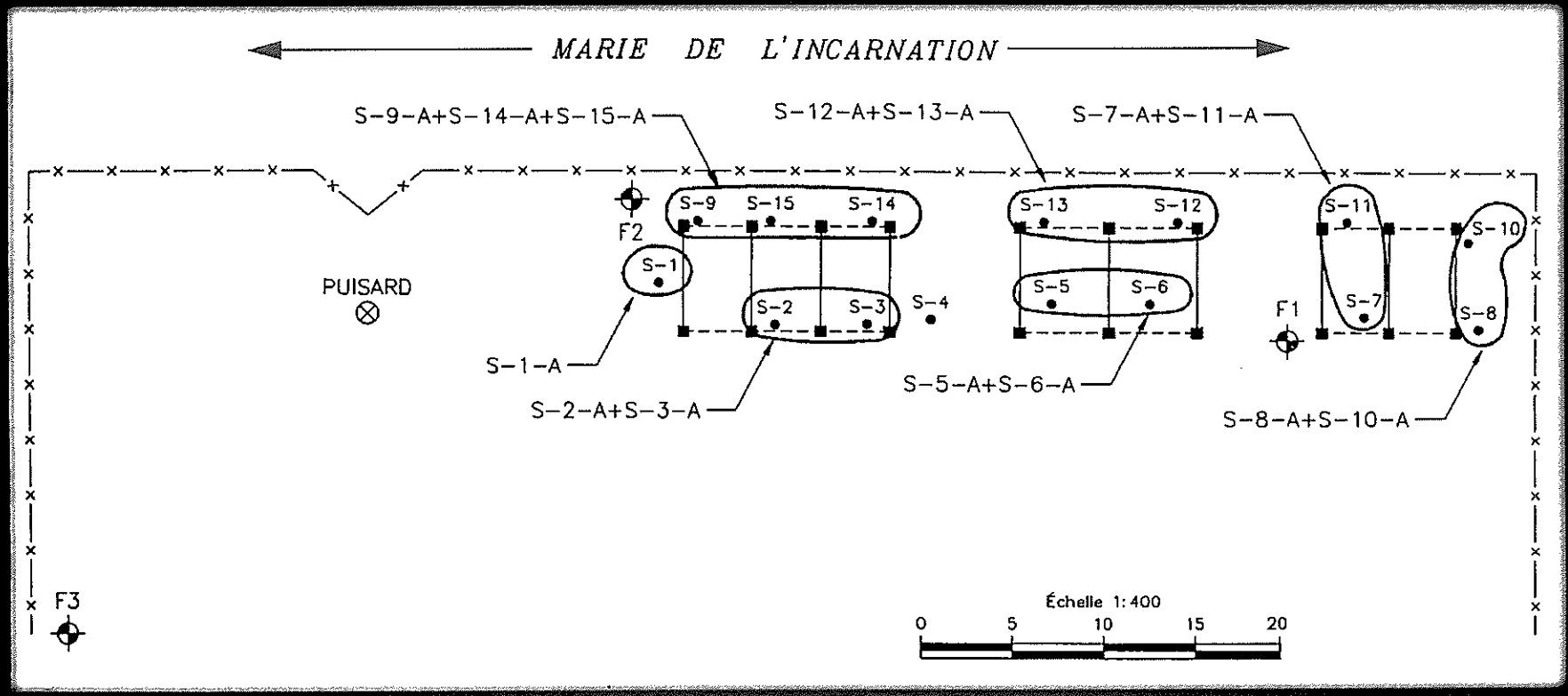
  Ontario : Passive
  - risk assessment study

- **Source of contamination :**
  - Shifting from oil based preservatives → Water-based preservatives for all Bell Canada's network operations

Sampling Method - Ontario



Sampling Method - Québec



Legend :

⊗ - Monitoring well location

Québec Results

Site	Exceeding parameters	MEFQ Clean-up Criteria	Concentration in different media	Ground Cover	Approximate Volume
1	PCP Total Phenols PCP	5,0 ppm 5,0 ppb 5,0 ppb	Soil: 9,9 - 7,3 - 10 ppm Groundwater: 13,0 ppb 5,0 ppb	Back Fill	63 m^3
2	Min.O&G Cr Total Phenols	5000 ppm 0,5 ppm 5,0 ppb	Soil: 8600 ppm Groundwater: 1,1 ppm 27 ppb	Asphalte	13 m^3
3	Min.O&G	5000 ppm	Soil:12000 - 10000 ppm	Back Fill	23 m^3
4	PCP Min.O&G As	5,0 ppm 5000 ppm 50 ppm	Soil: 24 - 98 - 23 ppm 8600 - 5600 ppm 50 ppm	Back Fill	10 m^3
5	PCP As PCP 2,3,4,6-TetraCP 2,3,4,5-TetraCP 3,4,5-TriCP	5,0 ppm 50 ppm 5,0 ppb 5,0 ppb 5,0 ppb 5,0 ppb	Soil: 32 - 260 ppm 59 ppm Groundwater: 400 ppb 19 ppb 11 ppb 10 ppb	Back Fill	10 m^3
6	PCP	5,0 ppm	Soil: 13 ppm	Back Fill	10 m^3
7	Total phenols PCP	5,0 ppb 5,0 ppb	Groundwater: 32 ppb 18 ppb	Back Fill	---
8	PCP Min. O&G	5,0 ppm 5000 ppm	Soil:24 - 12 - 2300 ppm 32000 ppm	Back Fill	125 m^3
9	PCP	5,0 ppm	Soil: 180 ppm	Back Fill	2 m^3
10	Min. O&G PCP	5000 ppm 5,0 ppb	Soil: 16000 ppm Groundwater: 95 ppb	Back Fill	3 m^3
				TOTAL	[illegible]

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Ontario Results

Site	Exceeding parameters	MOEE Clean-up Criteria	Concentration in different media	Ground Cover	Approximate Volume
1	Cr	0,05 ppm	Groundwater: 0,05 ppm	Back Fill	----
2	PCP	5,0 ppm	Soil: 7,3 ppm	Back Fill	6 m^3
3	Cr	0,07 ppm	Groundwater: 0,07 ppm	Back Fill	----
4	Cu	23 ppb	Groundwater: 30 ppb	Back Fill	----
5	As	20 ppm	Soil: 26 ppm 34 ppm	Back Fill	10 m^3
6	Cu	23 ppb	Groundwater: 120 ppb	Back Fill	----
7	Cu PCP	23 ppb 30 ppb	Groundwater: 26 ppb 103 ppb	Back Fill	----
8	As	20 ppm	Soil: 36 ppm 42 ppm	Back Fill	10 m^3
9	As	20 ppm	Soil: 40 ppm	Back Fill	5 m^3

Number of contaminated sites

Québec

	Groundwater	Soil
Min. Oil+Grease	—	5
PCP	3	6
Phenolics	2	—
As-Cr-Cu	1	1

Ontario

	Groundwater	Soil
Min. Oil+Grease	—	—
PCP	1	1
Phenolics	—	—
As-Cr-Cu	5	3

Québec

♣ **Site specific contamination levels**

♦ **Comparison study**

Soil

Site	Min. O.+G.	PCP	Phenolics	As-Cr-Cu
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Groundwater

Site	Min. O.+G.	PCP	Phenolics	As-Cr-Cu
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Legend :

- 1 - 2 X greater than clean-up criteria
- 2 - 10 X greater than clean-up criteria
- 10 - 100 X greater than clean-up criteria
- Over 100 times

Ontario

♣ Site specific contamination levels

♦ Comparison study

Soil

Site	Min. O.+G.	PCP	Phenolics	As-Cr-Cu
1				
2				
3				
4				
5				
6				
7				
8				
9				

Groundwater

Site	Min. O.+G.	PCP	Phenolics	As-Cr-Cu
1				
2				
3				
4				
5				
6				
7				
8				
9				

Legend :

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Schematic Section of a Bioactive / Filtration Multi-Layer System