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in Brownfields Rehabilitation

# *Overview of Contaminated sites in Canada*

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***Vice-president MCEBR***

*International Committee on Contaminated Land*  
*Paris, France*  
*September 29-30, 2005*





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## Categories of Contaminated Sites

- Industrial sites : owned and operated by private companies, mining, petroleum, metal transformation, manufacturing, etc.
  - Government sites : owned and operated by government departments, e.g. DND, Transports.
  - Federal sites: former sites for different use (military, mining, radar, etc.) returned to the government as a legacy of the past
  - Orphan sites: different kinds of operations returned to the government (municipal, provincial, federal) (no tax payment, bankruptcy, etc.)
  - Brownfields: all of the above, located in a municipality, infrastructures and services, contaminated or suspected to be contaminated.
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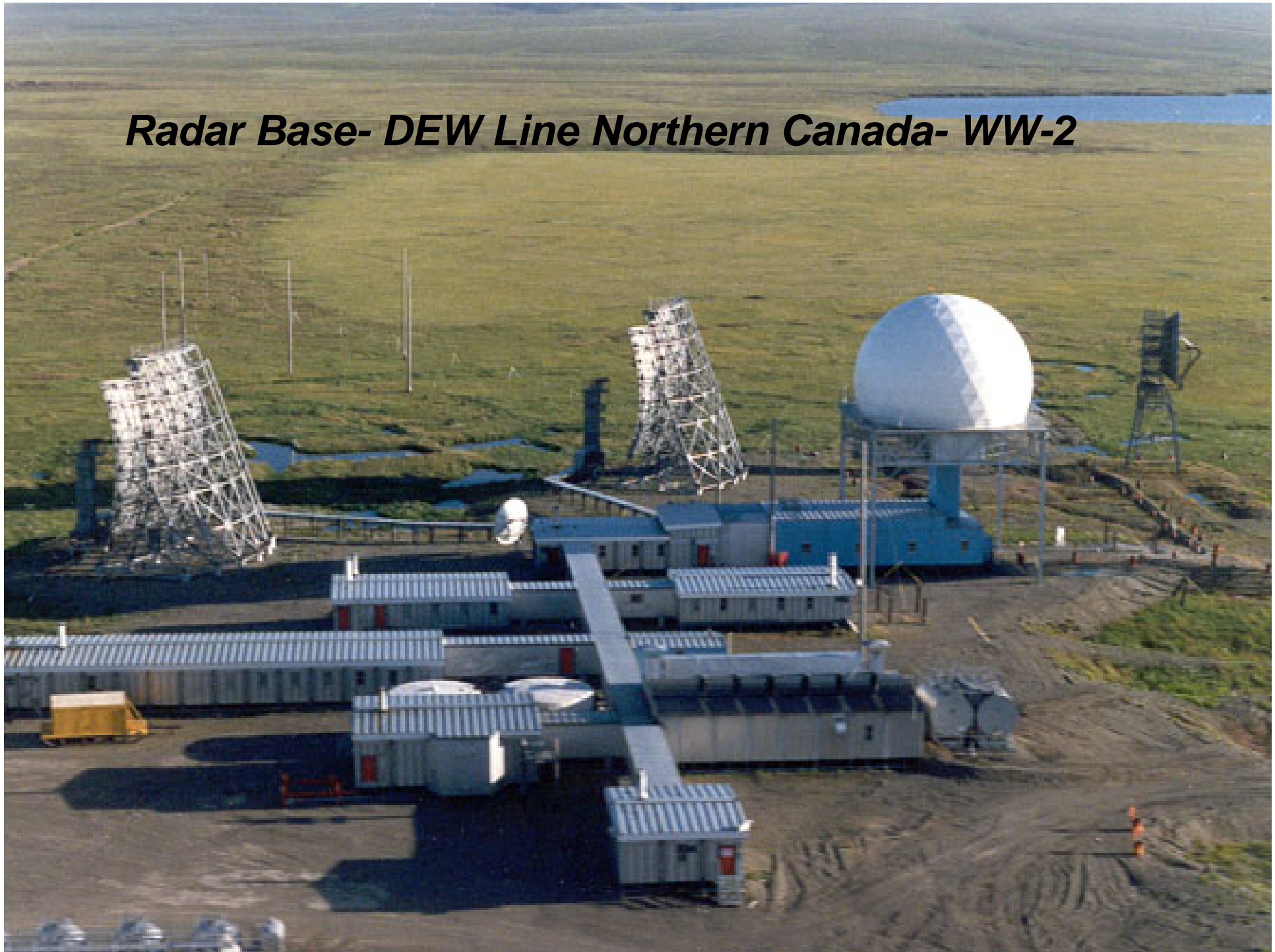
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## Abandoned Mines in the North Canada

- Very complex and costly contaminated sites
  - The federal government inherited these sites from the private sector
  - Hundreds of thousands of tons of highly toxic chemicals are found at abandoned mine sites
  - Some sites represent a serious threat to human health and the environment
  - In many cases, perpetual care will likely be required
  - estimated that long-term solutions will cost Canadian taxpayers at least \$555M
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***Radar Base- DEW Line Northern Canada- WW-2***



# Sydney- Cape Breton





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## Sydney Tar Ponds

One of Canada's largest & most contaminated sites

- Not considered a federal site
  - 25,000 people in a 4 sq km area
  - 700,000 tonnes of contaminated sediments
  - PCBs, PAHs, raw sewage, heavy metals
  - Football field 60 storeys high
  - clean up costs \$ 500 M estimated
  - public not supportive of HHRA
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# Industrial Sites





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## Brownfields in Canada

- 30,000 – 50,000 in Canadian cities
  - financial issues:
    - existing programs , Revi-sol in Quebec, municipal tax incentives in Ontario
      - major tax return to municipalities
      - no federal program but FCM supports projects
    - high economic impact : \$3,8 for each \$ spent on brownfield restoration
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## Major Issues with Contaminated Sites

- Legal
    - Liability and long term responsibility
  - Costs of remediation
  - Risk assessment acceptance by all stakeholders
    - Part of the regulatory process
    - Financial institutions not all supportive
  - Technological and sustainability issues
    - Digging and landfilling is still a large part of remediation solution
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## Complex Groundwater Contamination

- Chlorinated solvents, phenols , HC
    - major cases, 20-30 years old , no solution yet !
    - public and abandonned industrial sites
    - large plumes, several sq. kilometers
    - complex hydrogeological systems, fractured bedrock, DNAPL's and LNAPL's.
    - drinking water sources, domestic and institution impacted
    - impacts on natural environment, rivers
    - solutions: building water distribution systems, mitigation, control and treatment
    - multi-Millions \$ solutions to recover GW use
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# Soil contamination

- Heavy metals
    - mining sites
    - brownfields sites
      - historic fill materials (Pb, Zn, Cd, As)
      - bound to matrix or new mineral complex
      - bioavailability
      - standard digestion methods vs leaching
  - Hydrocarbons
    - long chain hydrocarbons
    - PAH's, PCP's
-



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## **Communication and Education**

Information to the public and to  
stakeholders (developers, bankers,  
decision makers in public  
organizations)

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# Solutions

**Financial support, technology  
development, remediation  
program**

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# The Legacy of Federal Contaminated Sites in Canada

***“2004 Budget announcement  
\$3,5 Billions over the next 10  
years to clean federal sites”***

23 March 2004

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## Financial Assistance for Site Remediation

- Revi-Sols, province of Québec, grants for remediation of brownfields
  - Tax reduction for site redevelopment
  - Sustainable Development Technology Canada, assistance for technology development
  - MCEBR, technology development & demonstration, assistance to developers
  - Federation of Canadian Municipalities
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# *Canadian Brownfields Network (CBN)*

- The Canadian Urban Institute ([www.canurb.com](http://www.canurb.com)) and aboutREMEDICATION launched the CBN in response to NRTEE recommendation for a national brownfields network
  - CBN Principles:
    - Coordinate national interests and strengthen the Canadian brownfields redevelopment industry
    - Facilitate linkages, builds capacity, and coordinate the exchange of ideas, expertise and stories
    - Annual conference on Brownfields in Canada; Brownie Awards for best projects, priority to sustainable development
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## *Strategic Alliances*

Network – members and strategic alliances  
with existing organizations



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**Seneca**





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## MCEBR –Promotion of Sustainable Solutions



- Exhibit in the hall of the MCEBR
- Presence at major conferences and technical and commercial expositions
- Exposure to end-users
- Support the promotion et la commercialization of technologies and remediation solutions
- In collaboration with Réseau Environnement