

# THE MANAGEMENT OF EXCAVATED CONTAMINATED SOIL (TREATED OR NON TREATED)

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# The Quebec Philosophy Regarding the Excavated Contaminated Soil Disposal

Two antagonistic principles are colliding \*

- The protection principle

- Soil quality must be preserved where the soil is clean and restored where it is impacted
- It means that no soil of a lower quality can be brought on a cleaner soil

- The waste value enhancement principle (valorisation)

- Instead of being needlessly wasted or transformed at high cost (destruction, extensive treatment, land filling) «waste» (including solid waste and soil) should be used for beneficial use (ex: replace clean material under roads, etc), reducing thus the impact on the environment.

# The Quebec legislation and guidelines regarding the excavated contaminated soil management

- The 1998 Soil Protection and Contaminated Site Policy
- The 2001 Regulation on the landfilling of contaminated soil
- The 2005 Solid Waste Regulation (soon to be adopted)
- The 2005 Omnibus Regulation (project)

# The 1998 Excavated Contaminated Soil Management Grid

- $< A$  : no restriction
- A-B :
  - can be used on residential (being currently rehabilitated), commercial or industrial lots if not beyond actual soil quality or ;
  - Daily and final recovering in municipal waste landfills
- B-C :
  - Optimal treatment and management according to final concentration
  - Landfill on the land of origin if this land is used for commercial or industrial activities and if it is not exceeding the actual level of contamination
- $> C$  :
  - Optimal treatment and management according to final concentration
  - If treatment impossible, land filling in a contaminated soil special landfill

# The 2001 Regulation on the Landfilling of Contaminated Soil

- In 1998, EPA introduced a new regulation regarding the landfilling of contaminated soil in the U.S.
- Beyond a certain concentration, no landfilling without treatment
- The import of U.S. soils for landfilling sky rocketed
- Public opinion and politicians were shocked
- In 2001, the regulation on the landfilling of contaminated soil was adopted to counteract the U.S. import
- A mirror regulation
- Because of the ALENA, Quebec had to impose to itself what it imposes on its commercial partners

# The 2001 Regulation on the Landfilling of Contaminated Soil

- An excavated soil contaminated above a certain concentration (D level) must be brought back to a concentration under the D level before it can be landfilled (if a treatment technology is available in the province)

## Evolution of Soil Treatment and Secure Landfilling of Contaminated Soils in Quebec (Metric Tons)

Year	Landfilled quantity <sup>(1)</sup>	Treated Quantity <sup>(2)</sup>
1996	80 038 (33,4%)	159 787 (66,6%)
1997	116,170 (45,2%)	140,838 (54,8%)
1998	119 643 (42,3%)	162,917 (57,7%)
1999	319 335 (60,8%)	205 859 (39,2%)
2000	320 304 (60,1%)	212 221 (39,9%)
2001	375 500 (59,8%)	254 816 (40,2%)
2002	118 590 (29,5%)	283 722 (70,5%)
2003	118 421 (21,1%)	441 750 (78,9%)
(1) 5 sites (2) 30 treatment centres		

# The 2005 Solid Waste Regulation

- The former Solid Waste Regulation (and Soil Policy) allowed the use of A-B and B-C soils for daily covering as well as the use of A-B soil for final recovering;
- The new Solid Waste Regulation specified that:
  - For final recovering A-B, B-C on the first layer only (30 cms)
  - For daily recovering, A-B, B-C having an hydraulic conductivity of more then  $1 \times 10^{-4}$  cm/s and less then 20% weight in particles having a diameter equal or above 0,08 mm (B-C not accepted if containing volatile organic contaminants)

# The 2005 Solid Waste Regulation

- As a result, the quantity of soil acceptable in municipal landfill will drop;
- Treatment plants operator suggested that as much as 80% of the treated soil would not pass those new criteria (Ministry has reserve on this number)
- Treatment plants operator are concerned with accumulating mountains of treated soil in their backyard without disposal option
- Pressure is building to dispose of treated soil (but still contaminated) cleaner land

# The Amount of Excavated Contaminated Soil

- In 2004:
  - Treated (432 710 tons)
  - Landfilled in special landfill (93 548 tons)
  - Total: 526 258 tons
- Treated soils
  - Biological (334 888 tons) (most of it being A-B, B-C after treatment)
  - Thermal (52 873 tons)

# The Amount of Excavated Contaminated Soil

- But there is a lot more A-B, B-C excavated soil: all projects where soil of this quality had to be excavated and could not be brought in place because buildings will be built
- Excavated soil (A-B, B-C, >C, >D) are also illegally landfilled and tendency to do so for A-B, B-C may rise if no (economical) options are put in place

# The Amount of Excavated Contaminated Soil

- Most of the biologically treated excavated soils were contaminated by hydrocarbons (TPH, PAH's). Depending of the contaminants, the cleanup levels are the B-C or A-B range

# The 2005 Omnibus Regulation (project)

To solve this potential deadlock, the following options are considered in a new regulation:

- All A-B soils and heavy metals B-C non leachable soils could be disposed off in open air quarry or mining site having the needed hydrogeological characteristics
- A-C soils and mineral waste A-D can be reused for the regeneration of mine tailings as long as those tailings are made of similar waste and that the imported material is not creating new problem (ex: leachate)
- Contaminated soil A-C could be reused as filling material under roads, sidewalks, bicycle paths, municipal parks (but no playground) ? (Inscription of contamination on land title? Run against protection principle) (but consequent with other regulation permitting the used of granulate made from recycled materials (asphalt, etc.))
- A-C soils can be used in any short term rehabilitation project if the receiving land contains soils contaminated below the imported soils
- Options offered by the New Solid Waste Regulation

## The 2005 Omnibus Regulation (project)

- Excavated A-D soil may be reused on the land of origin if it is part of a risk management plan and following a risk assessment showing that there is no risk (or an acceptable risk)
- The soil may be placed in an above ground structure (bank, anti-sound wall, etc) if there is:
  - an encapsulation of the contaminated soil and a follow up plan of the site;
  - the soil contamination and management measures are registered on the land title;
  - the structure stays the property of an accountable entity



What is Happening  
Elsewhere?