

# Fertilizing Residuals and the new “Permit-by-notification” system – Quebec, Canada

October 2017

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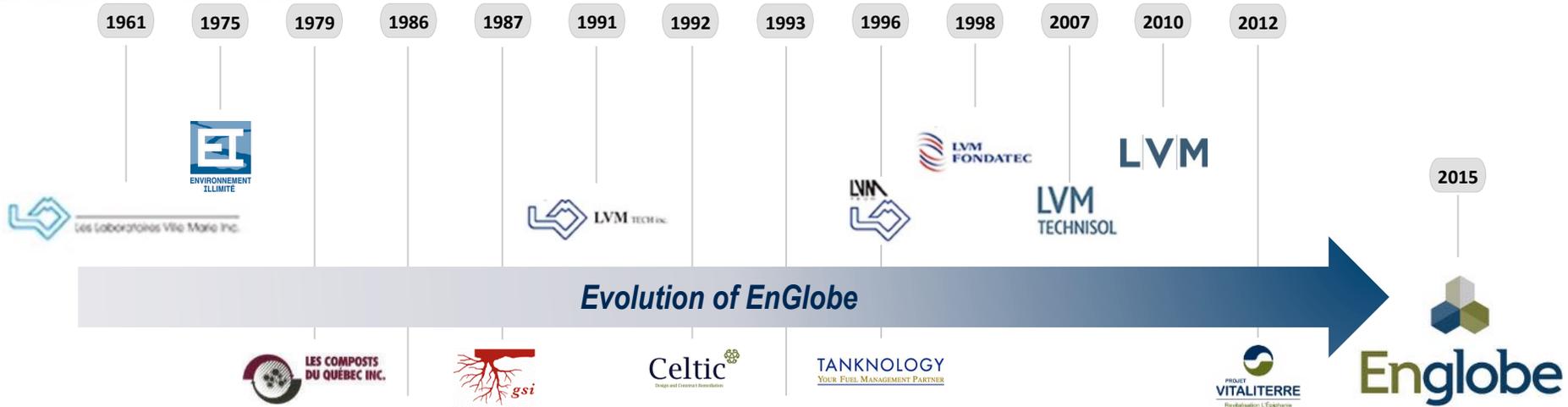


# Agenda

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- ◆ Englobe: Who we are
- ◆ Soil & Biomass Treatment Centers Division
- ◆ A Case for Biosolids Recycling
- ◆ Fertilizing Residuals Materials Management Options & Context
  - ◆ *Land Application Option*
  - ◆ *Farm slurry Lagoon Option*
  - ◆ *Degraded Sites Option*
  - ◆ *Composting Facility Option*
- ◆ Conclusion

# History : who we are



(1961) Year founded



# Locations : where we are

## Canada



- + 60 Business Offices worldwide
- 30 Materials Testing Labs across Canada
- + 25 Soil and organic Treatment Facilities worldwide

## France

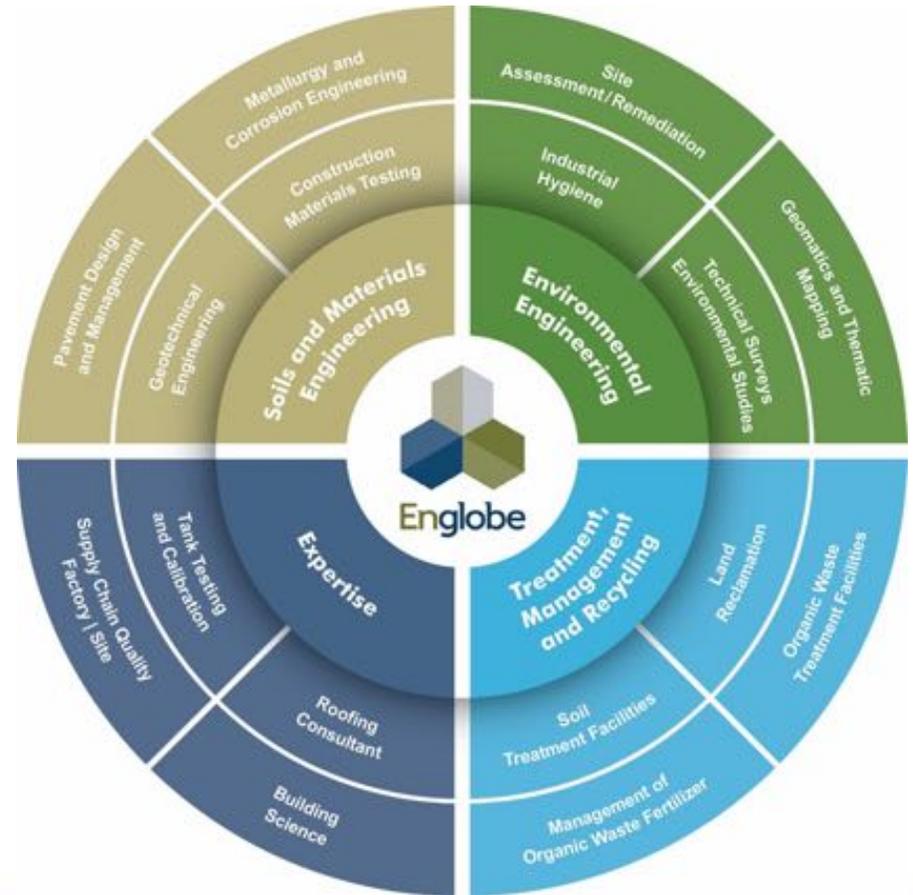


## United Kingdom



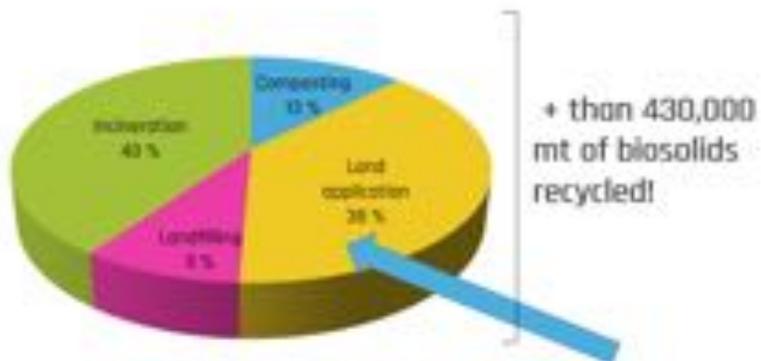
# Services : what we do

- ◆ Treatment, Management and Recycling
- ◆ More than 35 years of experience
- ◆ 325 000 metric tons of organic waste reused per year
- ◆ 100 000 mt received at our composting sites

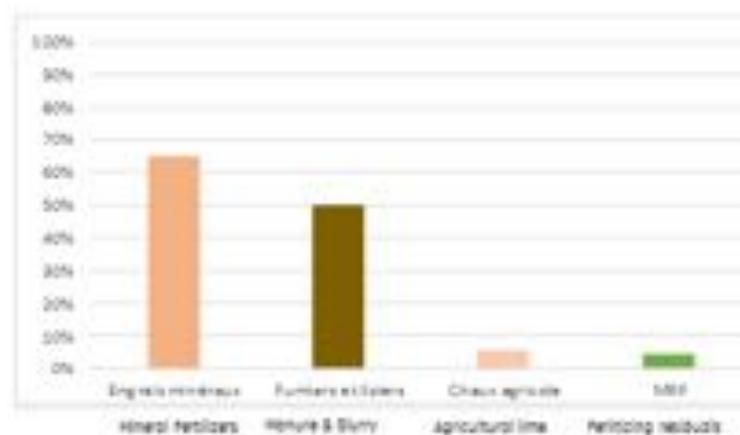


# A Case for Biosolids Recycling

Municipal biosolid end-uses in 2015



Agricultural Areas Receiving Fertilizers (2015)



Ministère de l'Énergie et des Ressources  
 Québec  17



Ministère de l'Énergie et des Ressources  
 Québec 

# A Case for Biosolids Recycling

- ◆ Easy : Great products and clients in need of fertilizers and of savings !

**Englobe** englobe.com

**PRODUCT DATA SHEET**

**MUNICIPAL BIOSOLIDS – ANAEROBIC DIGESTATE**

**ORGANIC AMENDMENT AND FERTILIZER**

**BENEFITS**

- Slow release fertilizer, rich in nitrogen and phosphorus
- Provides organic matter
- Excellent source of trace elements
- Improves the structure and productivity of the soil
- Reduces costs associated to purchasing chemical fertilizers

**FERTILIZING VALUES**

Parameters	TGA value (average)	Application rate	
		g/ha/season	kg/ha
Total Nitrogen % N <sub>T</sub>	5.5	3.2	3.2
Ammonia Nitrogen % N <sub>H</sub>	3.7	3.5	3.5
Phosphorus % P <sub>2</sub> O <sub>5</sub> (total)	10.8	5.4	5.2
Phosphorus % P <sub>2</sub> O <sub>5</sub> (available)	5.5	3.5	3.4
Calcium % Ca	2.5		
Total Solids % TS	31		
Organic Matter % OM	48		
pH	8		
EC	1.4		

**SPECIFICATIONS**

- Biosolids produced by centrifugation of anaerobically digested sludge from a municipal waste water treatment plant
- Periodic quality control
- Pre-harvest interval following landfarming ranging from 30 days to 36 months

**APPLICATION RATE**

- Application rate of 5 to 10 m<sup>3</sup>/ha (2 to 4 m<sup>3</sup>/acre)
- Requires use of a precision spreader (see application video)
- Must respect application rate specified in the FAIRPLAY plan

Please contact our technical advisors for additional information:

<small>Agribusiness</small> 491-444-7507	<small>Quebec City</small> 418-871-0227 ext. 10 10 00	<small>Central Quebec</small> 819-860-7393
<small>EST 2010</small> <small>1000</small> <small>1000</small>	<small>1000</small> <small>1000</small> <small>1000</small>	<small>1000</small> <small>1000</small> <small>1000</small>
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Revised 07-2017



# Recycled Residuals Management Options

- ◆ A) Land application
- ◆ B) Storage on farms: slurry pits/lagoons
- ◆ C) Site remediation
- ◆ D) Composting

# Option A: Recycling on agricultural lands

- ◆ Permit by notification
  - ◆ Greatly reduced the paperwork and delays for land app
  - ◆ The formal notification is not analyzed by the MOE- checks for it to be complete
  - ◆ Responsibility relies on the Agronomist
  - ◆ Role of the agronomist and certified technician enforced
- ◆ Simplified management for certified products
  - ◆ BNQ certified products



## Option A: Role of the Order of Agronomists of Qc

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- ◆ All formal notifications and C of A requests must be signed by an agronomist.
- ◆ All fertilization recommendations must be written by an agronomist.
- ◆ A certified technician in agronomy must conduct the site inspection/visits; however he/she must be immediately supervised by an agronomist.
- ◆ The technician may pursue sales functions for the application of biosolids and collect client info so long as they do not recommend dosing or conduct diagnostics.

## Option A: Current Legislative Guidelines

- ◆ Simplifies the process : reduces risk related to permitting - timing
- ◆ Speeds up the approval process : 10 days
- ◆ Cost savings for generators : competitive market
- ◆ Land app works great in nice weather ...
- ◆ Importance of plan B - C - D

## Option A: Limits/Constraints with land application

- ◆ Each year, FRM land applications are conducted between April 1st – October 1st.
- ◆ Regardless of the date, land application must be conducted under :
  - ◆ Dry conditions;
  - ◆ On unfrozen soil;
  - ◆ Without snow accumulation;
  - ◆ With a N-NH<sub>4</sub> ratio / N < 30 % (after 1st of Oct).

# Option A: Limits/Constraints with land application

The FRM land application distance limits are established as a function of :

- ◆ the P category (Pathogen: P1 or P2);
- ◆ the O category (Odors : O1, O2, O3, and ☹ ) of the applied materials:
  - ◆ O1 : little or no odors : wood ash, compost, paper mill and deinking sludge C/N >70 (typically less than cow manure);
  - ◆ O2 : odorous : septic sludge, lime stabilized biosolids, most conditioned biosolids
  - ◆ O3 : biosolids from aerobic process, Kraft paper mill biosolids or C/N < 50, limed slaughterhouse sludge, etc. (> cow manure, < pig manure);
  - ◆ Beyond (> O3) : the nasty stuff ! Anaerobically digested biosolids - HS centrifuge, Kraft paper mill biosolids C/N < 50 , primary slaughterhouse sludge (> pig manure).

# Option A: Limits/Constraints with land application

- ◆ Odor classification of the materials
  - ◆ Specific for each process and material
  - ◆ Information in the Guide + resource at MOE
- ◆ Smell test panel – olfactometry
  - ◆ Can reduce the category
  - ◆ Requires time and planning
  - ◆ Brings savings
  - ◆ Category change by the MOE

# Option A: Land application distances

Environment	Location	Basic requirements	Additional requirements (P2 or O2/O3)
Ground water	Groundwater catchment work intended to supply drinking water for human consumption - category 3 (individual wells)	30 m (100 m if the FR is contaminated with human fecal matter, except for products certified by the BNQ.	
	Other groundwater catchment work intended to supply drinking water for human consumption	varies	
	Peat bog and organic soil (> 30% organic matter d.w.)		P2 : Prohibited
Surface water	Agricultural ditch	1m	
	Ditch in a non-agricultural environment	1m	P2: 10m
	Watercourse, lake, swamp, pond or natural marsh	3m	
Air (bio aerosols)	Property line		P2: 10m
	Road		
	Dwelling or protected immovable		P2: 100m
Air (odors)	Dwelling or protected immovable		O2 : 75m (O3 : 500m), except where it is incorporated into the soil immediately
Air (dust)	Dwelling or protected immovable	Visible dust must not be carried further than 2m within a neighboring property.	

## Option A: Limits/Constraints with storage

Other constraints (not related to distance) must also be considered:

- ◆ Prohibited to store FRMs on soils, if dryness ratio < 15 %;
- ◆ Stored quantities must be lower than (250 m<sup>3</sup> or 500 m<sup>3</sup>) depending on the FRMs between November 23 -30 of each year;
- ◆ Winter storage of FRMs having a dryness ratio inferior to 30 % (all municipal biosolids) must be:
  - ◆ Encapsulated with 30 cm (1 ft) of compost or deinking residues;
  - ◆ Winter cover tarps.

# Option A: Limits/Constraints with storage

Environment	Location	Basic requirements	Additional requirements	
			P2	O2/O3
Ground water	Individual wells and other groundwater catchment works intended for human consumption	100m		
	Rock outcrop	100m		
	Field stockpiled manure	100m		
Surface water	Agricultural or non-agricultural ditch	15m		
	Drainage furrow (dead furrow or plough furrow or grassed waterway)	1m	5m (3m for FR with dryness ≥ 20 %)	
	Watercourse, lake, swamp, pond or natural marsh	50m		
	Flood plains (0-20 years)	Prohibited from November 23 to May 31		
Air (bio aerosols)	Dwelling or protected immovable		100 m	
Air (odors)	Dwelling or protected immovable			O2 : 75m O3 : 500m
Air (dust)	Dwelling or protected immovable	Dust must not be carried further than 2m within a neighboring property		

# Option B: Farm Slurry Lagoons

- ◆ Lagoon/tank type: liquid or solid
- ◆ Regulatory aspects of management in farm lagoons
- ◆ Odor issue and MRF mixing
- ◆ Acceptability – Odor !

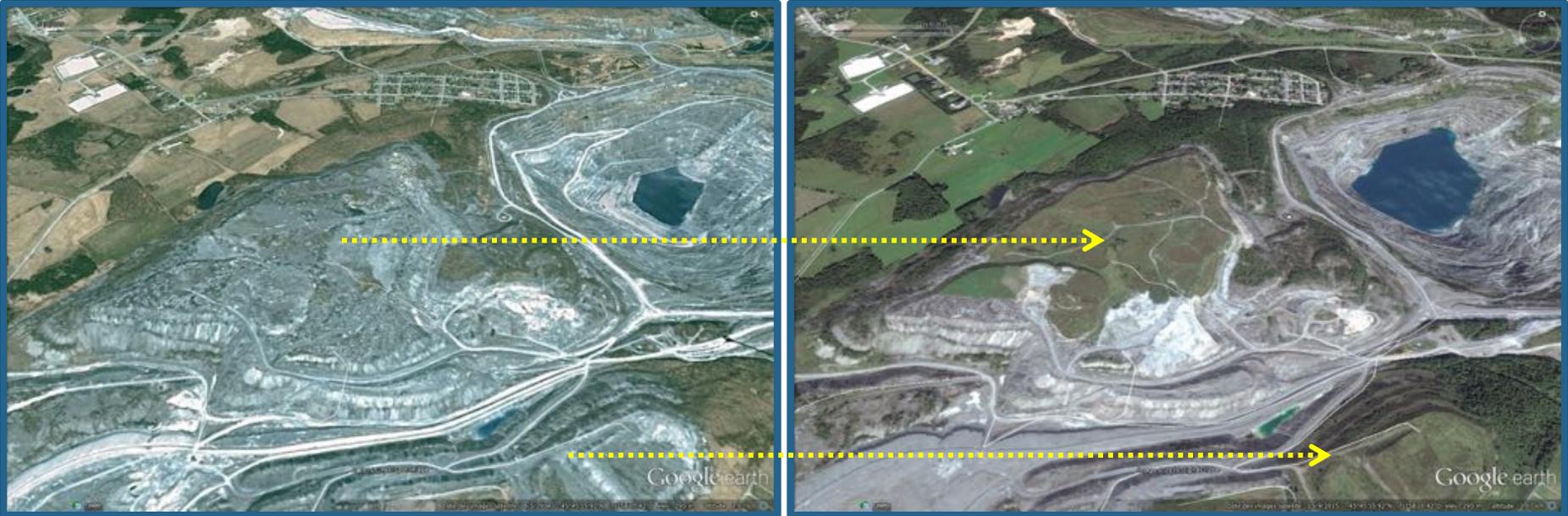


## Option C: Degraded Sites

- ◆ A revegetation project : create a complete and sustainable growing media
- ◆ Agronomy : similar to land application
- ◆ Regulatory aspects: certificate of authorization + delays
- ◆ Social acceptability issues



# Option C: Jeffrey Mine (Asbestos Qc.)



## Option C: Jeffrey Mine (Asbestos Qc.)



# Option D: Composting Facilities

- ◆ Diversion program by 2020 L&Y + Food waste
- ◆ Contingency option for land applicable materials
- ◆ Compost products
  - ◆ Horticultural market : BNQ
  - ◆ Agricultural market : land application regulation
  - ◆ Soil health : benefits !!



## U.S. – Canada Synergy

- ◆ US material can be recycled / land-applied, but in respect of Quebec's regulation
- ◆ French !!!
- ◆ Manage social acceptability
- ◆ Same diversion challenge for organics in Quebec and Northeastern US



# Conclusion

- ◆ Let's continue to build the value of the product.
- ◆ Let's demonstrate management success.
- ◆ Let's convince that the organic recycling challenge comes with benefits for the environment.



