

Impacted Soil as a Resource A Different Way of Thinking

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Definitions

Waste – "any solid or liquid material or product or combination of them that is intended to be treated or disposed of or that is intended to be stored and then treated or disposed of, but does not include recyclables."

Recyclable - "a substance or mixture of substances that is intended to be recycled."



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How this commonly applies to soil

Soil with low levels of contamination – treated as waste, hauled to landfill at great expense.

Then we have to go get new clean soil to use as backfill.



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Soil is a resource

It is valuable, we need it:

- some places even import soil

Low level impacts – may still be suitable for many uses





Missed Opportunity

By treating soil as a waste we are spending lots of money that may not need to be spent.



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Missed Opportunity

Soil that exceeds agricultural or residential guidelines might be just fine for a less sensitive.

Soil that exceeds Tier 1 or even Tier 2 might meet a guideline for a different location (*e.g.* isolated from DUA, not near surface water).



Other considerations

Greenhouse gas, pollutant emissions from all the trucking

Landfill space

Environmental implications of getting clean soil from a pristine location



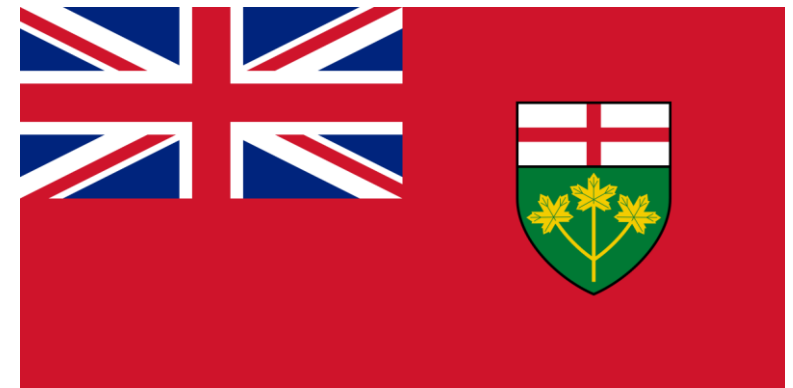


Other Jurisdictions

Some provinces have specific policy around re-use of impacted soil
(may not be perfect but at least something)

BC – Contaminated Soil Relocation Agreement

Ontario – Excess Soil Management Regulation





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Alberta

Prohibits deposit of waste at any place other than an authorized waste management facility

AER – contaminated soil is oilfield waste

Despite current regulatory situation, growing interest in re-use

Has been successfully done



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"Too Good to Waste"

Alberta Environment published "Too Good to Waste" in 2016

Framework for waste reduction in Alberta

Disposal (landfilling) is the least preferred option under this framework

Includes specific mention of potential beneficial use of impacted soil

Action: "Protect land quality by evaluating management practices for excavated soil, contaminated soil and the land application of residual materials to ensure that land is not degraded and that soil and residual materials are used to their best advantage"





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Beneficial use of soil

Low sensitivity locations

- Roads & overpasses

Re-grading

Fill at depth



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Use of Soil at Depth

Soil may exceed guidelines for surface soil

May meet subsoil guidelines

Why not use at depth?



Facilities

Scenario: Soil is excavated during facility upgrade work.
Hydrocarbons exceed Tier 1 guidelines

Do we have to haul to a landfill?

Is fill needed elsewhere?

Can the soil meet site-specific guidelines?



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Case Study: Water Treatment Plant

During expansion of water treatment plant in an area with a long history of industrial use, soils found to have PAH above Tier 1 guidelines

City needed material as part of a berm along the site

Wanted to use the soil as part of the berm (with a clean clay cap)





Case Study: Water Treatment Plant

1D transport modelling demonstrated PAH were not expected to significant impact groundwater

- Supported by site groundwater data

Study of local background concentrations – determined that PAH concentrations were consistent with background in the area

AEP approved use of the soil in the berm provided further testing confirmed consistent concentrations



Case Study: Water Treatment Plant

Next Project Phase – Lands outside of the plant were required for plant outfall expansion

Significant volumes of PAH impacted soil identified (15,000m³+)

Soil Re-Use expanded to utilize this material for other backfill requirements within the plant

- Eliminated additional trucking and landfill disposal
- Resulted in re-use of soil and elimination of soil import
- Collaboration with the City, the Env Consultant, & GC

Savings = ~\$1,000,000.00



Case study: Commercial Redevelopment

How can you turn a 55,000m³ "liability" into a resource?

New commercial office in SW Calgary with PAH and VOC soils exceeding generic AB T1 Guidelines.

Cost to Landfill = ~\$3,000,000.00





Case study: Commercial Redevelopment

How can you turn a 55,000m³ "liability" into a resource?

Why a Resource?:

- Excellent clay soil for engineered/structural fill
- Optimal moisture content and free of cobble or debris
- Site had excellent access for high volume truck and trailer hauling units
- Site was close to major roads and central within city



Case study: Commercial Redevelopment

How can you turn a 55,000m³ "liability" into a resource?

What Needed to Happen?:

- Receiving site required that could accept the material
- Alignment of scheduling challenges at both sites
- Ability to move large volumes of material
- Multiple stakeholders – Owners, General Contractors, Env & Geotechnical Consultants, Earthworks Contractors



Case study: Commercial Redevelopment

How did all of the moving parts align and was it successful?

- MEMS worked with the receiving site owner to develop site specific guidelines (City of Calgary)
- Receiving site GC and Consultants were very collaborative and motivated.
- Alternate approaches to achieve generic AB T1 guidelines were evaluated and tested, but were not viable.

Project savings of ~\$2MM when compared to landfill disposal and receiving site needing to purchase import material from other sources or further away.



Conclusions

"Impacted" soil can be a valuable resource

Beneficial re-use of soil is consistent with recommendations made under Alberta waste management framework

There are tools/methods available to assess risks from soil

We need to stop automatically classifying excess soil as a "waste"!