Soil Reuse Study – An Overview

May 15, 2014
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Soil Reuse Context

• Brownfields as construction sites
• Greenfield vs. Brownfield sites – fate of excess soils
• Hauling and landfill disposal as a legitimate and significant cleanup cost component
• Eligible cost under Brownfield cleanup grant programs
Why This Study? – Potential Benefits of Soil Reuse

• Significant cost savings – individual site cleanups
• More efficient use of public brownfield grant funds, private capital
• Conservation of landfill space
• Reduction of carbon footprint for cleanups – reduced hauling distances
• BUT – no documentation of the magnitude of potential benefits
Study Overview - Three Components

• Case Study Sites:
  – Cost Analysis – Potential Savings
  – Environmental Impact Analysis

• Policy and Legal Analysis
  – Barriers to soil reuse
Soil Reuse Timeline

• Hennepin County: Needs Assessment and U.S. EPA Memorandum of Agreement
  – Funding for Soil Reuse Study – 2005 Closeout of RLF
• 2007 MN BF Forum - identifies soil reuse as a significant barrier to brownfield redevelopment
• 2008 MN BF Forum: “National Models and the Minnesota Experience”
• 2009-2012: MPCA develops off-site fill reuse guidance:
  – Best Management Practices for the Off-Site Reuse of Unregulated Fill
  – Off-Site Use of Regulated Fill Policy; Regulated Fill Application
    • MN BF Survey on Regulated Fill Policy
Case Study Sites – Eleven Total

- 0.7 - 46 acres
- Cleanup 2007-2013
- Total soil volume managed = 5,800 – 410,533 cy
- All featured some landfill disposal
- 8 - on-site re-use
- 4 – off-site re-use
Site Data Collected

- Soil volumes by soil category and management strategy
  - On-site reuse, off-site reuse, landfill disposal
- Cost to haul and dispose or haul and place
- Distance to reuse on-site, cost to place and compact
- Distance to landfills and reuse locations
- Truck capacity, gas usage (MPG)
- Grant funds awarded: total, soil-disposal
Soil Categories

- A – “Unregulated Fill” – MPCA Definition
- B – “Debris-Containing Fill”
- C – “Regulated Fill – Current Policy”
- D – “Regulated Fill – Revised”
- E – “Contaminated Fill – Landfill Disposal”
## Case Study Sites – Soil Management Practices and Soil Categories

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Year Completed (Soil Cleanup / Redevelopment)</th>
<th>Size (Acres)</th>
<th>Total Volume of Soil Involved – All Categories (C.Y.)</th>
<th>Soil Management Practices Used</th>
<th>Landfill (Soil Categories)</th>
</tr>
</thead>
<tbody>
<tr>
<td>222 Hennepin</td>
<td>2012/2013</td>
<td>2.5</td>
<td>33,055</td>
<td></td>
<td>B, C</td>
</tr>
<tr>
<td>Beacon Bluff</td>
<td>2010/Ongoing</td>
<td>46</td>
<td>410,533</td>
<td>A, C</td>
<td>D, E</td>
</tr>
<tr>
<td>Clyde Ironworks</td>
<td>2007/Ongoing</td>
<td>10.0</td>
<td>16,590</td>
<td>C, D</td>
<td>A</td>
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<tr>
<td>Gateway Gardens</td>
<td>2010/2010</td>
<td>1.3</td>
<td>5,800</td>
<td>A</td>
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<tr>
<td>HCMC Clinic</td>
<td>2010/2011</td>
<td>3.1</td>
<td>26,300</td>
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<tr>
<td>Heritage Park</td>
<td>2011/2012</td>
<td>2.3</td>
<td>12,785</td>
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<tr>
<td>Pelham</td>
<td>2011/2013</td>
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<td>37,400</td>
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<tr>
<td>Seward Commons</td>
<td>2012/2013</td>
<td>0.7</td>
<td>15,800</td>
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<td>A, C, D</td>
</tr>
<tr>
<td>Sunrise Assisted Living</td>
<td>2005/2005</td>
<td>2.9</td>
<td>14,000</td>
<td>A</td>
<td>A, D, E</td>
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<tr>
<td>The Mist</td>
<td>2006/2006</td>
<td>4.0</td>
<td>62,748</td>
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</table>
Off-Site Reuse – Cost Analysis

Findings

• Four of eleven sites – unregulated fill
• Cost savings ranged from $49,736 - $1,066,540
• Cost savings represented 42% - 99% relative to landfilling alternative
• Cost savings at both large and small scale sites
• Cost savings increases with soil volume, distance “savings”
On-Site Reuse – Cost Analysis

Findings

• Eight of eleven sites

• Cost savings ranged from $21,293 to $6,249,674

• Cost savings represented 78% - 92% relative to landfilling alternative

• Opportunity for cost savings great, but limited by time, space constraints
Grant Funding – Cost Analysis

Findings

• 9 sites received cleanup grant funds
• Total grant funds awarded: $5,326,281
• Overall, 52% of grant funds were used for landfill disposal
• Individual sites - from $206,429 to $2,176,077 was used for landfill disposal (42% to 100% of the grant award)
• Opportunity for savings
Environmental Impact Analysis

• Compared estimated CO$_2$ production between soil management strategies

• CO$_2$ production was estimated using hauling distance, fuel usage (mpg), number of trips, and CO$_2$ production rate based on truck type.

• Off-site reuse - “CO$_2$ Savings” depends upon volume and reduction of hauling distance - landfill vs. reuse location

• Off-site reuse - absolute savings: 5,600 kg – 217,500 kg CO$_2$ per site

• This represented a 21%-88% savings compared to CO$_2$ production for the landfill disposal alternative
From Case Studies –
Limiting Factors for Reuse:

• Identifying reuse location in time frame for source site redevelopment

• Lack of space to stage, segregate, screen and store soil for reuse

• Debris in otherwise re-useable unregulated or regulated fill

• Geotechnical quality of unregulated and regulated fill
From Case Studies:
Factors Favoring Soil Reuse

• Opportunity for significant cost savings (large volumes, long hauling distance)
• Motivated development team
• Problem solving relationship between regulatory staff and consultant leads to individual site solutions
Legal and Policy Analysis

• Reviewed policy, statute and rules that affect soil reuse in MN
• Pathway for soil reuse and barriers along the pathway
• Current MPCA guidance provides an initial foundation for an effective regulatory framework
• The study team concluded that adjustments are needed to current policy to encourage reuse in-lieu of landfilling
Liability Exposure

• CERCLA/MERLA

• RCRA/MPCA Solid and Hazardous Waste Statutory Authority (Minn. Stat. Chap. 116)

• Petroleum (Minn. Stat. Chap. 115C; Minn. Stat. Chap. 115E; and as a pollutant or contaminant under Minn. Stat. § 115B.17)

• Solid Waste Rules (Debris in Soil)
Non-Petroleum Liability Assurances

• MPCA offers No Action Determinations for importing and exporting sites, although none have been issued to date.
• MPCA has determined that it does not have the statutory authority to issue No Association Determinations for soil reuse.
• Recommendation: The MPCA should expand liability protection options to include a No Association Determination for the acts of exporting, importing and placing fill consistent with the receiving site’s Response Action Plan – this will likely require a statutory amendment.
Petroleum Site Closure and Assurances

- Current MPCA petroleum assurances do not apply to soil reuse.
- General liability letters address petroleum originating from a tank release and only speak to the site where the tank release occurred.
- Recommendation: the MPCA should offer a General Liability Letter that is specific to the reuse of petroleum-contaminated soil in a manner consistent with MPCA guidance and an approved Response Action Plan or Soil Reuse Plan for the receiving site.
- Would likely require amendment to Minn. Stat. §115C.
Debris Containing Fill – A Solid Waste Issue

• Most or all unregulated debris containing fill is disposed of in landfills, even though this provides no reduction of environmental risk.

• MPCA guidance for unregulated fill allows a “de minimis” amount of waste, but this amount is not defined; regulated fill can’t contain any amount of waste.

• Current interpretation of Solid Waste Rules disallow reusing fill with debris and are silent on screening and sorting to remove debris.

• Standing Beneficial Use Rule
Debris Containing Fill – Recommendations

• A clear definition of the allowable “de minimis” amount of debris should be defined for unregulated fill and for regulated fill

• Relief or exemption from the Solid Waste Rules should be provided in order to allow the reuse of fill containing debris if screening and/or sorting are feasible.
Intermediate Staging of Regulated Fill

• Current MPCA Regulated Fill Use guidance does not allow for intermediate staging of soils or staging at the receiving site.
• In addition to geotechnical concerns, space and time constraints are often barriers to off-site reuse.
• Matching a brownfield redevelopment site “long on soils” up with a site “short on soils” is very difficult under the current constraints of soil reuse.
• Disparity between larger sites and smaller sites.
Intermediate Staging - Recommendations

• Adjust policy to allow for intermediate staging of unregulated and regulated fill at an off-site location and/or at the receiving site.
• Would require appropriate soil management and documentation.
• Manager by private – or public – entities.
• A pilot project would be a good first step.
Regulated Fill Use Guidance – Driven by Regulated Fill Definition

• By definition “regulated fill” cannot contain contaminants at concentrations exceeding Industrial Soil Reference Values for SVOCs and metals, Tier 2 Soil leaching Values for VOCs. This limits reuse possibilities.

• Recommendation: Decisions about fill placement should be based on the receiving site Response Action Plan – this would be consistent with the MPCA’s risk based approach to site evaluation and cleanup. Note: this would result in a broadened definition of “regulated fill.”
MPCA Regulated Fill Application – Requires Signature from LUG

- Current guidance requires that local units of government be notified of regulated fill application – and notification requires signature from Local Unit of Government (LUG).

- Recommendation: Signature requirement should be dropped; notification is reasonable but requiring a signature could be interpreted as an approval process, which may unnecessarily and unintentionally create a barrier to soil reuse
Further Data Needed to Understand Soil Reuse Benefits

- While it is generally understood that grant dollars are used to landfill soils that could otherwise be reused off-site, we don’t have sufficient supporting data.

- Recommendation: require that more detailed, unit-cost data be collected and submitted for grant-funded cleanups (DEED, Metropolitan Council, Hennepin and Ramsey County).
Next Steps:

• Request State and local grant programs to collect soil reuse data for grant sites
• Work with MPCA to pursue improved liability options
• Work with MPCA to pursue improvements to Off-Site Use Guidance for Regulated Fill
• Intermediate soil staging facility pilot?
Thank You to Consultants and Property Owners:

- American Engineering Testing, Inc.
- Barr Engineering
- Braun Intertec Corporation
- Landmark Environmental
- Liesch, a Terracon Company
- Loucks Associates
- Peer Engineering
- St. Paul Port Authority
Project Team

- Martha Faust
- Deborah DeLuca
- Steve Heurung
- Mary Finch
- Gil Gabanski
- John Evans
- Dave Jaeger
- Jill Mazullo
- Jamie Radel
- Mike Wardwell
THANK YOU

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