R.I.G. Alternate Daily Cover
The easiest way to improve efficiency of MSW systems

SWANA Northern Lights Chapter
Annual Conference
“Measuring Success”
Best Practices

• **Build landfill progressively in Phases.**
• **Build each phase using cells.**
• **Each cell to be isolated with operational cover.**
• **Two types of operational cover**
  – Intermediate Cover (usually 300 mm)
  – Daily Cover (usually 150 mm)
Daily Cover

**Why provide daily cover?**

- *Isolate refuse from vectors.*
- *Prevent fly-laying and emergence.*
- *Reduce odours.*
- *Control fire ignition / spread.*
- *Minimize wind blown litter.*
- *Cover hazardous substances.*
- *Improve site aesthetics.*
Vector Control

Regional Landfill
Nanaimo

Gitlakdamix Landfill
Nass Valley
Isolate Hazardous Waste
Exposed waste promotes emergence of flies
Without soil cover operators run huge risk of major landfill fire
If cover too sparse, waste pokes through
Too much cover means wasted air space
Just right operational cover usually translates to waste to cover ratio of 2:1 to 3:1
• Regulations require daily cover.
  – 150 mm soil at end of each day, or functional equivalent.

• Options for cover include:
  – Local soil (clay, sand, gravel)
  – Contaminated soil
  – Dryland sort scrapings
  – Blended wood waste / soil
  – Alternate daily cover
Cover Soil Type

• **Clay Soil**
  – *ruts*
  – *trafficability issues*
  – *leachate breakouts*
  – *dusty when dry*

• **Sand**
  – *easy to work*
  – *trucks get stuck if dry*

• **Gravel/Crush Rock**
  – *easy to work*
  – *free draining*
  – *great trafficability*
  – *expensive*
Typical Application of Daily Cover
Alternate Daily Cover

- Alternate daily cover provides same function (in some cases) as soil without consuming air space.

- Options include:
  - tarps
  - spray on mulch
  - plastic films
  - wood waste soil blend
  - snow in winter
  - auto fluff (NO!!!)
  - shredded tires (NO!!!!)
Wood waste soil blend
Tire Fluff ADC at Nova Scotia LF
Reusable Tarps are common ADC Solution
Economics of Alternate Cover

- Deployment of alternate cover takes about the same time or slightly less than soil (10 to 20 min. per day).

- Main savings are realized from air space saved by eliminating daily soil cover.

- Example from analysis of Nanaimo Regional Landfill, operating at 44,000 tonnes/yr.
  - Soil Cover: $2,968/week
  - Plastic Film: $3,307/week
  - Tarp-O-Matic: $2,758/week

- Revenue gained from saved air space: $12,614 per week, or $655,928/yr.
Steel Plate ADC developed at Revelstoke
R.I.G. Manufactured at BRESCO’s shop in Revelstoke, B.C.
Transported to site on trailer
Deployment with Loader
Typical cycle time is 90 seconds/plate
Typical Active Face
7 R.I.G. Plates in Use
R.I.G. can also be deployed with Excavator
Hydraulic Thumb improves control of plate
R.I.G. is not only ADC it is an engineered landfill construction system
MSW is compacted against containment log
Well run landfill using R.I.G.
Advantages of Revelstoke Iron Grizzly ADC

- Rigid plate does not flap in wind.
- Snow can be scraped off plates without damage.
- Plates will not rip or tear.
- Birds cannot peck through plates.
- No ongoing expenditures for new materials (film or mulch).
- Plates cannot be removed by scavengers.
- Plates can be placed with loader or excavator.
- Plates are fire-proof.
RIG CALCULATOR

- Demonstrates economic benefits of ADC system
- Input required for analysis:
  - Annual tonnage: 30,000 TPY
  - Compaction Density: 0.75 T/m3
  - Landfill Tipping Fee: $75/tonne
  - Lifespan: 68 years
  - Footprint Area: 40 Ha
  - Current Soil Cover Use: 1.73:1
Example Calculation for Cranbrook Landfill

- **Historic Soil Cover:** 63.4 m$^3$/day
- **Current Soil Cover:** 18.9 m$^3$/day

What is historic waste to cover ratio? 1.73:1
What is current waste to cover ratio? 5.81:1
What is annual air space saving? 16,245 m$^3$
What is annual Ops. Cost Saving? $85,930
What is value of air space saved? $527K
What is annual cost saving (future revenue)? $35.76 million
### CELL USE ANALYZER SPREADSHEET - Summary Comparison

#### Cranbrook Landfill Site

<table>
<thead>
<tr>
<th></th>
<th>Without RIG</th>
<th>With RIG</th>
<th>Total Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Volume of Soil Used (m³)</td>
<td>63.36</td>
<td>18.85</td>
<td>44.5</td>
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<tr>
<td>Landfill Lifespan (years)</td>
<td>50</td>
<td>68</td>
<td>18</td>
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<tr>
<td>Cost per Tonne</td>
<td>$43</td>
<td>$40</td>
<td>$2.86</td>
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<tr>
<td>Total Tipping Fee Revenue</td>
<td>$65,225,279</td>
<td>$88,551,444</td>
<td>$23,326,165</td>
</tr>
<tr>
<td>Total Profit (Revenue less Costs)</td>
<td>$718,512</td>
<td>$6,806,313</td>
<td>$6,087,801</td>
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</tbody>
</table>

#### Overall

- **Operational Cost Saving per Year with RIG**: $85,930
- **Operational Cost Saving over Lifespan**: $5,830,844
- **Value of Air Space Conserved per Year**: $527,092 (based on tipping fee)
- **Payback for RIG on Operational Costs**: 4.78 months
- **Payback for RIG on Air Space Revenue**: 0.78 months
Summary

• **Daily Cover**
  
is 0.15 m soil or equivalent placed over active face at the end of each day

• **Alternate Daily Cover (ADC)**
  
  should be considered to improve waste to cover ratio

• **R.I.G. Daily Cover (ADC)**
  
is most versatile and durable ADC system with minimal long term costs
Contact Information

Google: “Revelstoke Iron Grizzly”

www.irongrizzly.ca

Brett Renaud     (250) 837-8646
Tony Sperling    (604) 986-7723
REVELSTOKE
IRON GRIZZLY