2017 Iowa Statewide Waste Characterization

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FUNDED BY:

IOWA DEPARTMENT OF NATURAL RESOURCES
Agenda

• Purpose of waste characterization study
• Background
• Waste sort process
• Results
• Resulting initiatives
Why sort waste?

• Document impact of:
  • Diversion programs (recycling, waste bans)
  • Citizen education/awareness

• Provide data in support of:
  • Identifying efforts needed to meet state and local waste reduction and recycling goals
  • Improving program efficiencies
  • Strengthening economic development efforts
  • Focusing citizen education and awareness efforts
Previous Iowa Waste Sorts

• 1998
• 2005
• 2011
13 Participating Landfills and Transfer Stations

2017 Host Facilities

- West Central Iowa Solid Waste
- Metro Park East Landfill
- Landfill of North Iowa
- City of Cedar Falls Transfer Station
- Cedar Rapids/Linn County Solid Waste Agency Site #2
- Iowa City Landfill & Recycling Center
- Newton Sanitary Landfill
- South Central Iowa Solid Waste Agency Landfill
- Dubuque Metropolitan Solid Waste Agency
- City of Cedar Falls Transfer Station
- Waste Commission of Scott County
# Background Information

## Host Facility Study Participation

<table>
<thead>
<tr>
<th>Host Facility</th>
<th>Study Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Cedar Falls</td>
<td>X</td>
</tr>
<tr>
<td>Cedar Rapids/Linn County Solid Waste Agency</td>
<td>X</td>
</tr>
<tr>
<td>Dubuque Metropolitan Area Solid Waste Agency</td>
<td>X</td>
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<tr>
<td>Iowa City Landfill and Recycling Center</td>
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<tr>
<td>Landfill of North Iowa</td>
<td>X</td>
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<tr>
<td>Metro Waste Authority</td>
<td>X</td>
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<tr>
<td>City of Newton</td>
<td>X</td>
</tr>
<tr>
<td>South Central Iowa Solid Waste Agency Landfill</td>
<td>X</td>
</tr>
<tr>
<td>Waste Commission of Scott County</td>
<td>X</td>
</tr>
<tr>
<td>West Central Iowa Solid Waste</td>
<td>X</td>
</tr>
</tbody>
</table>
MSW Landfilled

Waste Characterization Study Tonnages

- 1998: 2,462,944 tons
- 2005: 2,679,699 tons
- 2011: 2,684,649 tons
- 2017: 2,781,566 tons
Similarities to Previous Studies

• Waste generating sectors
• In-state wastes
• Host facility sort duration
• Targeted waste from transfer stations
• Site-Specific Sampling Plans
• Seasonal sampling & sorting events

2017 study waste designed to mirror previous studies
Differences from Previous Studies

• Material categories (minimal)
• Number of host facilities
• Number of samples
• Visual characterization of bulky wastes

Some differences between studies do exist
The Dirty Details

- Residential and industrial/commercial/institutional (ICI) sectors analyzed
- 524 solid waste samples collected
  - 275 samples of residential waste
  - 249 samples were from ICI generating sector
- Performed in May, June and July 2017
The Dirty Details

• 9 major material categories (61 subcategories)
  • Paper (8)
  • Plastic (11)
  • Metal (6)
  • Glass (6)
  • Organics (6)
  • Durables (4) (cell phones, monitors, tvs, appliances)
  • C&D (6)
  • Household hazardous materials (7)
  • Other (7)
## The Process

### Develop a Sampling Plan

<table>
<thead>
<tr>
<th>Name</th>
<th>Tons</th>
<th>Direct Haul or Transfer</th>
<th>Mag</th>
<th>Tons</th>
<th>Direct Haul or Transfer</th>
</tr>
</thead>
</table>
| Residential      | 53,541 | Direct Haul to Landfill | 100%| 83,297 | Direct Haul to Landfill | 116,790
| Residential      | 100%   | Direct Haul to Landfill | 100%| 83,297 | Direct Haul to Landfill | 116,790
| Total RES Tons   | 53,541 | Direct Haul to Landfill | 100%| 83,297 | Direct Haul to Landfill | 116,790
| % Total          | 29%    | % Total                 | 71% | % Total| 100%                     |

### Sampling Plan

<table>
<thead>
<tr>
<th># of Samples</th>
<th>Sample Description</th>
</tr>
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<tbody>
<tr>
<td>14</td>
<td>Direct Haul to Landfill</td>
</tr>
<tr>
<td>36</td>
<td>Direct Haul to Landfill</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Samples</th>
<th>Sample Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>62%</td>
<td>Cedar Rapids Solid Waste</td>
</tr>
<tr>
<td>19%</td>
<td>City of Marion</td>
</tr>
<tr>
<td>19%</td>
<td>Fudd Sanitation (some ICI)</td>
</tr>
<tr>
<td>5%</td>
<td>Major Industries at Landfill</td>
</tr>
</tbody>
</table>

### Always play it safe

- Wear proper safety gear.
- Follow all safety protocols.
- Stay alert and aware of surroundings.

### Talk it out

- Discuss the sampling plan with team members.
- Ensure everyone understands their role.
- Address any concerns or questions.

SCS ENGINEERS
The Process

Obtain a sample

Weigh the sample
The Process

Sort it

Weigh and record it
You never know what you will find....
Overall Results

- Paper, 25.5%
- Organics, 31.5%
- Plastic, 18.3%
- Other, 11.4%
- Construction & Demolition, 5.4%
- Metal, 3.9%
- Glass, 2.1%
- Durables, 1.4%
- HHM, 0.5%
## Top 5 Material Components

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>10.7%</td>
<td>10.3%</td>
<td>8.5%</td>
<td>7.5%</td>
<td>5.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>10.6%</td>
<td>8.5%</td>
<td></td>
<td></td>
<td>7.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>13.3%</td>
<td>9.0%</td>
<td></td>
<td></td>
<td>6.7%</td>
<td>6.1%</td>
<td>5.4%</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>20.0%</td>
<td>8.7%</td>
<td></td>
<td></td>
<td>7.6%</td>
<td></td>
<td></td>
<td>4.6%</td>
</tr>
</tbody>
</table>

Total Proportion of Top 5 Materials

- 1998: 42.4%
- 2005: 39.2%
- 2011: 40.5%
- 2017: 47.0%
5 Materials Ranked in Top 10 for All Studies

- Food waste
- Plastic film
- OCC and Kraft paper
- Textiles and leather
- Other plastic products
New Materials in Top 10 in 2017

• Other organics (e.g., cat litter, dirt, dog waste)
• Diapers
Residential & ICI Results

Residential
- Plastic, 16.6%
- Paper, 22.8%
- Other, 14.6%
- Construction & Demolition, 4.0%
- Metal, 3.9%
- Glass, 2.6%
- Durables, 1.5%
- HHM, 0.5%
- Organics, 33.5%

ICI
- Plastic, 19.7%
- Paper, 27.8%
- Other, 8.6%
- Construction & Demolition, 6.5%
- Metal, 3.8%
- Glass, 1.8%
- Durables, 1.3%
- HHM, 0.4%
- Organics, 29.8%
## Trends Noted

<table>
<thead>
<tr>
<th>Material Category</th>
<th>Overall MSW</th>
<th>Residential</th>
<th>I/C/I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper</td>
<td>--</td>
<td>Increase</td>
<td>--</td>
</tr>
<tr>
<td>Metal</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Glass</td>
<td>Increase</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Organic</td>
<td>Increase</td>
<td>--</td>
<td>Increase</td>
</tr>
<tr>
<td>C&amp;D</td>
<td>Decrease</td>
<td>Decrease</td>
<td>Decrease</td>
</tr>
<tr>
<td>Plastic</td>
<td>--</td>
<td>Increase</td>
<td>--</td>
</tr>
<tr>
<td>Durable</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Household hazardous materials</td>
<td>Increase</td>
<td>--</td>
<td>Increase</td>
</tr>
<tr>
<td>Other</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
Recoverability Analysis

- Non-Marketable: 28.9%
- Compostable: 30.6%
- Reusable: 7.2%
- Recyclable: 31.8%
- Bottle Bill: 1.6%
Recoverability Analysis

- Non-Marketable: 28.9%
- Recyclable: 31.8%
- Compostable: 30.6%
- Reusable: 7.2%
- Bottle Bill: 1.6%
- Paper: 14.9%
- Plastic: 9.3%
- Metal: 3.4%
- Other: 3.2%
- Glass: 0.9%
Recoverability Analysis

Breakdown of Recoverable Materials:
- Non-Marketable: 28.9%
- Recyclable: 31.8%
- Compostable: 30.6%
- Reusable: 7.2%
- Yard Waste: 2.9%
- Food Waste - Loose: 13.3%
- Compostable Paper: 7.6%
- Food Waste - Packaged: 6.7%
Recoverability Analysis

- Bottle Bill, 1.6%
- Non-Marketable, 28.9%
- Compostable, 30.6%
- Reusable, 7.2%
- Recyclable, 31.8%
- Textiles & Leather, 4.1%
- Construction & Demolition, 1.7%
- Carpet & Carpet Padding, 1.1%
- Chemicals, 0.2%
Non-Marketable Materials

- Compostable, 30.6%
- Recyclable, 31.8%
- Non-Marketable, 28.9%
- Reuseable, 7.2%
- Bottle Bill, 1.6%

- Other Plastic Film, 7.8%
- Fines, 4.8%
- Other Organics, 4.1%
- Diapers, 3.5%
- Non-Recyclable Paper, 2.9%
- Other, 2.7%
- Treated Wood, 2.2%

- Expanded Polystyrene, 0.8%
Diversion Opportunities

• Approximately 70% can be diverted
  • Recyclable – 33.4%
  • Compostable – 30.6%
  • Reusable – 7.2%

• Diverting waste from disposal can:
  • Increase revenue
  • Create jobs
  • Reduce greenhouse gas emissions
Estimated Economic Value of Diversion Opportunities

- Recyclable paper $20.4 MM
- Recyclable containers $39.9 MM
Job Creation Opportunities

Jobs created by disposing of recyclable material

Jobs created by sorting and processing of recyclable materials 10X

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3 Institute of Local Self-Reliance; Recycling Mean Business; 2002; access on October 23, 2017 from https://ilsr.org/recycling-means-business/
Greenhouse Gas Reduction Opportunities

Disposing recyclable or compostable material

Recycling and Composting

Energy and Emissions

Energy and Emissions

USEPA’s Waste Reduction Model (WARM) estimates over 1.4 MM metric tons of carbon dioxide equivalent emissions can be reduced by recycling paper and containers and composting food waste.
How IDNR and Participating Facilities Are Using the Data

• Compare to previous years to see trends
• Determine effectiveness of existing programs
• Make decisions to modify existing programs
• Develop education and outreach
2017 Waste Characterization Study

IDNR

- Scheduling a stakeholder meeting for March 30
  - Presentation on Waste Characterization Study and Hub and Spoke Recycling Study
  - Discussion on funding
  - Bulk of day: brainstorm/strategy discussion

- Food waste will be a priority partly as a result of the WCS
2017 Waste Characterization Study

Dubuque Metropolitan Area Solid Waste Agency

• Complete additional study to identify source separated organics generators, refine waste

• Plan infrastructure development
  • Upgrade compost facility?
  • Basis for business model for modifications to a WWTP digester or establishment of a high solids digester

• Education
  • Push for back to basics recycling with focus on paper and plastics
  • Glass will be socially driven, not enough there
2017 Waste Characterization Study

City of Iowa City

• Food Waste
  • Already discussing food waste reduction and composting efforts
  • Expand education programs and programs for business food waste
  • Residential food waste reduction and composting campaign
  • City sell compost bins at a discount, promote food waste reduction
  • 2014 EPA Project “Food: Too Good to Waste”
  • June 2016 staff presented curbside food waste collection
2017 Waste Characterization Study

City of Iowa City

• Food Waste
  • Code changes approved in November 2016
  • Slow roll-out of program began March 2017
  • Led to several changes on how services charged
    • Went from annual yard waste sticker to $2 monthly fee for all customers
    • Resulted in significant increase in revenue and move to offering two cart options to customers (25 and 96 gallons)
2017 Waste Characterization Study

City of Iowa City

• Cardboard Ban
  • Based on 2011 WCS results
  • Introduced to City Management in June 2016
  • City code approved by Council July 2017
  • In effect January 2, 2018
    • Subject to double charge
  • January 2.9 contaminated loads per day
  • February 1.4 contaminated loads per day
2017 Waste Characterization Study

• Implementing changes takes time
• Have data and basis to do so
2017 Iowa Waste Characterization Report

www.iowadnr.gov/FABA

The 2017 study will be posted here
Contact

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(515) 631-6161

2017 Iowa Waste Characterization Study
www.iowadnr.gov/FABA