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How A Waste Assessment Can GREEN Your Building Operation

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EPA Webinar - Big Building Recycling Programs

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Kessler Consulting, Inc.

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What is a Waste Assessment?

- **Visual** analysis of
  - Waste and/or Recyclables in the workplace
  - Types and quantities
  - Waste management practices
  - Opportunities for Waste Prevention/Reduction
- Powerful tool to continuously improve green building operations
  - Identify opportunities for managing materials and resources

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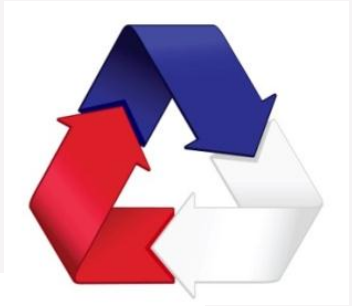
Definitions:



U.S. EPA Waste Management Hierarchy

More Preferable

Less Preferable

Waste Prevention:
Reduce the quantity and/or toxicity of waste

Waste Diversion:
Reuse - Retain maximum value of resources
Recycle - Recover materials for beneficial use
Compost - Convert organics for horticultural use

Disposal:
Combust and/or place remaining waste in a well-managed, controlled disposal site

Least Environmental Impact

Most Environmental Impact

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Decision Maker Benefits

- Collection and disposal cost savings
- Improve work practice efficiencies
- Enhance existing environmental initiatives
- Improve employee morale
- Green Programs/Contributions
- Qualitative complement to quantitative waste composition study

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Six Basic Steps

1) Planning
2) Building Demographics
3) Information/Data Gathering
4) On-Site Analysis
5) Employee Input/Feedback
6) Analysis of Qualitative Findings

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Planning – Step 1

- Define objectives and expected outcomes
- ID assessors and equipment
- Identify major waste types (anticipated)
- Identify major resource types (anticipated)
- Timing of event
- Building demographics
- Identify local partners

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Building Demographics – Step 2

Building Type

1. Free Standing (O, PM)
2. Strip Mall (O, PM)
3. High Rise (O, PM)
4. Office Park (O, PM)

Size

1. Square Footage
2. Floors/Levels
3. Cafeteria
4. Special/Other

Business Activities

Occupants/Job Function

Internal Design/Flow

External Design/Flow

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Information/Data Gathering – Step 3

Building Information

- Square Footage
- Hours of Operation
- Employee Population
- Public access
- Organizational chart
- Floor map

Historical Data

SW Collection

(1) Container Type and Size

(2) Service/Week

(3) Disposal Fees

Recycling Collection

(1) Container Type and Size

(2) Service/Week

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On-Site Analysis – Step 4

- Facilities/Custodial staff interviews
- Employee volunteers and training
- Equipment
- Visual observation during walk through
  - Internal
  - External
- Clip Boards/Forms/Phone #s

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Employee Input/Feedback – Step 5

- Electronic Survey
- Interview during on-site analysis
- Casual discussions with groups at lunch
- Convene informal employee focus group
- Green Team members

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Qualitative Analysis – Step 6

- **Type of Waste Generated**
  - MSW
  - SW
  - HW
  - Industrial Waste
- **Total Amount of Waste Generated**
  - Volume or tons
  - Volume to tons conversion
- **Type and quantity of containers**
- **Container content**
  - Quantity
  - Quality
    - Recyclables in garbage;
    - Contamination in recycling bins

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Qualitative Analysis – Step 6
(cont'd)

- **Collection costs and data** with recommended savings
- **Spreadsheets and graphs** from forms and data
- **Common themes/issues** that offer standardization and solutions
- **Employee solutions** to challenges - link to pertinent data findings
- **Photos** help **tell** the **story** to owners
- Provide results in a consolidated **report** with **recommendations for upper management**

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Sample Forms – 1

Form A: Planning the Waste Assessment – Building: _____

Issue	Result
Objective of VWA:	
Facility(s)/area(s) to be inspected:	
Number of staff (FTE):	
Facility/area square footage:	
Operating hours:	
Timeframe and preferred dates for VWA:	
Stakeholders to be consulted:	
Privacy/confidentiality:	
Security:	
Resources/client staff:	
Approval to obtain contractor and custodial information:	
Other potential issues:	

Form B: Information Gathering - Building:_____

Contractor Details

Contractor	Contact Information
Property manager (if applicable):	
Cleaning contractor:	
Waste contractor:	
Recycling contractor:	

Waste Streams Collected

Waste and Recycling Type	Container Type	Material Type
Garbage		
Recyclable fibers		
Recyclable containers		
Compostable food waste		
Recyclable E-waste		
Renovation (C&D Debris)		
Hazardous Waste/Special Waste		
Other		

Notes:

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Sample Forms – 2

Form F: Site Analysis – Data Collection – Building: ________________________

Garbage Can Details (i.e., desk garbage cans)			Contents (visual inspection only)	Recycling Bin Details (i.e., desk recycling bins)			Contents (visual inspection only)
Can No.	Size:	% Full:	□ general waste □ rec. containers □ rec. paper □ other (list) ______ ______ ______	Bin No.	Size:	% Full:	□ acc. recyclables □ contamination (list) ______ ______ ______ ______
Can No.	Size:	% Full:	□ general waste □ rec. containers □ rec. paper □ other ______ ______ ______	Bin No.	Size:	% Full:	□ acc. recyclables □ contamination (list) ______ ______ ______ ______
Can No.	Size:	% Full:	□ general waste □ rec. containers □ rec. paper □ other ______ ______ ______	Bin No.	Size:	% Full:	□ acc. recyclables □ contamination (list) ______ ______ ______ ______
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Can No.	Size:	% Full:	□ general waste □ rec. containers □ rec. paper □ other ______ ______ ______	Bin No.	Size:	% Full:	□ acc. recyclables □ contamination (list) ______ ______ ______ ______

Form H: Site Analysis – Enclosure/Dock Area Visual Operation Inspection

Building :____

Area: _________________________ **Date and time:** __________________

Questions	Comments
Is there a designated area for hazardous waste collection?	
Are dumpsters and/or roll -offs collected on -call or are they on a weekly collection schedule?	
How do vehicles flow in and out of the dock area?	
Is collection container placement optimal so as not to increase dump and/or pull charges?	
Are there additional containers that were not accounted for?	
Does generation warrant a baler (for recyclables) or a compactor (for waste)? If yes, is there space?	
Who is responsible for dumpster and/or roll -off collection (i.e. , municipality or private hauler)?	
Are there any overhang or collection service issues around the area?	

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Benchmark: Case Study #1

Building 1

- 121,400 sq ft
- 430 employees
- 4,500 visitors/mo
- 25 tons recycled*
- 84 tons disposed**

Building 2

- 68,145 sq ft
- 242 employees
- 26,000 visitors/mo
- 17 tons recycled*
- 33 tons disposed**

* 10/2009 – 9/2010 actual tons
** Volumes to estimated annual tons

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On-Site Visual Findings: *Building 1*

- Garbage:
  - 12% of cans had recyclable containers
  - 8% had recyclable paper
- Recycling:
  - 14% of bins had contaminants
- Employee responses overall positive about the program
  - Some requests for additional garbage capacity
  - Employee requests for additional signage

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On-Site Visual Findings: *Building 2*

- Garbage:
  - 6% of cans had recyclable containers
  - 32% held recyclable paper
- Recycling
  - 11% of bins held contaminants
- Employee responses mixed
  - A lot of innovative employee initiatives
  - Interviews find inconsistent program knowledge among some employees
    - Employee survey to verify on-site interviews

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Case Study #2: Recycling Savings & Revenue Projection

Average Composition Client Waste Stream

Tons Remaining	Average Composition	Tons Generated	Client Estimated Potential Recovery	Estimated Tons Recovered	Estimated Savings	Potential Revenue for Material
Fiber (including cardboard, office paper, and paperboard)	49.5%	2,229.48	50%	1,114.74	$ 79,146.54	$ 33,700.00
Plastics	15.0%	675.60	5%	33.78	$ 2,398.38	$ -
Food Waste	14.0%	630.56	1%	6.3056	$ 447.70	$ -
Yard Waste Trimmings	1.0%	45.04	50%	22.52	$ 1,598.92	$ -
Metals	6.0%	270.24	2%	5.4048	$ 383.74	$ -
Glass	4.0%	180.16	1%	1.8016	$ 127.91	$ -
Diapers	2.0%	90.08	0%	0	$ -	$ -
Wood	1.5%	67.56	95%	64.182	$ 4,556.92	$ -
Other	7.0%	315.28	0%	0	$ -	$ -
Total	**100.0%**	**4,504**		**1,248.73**	**$ 88,660.11**	**$ 33,700.00**

Recycling Rate with Estimated Potential Recovery **28%**

Disposal Cost/Ton: $71

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Conclusions and Next Steps to Achieve Higher Recycling Rates

- Revamp the education program
  - Redistribute what's recyclable information
  - Proper use of garbage and recycling bins
- Provide continuing education
  - Communication channels
  - Signage and container labeling
- Additional garbage options
  - Deskside waste reduction tips
  - More common area cans
  - Reduce container size and/or collection service frequency to reduce annual costs by 25-50%
- Procurement supplies and product review
- Recommendations towards Zero Waste

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