

EMS In-Depth: A's & I's and Rating their Significance Workshop

Iowa Department of Natural Resources
Ankeny, Iowa
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Welcome

- Facilitator Introduction
- Course Content and Materials
- Logistics
- Introductions of Participants
 - What is your name?
 - Where do you work?
 - What is your title and job responsibilities?
 - What experience do you have with EMS?
 - What do you hope to gain from this course?



EMS Refresher

What IS an EMS?

- Environmental Management System (not Emergency Medical Services, etc.)
- Similar to any other management system
- Method for carefully and deliberately controlling performance (i.e., processes, procedures, and programs) 🔍
- Integrated within an organization
- Used to ensure an organization can fulfill tasks and achieve goals
- Continual improvement



EMS Refresher

What IS NOT an EMS?

- Disorganized approach to managing performance
- Informal and undocumented
- Detached environmental responsibilities
- Entirely focused on compliance
- Flawless



EMS Refresher

What are Some Benefits of an EMS?

- Reduced influences on the environment
- Improved environmental compliance
- Enhanced public image
- Cost savings
- Reduced risks
- Improved employee satisfaction



EMS Refresher

What are the Key Elements of an EMS?

- Environmental policy
 - Overall intentions
- Planning
 - **Environmental aspects (and impacts)**
 - Legal and other requirements
 - Objectives, targets and programme(s)
- Implementation and operation
- Checking
- Management review



Environmental Aspects and Impacts

What are Environmental Aspects and Impacts?

- ISO 14001:2004 definitions
 - An aspect is an “element of an organization’s activities or products or services that can interact with the environment”
 - An impact is “any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization’s environmental aspects”



Environmental Aspects and Impacts

What are Environmental Aspects and Impacts?

- ISO 14001:2004 definitions
 - An aspect is an “ελεμεντ οφ αν οργανιζατιον□σ αχτιπιτιεσ ορ προδυχτσ ορ σερωιχεσ τηατ χαν ιντεραχτ ωιτη τηε ενπιρονμεντ”
 - An impact is “ανψ χηανγε το τηε ενπιρονμεντ, ωηετηερ αδπερσε ορ βενεφιχιαλ, ωηολλψ ορ παρτιαλλψ ρεσυλτινγ φρομ αν οργανιζατιον□σ ενπιρονμενταλ ασπεχτσ”



Environmental Aspects and Impacts

What are Environmental Aspects and Impacts?

- Layman's terms
 - An aspect is a cause (reason)
 - An impact is an effect (result) on the environment
 - "Because of _____X_____, _____Y_____ happened"
(Aspect) (Impact)
 - "Because of the oil spill, the soil has become contaminated"
 - "Because of the air emissions, the atmosphere has become polluted"



Environmental Aspects and Impacts

What aspects (causes) and impacts (effects) do you see here?



Environmental Aspects and Impacts

What aspects (causes) and impacts (effects) do you see here?



Environmental Aspects and Impacts

What are the Requirements for Aspects and Impacts?

1. Identify
2. Prioritize (significant aspects and impacts)
3. Include and maintain



Continual Improvement



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- An organization's aspects (causes) originate from its activities, products, and services
 - "Grouping" methodology
 - "Surveying" methodology
 - "Mass balancing" methodology
 - "Back-calculating" methodology
 - "Potpourri" methodology



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

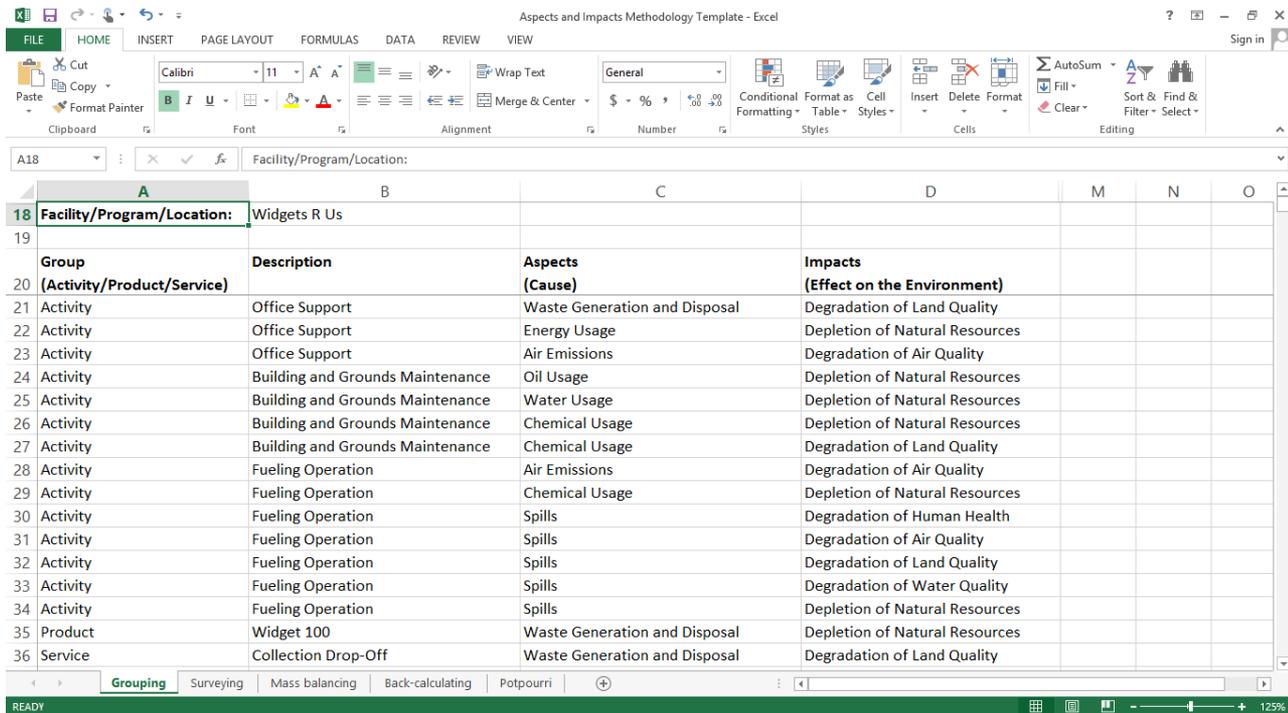
- “Grouping” methodology
 - Focuses on one category at a time
 - Starts with activities, moves to products, and finishes with services



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- “Grouping” methodology



Aspects and Impacts Methodology Template - Excel

Facility/Program/Location: Widgets R Us

Group (Activity/Product/Service)	Description	Aspects (Cause)	Impacts (Effect on the Environment)
Activity	Office Support	Waste Generation and Disposal	Degradation of Land Quality
Activity	Office Support	Energy Usage	Depletion of Natural Resources
Activity	Office Support	Air Emissions	Degradation of Air Quality
Activity	Building and Grounds Maintenance	Oil Usage	Depletion of Natural Resources
Activity	Building and Grounds Maintenance	Water Usage	Depletion of Natural Resources
Activity	Building and Grounds Maintenance	Chemical Usage	Depletion of Natural Resources
Activity	Building and Grounds Maintenance	Chemical Usage	Degradation of Land Quality
Activity	Fueling Operation	Air Emissions	Degradation of Air Quality
Activity	Fueling Operation	Chemical Usage	Depletion of Natural Resources
Activity	Fueling Operation	Spills	Degradation of Human Health
Activity	Fueling Operation	Spills	Degradation of Air Quality
Activity	Fueling Operation	Spills	Degradation of Land Quality
Activity	Fueling Operation	Spills	Degradation of Water Quality
Activity	Fueling Operation	Spills	Depletion of Natural Resources
Product	Widget 100	Waste Generation and Disposal	Depletion of Natural Resources
Service	Collection Drop-Off	Waste Generation and Disposal	Degradation of Land Quality



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

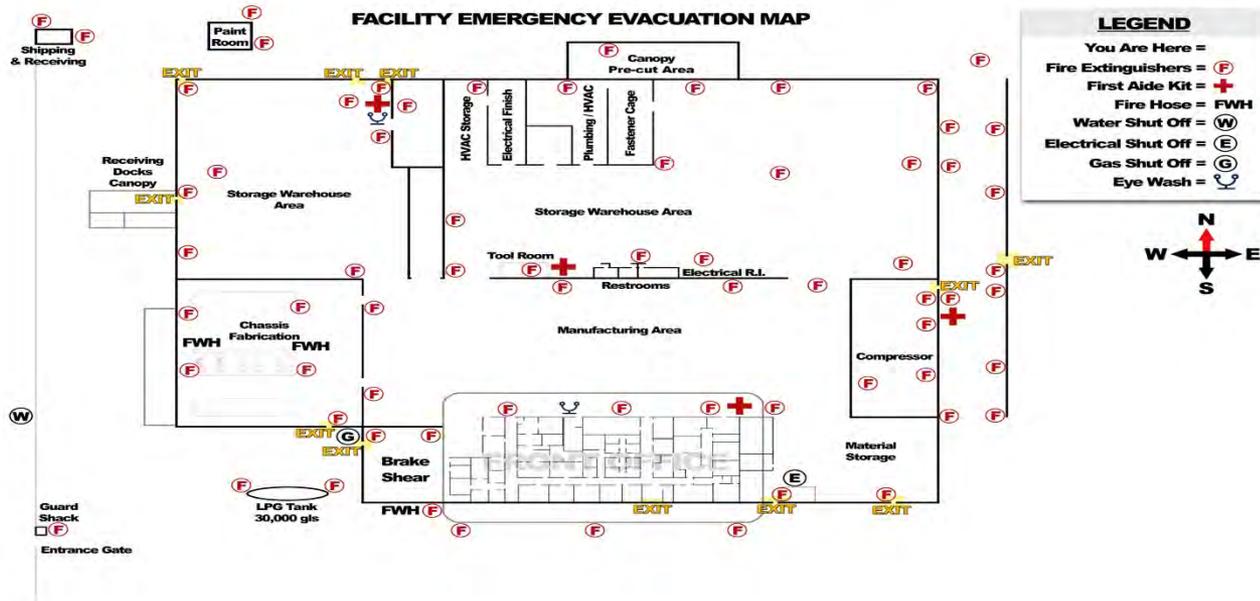
- “Surveying” methodology
 - Typically focuses on areas
 - Starts at one end of the facility / site (property) and finishes at the other end



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- “Surveying” methodology



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- “Surveying” methodology

Area	Aspects (Cause)	Impacts (Effect on the Environment)
Shipping & Receiving	Waste Generation and Disposal	Degradation of Land Quality
Shipping & Receiving	Energy Usage	Depletion of Natural Resources
Paint Room	Air Emissions	Degradation of Air Quality
Canopy Pre-cut Area	Air Emissions	Degradation of Air Quality
HVAC Storage	Energy Usage	Depletion of Natural Resources
Electrical Finish	Chemical Usage	Depletion of Natural Resources
Plumbing/HVAC	Energy Usage	Depletion of Natural Resources
Fastener Cage	Waste Generation and Disposal	Degradation of Land Quality
Receiving Docks Canopy	Waste Generation and Disposal	Degradation of Land Quality
Storage Warehouse Area (#1)	Energy Usage	Depletion of Natural Resources
Storage Warehouse Area (#2)	Spills	Degradation of Land Quality
Tool Room	Energy Usage	Depletion of Natural Resources
Restrooms	Waste Generation and Disposal	Degradation of Land Quality
Restrooms	Water Usage	Depletion of Natural Resources
Electrical R.I.	Energy Usage	Depletion of Natural Resources
Chassis Fabrication	Chemical Usage	Depletion of Natural Resources



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

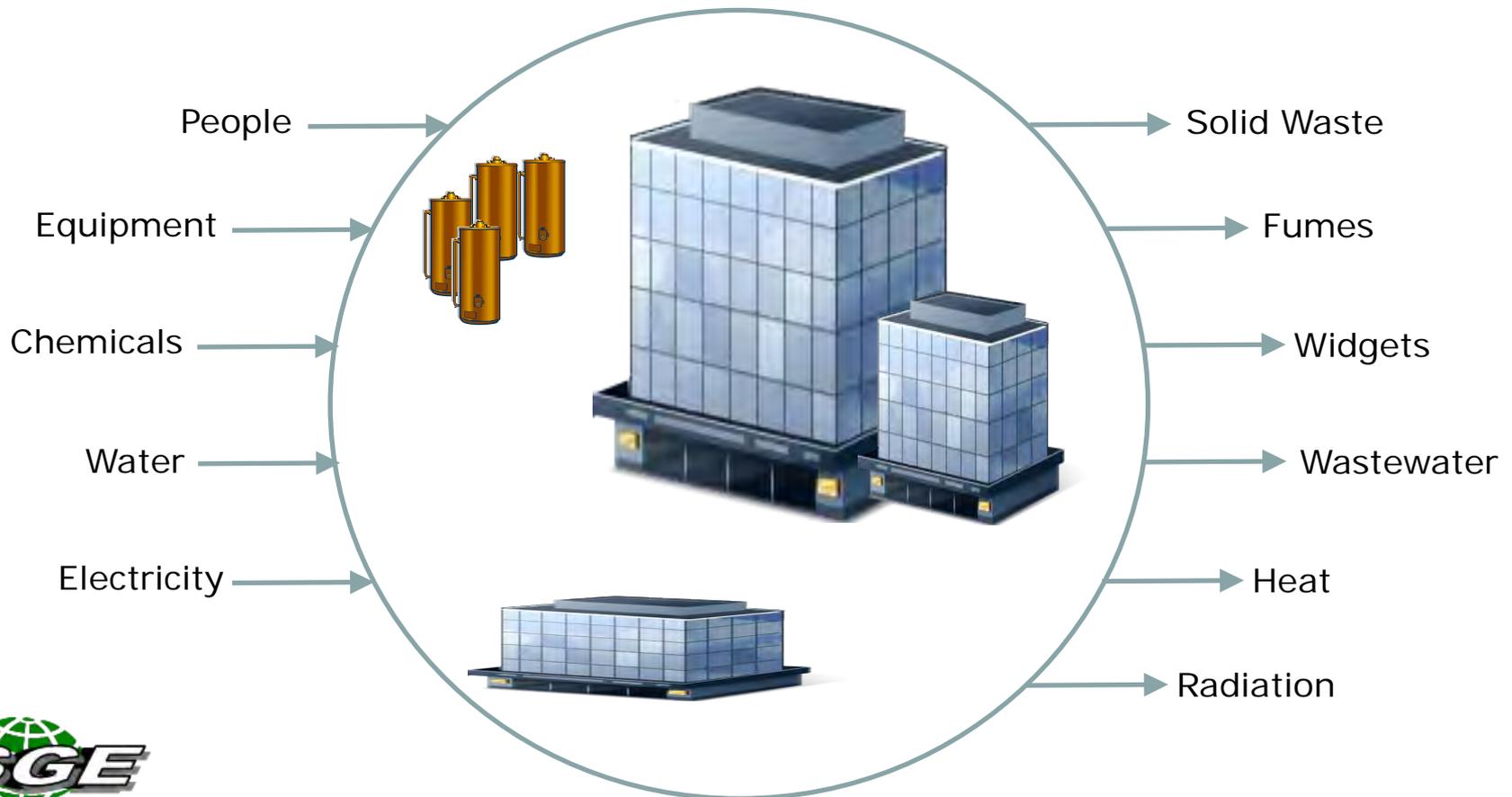
- “Mass balancing” methodology
 - Typically macroscopic
 - Starts with inputs and finishes with outputs



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

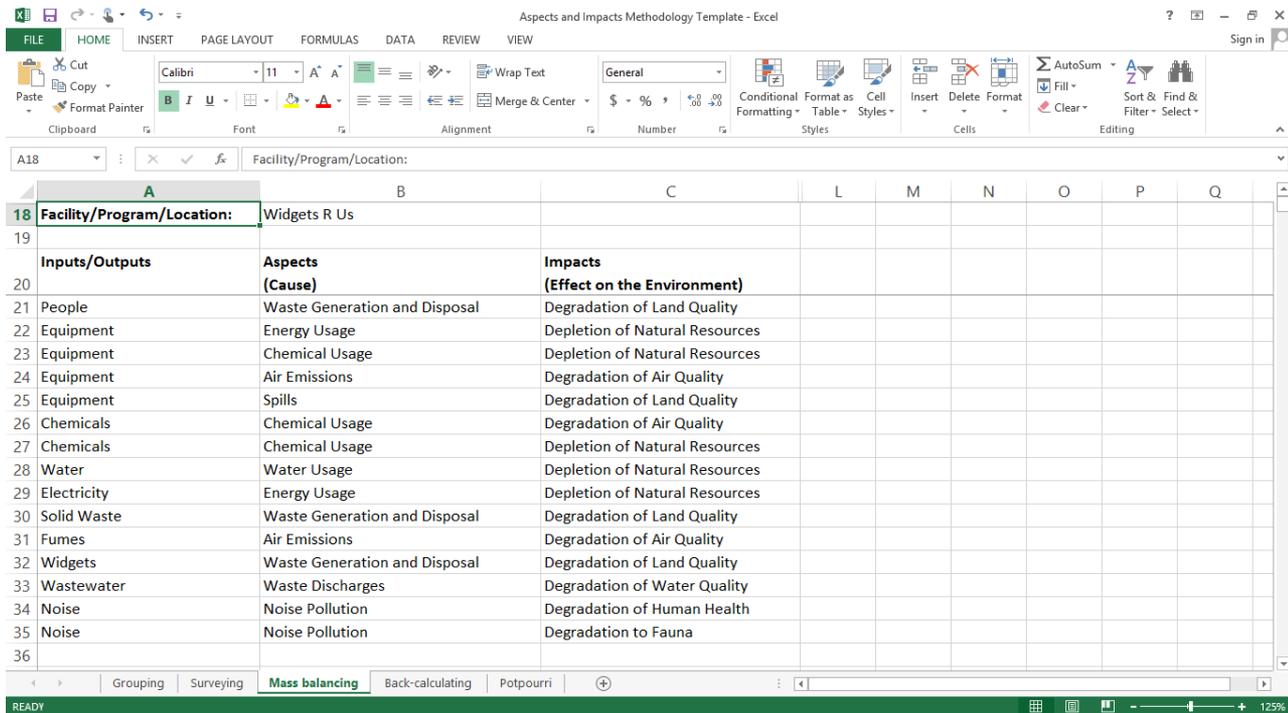
- “Mass balancing” methodology



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- “Mass balancing” methodology



Aspects and Impacts Methodology Template - Excel

Facility/Program/Location:									
A	B	C	L	M	N	O	P	Q	
18	Facility/Program/Location:	Widgets R Us							
19									
20	Inputs/Outputs	Aspects (Cause)	Impacts (Effect on the Environment)						
21	People	Waste Generation and Disposal	Degradation of Land Quality						
22	Equipment	Energy Usage	Depletion of Natural Resources						
23	Equipment	Chemical Usage	Depletion of Natural Resources						
24	Equipment	Air Emissions	Degradation of Air Quality						
25	Equipment	Spills	Degradation of Land Quality						
26	Chemicals	Chemical Usage	Degradation of Air Quality						
27	Chemicals	Chemical Usage	Depletion of Natural Resources						
28	Water	Water Usage	Depletion of Natural Resources						
29	Electricity	Energy Usage	Depletion of Natural Resources						
30	Solid Waste	Waste Generation and Disposal	Degradation of Land Quality						
31	Fumes	Air Emissions	Degradation of Air Quality						
32	Widgets	Waste Generation and Disposal	Degradation of Land Quality						
33	Wastewater	Waste Discharges	Degradation of Water Quality						
34	Noise	Noise Pollution	Degradation of Human Health						
35	Noise	Noise Pollution	Degradation to Fauna						
36									

Grouping | Surveying | **Mass balancing** | Back-calculating | Potpourri | 125%



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- “Back-calculate” methodology
 - Focuses on impacts
 - Evaluates each



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- “Back-calculate” methodology

Aspects and Impacts Methodology Template - Excel

Facility/Program/Location:						
A	B	C	D	M	N	O
18	Facility/Program/Location:	Widgets R Us				
19						
20	Impacts (Effect on the Environment)	Aspects (Cause)	Description	Group (Activity/Product/Service)		
21	Degradation of Human Health	Spills	Fueling Operation	Activity		
22	Degradation of Human Health	Air Emissions	Welding Operation	Activity		
23	Improvement of Human Health	Examinations	Health Clinic Fair	Service		
24	Degradation of Air Quality	Air Emissions	Painting Operation	Activity		
25	Degradation of Air Quality	Spills	Fueling Operation	Activity		
26	Degradation of Air Quality	Air Emissions	Sanding Operation	Activity		
27	Degradation of Air Quality	Energy Usage	Office Support	Activity		
28	Degradation of Water Quality	Stormwater Discharges	Outdoor Material Storage	Activity		
29	Improvement of Water Quality	River Cleanup	Adopt-A-Stream	Activity		
30						
31						
32						
33						
34						
35						
36						



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

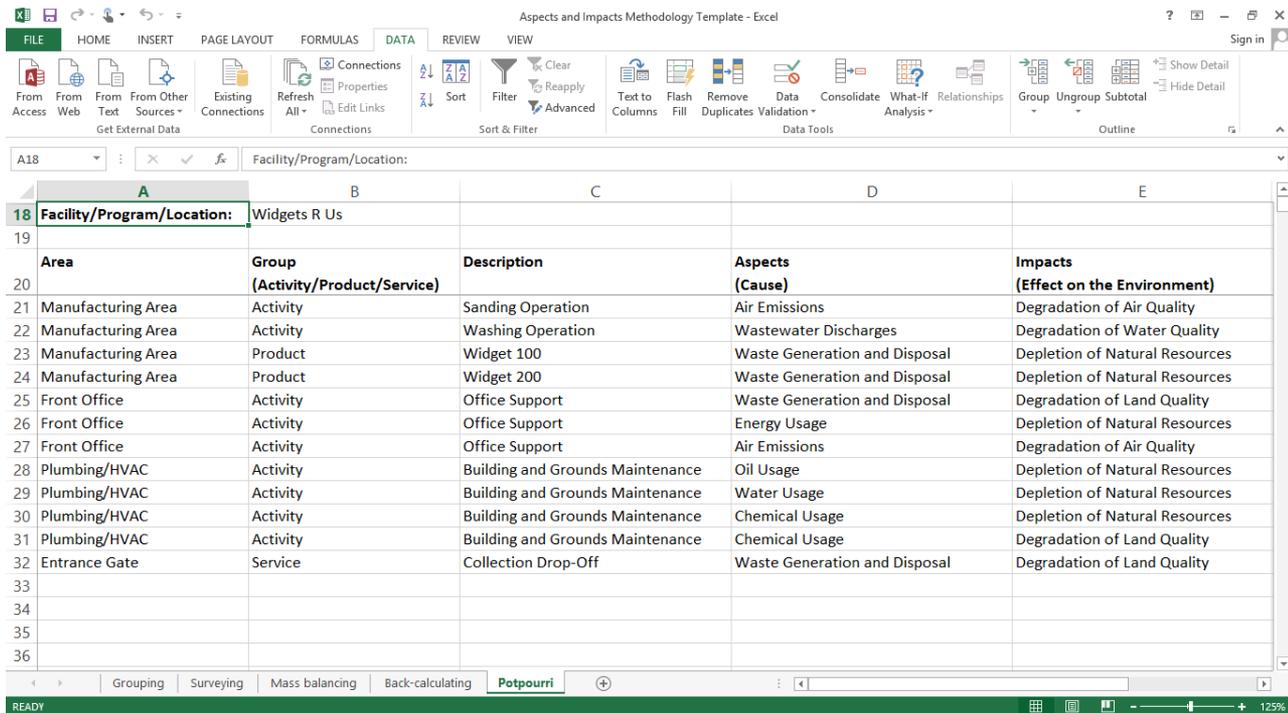
- “Potpourri” methodology
 - Typically combines two methods
 - “Grouping” and “Surveying” combo is popular
 - Starts at one end of the facility / site (property)
 - Focuses on one area at a time
 - Lists out all activities, products, and services
 - Moves to the next area and repeats
 - Finishes at the other end of the facility / site (property)



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- “Potpourri” methodology



Aspects and Impacts Methodology Template - Excel

Facility/Program/Location:	A	B	C	D	E
18	Facility/Program/Location:	Widgets R Us			
19					
20	Area	Group (Activity/Product/Service)	Description	Aspects (Cause)	Impacts (Effect on the Environment)
21	Manufacturing Area	Activity	Sanding Operation	Air Emissions	Degradation of Air Quality
22	Manufacturing Area	Activity	Washing Operation	Wastewater Discharges	Degradation of Water Quality
23	Manufacturing Area	Product	Widget 100	Waste Generation and Disposal	Depletion of Natural Resources
24	Manufacturing Area	Product	Widget 200	Waste Generation and Disposal	Depletion of Natural Resources
25	Front Office	Activity	Office Support	Waste Generation and Disposal	Degradation of Land Quality
26	Front Office	Activity	Office Support	Energy Usage	Depletion of Natural Resources
27	Front Office	Activity	Office Support	Air Emissions	Degradation of Air Quality
28	Plumbing/HVAC	Activity	Building and Grounds Maintenance	Oil Usage	Depletion of Natural Resources
29	Plumbing/HVAC	Activity	Building and Grounds Maintenance	Water Usage	Depletion of Natural Resources
30	Plumbing/HVAC	Activity	Building and Grounds Maintenance	Chemical Usage	Depletion of Natural Resources
31	Plumbing/HVAC	Activity	Building and Grounds Maintenance	Chemical Usage	Degradation of Land Quality
32	Entrance Gate	Service	Collection Drop-Off	Waste Generation and Disposal	Degradation of Land Quality
33					
34					
35					
36					

Grouping | Surveying | Mass balancing | Back-calculating | Potpourri



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- The plain truth
 - No “magic bullet”
 - Best method depends on organization
 - Pros and Cons for each method



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- Helpful hints
 - Use consistent terminology and lists / selections
 - Environment
 - Impacts
 - Aspects
 - Use Excel (or some other software)
 - Copy and Paste
 - “Pick From Drop-down List”
 - Data Validation
 - Filters



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- Helpful hints
 - Use what is already available / common within your organization
 - Maps / diagrams
 - Flowcharts
 - Quality / safety / ergonomic analyses
 - Budgets



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- Helpful hints
 - Brainstorm with a group
 - Variety of people / experiences
 - Don't get too many "cooks in the kitchen"
 - Avoid ISO definitions
 - Don't overthink / over-analyze



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- Helpful hints
 - Reference other organizations similar in size / scope
 - Don't discriminate
 - Environmental policy
 - Abnormal and emergency situations
 - Maintenance, contractors, suppliers, visitors
 - Planned / new APS
 - Adverse / beneficial impacts



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- Helpful hints
 - Maintain on an annual basis
 - Keep it simple!!!
 - Focus on what your organization can control / influence
 - Generalize
 - Do a draft then finalize
- Continual improvement



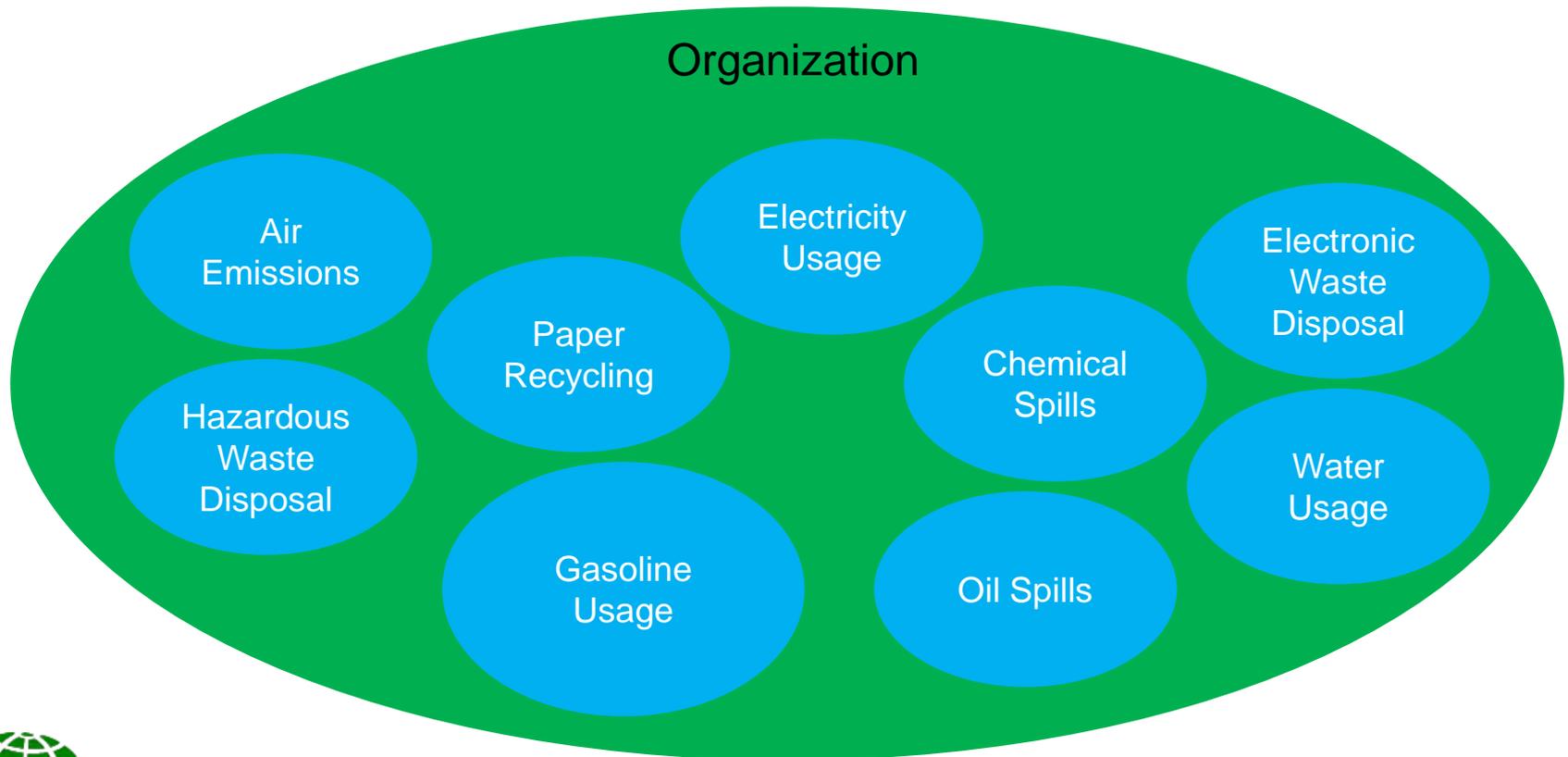
Environmental Aspects and Impacts

Identifying Aspects and Impacts Exercise and Networking



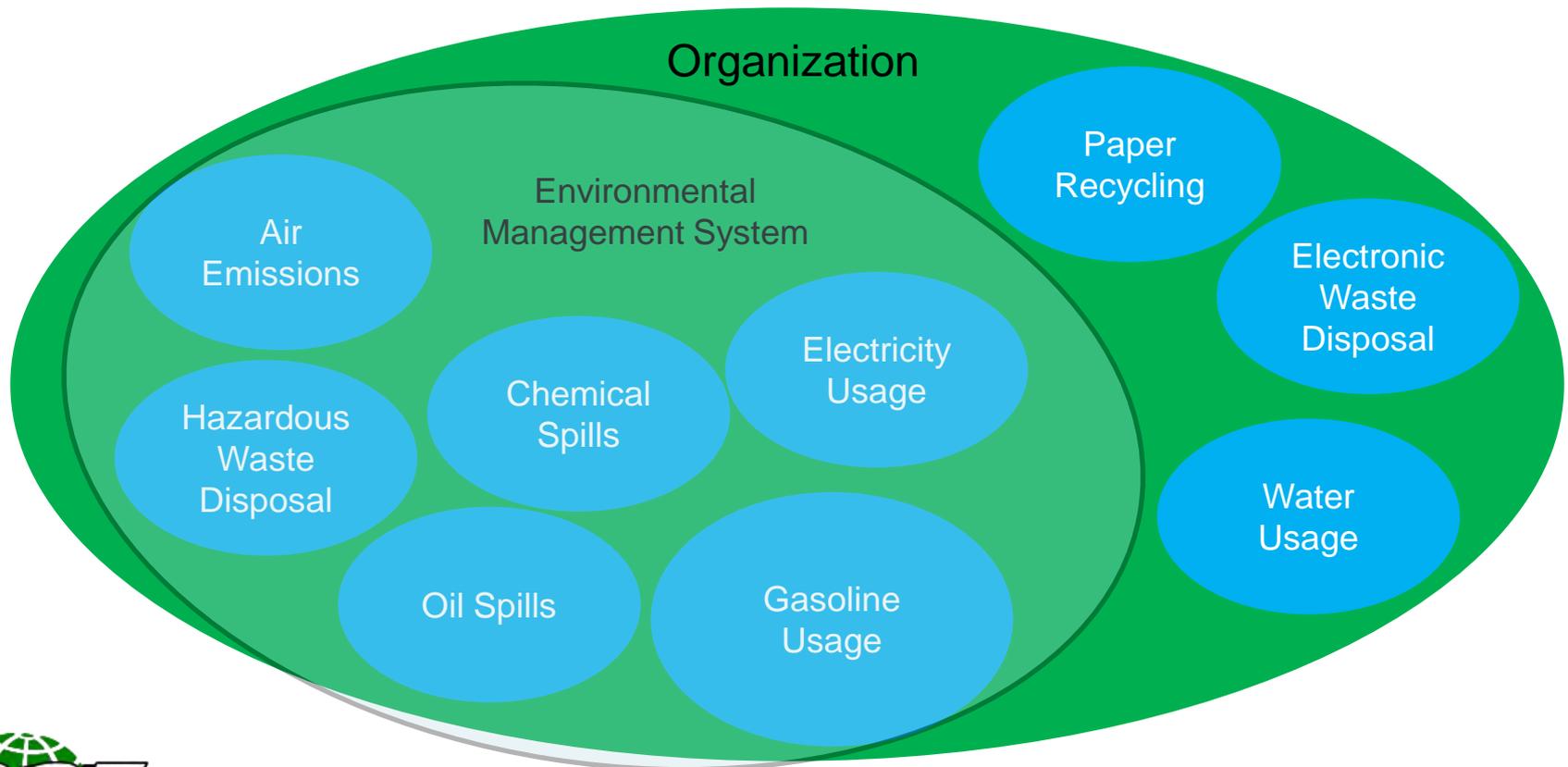
Significant Aspects and Impacts

As with any organization, everything is not managed equally. Some things are more important than others



Significant Aspects and Impacts

Those things that are more important are addressed as a priority by the EMS



Significant Aspects and Impacts

✓ Identify

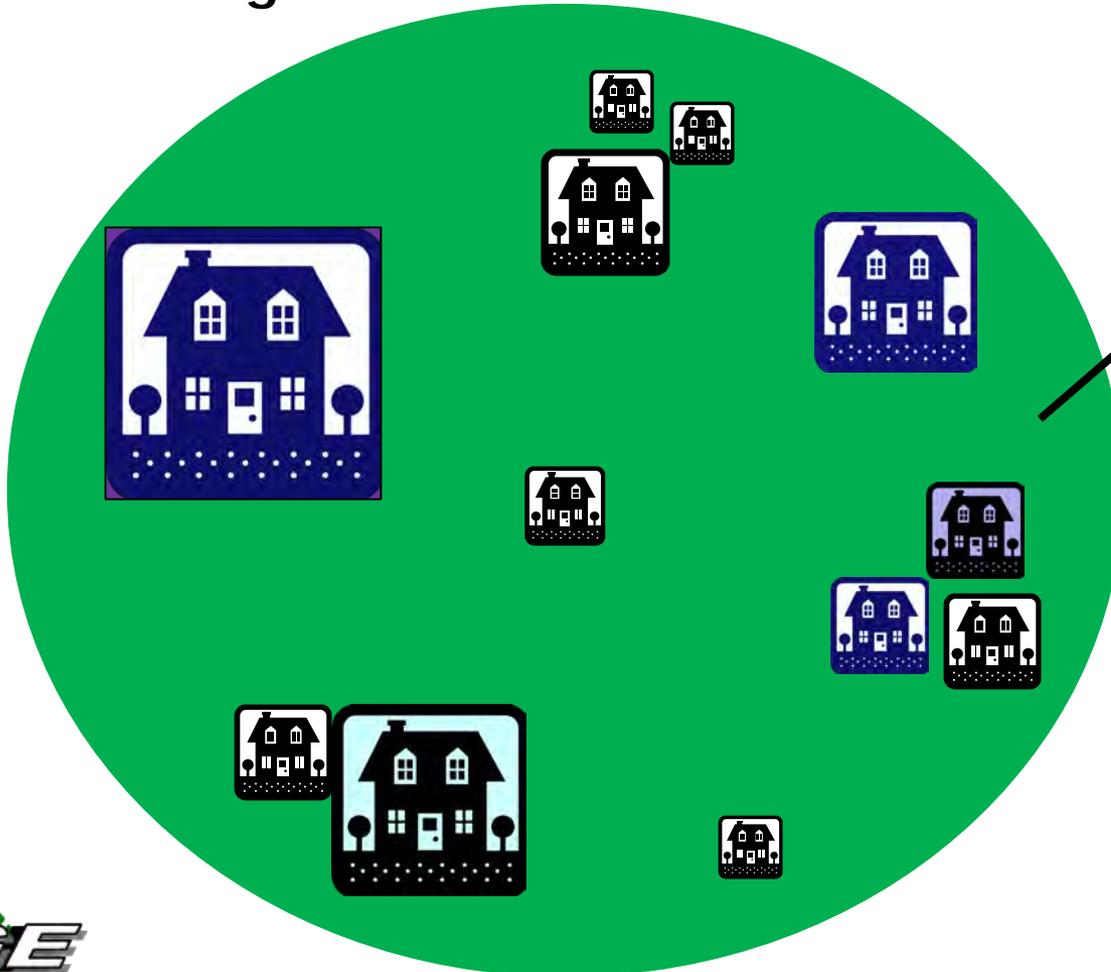
Activities / Products / Services	Environmental Aspects (Causes)	Environmental Impacts (Effects)
Oil Management	Oil Spills	Degradation of Water Quality
General Office Support	Electricity Usage	Depletion of Natural Resources
Equipment Operation	Air Emissions	Degradation of Air Quality
Equipment Operation	Gasoline Usage	Depletion of Natural Resources

2. Prioritize



Significant Aspects and Impacts

The process of buying a home is a good example of prioritizing



Out of all the houses available in your area, how do you decide which ones to go see?



Significant Aspects and Impacts

Different Ways of Determining Significance

- Align with environmental policy. Include criteria and provide consistent results
 - “All-in” methodology
 - “Comparative” methodology
 - “Scoring” methodology



Significant Aspects and Impacts

Different Ways of Determining Significance

- “All-in” methodology
 - All aspects and impacts are significant
 - Criteria -> everything
 - Definitely provides consistent results



Significant Aspects and Impacts

Different Ways of Determining Significance

- “Comparative” methodology
 - Compares each aspect and impact relative to something
 - Criteria -> another organization, industry, geographic location, etc.



Significant Aspects and Impacts

Different Ways of Determining Significance

- “Comparative” methodology

Group (Activity/Product/Service)	Description	Aspects (Cause)	Impacts (Effect on the Environment)	Criteria	Significant? (Y/N)
Activity	Office Support	Waste Generation and Disposal	Degradation of Land Quality	Approx. 105 lbs. per person (2013). Below average for office waste generation within the state.	N
Activity	Office Support	Energy Usage	Depletion of Natural Resources	Approx. 20 kW/sf. (2013). Nearly average within the state.	N
Activity	Office Support	Air Emissions	Degradation of Air Quality	Air emissions from office considered exempt by the state.	N
Activity	Building and Grounds Maintenance	Oil Usage	Depletion of Natural Resources	Approx. 2,750 gals. for company (2013). Below average for businesses within the state.	N
Activity	Building and Grounds Maintenance	Water Usage	Depletion of Natural Resources	Approx. 10,000,000 gals for company (2013). Above average for businesses within the state.	Y
Activity	Building and Grounds Maintenance	Chemical Usage	Depletion of Natural Resources	Company is above average user of TRI chemicals within the state (2012).	Y
Activity	Building and Grounds Maintenance	Chemical Usage	Degradation of Land Quality	Company is above average user of TRI chemicals within the state (2012).	Y



Significant Aspects and Impacts

Different Ways of Determining Significance

- “Scoring” methodology
 - Focuses on a few characteristics
 - Values each characteristic
 - Calculates total value based on a formula
 - Very common method



Significant Aspects and Impacts

Different Ways of Determining Significance

- “Scoring” methodology

Significance Methods Template - Excel

Area	Aspects (Cause)	Impacts (Effect on the Environment)	Probability	Severity	Regulated	Stakeholder Interest	Total	Significant? (Y/N)
Shipping & Receiving	Waste Generation and Disposal	Degradation of Land Quality	5	3	1	1	15	N
Shipping & Receiving	Energy Usage	Depletion of Natural Resources	5	3	1	3	45	N
Paint Room	Air Emissions	Degradation of Air Quality	5	3	3	3	135	Y
Canopy Pre-cut Area	Air Emissions	Degradation of Air Quality	5	3	3	3	135	Y
HVAC Storage	Energy Usage	Depletion of Natural Resources	5	3	1	3	45	N
Electrical Finish	Chemical Usage	Depletion of Natural Resources	3	3	1	1	9	N
Plumbing/HVAC	Energy Usage	Depletion of Natural Resources	5	3	1	3	45	N
Fastener Cage	Waste Generation and Disposal	Degradation of Land Quality	3	3	1	1	9	N
Receiving Docks Canopy	Waste Generation and Disposal	Degradation of Land Quality	3	3	1	1	9	N
Storage Warehouse Area (#1)	Energy Usage	Depletion of Natural Resources	5	3	1	3	45	N
Storage Warehouse Area (#2)	Spills	Degradation of Land Quality	3	3	3	3	81	N
Manufacturing Area	Waste Generation and Disposal	Degradation of Land Quality	5	5	5	3	375	Y



Significant Aspects and Impacts

Different Ways of Determining Significance

- The plain truth
 - No “magic bullet”
 - Best method depends on organization
 - Pros and Cons for each method



Significant Aspects and Impacts

Different Ways of Determining Significance

- Helpful hints
 - Be consistent
 - Use Excel (or some other software)
 - Use what is already available / common within your organization
 - Don't worry about collecting data



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- Helpful hints
 - Brainstorm with a group
 - Variety of people / experiences
 - Don't get too many "cooks in the kitchen"
 - Avoid ISO / technical definitions
 - Don't overthink / over-analyze
 - Document "rules" for consistency
 - Reference other organizations similar in size / scope



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- Helpful hints
 - Avoid criteria with overlap
 - Include a “trump card”, if necessary
 - Maintain on an annual basis



Environmental Aspects and Impacts

Methods for Identifying Aspects and Impacts

- Helpful hints
 - Keep it simple!!!
 - Use easy “rules”
 - Do a draft then finalize
 - Conduct a reality check
 - Continual improvement



Significant Aspects and Impacts

Determining Significance Exercise and Networking



Open Discussion

- Questions??
- Attendance sheet
- Evaluations
- Thank you for attending
- Contact SGE anytime
 - Cory Sander @ 614-917-3074
 - Cory@SanderGroupEnv.com
- Stay around for additional questions or comments and networking
- Hope to see you or talk to you again soon

